EDA participating Member States (pMS)

COMMON POSITION ON AMMUNITION CLASSIFICATION UNDER REACH

1 October 2021

Revision History

DATE	VERSION	COMMENTS
25 September 2017	Initial	Initial version, adopted by EDA participating Member States (pMS) (EDA Steering Board) and Norway, and later published openly at EDA website, in September 2017.
1 October 2021	Revised	Incorporating 1) the outcome of further EDA technical-level work with support by the EDA REACH Task Force, after the adoption of the initial version, 2) the outcome of EDA follow-on exchanges, on the initial document version, with key stakeholders (pMS, European Commission, European Chemicals Agency (ECHA) and EU industry), 3) recent developments at EU-level and pMS national level, in the area of Ammunition Classification under REACH.

DISCLAIMER

This document reflects EDA participating Member States (pMS) position/views on the classification under REACH of **specific (not necessarily all inclusive)** ammunition categories and types, **used strictly for defence purposes**. In this regard, the position/views reflected in the document **are not applicable in any way to products not used for defence purposes that may have similar characteristics/functions**. Views reflected are **for reference only** and **are not in any way legally binding** for those obligated by REACH, the EDA pMS, or other REACH stakeholders. **Usage of the information** contained in the document **remains under the sole responsibility of the users**, including ensuring that any conclusions drawn on the basis of the information are compliant with REACH or any other applicable national and EU legislation. EDA and its pMS, adopting this document, will not be held liable or bear any responsibility in this regard.

Table of Contents

ANNEXES

1. INTRODUCTION

The purpose of the REACH Regulation[1], in force since 1 June 2007, is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market, while enhancing competitiveness and innovation. In parallel, the associated CLP Regulation[2] ensures that the hazards presented by chemicals are clearly communicated to workers and consumers in the European Union through classification and labelling of chemicals.

REACH lays down provisions on substances[3] and mixtures[4]. These provisions apply to the manufacture, placing on the market[5] or use of such substances on their own, in mixtures or in articles[6] and to the placing on the market of mixtures, based on the principle that it is for manufacturers, importers and downstream users[7] to ensure that they manufacture, place on the market or use such substances that do not adversely affect human health or the environment. Duties and obligations increase in case chemicals used are considered as Substances of Very High Concern (SVHCs) and are included in the REACH Candidate List[8].

Since the introduction of the REACH Regulation, the EU defence industry in the supply chain (e.g. manufacturers, importers or downstream users) has acknowledged the importance of the classification of military equipment under REACH, in sectors of high importance for defence, such as ammunition.

Such importance is highlighted by the fact that the duties and obligations imposed on defence industry (as manufacturers, importers and downstream users) by REACH vary considerably depending on the

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[1] REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. The REACH Regulation applies to the European Economic Area (EEA), i.e. the 28 EU Member States and Iceland, Liechtenstein and Norway.

[2] REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

[3] Substance: means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition (per Article 3, par. 1 of REACH Regulation).

[4] Mixture: means a mixture or solution composed of two or more substances (per Article 3, par. 2 of REACH Regulation).

[5] Placing on the market: means supplying or making available, whether in return for payment or free of charge, to a third party. Import shall be deemed to be placing on the market (per Article 3, par. 12 of REACH Regulation).

[6] Article: means an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition (per Article 3, par. 3 of REACH Regulation).

[7] Downstream user: means any natural or legal person established within the Community, other than the manufacturer or the importer, who uses a substance, either on its own or in a mixture, in the course of his industrial or professional activities. A distributor or a consumer is not a downstream user (per Article 3, par. 13 of REACH Regulation).

[8] Refer to https://echa.europa.eu/candidate-list-table. The first step in the authorisation process is to identify those substances that may have serious effects on human health or the environment and, therefore, the risks resulting from their use must be properly controlled and the substances progressively replaced when possible. Member States or ECHA, at the request of the European Commission, can propose a substance to be identified as a Substance of Very High Concern (SVHC). If identified, the substance is added to the Candidate List, which includes candidate substances for possible inclusion in the Authorisation List (Annex XIV). The inclusion of a substance in the Candidate List creates legal obligations to companies manufacturing, importing or using such substances, whether on their own, in mixtures or in articles.

agreed classification of the equipment, in this case ammunition, under REACH, as described further in Section 4 below.

2. ECHA GUIDANCE ON ARTICLES – APPLICATION TO AMMUNITION

Since the start of implementation of the REACH Regulation, the European Commission, via the European Chemicals Agency (ECHA), has made information available and developed tools to support stakeholders in fulfilling their duties under the Regulation.

More specifically, to assist manufacturers, importers and downstream users in identifying and complying with their duties and obligations under REACH, especially in relation to registration and notification duties according to REACH Article 7(1)[9] and 7(2)[10] respectively, and in relation to article supply chain communication duties according to REACH Article 33(1)[11], ECHA has developed and published a related "Guidance on Requirements for Substances in Articles" (latest version 4.0/June 2017)[12] (hereinafter "ECHA Guidance").

As clarified by ECHA in its Guidance, while it aims to assist users in complying with their duties and obligations under the REACH Regulation, ***"users are reminded that the text of the REACH Regulation is the only authentic legal reference and that the information in the ECHA document does not constitute legal advice"***.

The ECHA Guidance provides a methodology for classifying objects under REACH (which was the basis for the EDA work methodology on Ammunition Classification, to be further explained under Section 6.3 below) into **three possible classification categories**:

1) The object is a **substance** or a **mixture**;

2) The object is a **combination of an article and a substance/mixture**;[13]

3) The object is an **article.**[14]

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[9] REACH Article 7(1) states: *"Any producer or importer of articles shall submit a registration to the Agency for any substance contained in those articles, if both the following conditions are met: (a) the substance is present in those articles in quantities totalling over one tonne per producer or importer per year; (b) the substance is intended to be released under normal or reasonably foreseeable conditions of use. A submission for registration shall be accompanied by the fee required in accordance with Title IX."*

[10] REACH Article 7(2) states: *"Any producer or importer of articles shall notify the Agency, in accordance with paragraph 4 of this Article, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1), if both the following conditions are met: (a) the substance is present in those articles in quantities totalling over one tonne per producer or importer per year; (b) the substance is present in those articles above a concentration of 0,1 % weight by weight (w/w)."*

[11] REACH Article 33(1) states: "*Any supplier of an article containing a [candidate list] substance […] in a concentration above 0,1 % weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance."*

[12] Refer to https://echa.europa.eu/documents/10162/23036412/articles_en.pdf/cc2e3f93-8391-4944-88e4-efed5fb5112c ECHA has also published an "ECHA Guidance on Requirements for Substances in Articles - in a Nutshell"/v.3.0/ December 2017, available at https://echa.europa.eu/documents/10162/23036412/nutshell_guidance_articles2_en.pdf/1e13dcce-b46b-43cb-904e-6c4675613e9d.

[13] The "combination of an article and a substance/mixture" classification category is not mentioned in the legal text of the REACH Regulation.

[14] "Article" (e.g. paper sheet, one-piece plastic spoon) or "Article with an integral substance or mixture" (e.g. thermometer).

European defence industry produces a large number of different categories/types of ammunition, with different characteristics, functions, shapes, and, in many cases, sophisticated designs. On the other hand, the main existing tool for ammunition classification under REACH, the ECHA Guidance, is a generic document providing (admittedly useful) guidance on a wide range and variety of products. Among its information, it provides for some borderline cases representing objects with different levels of complexity (e.g. printer cartridge). Ammunition (in general and some types even more in particular) are rather more complex as their overall function is determined by the sophisticated design and interplay between its different components.

In conclusion, **the ECHA Guidance is general and does not address specifically ammunition[15]. Its application on ammunition, considering their technical sophistication and complexity, needs to take place after appropriate methodology clarification and adaptation, which requires combined in-depth REACH and ammunition technical expertise**.

3. EU DEFENCE INDUSTRY WORK – GUIDANCE ON AMMUNITION CLASSIFICATION

To ensure a harmonised implementation and interpretation of REACH in the field of ammunition industries, the French association for the land armaments industry: *"Groupement des Industries de Défense et de Sécurité Terrestres et Aéroterrestres"* (*GICAT*)/REACH Working Group[16] developed a professional Guidance titled *"Status of Ammunition and Components of Ammunition in the REACH Regulation – Professional Guidance"* originally published in 2009, and later on updated several times to reflect related developments at EU level (hereinafter "GICAT REACH Professional Guidance")[17].

This GICAT REACH Professional Guidance used the ECHA Guidance criteria and aims to provide a reference document for European defence industry and other competent stakeholders when dealing with the issue of ammunition classification under REACH.

The latest version of the GICAT REACH Professional Guidance is v. 4/18 December 2020[18], resulting from work conducted aiming, as reflected in the document, to incorporate updates according to the latest ECHA Guidance on requirements for substances in articles (version 4.0/June 2017) and required changes based on GICAT exchanges in recent years on Ammunition Classification under REACH with the Aerospace and Defence Industries Association of Europe (ASD)[19] as well as EDA.

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[15] The advice provided in the ECHA Guidance applies in principle to all objects/articles. Some principles apply to subgroups of these with common characteristics, depending on the aspect/issue covered by the text. The examples in the ECHA Guidance aim at illustrating the application of the general principles which can be extended/adapted for other cases.

[16] GICAT REACH Working Group is composed of experts from Etienne LACROIX, NEXTER MUNITIONS, EURENCO, THALES LAS FR, ARIANE GROUP, MBDA-FRANCE, DAVEY BICKFORD, JUNGHANS-T2M, NOBELSPORT, AIRBUS DS, and with the participation of the SFEPA.

[17] Refer also to https://www.gicat.com/espace-membre/guide-de-procedure-reach/.

[18] https://www.gicat.com/travaux-du-groupe-de-travail-munitions-reach-du-gicat/ As mentioned in the GICAT REACH Professional Guidance, the document has received the agreement of:

- The French association of manufacturers of explosives, pyrotechnics and fireworks, SFEPA, representing 33 companies;
- The Aerospace and Defence Industries Association of Europe, ASD REACH Implementation Working Group, representing 23 National Associations headquartered in 18 countries;
- BDSV (Bundersverband der Deutschen Sicherheits and Verteidigungsindustrie), the REACH Working Group of the Federation of German Security and Defence Industries, representing over 221 companies (including subsidiaries).

[19] The Aerospace and Defence Industries Association of Europe (ASD) represents over 3,000 companies. It has 40 direct members, active in 18 countries, including 18 major European industries and 23 National Defence Industry Associations. Refer also to http://www.asd-europe.org/.

The challenges and complexity for classifying complex objects, in this case ammunition, under REACH, mentioned above, also in relation to the application of the ECHA Guidance, are elaborated in detail in Section 4 of the latest GICAT REACH Professional Guidance, including information on the architecture, design and functioning of ammunition.

4. DUTIES AND OBLIGATIONS UNDER REACH – IMPACT AND IMPORTANCE OF CORRECT AMMUNITION CLASSIFICATION

From a point of view of the concerned industry, REACH imposes significantly different duties and obligations if the object in question, in this case ammunition, is classified as **article** (where a substance/mixture may form an integral part of the article), while when ammunition is classified as a **combination of an article** (acting as a container or carrier material) **and a substance/mixture**, other duties, and often additional, more complex, time consuming and costly duties and obligations may apply to the substances and mixtures comprised in it.[20]

Accordingly, for manufacturers or importers, **the correct classification of military equipment**, here namely ammunition, **is of great importance, since an incorrect classification may:**

- **Lead to substantial additional work and expense for the affected defence industries, and other competent stakeholders, which is disproportionate to the possible health and environmental benefits generated**;
- **Impact significantly the availability, cost, reliability and performance of related equipment/ammunition;**
- **Affect the consequent application (by duty holders) of other EU legislation on such military equipment, such as: the CLP Regulation (in general and specifically its recently added Annex VIII on Poison Centres Notifications[21]), and the notification of information in accordance with the Waste Framework Directive (WFD)[22]/SCIP Database[23].**

All defence stakeholders recognise and understand that defence exemptions under Article 2(3) of REACH[24] cannot be used as a means to reduce or eliminate their duties and obligations under REACH.

The principles and technical requirements for granting defence exemptions by EDA pMS have been agreed in the *EDA Code of Conduct on REACH Defence Exemptions (CoC)*[25], adopted by EDA pMS in March

[20] Detailed information on consequences of classification, duties and obligations under REACH, for each classification category, can be found in Annex 1 of the GICAT REACH Professional Guidance.

[21] COMMISSION REGULATION (EU) 2017/542 of 22 March 2017 amending REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on classification, labelling and packaging of substances and mixtures by adding an Annex on harmonised information relating to emergency health response (Text with EEA relevance).

[22] DIRECTIVE (EU) 2018/851 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 2008/98/EC on waste.

[23] SCIP is the database for information on Substances of Concern In articles as such or in complex objects (Products) established by ECHA, under the WFD, Article 9(1)(i) https://echa.europa.eu/scip.

[24] REACH Article 2(3) states: "*Member States may allow for exemptions from this Regulation in specific cases for certain substances, on their own, in a mixture or in an article, where necessary in the interests of defence*".

[25] https://www.eda.europa.eu/docs/default-source/documents/eda-code-of-conduct-on-reach-defence-exemptions.pdf and associated Framework for Applying for a Defence Exemption from a Requirement of REACH https://www.eda.europa.eu/docs/default-source/documents/annex-to-coc---framework-for-applying-for-a-defence-exemption-from-a-requirement-of-reach.pdf.

2015[26]. In accordance with the current version of the CoC, the granting of the defence exemptions should be considered only after the following alternative methods have been examined:

- complying with the requirements of the REACH Regulation; and
- elimination[27] or substitution of hazardous substance(s) with less hazardous/safer alternatives.

Therefore, only when compliance with the above is not possible, then the granting of defence exemption(s) could be considered in a case-by-case basis, **as a last resort solution**, if/when applicable.

In addition, defence exemptions are not a panacea since they cannot guarantee the market availability of chemicals necessary to maintain military equipment, in the long term. In cases where defence industries in more than one Member State are involved in a transnational supply chain, defence exemptions are not even an option, or can be very difficult to manage.

5. CJEU JUDGEMENT OF 10 SEPTEMBER 2015 IN CASE C-106/14

The Court of Justice of the European Union (CJEU) with its judgement of 10 September 2015 in case C-106/14[28] clarified the scope of the notification and communication obligations under Articles 7(2) and 33 of REACH, which apply to articles that are present in complex products (i.e. products made up of more than one article) as long as these articles keep a special shape, surface or design and do not become waste.

According to the Court's judgement:

- Article 7(2) of the REACH Regulation must be interpreted as meaning that, for the purposes of application of that provision, it is for the producer to determine whether a Candidate List substance of very high concern, is present in a concentration above 0.1% weight by weight of any article it produces and, for the importer of a product made up of more than one article, to determine for each article whether such a substance is present in a concentration above 0.1% weight by weight of that article.
- Article 33 of the REACH Regulation must be interpreted as meaning that, for the purposes of application of that provision, it is for the supplier of a product one or more constituent articles of which contain(s) a Candidate List substance of very high concern in a concentration above 0.1% weight by weight of that article, to inform the recipient and, on request, the consumer, of the presence of that substance by providing them, as a minimum, with the name of the substance in question.

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[26] All EDA pMS, except Poland, as well as Norway, have subscribed to the EDA CoC on REACH Defence Exemptions.

[27] "Elimination" of a hazardous substance has the meaning that the whole product containing the hazardous substance may be replaced and the new product does not contain a hazardous substance, while in "substitution" the hazardous substance within a product is replaced with a less hazardous/safer one.

[28] CJEU Case C-106/14 "*Fédération des entreprises du commerce et de la distribution (FCD) and Fédération des magasins de bricolage et de l'aménagement de la maison (FMB) v Ministre de l'écologie, du développement durable et de l'énergie, Request for a preliminary ruling from the Conseil d'État (France), Reference for a preliminary ruling — Environment and protection of human health — Regulation (EC) No 1907/2006 (REACH Regulation) — Articles 7(2) and 33 — Substances of very high concern present in articles — Duties to notify and provide information — Calculation of threshold of 0,1% weight by weight*". The CJEU judgment of 10 September 2014 in case C-106/14 is available at: http://curia.europa.eu/juris/liste.jsf?language=en&td=ALL&num=C-106/14.

The EDA work on ammunition classification, as described in detail in Section 6 below, was conducted bearing in mind the CJEU Judgement of 10 September 2015 in case C-106/14 and thus **the outcome of the work, as reflected in the present document, is considered as consistent with this judgement**.

6. EDA WORK ON AMMUNITION CLASSIFICATION

The EDA work on Ammunition Classification under REACH aims at **establishing an EDA pMS common position on the topic, by considering also relevant work conducted previously by EU defence industry,** in order to:

- Reduce the risk of misinterpretation of, and enhancing compliance to, the REACH Regulation´s provisions on substances/mixtures or articles;
- Support the European Defence Technological and Industrial Base (EDTIB) in its efforts to raise awareness on issues pertaining to ammunition classification under REACH; and
- Minimise the possibility of cases of potential incorrect classification of ammunition along the REACH Regulation´s provisions on substances/mixtures or articles, and related potential negative impact to the operational effectiveness of the EDA pMS' Armed Forces.

This document reflects EDA pMS position/views on the classification under REACH of **specific (not necessarily all inclusive)** ammunition categories and types, **used strictly for defence purposes**. In this regard, it is highlighted that the position/views reflected in the document **are not applicable in any way to products not used for defence purposes that may have similar characteristics/functions**.

6.1 Background – Process of Work

Up to the adoption of the EDA pMS Common Position on Ammunition Classification under REACH (hereinafter "Common Position") /September 2017 (Stage 1)

In late 2013, a discussion on status/classification of certain ammunition types under REACH was initiated amongst stakeholders at EU level, focusing on the question[29] whether a certain type of ammunition, specifically standard small caliber "ammunition cartridges" is to be determined as a "combination of an article and a substance/mixture" or an "article with an integral substance/mixture", which the European Commission was called upon to review and answer.

Following discussion also in the frame of the Commission's special group of representatives of Member States' competent authorities on REACH and CLP (CARACAL), the Commission informed ECHA in December 2014 on the outcome of its review, based on which the specific ammunition should be considered as "Articles".[30]

On the basis of this discussion, which was focused **on only one out of the many** existing categories/types of ammunition used by MoDs/Armed Forces, the EDA proposed the initiation of related work for a wider

[29] Originated initially by the German Federal Institute for Occupational Safety and Health (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA)).

[30] Refer to subsequent related publications by ECHA under https://echa.europa.eu/support/qas-support/qas (Q&A # 1059) stating: *Question: Are ammunition cartridges designed to launch a projectile (e.g. a bullet) considered as 'articles' under REACH? Answer: Yes, ammunition cartridges that are designed to launch a bullet are considered to be articles with an integral substance/mixture (the propellant) because the shape, surface and design of such ammunition cartridges determine their function to a greater degree than does its chemical composition. It should be noted that this answer is limited to ammunition cartridges that are designed to launch a projectile (i.e. a bullet). It does not necessarily apply to ammunition where the function of the object is the deliberate release of a mixture (i.e. flares, gas grenades, etc.).*

spectrum of ammunition types to develop an EDA pMS common position that could serve as future reference for EDA pMS experts, national helpdesks, competent authorities, as well as industrial stakeholders. This would also assist EDA pMS in building a common understanding of REACH through exchanging best practices. Following strong support to the EDA proposal by its pMS, the Commission and EU defence industry, work was initiated in June 2014.

Due to the complexity of the issue, an expert group comprised of EDA pMS experts from MoDs/Armed Forces called the *"EDA REACH Task Force"* [31], was formed to support the Agency at the technical level.

Regular EDA REACH Task Force meetings (total 13) took place between September 2014 and June 2017, for technical level discussion and elaboration of related documents. Work sharing between Task Force experts was applied on the basis of dedicated Action Items assigned to them, continuously monitored for prompt and proper implementation.

As an outcome of the technical work completed during this period (Stage 1), in September 2017 the Common Position was adopted by the EDA Steering Board. More specifically, the EDA Steering Board:

a. *welcomed the EDA work and results achieved to date on Ammunition Classification under REACH and adopted the Member States' Common Position on Ammunition Classification under REACH (at Annex);*

b. *tasked the Agency to:*

    i. *disseminate the document as widely as possible to all relevant stakeholders, including the Commission, ECHA and EU defence industry; make the document publicly available at EDA's website;*

    ii. *assess potential future feedback/comments from relevant stakeholders, including the Commission, ECHA and EU defence industry, as basis for future improvement of the Common Position adopted.*

c. *called on Third States bound by the REACH Regulation and having an Administrative Arrangement with the Agency, wishing to adopt the Member States' Common Position on Ammunition Classification under REACH, to inform the Agency by 15 November 2017.*

In October 2017, the Common Position was adopted also by Norway.

After the adoption of the Common Position/September 2017 (Stage 2)

In line with the Steering Board tasking, upon its adoption, the EDA disseminated the Common Position as widely as possible to all relevant stakeholders, including the Commission, ECHA and EU defence industry (and made the document publicly available on EDA's website), requesting potential feedback with the intention to assess as basis for future improvement of the document.

In late 2017/early 2018, a discussion of the issue of the Common Position (but not going into technical-level details) took place in a meeting of the Commission's expert group of Member States' Competent

[31] Currently 10 EDA pMS (CZ, DE, EL, ES, FI, FR, IT, NL, RO, SE) as well as Norway, participate in the EDA REACH Task Force. EDA pMS experts participating in the EDA REACH Task Force have in-depth expertise on REACH. Some of them, apart from REACH, have also in-depth ammunition expertise. Finally, EDA pMS ammunition experts (subject matter experts) were also heavily involved in the process, to support the Task Force work.

Authorities (MSCAs) for REACH and CLP (CARACAL), for which EDA (not attending the meeting) was informed.

Later in 2018 and during 2019, related informal discussions took place between the Commission (DG GROW), ECHA and EDA, the outcome of which was later taken into account in work by EDA to incorporate overall informal feedback/proposals for improvement received from stakeholders. It has to be highlighted that during this period, and until the finalisation of the revised Common Position, EDA did not receive any formal feedback/comments on the Common Position adopted in September 2017, directly from any stakeholder.

During this phase of work (stage 2), regular EDA REACH Task Force meetings (total 16) took place between November 2017 and December 2020, for technical level discussion and elaboration of documents, in view of preparing, among other issues, a revised version of the Common Position which was concluded in January 2021.

The scope of technical work conducted during this stage included also the following:

- review (re-validation or update, as necessary) of the classification of the ammunition categories previously reflected in par. 7.1 of the Common Position/September 2017;
- further examination and decision for the 9 categories/sub-categories reflected in par. 7.2 of the Common Position/September 2017, which had not been classified.

Throughout the course of the work (before and after the adoption of the Common Position/September 2017), the following principles were agreed by the EDA REACH Task Force, as basis for conducting the work, and were followed throughout the process:

- Taking into account, to the extent possible, previous work on ammunition classification conducted by EU defence industry, especially the GICAT REACH Professional Guidance;
- Following closely the related ECHA Guidance, keeping in mind its general nature and the need for its tailored application on ammunition, due to their technical sophistication and complexity, as described in Section 2 above.

During the process, the EDA pMS were periodically informed on progress at working level through several EDA REACH Plenary meetings (total 10 between November 2014 and January 2021), as well as related EDA communications.

At higher level, relevant developments/EDA proposals on the issue were presented and reviewed at several EDA Steering Boards (30 September 2015, 19 October 2016, 21 February 2019), the decisions of which strongly supported the continuation of the EDA work in this field, and welcomed/adopted related completed deliverable(s) (EDA Steering Board September 2017 – adoption of the Common Position).

Finally, throughout the course of work, regular informal interaction and exchange of information, including through correspondence and ad-hoc meetings, were established between EDA, the EDA REACH Task Force and competent stakeholders, as follows:

- European Commission: The work took place in full transparency to the Commission. DG GROW representative(s) took part periodically in EDA REACH meetings and contributed in related informal exchanges between EDA, EC and ECHA;

- ECHA: In recent years, before (during development) and after the adoption/publication of the Common Position/September 2017, a very useful informal interaction and exchange of views at technical level has been established, between EDA and ECHA, aiming to raise awareness of and improve each side's understanding on how the ECHA Guidance can be best utilised in the area of Ammunition Classification under REACH, and to discuss specific points of special attention;

- EU Defence Industry: : Since the early stages of EDA work, a very beneficial continuous interaction has been established at technical level between EDA and EU defence industry with expertise/prior work in the area of Ammunition Classification under REACH, more specifically FR GICAT and ASD (and through which National Defence Industry Associations (NDIAs) and individual industries/members of ASD), aiming to share information on developments of work conducted by each organisation, and to facilitate an exchange of views between defence governmental and industrial stakeholders, in this important area. This exchange took place through different means:

    - Periodic/Ad-hoc updates to, and feedback from, through correspondence;

    - EDA meetings/sessions that wider industry was invited to attend, organised annually during EDA REACH Plenary meetings (November 2014, November 2015, June 2017, June 2018 and June 2019);

    - Technical meetings organised specifically, or including discussions also on, ammunition classification (e.g. 12 May 2016 in EDA premises, 25 January 2017 in Nexter-Munitions premises, Bourges, FR, and finally 24 June and 20 November 2020, through WebEx).

Periodic updates of and technical feedback on documents from the EDA CapTech[32] Ammunition Technologies, also took place.

Finally, upon conclusion of the technical work of Stage 2 in January 2021, dedicated EDA Communications EDA202103158/ISE/ALE/30 March 2021 and EDA202108010/ISE/CTA-ALE/9 August 2021 were sent to EDA pMS and Norway, informing on/attaching the draft final text of the updated Common Position, and requesting pMS to review and provide comments, in view of incorporating such comments in the text, before submitting the final proposal to the EDA Steering Board, through a written procedure.

6.2. Scope of Work Conducted – Types of Ammunition Reviewed

Taking into account the complexity of the topic of ammunition, it was agreed not to enter into a debate/focus on establishing a commonly agreed definition of ammunition, since it will be very difficult to achieve an agreement on such a definition by all pMS under EDA and to avoid duplication, since such ammunition (or munition) "generic" definitions have been previously established under other fora, such

[32] Capability Technology areas. For more information refer to https://www.eda.europa.eu/Aboutus/how-we-work/expert-teams/capability-technology-areas.

as NATO standards AOP-38[33] and AAP-6[34]. In the context of the present document the term "ammunition" refers to munition/ammunition, in a broad sense.

The list of ammunition identified for classification covered as many as possible of the known types of ammunition used by the EDA pMS MoDs/Armed Forces, independent of their use i.e. for defence or other more general purposes, covering also explosives and other related material (e.g. shape-charges for demolition). Therefore, in principle, as long as a type of ammunition was identified as being in the inventory of MoDs/Armed Forces, it was included for review (total 20 types/categories). In addition, borderline categories/types of ammunition[35] were included and were, to the extent possible, reviewed, with a view to identifying their potential differences from straightforward cases of ammunition types in regards to their classification under REACH.

[33] NATO Allied Ordnance Publication (AOP) – 38 "GLOSSARY OF TERMS AND DEFINITIONS CONCERNING THE SAFETY AND SUITABILITY FOR SERVICE OF MUNITIONS, EXPLOSIVES AND RELATED PRODUCTS", Edition 3.0/April 2002. In accordance with AOP-38-3/April 2002, the terms "ammunition" and "munition" is defined as follows:

- Ammunition: An item containing one or more projectiles, together with propellant needed to impart velocity to the projectile(s) which are propelled from a reusable launcher. The projectiles may be inert or contain a high explosive, smoke generator or other energetic composition. The launcher may be a gun. The NATO and US term "ammunition" covers "munition" as defined in this glossary. Ammunition is a sub-set of munitions.
- Munition (US: ammunition): A complete device, (e.g., missile, shell, mine, demolition store, etc.) charged with explosives, propellants, pyrotechnics, initiating compositions or nuclear, biological or chemical material, for use in connection with offence, or defence, or training, or non-operational purposes, including those parts of weapon systems containing explosives. Alternative definition: Any item which function requires the presence in it of explosive or energetic materials. Other definitions in AAP-6. In logistic configuration, the logistic packaging of the munition is included.

[34] NATO AAP-6 "NATO GLOSSARY OF TERMS AND DEFINITIONS" Edition April 2013 (more recent versions may be available). In accordance with AAP-6/April 2013, the term "munition" is defined as follows:

- Munition: A complete device charged with explosives, propellants, pyrotechnics, initiating composition or chemical, biological, radiological or nuclear material, for use in military operations, including demolitions. Notes: 1. Certain suitably modified munitions may be used for training, ceremonial or non-operational purposes. 2. In common usage, "munitions" (plural) may be military weapons, ammunition and equipment. Related terms: ammunition lot; binary chemical munition; chemical munition; explosive ordnance; fixed ammunition; multi-agent munition; proofing; semi-fixed ammunition; separate loading ammunition (agreed under NATO 02 Mar 2009).

[35] Categories that may fall in the borders between a "combination of an article and a substance/mixture" and an "article" (with an integral substance or mixture).

The complete list of types/categories of ammunition reviewed, is as follows:

CATEGORY/ TYPE No.	CATEGORY/TYPE TITLE
1	Energetic Materials without a defined shape
2	Energetic Materials/Propellants with a defined shape
3	Energetic Materials/ Explosives without a defined shape
4	Energetic Materials/ Explosives with a defined shape
5	Propelling Charge without initiation system
6	Charges/High explosive charge with defined shape (engineering charge) without its initiation system
7	Pyrotechnic (or energetic) components and devices used in ammunition
8	Pyrotechnic and Explosive Cords
9	Propelling charge with initiation system
10	Self-propelled munition engine
11	Warhead with initiation system
12	(Armor-) piercing / kinetic energy ammunition
13	High Explosive (HE) ammunition and munitions
14	Fixed or projected illuminating ammunition
15	Screening Smoke and coloured smoke ammunition
16	Emissive decoys
17	Passive decoys
18	Physiological-effect ammunition
19	Special-effect ammunition
20	Practice (or training) ammunition
21	Location Markers

These categories are further divided into subcategories, depending on the special characteristics and/or deviations in main function of ammunition belonging to the corresponding categories/types. More details on the subcategories for each category/type can be found in the Ammunition Categories/Types Table, attached as Annex B.

Note: The categorisation developed under the EDA work for ammunition classification purposes may not fully coincide with relevant categorisations by other stakeholders who have also conducted work on ammunition classification. If needed, it will be up to the potential user of information to assess potential relevance between EDA's and other stakeholders' ammunition categories.

6.3 Classification Methodology Applied

As mentioned in Section 6.1 above, the EDA ammunition classification work was based on the related ECHA Guidance.

More specifically, the ECHA workflow (Decision-making on whether an object is an article or not) in Chapter 2.3 titled *"Deciding whether an object is an article or not"*, page 18 of the ECHA Guidance (v.4.0/June 2017) and related step-by-step questions were the basis of the process that was followed for EDA work on ammunition classification. These are reflected in detail in Annex A.

Main Classification Methodology Principles

The review of each category and consequent classification under REACH was conducted with a critical/strict view to classification, so that the results are as objective and justifiable, as possible.

It has to be noted that the ECHA Guidance (v.4.0/June 2017) Step 2 question mentions: "*If it can be unambiguously concluded that the shape, surface or design of the object is more relevant for the function than its chemical composition, the object is an article. If the shape, surface or design is of equal or less importance than the chemical composition, it is a substance or mixture. The assessment on whether an article should be considered an "article with intended release of a substance/mixture" or not, as defined in chapter 4.1, is strongly recommended to be done at this step, before proceeding with the next steps. If it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not, a deeper assessment is needed; for this proceed with step 3. Steps 3 to 6 were developed to support a deeper assessment for certain large (sub)groups of objects with common features. Note that they do not cover all possible objects, therefore, they may not allow reaching a final conclusion for a particular object under assessment. In such cases, the assessment needs to take into account other specific considerations that will allow answering the question in step 2 in the workflow above."*

Considering the complexity of ammunition, it became obvious that it was very difficult, if not impossible, to be able to unambiguously conclude on the above mentioned for specific (especially borderline) categories, while doing so for other cases would need extensive in-depth knowledge and information of the design characteristics, as well as potential end user requirements and/or technical specifications of the ammunition, which was not available to EDA or its shareholders i.e. the EDA pMS.

In parallel, the fact that the Step 2 question (shape, surface or design of the object is more relevant for the function than its chemical composition, **or not**) requires a one-off answer to determine the classification, resulted in specific cases (even if few in number) where stakeholders (based on the potential information and data known to them) took totally opposite positions when answering the Step 2 question, thus leading to contradicting results for the exact same ammunition type. On the other hand, the step/questions that follow Step 2 question (Step 3 to 6 questions) engage into deeper discussion on the (individual and also combined) characteristics of the objects in question, thus providing a more objective and tailored way to determine their classification, especially for complex objects, such as in this case, ammunition.

Considering all the above mentioned, as well as the need to have a uniform, consistent and objective methodology that could/would be applied for **all** ammunition categories/types, regardless of their nature and characteristics, the EDA work on ammunition classification applied the following rule:

- When examining all categories of ammunition, the initial intent would be when answering Step 2 question to try to unambiguously conclude (provide a clear *"yes"* or *"no"* answer), if possible, based on the information gathered/available;
- For all cases that this would not be eventually possible (Step 2 question cannot be answered unambiguously), work will proceed in answering the further steps/questions, as per the ECHA Guidance;

- For those cases where it will be eventually possible to answer the Step 2 question **unambiguously** with a *"yes"* (Article), the further steps will also be examined/answered per the ECHA Guidance, as a back-up, to further support the "Article" classification.[36]

Finally, it became clear from further in-depth review during the course of the work, that some ammunition categories reflect borderline cases and are so complex/inclusive of potential different subcategories/types of ammunition, that EDA and MoD experts (EDA REACH Task Force) did not possess all the technical information and expertise necessary to decide unambiguously on all types of ammunition included in each category, to be able to conclude on their (overall category) classification under REACH, while such in-depth information is known only to industry/suppliers for each ammunition type, on a case-by-case basis. For these specific ammunition categories, it was decided to reflect ***"To be determined by the supplier on a case-by-cases basis"*** as the outcome of the classification work within the scope of this document. For such ammunition categories/types, one can refer to potential related industry guidance(s), such as the GICAT REACH Professional Guidance mentioned in Section 3 above for more information.

When classifying the different types of ammunition, the questions/steps mentioned in the ECHA Guidance are very important, and therefore, their exact scope needed to be very clear. Following in-depth review of the ECHA Guidance steps/questions and bearing in mind the need to apply these to classify ammunition specifically, **informal technical-level** exchanges took place with ECHA services for clarifications, the outcome of which was taken into account in further work by the EDA/EDA REACH Task Force.

Ammunition Categories/Types Table

A description of the "function" for each category/subcategory was identified. **This is considered a crucial factor since all the Steps/Questions in the ECHA Guidance need to be answered always considering the "main function"[37] of the respective ammunition type under examination.**

Potential additional information that was deemed useful for the task at hand, including potential **non-exhaustive examples** and **indicative pictures** for each ammunition type, were identified. All related information was compiled into a single "Ammunition Table", attached as Annex B.

Important Note: This table should be seen as merely an **illustrative compilation** of the ammunition categories/types that were reviewed, based on information available to the EDA and the EDA REACH Task Force. Therefore, **special cases of ammunition may exist which, depending on their design and characteristics, would be better fitted under other categories than the ones they are currently reflected under, in the Ammunition Table. This will be up to ammunition manufacturers, being the entities that have the required in-depth knowledge and expertise, to further assess and identify.**

[36] Even if this methodology (follow steps after step 2 as back-up) is not mentioned in the ECHA Guidance, this is a working level methodology adopted by the EDA REACH Task Force, for backing-up results concluded, that is not in any way in conflict with the ECHA guidance. It was especially important to apply this methodology in cases that different opinions/views on the ambiguity or not of answering Step 2 existed within the EDA REACH Task Force. In any case, the ECHA guidance is not a legally binding document, and as mentioned previously, its application on ammunition, considering their technical sophistication and complexity, needs appropriate methodology clarification and adaptation, which requires combined in-depth REACH and ammunition technical expertise.

[37] On the basis of Chapter 4 of ECHA Guidance v.4.0/June 2017, other functions may play a less important role in the assessment.

Ammunition Classification Evidence Forms

A specific document template denoted *"Evidence Form"* was created to facilitate the ammunition classification process on the basis of the ECHA Guidance (answering of Steps/Questions), providing the means to fill in related answers to the ECHA Guidance Steps/Questions, as shown in Annex C, Attachment 1.

Each of the categories/subcategories of ammunition identified in the Annex B (Ammunition Table), for which a definitive classification (Article, Combination, Substance/Mixture) was possible/concluded, were reviewed in-depth and answers were filled in respective Evidence Forms. All filled evidence forms are attached in Annex C, Attachment 2, justifying the proposed classification of respective ammunition categories/types. For the ammunition categories which were deemed especially complex/borderline cases and for which the classification is "To be determined by the supplier on a case-by-case basis", no evidence forms were filled/included in Annex C, Attachment 2.

All Evidence Forms answers to questions, for all categories/subcategories of ammunition for which such forms were developed, are attached in Annex C, Attachment 3, to provide a global view.

Intended Release of Substances in Articles

The issue of "intended release" (or not) of substances, applicable in cases where an object is classified as an Article, as reflected in par. 4.1 of ECHA Guidance, was not examined by EDA/Task Force during the work conducted[38], considering that this goes a step further to classification and requires even deeper understanding and related technical information on design and function, for each ammunition category/subcategory.

7. WORK FINAL RESULTS - CONCLUSIONS

The following constitute the final results/conclusions from EDA ammunition classification work for the ammunition categories/subcategories reviewed.

Category/ Type No.	Category/ Type Title	Main Function	Final Classification
1	**Energetic Materials without a defined shape**	To generate gases or flames.	**Substance/Mixture**
2	**Energetic Materials/ Propellants with a defined shape**	To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in a manner compatible with the weapon system.	**Article**
3	**Energetic Materials/ Explosives without a defined shape**	To generate a shock wave.	**Substance/Mixture**

[38] Information on intended release of substances in Articles, for specific ammunition categories, can be found in latest update of the GICAT REACH Professional Guidance, which covers this issue.

Category/ Type No.	Category/ Type Title	Main Function	Final Classification
4a	**Energetic Materials/ Explosives with a defined shape**	a. To produce energetic effects.	**To be determined by the supplier on a case-by-case basis**
4b		b. To obtain / initiate / support / reinforce the explosive reaction of a main charge, through a specific reaction rate or delay time.	**Article**
5	**Propelling Charge without initiation system**	To provide gases to propel a projectile. The modular charges could be added to govern the specific combustion law (speed, duration, gas volume) and their number is calculated to reach a target at a specific distance.	**Article**
6a	**Charges/High explosive charge with defined shape (engineering charge) without its initiation system**	a. To destruct or damage a defined target by the projection of fragments, solid and inert materials.	**Article**
6b		b. To generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target.	**Article**
7a	**Pyrotechnic (or energetic) components and devices used in ammunition**	a. To transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, pressure generation) **not related to gas generation**.	**Article**
7b		b. To transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave).	**Article**
8a	**Pyrotechnic and Explosive Cords**	Pyrotechnic Cords: To transmit a pyrotechnic reaction, to generate a time delay and/or transmit an initiation effect.	**To be determined by the supplier on a case-by-case basis**
8b		Explosive Cords: To transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.	**Article**
9	**Propelling charge with initiation system**	To project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher).	**Article**
10a	**Self-propelled munition engine**	a. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a**	**Article**

Category/ Type No.	Category/ Type Title	Main Function	Final Classification
		defined shape, pre-casted externally in a mould.	
10b		b. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a defined shape, casted internally to the engine**.	**Article**
10c		c. To propel munitions at a specific distance, in an autonomous way, **designed to function with liquid propellant (procured without the liquid propellant)**.	**Article**
10d		d. To propel munitions at a specific distance, in an autonomous way, **by using electric power**.	**Article**
11	**Warhead with initiation system**	To destruct a defined target by the projection of solid and inert materials and/or by the generation of a shock wave or a blast effect (blast over-pressure).	**Article**
12	**(Armor-) piercing / kinetic energy ammunition**	To propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.	**Article**
13a	**High Explosive (HE) ammunition and munitions**	a. To destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet).	**Article**
13b		b. To generate a shock wave under the effect of a stimulus (electric, mechanical, shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure).	**Article**
14	**Fixed or projected illuminating ammunition**	To emit a light with a specific spectrum to illuminate a defined target, or give a signal, for a given duration, at a given point or at a specific distance.	**To be determined by the supplier on a case-by-case basis**
15a(i)	**Screening smoke and coloured smoke ammunition**	a. To produce an opaque screen in a specific wave band, for a determined duration, to obscure a defined target at a specific distance: (i) by combustion reaction.	**To be determined by the supplier on a case-by-case basis**

Category/ Type No.	Category/ Type Title	Main Function	Final Classification
15a(ii)		(ii) by dispersal of a suitable material propelled out of the container.	**To be determined by the supplier on a case-by-case basis**
15a(iii)		(iii) by dispersal of a suitable material and by releasing smoke.	**To be determined by the supplier on a case-by-case basis**
15a(iv)		(iv) by a substance reacting with the ambient environment.	**To be determined by the supplier on a case-by-case basis**
15b(i)		b. To produce a coloured or white smoke in a specific wave band, for a determined duration, to "mark" a position or provide information: (i) by combustion reaction or by sublimation of a colourant.	**To be determined by the supplier on a case-by-case basis**
15b(ii)		(ii) by a substance reacting with the ambient environment.	**To be determined by the supplier on a case-by-case basis**
16a	**Emissive decoys**	To deliver a signal with specified spectral outputs and temperatures for a specified time, of a given power according to a given time law and frequency bands, to confuse missile guidance electronics a. pyrotechnic flares.	**To be determined by the supplier on a case-by-case basis**
16b		b. pyrophoric flares (solid in the container).	**To be determined by the supplier on a case-by-case basis**
17	**Passive decoys**	To deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics.	**Article**
18a(i)	**Physiological-effect ammunition**	a. To produce a non-lethal physiological effect by dispersal of a substance / mixture: (i) in form of an aerosol emitted.	**Combination of Article and a Substance/Mixture**
18a(ii)		(ii) from a grenade by reaction gases evolved from a pyrotechnic fuel composition.	**To be determined by the supplier on a case-by-case basis**
18b		b. To propel non-lethal bullets.	**Article**
19a	**Special-effect ammunition**	a. To generate a special effect such as: acoustic (thunder flash) effect in a given volume.	**To be determined by the supplier on a case-by-case basis**

Category/ Type No.	Category/ Type Title	Main Function	Final Classification
19b		b. To generate a special effect such as: incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time.	**Article**
19c		c. To generate a temporary blinding effect with a flash of a given duration and intensity to get the enemy stunned by instant and surprising high brightness and noise.	**To be determined by the supplier on a case-by-case basis**
19d		d. To generate a special effect in order to simulate an under-water acoustic signature.	**To be determined by the supplier on a case-by-case basis**
20a	**Practice (or training) ammunition**	To simulate real ammunition for training purposes by simulating the lethal effect (which differs/depends on each type of ammunition based on its design/purpose): a. without release of a substance/mixture.	**Article**
20b		b. with / through release of a substance/mixture.	**To be determined by the supplier on a case-by-case basis**
21a	**Location Markers**	a. To generate a visual effect for a specific duration, visible at a specific distance, by combustion reaction or reaction with the ambient environment (e.g. water).	**To be determined by the supplier on a case-by-case basis**
21b		b. To signal a position by releasing substances such as a dye to obtain a visual effect.	**To be determined by the supplier on a case-by-case basis**

8. DISSEMINATION/PUBLICATION OF PRESENT DOCUMENT

Considering the nature and scope of this document, reflecting EDA pMS common position/views on the classification of ammunition categories and types under REACH, for reference by stakeholders, EDA's intention is, upon approval of its contents by EDA pMS, to disseminate the document to all relevant stakeholders, including EDA pMS MoDs, the Commission, ECHA, EU Member States' REACH and CLP Competent Authorities (MSCAs) and National Enforcement Authorities (NEAs)[39], as well as EU defence industry (EDA pMS National Defence Industry Associations (NDIAs) and ASD).

[39] Dissemination to MSCAs and NEAs could take place through/with the support of the Commission.

To ensure as wide dissemination as possible, EDA will also make the present document publicly available at EDA's website.

9. POTENTIAL FUTURE SCOPE OF WORK

While with the development of the current updated version of the Common Position, the EDA work under this area is considered as essentially completed, an examination of potential feedback/comments on the updated Common Position from stakeholders and further utilisation as basis for potential future improvement of the document, can take place in the future, as necessary.

10. REFERENCES

- NATO Allied Ordnance Publication (AOP)-38 "GLOSSARY OF TERMS AND DEFINITIONS CONCERNING THE SAFETY AND SUITABILITY FOR SERVICE OF MUNITIONS, EXPLOSIVES AND RELATED PRODUCTS" – v.3/April 2002.
- REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. The REACH Regulation applies to the European Economic Area (EEA), i.e. the 28 EU Member States and Iceland, Liechtenstein and Norway.
- REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.
- NATO AAP-6 "NATO GLOSSARY OF TERMS AND DEFINITIONS"/Edition April 2013 (Note: More recent edition(s) may be available).
- ASD Letter to European Commission on "Ammunition Classification in REACH"/1 July 2014.
- DE BDSV paper titled "German Defence and Security industry's comments on the European Commission's paper with regard to the two opposite opinions on how ammunition should be classified according to REACH with regard to the propellant substance"/2 July 2014.
- DE BDSV Position Paper "REACH - On the classification as "articles" of propellants based on nitrocellulosis"/August 2014.
- DE BDSV position on "Classification of ammunition as articles with an integral substance/mixture"/September 2014.
- CJEU judgment in case C-106/14/10 September 2015.
- FR MoD/DGA paper - Propellant with a defined shape/May 2017.
- ECHA, Guidance on Requirements for Substances in Articles, Version 4.0/June 2017.
- ASD paper to EDA (in agreement with FR GICAT and DE BDSV) "Industry input on the classification of solid Shaped Propellant Items (for use in ammunition) as "articles" under REACH"/28 June 2017.
- ECHA, Guidance on Requirements for Substances in Articles - in a Nutshell/v.3.0/ December 2017.

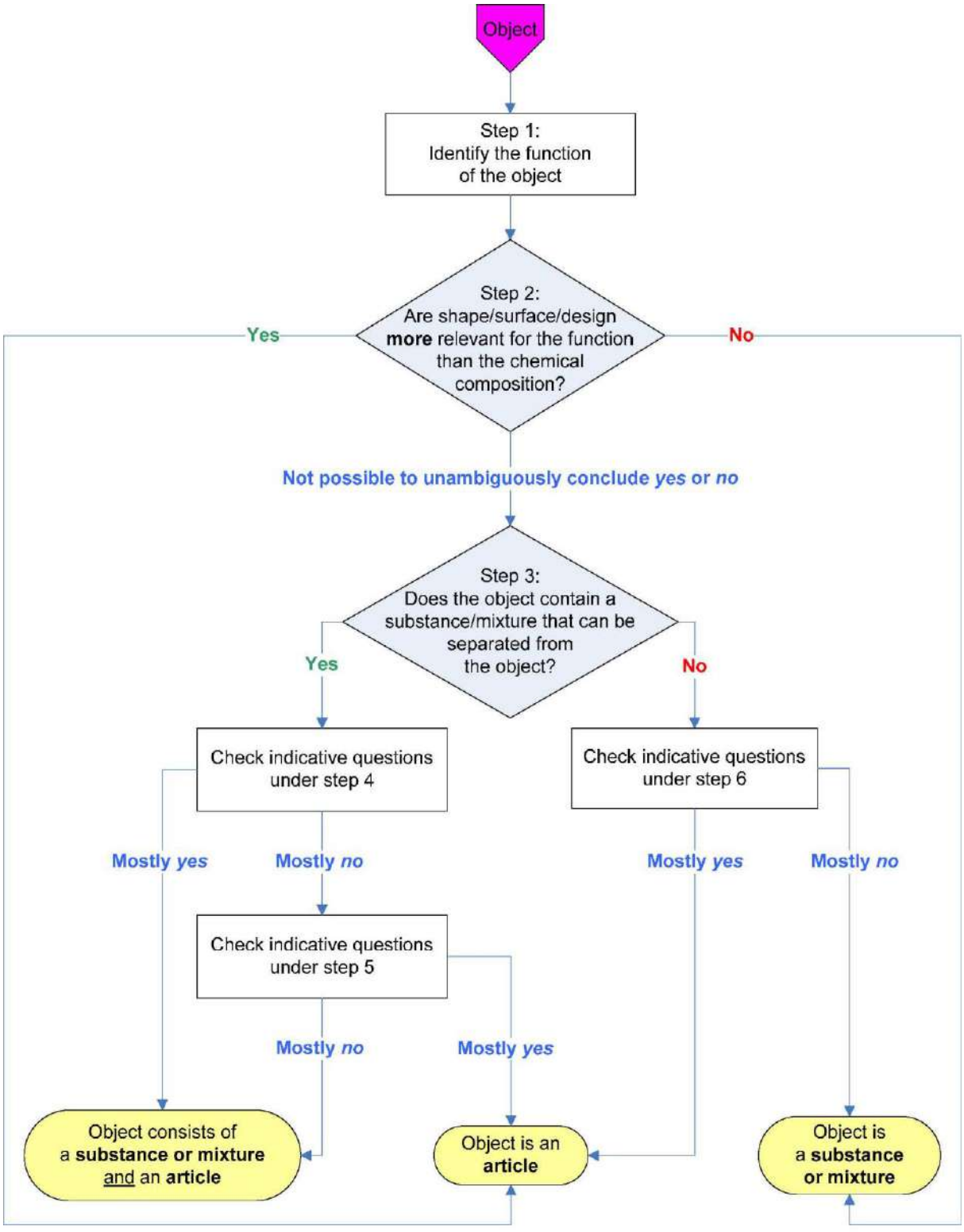
- FR GICAT “Status of Ammunition and Components of Ammunition in the REACH Regulation – Professional Guidance”, Issue 4.0/18 December 2020.

EUROPEAN DEFENCE AGENCY

ANNEX A: ECHA GUIDANCE WORKFLOW on ARTICLES CLASSIFICATION

ANNEX A - ECHA GUIDANCE WORKFLOW on ARTICLES CLASSIFICATION

In accordance with Figure 2, Section 2.3 of the ECHA Guidance v.4.0/June 2017, the workflow below provides guidance on deciding whether an object is an article or not:



ECHA RELATED QUESTIONS on ARTICLES CLASSIFICATION

In accordance with Section 2.3 of the ECHA Guidance v.4.0/June 2017, the steps/questions below should be followed/answered when using the flowchart mentioned, to decide whether an object is an article or not[1]:

***Step 1**: Define the function of the object in line with section 2.1.*

***Step 2**: Compare the importance of physical form and chemical characteristics for achieving the object's function. **If it can be unambiguously concluded that the shape, surface or design of the object is more relevant for the function than its chemical composition, the object is an article**. If the shape, surface or design is of equal or less importance than the chemical composition, it is a substance or mixture.*

The assessment on whether an article should be considered an "article with intended release of a substance/mixture" or not, as defined in chapter 4.1, is strongly recommended to be done at this step, before proceeding with the next steps.

***If it is not possible to unambiguously conclude** whether the object fulfils the REACH definition of an article or not, a deeper assessment is needed; for this **proceed with step 3**. Steps 3 to 6 were developed to support a deeper assessment for certain large (sub)groups of objects with common features. Note that they do not cover all possible objects, therefore, they may not allow reaching a final conclusion for a particular object under assessment. In such cases, the assessment needs to take into account other specific considerations that will allow answering the question in step 2 in the workflow above.*

***Step 3**: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (e.g. by pouring or wringing out). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (like e.g. the liquid in a thermometer or the aerosol in a spray can), or the object can carry it on its surface (like e.g. a wet cleaning wipe).*

If this applies to the object, proceed with step 4, otherwise proceed with step 6.

***Step 4**: For determining whether the chemical content of the object is an integral part thereof (and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered:*

Question 4a: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under step 1?

Question 4b: Does the object act mainly (i.e. according to the function defined under step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

[1] Following text is an extract from the ECHA guidance (pp. 19-22), which contains also some specific examples in certain cases to show how questions on these may be answered.

Question 4c: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

If these questions can predominantly be answered with yes (i.e. 2 or 3 out of 3) rather than no, then the object should be regarded as a combination of an article (functioning as a container or a carrier material) and a substance/mixture.

It is to be noted that an importer or supplier of such an object is also considered to be an importer or supplier of a substance/mixture. As such, he might also have obligations other than those of importers and suppliers of articles described in this guidance document. This means that substances in a container or on a carrier material might e.g. have to be registered, or be supplied with a safety data sheet. ***Importers and suppliers of a "combination of an article and a substance/mixture" therefore have to separately check if obligations for the article apply and if obligations for the substance/mixture apply.*** *Chapters 3 and 4 describe how to identify the obligations for the article; in order to identify the obligations for the substance/mixture (which is on the article's surface or enclosed in it) readers are advised to run the Navigator.*

Step 5*: If the answers to the indicative questions under step 4 are mostly no, the following questions should be used to cross-check whether the object as a whole should indeed be considered as an article and not as a combination of an article (functioning as a container or a carrier material) and a substance/mixture.*

Question 5a: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

Question 5b: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

Question 5c: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

If these questions can be answered with yes rather than no, then the function of the object is likely to be determined rather by the physical properties shape, surface and design, than by the chemical composition. The object is then regarded as an article with an integral substance/mixture (i.e. the substance/mixture forms an integral part of the article). *The substances (as such or in a mixture) that form an integral part of the article have only to be registered under the conditions described in subchapter 4.2.*

Step 6*: According to the assessment made under step 3, the object does not contain a substance or mixture that can be physically separated. Deciding whether the object fulfils the REACH definition of an article or not may however still be difficult in certain cases. Common examples are raw materials and semi-finished products that are further processed to final articles, but other cases might exist. In these cases, the following indicative questions may be used in order to better determine whether or not the object is an article. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.*

Question 6a: Does the object have a function other than being further processed?

If the object predominantly has other functions (i.e. end-use functions), then this may be an indication that it is an article according to the definition of REACH.

Question 6b: Does the seller place the object on the market and/or is the customer mainly interested in acquiring it because of its shape/surface/design (and less because of its chemical composition)?

If the object is mainly put on the market or acquired because of its shape/surface/design, this is an indication that the object is an article.

Question 6c: When further processed, does the object undergo only "light processing", i.e. no gross changes in shape?

"Light processing", such as drilling, surface grinding or coating, may improve or modify an object's shape, surface or design for carrying out a function and is thus frequently applied to objects which are already articles. Thus, if only "light processing" is applied, this is an indication that the object is an article.

Processes leading to gross changes in shape, meaning changes of depth, width and height of an object, are not regarded as "light processing". These can for example be primary shaping processes (such as casting or sintering) or forming processes (such as extrusion, forging or rolling). If the object preserves at least one of its characteristic dimensions (depth, width and/or height) when further processed, the process can be regarded as "light processing".

Question 6d: When further processed, does the chemical composition of the object remain the same?

A change of the chemical composition in the next processing steps may indicate the object being a mixture. However, some treatments of an object which is an article may result in a change in its overall chemical composition, but not in the status of the object being an article. Examples are printing onto the surface, painting, applying coatings, dyeing etc.

Not all questions may apply to all objects and the weight of evidence of the answers to the questions may vary from case to case. However, in concluding whether the object is an article or not, the answer to all of the relevant indicative questions should be considered and not only the answer to one of them. ***Predominantly answering with yes to the questions indicates that the object is an article. Predominantly answering no to the questions indicates that the object is a substance or mixture.*** *Appendix 4 illustrates how to apply these indicative questions and gives examples from four different industry sectors.*

Step 6 was developed to support the determination of the transition point from a substance/mixture to an article for a raw material during its processing and the assessment of objects which are further processed. The answer to indicative questions 6a and 6b may not be very helpful to reach a final conclusion for objects which are not intended to be further processed (and for which therefore questions 6c and 6d cannot be applied). For example, this is the case for objects containing a substance or mixture that cannot be physically separated from them and are not produced or manufactured to be further processed but rather to perform specific functions during their end-use (e.g. carbon electrodes for the manufacture of aluminium, grinding wheels made only of an abrasive material). In such cases, a deeper assessment may already need to be made to answer the question at step 2 more precisely. This should be done by taking into account specific considerations applicable to the particular object under assessment.

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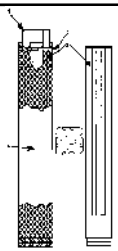
ANNEX B: AMMUNITION CATEGORIES/TYPES TABLE

ANNEX B - AMMUNITION CATEGORIES AND TYPES TABLE

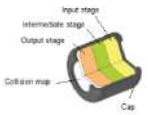
No.	CATEGORY/ TYPE	MAIN FUNCTION	ADDITIONAL INFORMATION	NON EXHAUSTIVE ILLUSTRATIVE EXAMPLES
1	**Energetic Materials without a defined shape**	To generate gases or flames.	The generation of gas is only due to the chemical nature of the substance and proceeds in an uncontrolled manner without a specific combustion law.	 Bulk black powder
2	**Energetic Materials/ Propellants with a defined shape**	To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in a manner compatible with the weapon system.	The gas flow must be compatible with the pressure that is able to support the weapon. It is achieved by acting on the emission surface of the grain. There are multiple different substances or mixtures that could be used for this purpose. **There is no use/function of the specific ammunition type/category when not fitted into a higher assembly.**	Agglomerate propellant charges, thrusters, solid propellant engines.  (Multi-)Perforated solid grain propellant  Perforated solid grain propellant  Free block of solid propellant for rocket engine

3	**Energetic Materials/ Explosives without a defined shape**	To generate a shock wave.	Only the chemical nature of substance is responsible for the shock wave.	All the explosive substances or its mixtures, before filling or making up a charge; explosive substances or mixtures, either used as such (plastic explosive) together with an ignition system, or for filling up (e.g. cords, grenades), or making a shaped charge or a pellet;  Explosive substances  Mouldable explosives: used for demolition (e.g. C4; P4) (shaped for convenience but not for use)  Mouldable Sheet Explosive (shaped for convenience but not for use)

4a	**Energetic Materials/ Explosives with a defined shape**	a. To produce energetic effects.	Responsible for the projection of solid and inert materials (e.g. fragments, core of a core generating charge, projectiles, shaped charge jet, plate) and their control movement. Pressed Energetic Materials (Pellets) designed to fit exactly inside of a shaped component forming part of a sub-system. Produce a controlled energetic effect.	Pressed energetic materials such as "free charge" (designed to fit exactly into a casing of given specifications, some ingredients can change).  Booster pellet
4b		b. To obtain / initiate / support / reinforce the explosive reaction of a main charge, through a specific reaction rate or delay time.	Pressed Energetic Materials (Pellets) designed to fit into a component forming part of a sub-system. Produce an energetic effect (such as combustion).	 Pressed energetic materials such as Ignition or delay pellet. (designed to fit exactly into a casing of given specifications, some ingredients can change)  Free charge for combustion

5	**Propelling Charge without initiation system**	To provide gases to propel a projectile. The modular charges could be added to govern the specific combustion law (speed, duration, gas volume) and their number is calculated to reach a target at a specific distance.	Mainly used in artillery ammunitions.	 Modular charge
6a	**Charges/ High explosive charge with defined shape (engineering charge) without its initiation system**	a. To destruct or damage a defined target by the projection of fragments, solid and inert materials.		**<u>Charge for</u>**: HE artillery and cannon projectiles; torpedo, missile and rocket warheads; aircraft bombs; (launched by any means) grenades; explosive reactive armour; anti-tank mines; HE mortar ammunition; HE pre-fragmented ammunition; ammunition comprising a HE filled projectile complete with a fixed or semi-fixed propelling charge, linked or not; shaped charge / hollow charge warheads and projectiles; explosively formed penetrator warhead; engineering explosive charges; reactive bricks; support shells; explosive shells; hollow shells; shape charge defensive grenades; HE cartridge of different calibres; mortar HE ammunition; HE ammunition.  High explosive charge without ignition system (inside hell)

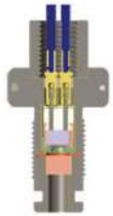
				 HE charge without ignition system (inside warhead)   Hollow charge  Explosively formed penetrator
6b		b. To generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target.		**<u>Charge for</u>**: Missile or torpedo or rocket warheads, submarine mines, reinforced blast ammunition, explosive shells.

				 Warhead (without initiation system) including HE charge (missile)  HE charge inside explosive shell (anti-infrastructure penetrator)
7a	**Pyrotechnic (or energetic) components and devices used in ammunition**	a. To transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, pressure generation) **not related to gas generation**.		Initiators; igniters; fuses; detonators; primers, delay devices; primer tubes; igniter plugs; safety and arming systems; priming fuses; relays; boosters; primer, squib, EED (Electro Explosive Device).  Relays/Booster  Booster

Fuses primer

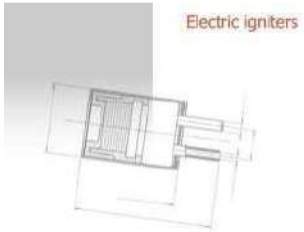
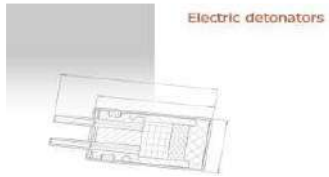
Primer for rifle cardridge

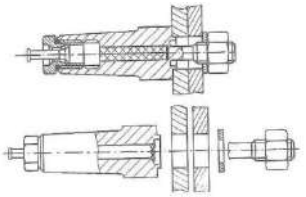
Primer for modular charge

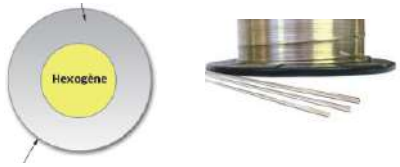


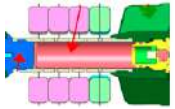
Opto-pyrotechnic squib

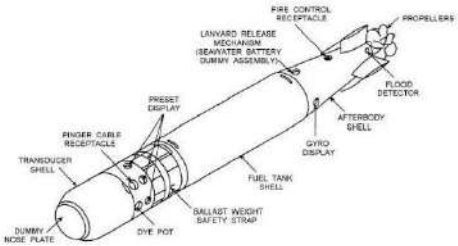
Fuse systems like Pyro- MEMS®

7b		b. To transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave).		Explosive bolts and nuts; various actuators (push rods, valves, retractors, releasers); cutters; separators; aircraft ejection system components or sub-assemblies.  Retractor  Cable cutter  Explosive bolt  Fragmentation nut

8a	**Pyrotechnic and Explosive Cords**	Pyrotechnic Cords: To transmit a pyrotechnic reaction, to generate a time delay and/or transmit an initiation effect.	The pyrotechnic material is attached to a liner of a specific diameter and shape that provides for the confinement of the material and for the transmission of the desired effect.	Time delay pyrotechnic cords; transmission pyrotechnic cords.  Pyrotechnic Cord
8b		Explosive Cords: To transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.	The explosive material is attached to a liner of a specific diameter and shape that provides for the confinement of the material and for the transmission of the desired effect.	Linear cutting charge (e.g. Blade©); time delay explosive cords; transmission explosive cords; detonation cords.  Explosive cords transmitting detonations  Explosive cord with mechanical action

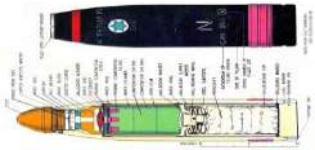
9	**Propelling charge with initiation system**	To project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher).		Propelling charge whether separate or semi-fixed to a projectile; tail charge assembly (TCA) for mortar ammunition.  Propelling charge  Tail charge assembly  Cut of tail charge with initiator
10a	**Self-propelled munition engine**	a. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a defined shape, pre-casted externally in a mould.**	The engine contains mainly an article (the propellant with a defined shape, pre-casted externally in a mould).	 Self-propelled munition engine for bombs

10b		b. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a defined shape, casted internally to the engine.**	The engine contains mainly an article (the propellant which is tightly integrated).	 Self-propelled munition engine for missiles
10c		c. To propel munitions at a specific distance, in an autonomous way, **designed to function with liquid propellant (procured without the liquid propellant).**	The engine contains mainly a liquid (the propellant which burns inside the engine). Fuel is filled just before use.	 Torpedo propelled by liquid fuel
10d		d. To propel munitions at a specific distance, in an autonomous way, **by using electric power.**	The engine is propelled by using a source of electric power e.g. battery, which may be a part of the object or an external electrical source.	 Torpedo propelled by electric power
11	**Warhead with initiation system**	To destruct a defined target by the projection of solid and inert materials and/or by the generation of a shock wave or a blast.	The design, the shape of the warhead are responsible, at the given time, for the projection of solid and inert materials (e.g. fragments, core of a core generating charge, projectiles, shaped charge jet, plate) and their control movement, thanks to their specific properties such as	 Warhead with Initiation system

		effect (blast over-pressure).	their shape, mass, and kinetic energy in order to reach and destroy the defined target while various explosives substances / mixtures could be used to obtain similar effects.	
12	**(Armor-) piercing / kinetic energy ammunition**	To propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.		Arrow shells; small calibre ammunition; APDS ammunition (armour piercing discarding sabot); APFDS ammunition (armour piercing fin stabilized discarding sabot); rockets.  Armour piercing / kinetic energy ammunition (APFDS)
13a	**High Explosive (HE) ammunition and munitions**	a. To destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet).		HE Artillery and cannon projectiles; torpedo, missile and rocket; aircraft bombs; (hand or launched by rifle or dispenser) grenades; explosive reactive armour (reactive brick); anti-tank mines; HE mortar ammunition; HE pre-fragmented ammunition; ammunition comprising a HE filled projectile complete with a fixed or semi-fixed propelling charge, linked or not; shaped charge / hollow charge

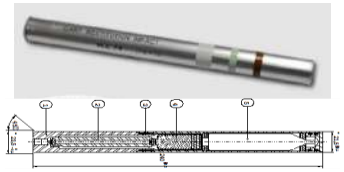
				projectiles; reactive bricks; support shells; explosive shells; hollow shells; shape charge defensive grenades; HE cartridge of different calibres.  Mortar HE ammunition  HE ammunition  Reactive brick  Defensive Grenades

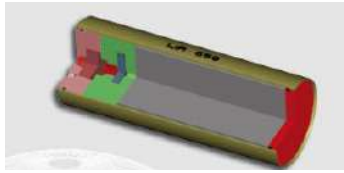
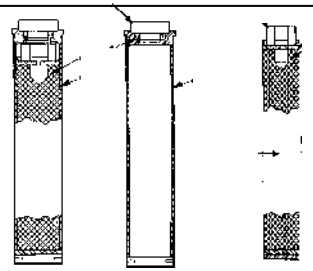
				 Ammunition shape charge shell
13b		b. To generate a shock wave under the effect of a stimulus (electric, mechanical, shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure).		Torpedoes, missiles and rockets; Submarine mines, high explosive charges. Reinforced blast ammunition.  Rocket
14	**Fixed or projected illuminating ammunition**	To emit a light with a specific spectrum to illuminate a defined target, or give a signal, for a given duration, at a given point or at a specific distance.		Illuminating ammunition (shells, flare payloads, illuminating flares); distress signals; distress flares; tracking flares.

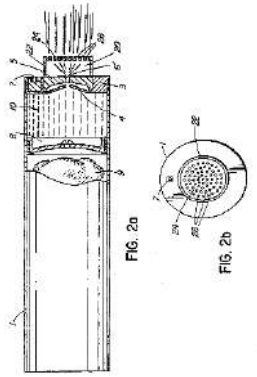
				 Ground-launched illuminating flares  Distress signals  Naval illuminating shell  Signal cartridge 40 mm
15a(i)	**Screening smoke and**	a. To produce an opaque screen in a specific wave	To optimize the release of the smoke during a specific duration, the design and	Smoke projectile grenade or canister based on red phosphorus or pyrotechnic smoke compositions;

	coloured smoke ammunition	band, for a determined duration, to obscure a defined target at a specific distance: i. by combustion reaction.	architecture of the material and mechanical systems are essential in order to pierce / melt holes or create openings in specific places of the special material and of a given size; to release smoke at a given rate; to keep combustion going and confined, according to a given combustion law, without stopping of going into flames. The reaction products could be sensitive to moisture in the atmosphere to generate smoke. The global result with the environment assures the function required to give a signal during a given duration, in a given point.	coloured or white smoke signalling grenades; smoke shells.   Instantaneous smoke grenade with red phosphorus
15a(ii)		a. To produce an opaque screen in a specific wave band, for a determined duration, to obscure a defined target at a specific distance: (ii) by dispersal of a suitable material propelled out of the container.	The released inert material has a defined shape and size and is contained in a container with a specific architecture, which will allow to create the screen effect (idem as passive decoy).	 Inert materials released by dispersion (instantaneous effect)

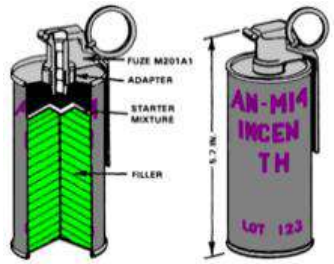
15a(iii)		a. To produce an opaque screen in a specific wave band, for a determined duration, to obscure a defined target at a specific distance: (iii) by dispersal of a suitable material and by releasing smoke.	Mixture of articles (shaped inert materials which are deployed and initially in a container – idem as previous case, and in another container there is a compacted smoke generating composition releasing reaction products (mostly C particles with specific shape and size to obscure + CO_x+ H_2O as by-products)).	Screening grenade based on metallic powders which may include additional smoke producing methods (e.g. Galix type ammunition); mix of black powder (instantaneous effect) and white smoke (slightly delayed effect).  Galix ammunition
15a(iv)		a. To produce an opaque screen in a specific wave band, for a determined duration, to obscure a defined target at a specific distance: (iv) by a substance reacting with the ambient environment.	The reaction products are sensitive to moisture in the atmosphere to generate smoke. The global result with the environment assures the function asked to give a signal during a given duration, in a given point.	 Smoke or phosphorous shell, terephthalic acid grenade, mortar smoke ammunition

				 Smoke projectile, grenade or canister based on white phosphorus; wideband smoke obscurant grenades
15b(i)		b. To produce a coloured or white smoke in a specific wave band, for a determined duration, to "mark" a position or provide information: (i) by combustion reaction or by sublimation of a colourant.	Explanation identical to 15a(i).	Coloured smoke or white smoke, smoke signals; cinnamic acid or terephthalic acid based compositions.   Coloured smoke signaling grenades, using dyes
15b(ii)		b. To produce a coloured or white smoke in a specific wave band, for a determined duration, to "mark" a position or provide information: (ii) by a substance reacting with the ambient environment.	The reaction products are sensitive to moisture in the atmosphere to generate smoke such as $TiCl_4$. The global result with the environment assures the function asked to give a signal during a given duration, in a given point.	Wide band obscuring grenades.  Impact marker

16a	**Emissive decoys**	To deliver a signal with specified spectral outputs and temperatures for a specified time, of a given power according to a given time law and frequency bands, to confuse missile guidance electronics a. pyrotechnic flares		Conventional decoys; spectral decoys; IR decoys; tracking flares; countermeasure flares and rockets.  Decoys (flares) released by an airplane  IR decoy cartridge  Elements of cartridges (full IR, casing, ejected free charge)

16b		To deliver a signal with specified spectral outputs and temperatures for a specified time, of a given power according to a given time law and frequency bands, to confuse missile guidance electronics b. pyrophoric flares (solid in the container).		 Pyrophoric IR decoy flare

17	**Passive decoys**	To deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics.		Electromagnetic effect cartridges; countermeasure rockets.  Chaff decoy system, dispensing system
18a(i)	**Physiological-effect ammunition**	a. To produce a non-lethal physiological effect by dispersal of a substance / mixture: (i) in form of an aerosol emitted.		 Special Purpose Ammunition
18a(ii)		a. To produce a non-lethal physiological effect by dispersal of a substance / mixture: (ii) from a grenade by reaction gases evolved from a pyrotechnic fuel composition.		 Grenades containing CS tear gas

18b		b. To propel non-lethal bullets.		 Rubber bullets
19a	**Special-effect ammunition**	a. To generate a special effect such as: acoustic (thunder flash) effect in a given volume.		Acoustic ammunition, flash bang grenades.  Stun (flash bang) grenade
19b		b. To generate a special effect such as: incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time.		 Incendiary ammunition, thermite, Red phosphorous

19c		c. To generate a temporary blinding effect with a flash of a given duration and intensity to get the enemy stunned by instant and surprising high brightness and noise.		Photo-flash ammunition.  Flash bang (hand) grenade
19d		d. To generate a special effect in order to simulate an under-water acoustic signature.	Bubble Generation by the combustion of a material to produce gas.	 Anti-sonar location markers
20a	**Practice (or training) ammunition**	To simulate real ammunition for training purposes by simulating the lethal effect (which differs/depends on each type of ammunition based on its design/purpose): a. without release of a substance/mixture.		Practice bombs and shells (that do not release substance/mixture); dummy hollow shell ammunition; practice rocket (that do not release substance / mixture); inert practice mines (that do not release substance / mixture); practice mortar ammunition (that do not release substance / mixture).

				 Reloadable stun practice hand grenade  Practice bomb
20b		To simulate real ammunition for training purposes by simulating the lethal effect (which differs/depends on each type of ammunition based on its design/purpose): b. with / through release of a substance/mixture.		Training tracking flares; practice smoke marker grenades; practice rockets (that release a substance / mixture during use); inert practice mines (that release a substance / mixture during use); practice mortar ammunition (that release a substance / mixture during use).

				  Practice grenades containing talc + plaster
21a	**Location markers**	a. To generate a visual effect for a specific duration, visible at a specific distance, by combustion reaction or reaction with the ambient environment (e.g. water).	The reaction products could be sensitive to moisture and water to generate a hot spot and smoke. The global result with the environment assures the function asked to give a signal during a given duration, in a given point. The released products are recombined with the environment (e.g. air, water) in order to produce something new (a screen or a marker).	 Marine markers, day and night location markers  Submarine location marker

21b		b. To signal a position by releasing substances such as a dye to obtain a visual effect.	The fluorescent dye is bulk powder in a container and it is the mechanical action with air contact which frees the powder.	  A green marker

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ANNEX C, Attachment 1: TEMPLATE TO BE FILLED FOR AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORMS

EUROPEAN DEFENCE AGENCY

TEMPLATE TO BE FILLED FOR

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: [ ] *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

[ ]

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

[ ]

Step 2: Are shape/surface/design more relevant for function than chemical composition?

[ ] *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

[ ]

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(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

- The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

- If the answer is unambiguously "**No**", then :
  - Provide clear justification:

  - The specific ammunition (sub)category/type should be regarded as a "**Substance or Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion".

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

  - Proceed with Step 3 for a deeper assessment.

<u>Step 3</u>: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*)[1].

Does this apply to the object?

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

[1] The ECHA SiA Guidance v. 4.0 states *(…in a spray can),* ***or the object can carry it on its surface (like e.g. a wet cleaning wipe)***. The text in bold was not included in the template since it is not applicable to ammunition.

(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

- Provide justification *(clarify how the substance/mixture can be separated from the object).*

- Proceed to Step 4.

- If the answer is "**No**", then :
  - Provide justification.

  - Proceed to Step 6.

Step 4: For determining whether the chemical content of the object is an integral part thereof (and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  [ ] *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3, or, 3 of 3 are "Yes"*), then the object should be regarded as a "**Combination of an Article and a Substance/Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion".

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a*:** If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

- ***Question 5b*:** Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

- ***Question 5c*:** Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3 or 3 of 3 are "No"*), then the object should be regarded as a "**Combination of an Article and a Substance/Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

- ***Question 6a*:** Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  [ ]

- ***Question 6b*:** Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/ design (and less because of its chemical composition)?

  [ ] *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  [ ]

- ***Question 6c*:** When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  [ ] *(Fill in with "Yes" or "No" or "N/A") (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  [ ]

- ***Question 6d*:** When further processed, does the chemical composition of the object remain the same?

  [ ] *(Fill in with "Yes" or "No" or "N/A") (*)*

  Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

- If the answers to the above questions are predominantly "**No**" (*i.e. 3 of 4, or, 4 of 4 are "No"*), then the object should be regarded as a "**Combination of an Article and a Substance/Mixture**".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

(*) fill the blank spaces using **bold blue** font to distinguish from pre-existing text

ANNEX C, Attachment 2:
FILLED EVIDENCE FORMS PER AMMUNITION TYPE/CATEGORY

ANNEX C, Attachment 2: FILLED EVIDENCE FORMS

PER AMMUNITION TYPE/CATEGORY

Table of Contents

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 1 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Energetic Materials without a defined shape

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate gases or flames

Step 2: Are shape/surface/design more relevant for function than chemical composition?

No *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**No**", then :
  - Provide clear justification:

    The specific ammunition is raw material, without any shape/design, thus the chemical composition is the only factor that is important. Only the chemical nature of substance is responsible for the generation of gas without a specific combustion law.

  - The specific ammunition (sub)category/type should be regarded as a "**Substance or Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Substance or Mixture

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 2 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Energetic Materials/Propellants with defined shape

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in a manner compatible with the weapon system.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition. For more detailed analysis refer to Annex E.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

No *(Fill in with "Yes" or "No") (*)*

- If the answer is "**No**", then:
  - Provide justification.

    The shaped propellant itself is the object formulated by a specific chemical substance. Therefore, the substance cannot be separated from the object/itself.
  - Proceed to Step 6.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

- ***Question 6a***: Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  The object has a function other than being further processed. It is to generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in a manner compatible with the weapon system. The object retains its integrity and is integrated in a system for generating gas by combustion of a defined law.

- ***Question 6b***: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition)?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  As concluded in Annex E, both the chemical composition and the shape, surface, and/or design, for the specific ammunition function are important and answering the Step 2 question unambiguously is not possible. However in this specific question, on the basis of further information received from defence/ammunition industry (who are the actual sellers), they (the sellers) confirmed that they place the object on the market because of its shape/surface/design (and less because of its chemical composition).

- ***Question 6c***: When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  Yes or N/A *(Fill in with "Yes" or "No" or N/A) (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  Once the propellant is shaped, it is only integrated in the shell without modifications and kept as is until it is used.
  If "integration into the shell" is considered as "further processing", the object retains all its design characteristics (no gross changes in shape) during this. Thus the answer to the Question is Yes.
  If on the other hand "integration into the shell" is not considered as "further processing", the question is Not Applicable to the specific ammunition type (N/A)

- ***Question 6d***: When further processed, does the chemical composition of the object remain the same?

  Yes or N/A *(Fill in with "Yes" or "No" or N/A) (*)*

  Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

  The composition remains the same when integrated into the shell. Only in nitrocellulose base propellants, some nitro groups can be released inside the object, but they are captured by the stabilizing substances of the mixture. Composite propellants are very stable during their storage life.
  If "integration into the shell" is considered as "further processing", then the answer to the Question is Yes.
  If on the other hand "integration into the shell" is not considered as "further processing", the question is Not Applicable to the specific ammunition type (N/A)

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

Note : Regardless if Questions 6c and 6d are answered with Yes or N/A (which dependson how "further processing" is interpreted) the result is not impacted, since the overall Step 6 questions are predominantly answered with "Yes" ("4 Yes", or "2 Yes and 2 N/A").

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 3 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Energetic Materials/Explosives without a defined shape

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate a shock wave.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

No *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**No**", then :
  - Provide clear justification:

    The specific ammunition is raw material, without any shape/design, thus the chemical composition is the only factor that is important. Only the chemical nature of substance is responsible for the shock wave.

  - The specific ammunition (sub)category/type should be regarded as a "**Substance or Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Substance or Mixture

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 4b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Energetic Materials/Explosives with a defined shape

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

b. To obtain / initiate / support / reinforce the explosive reaction of a main charge, through a specific reaction rate or delay time

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or

gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

No *(Fill in with "Yes" or "No") (*)*

- If the answer is "**No**", then:
  - Provide justification.

    The energetic materials/explosives with a defined shape themselves are themselves the objects formulated by a specific chemical substance. Therefore, the substance cannot be separated from the object/itself.

  - Proceed to Step 6.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

- ***Question 6a***: Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  The object has a function other than being further processed. It is to obtain / initiate / support / reinforce the explosive reaction of a main charge, through a specific reaction rate or delay time.

- ***Question 6b***: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition)?

  Yes/No (Inconclusive) *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  It is not possible to unambiguously answer with "yes" or "no" if the seller places the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition).

- ***Question 6c***: When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  Yes or N/A *(Fill in with "Yes" or "No" or "N/A") (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  No gross changes in shape/design when fitting the pressed energetic materials / explosives into a component , thereby forming part of a subsystem.If "fitting pressed energetic materials / explosives into a component" is considered as "further processing", the object retains all its design characteristics (no gross changes in shape) during this. Thus the answer to the Question is Yes. If on the other hand ""fitting pressed energetic materials / explosives into a component"" is not considered as "further processing", the question is Not Applicable to the specific ammunition type (N/A)

- ***Question 6d***: When further processed, does the chemical composition of the object remain the same?

  Yes or N/A *Fill in with "Yes" or "No" or "N/A") (*)*

  Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

  No change in the chemical composition when fitting the energetic materials / explosives into the component.
  If "fitting pressed energetic materials / explosives into a component" is considered as "further processing", the object retains its chemical composiition. Thus the answer to the Question is Yes.
  If on the other hand ""fitting pressed energetic materials / explosives into a component"" is not considered as "further processing", the question is Not Applicable to the specific ammunition type (N/A)

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

- **Note : If Questions 6c and 6d are answered with Yes (which depends on how "further processing" is interpreted) the overall Step 6 questions are predominantly answered with "Yes" ("3 Yes and 1 Inconclusive") and therefore the object is an Article. If Questions 6c and 6d are answered with N/A ("1 Yes, 1 Inconclusive, and 2 N/A), then step 6b (inconclusive) will require further elaboration to establish if it is a Yes (Article) or No (1 Yes, 1 No and 2 N/As – no clear classification). Step 6b will be further elaborated under Stage 2. At this time most scenarios lean towards the category be classified as Article.**

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 5 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Propelling charge without initiation system

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To provide gases to propel a projectile. The modular charges could be added to govern the specific combustion law (speed, duration, gas volume) and their number is calculated to reach a target at a specific distance

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant)*.

The propellant is considered as "the substance/mixture" contained in the object

Note: Characterising in this case the propellant as "substance/mixture" is merely for the purposes of answering question 3 i.e. if it can be separated from the object, and not to denote that the propellant should be classified as a "substance/mixture" per se, under REACH. There are specific propellant types e.g. with a defined shape (Category 2) that are classified as "Articles".

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The propellant can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case propellant) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above, especially in aspects related to "governing a specific combustion law (speed, duration, gas volume)". On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to provide gases to propel a projectile (to a target).

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life[1]?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

[1] When answering this question, for all ammunition categories/evidence forms, the term "end of service life" is considered to mean the end of the period of time that an object is (expected) to be used for the purpose for which it was produced/ manufactured.

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case propellant) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (propellant to provide the gases to propel a projectile (to a target).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to provide gases to propel a projectile (to a target) and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case propellant) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 6a *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Charges/ High explosive charge with defined shape (engineering charge) without its initiation system

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To destruct or damage of a defined target by the projection of fragments, solid and inert materials

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to* unambiguously *conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g.*

by pouring or wringing out). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    It contains primary and secondary explosive as substance/mixture
  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction
  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

  If the substance/mixture (in this case primary and secondary explosive) was removed or separated from the object and used independently, there would be no fragmentation effect and therefore substance/mixture would not be capable to perform the main function as describe in Step 1 above, especially in aspects related to "destruct or damage of a defined target by the projection of fragments, solid and inert materials". On the contrary, using the substance/mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to destruct or damage of a defined target by the projection of fragments, solid and inert materials.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case primary and secondary explosive) is consumed during the use phase of the object. The explosive substance destroys the object (bomb or projectile shell) during the detonation and generates fragments out of it.
After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3, or, 3 of 3 are "Yes"*), then the object should be regarded as a "**Combination of an Article and a Substance/Mixture**". Disregard rest of steps/questions and go to Part D "Conclusion".

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture (in this case primary and secondary explosive) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, to create the fragmentation effect, in order the object to be able to perform the main function (to destruct or damage of a defined target by the projection of fragments, solid and inert materials)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to provide gases to propel a projectile (to a target) and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case primary and secondary explosive) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 6b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Charges / High explosive charge with defined shape (engineering charge) without its initiation system

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant)*.

    Explosive substance/mixture
  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction
  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case explosive) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above, i.e. to generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (in this case explosive) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case explosive) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target and not to deliver the substance/mixture (in this case explosive) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case explosive) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 7a *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Pyrotechnic (or energetic) components and devices used in ammunition.

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, light, pressure generation) not related to gas generation.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant)*.

    The object contains a pyrotechnic substance/mixture.
  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    If the object was to be dismantled into its original components (even if that means breaking some parts) the substance/mixture could be physically separated from the object with different technical procedures e.g. jetting with air or fluid, melting, mechanical deconstruction

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case pyrotechnic material) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, light, pressure generation) not related to gas generation

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture is consumed in the pyrotechnic reaction which is crucial for transmitting the desired effect related to the main function of the object. The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case pyrotechnic material) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, light, pressure generation) not related to gas generation)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, light, pressure generation) not related to gas generation, and not to deliver the substance/mixture (in this case pyrotechnic material) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case pyrotechnic material) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 7b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Pyrotechnic (or energetic) components and devices used in ammunition.

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave).

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or

gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    The object contains a pyrotechnic substance/mixture.

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    If the object was to be dismantled into its original components (even if that means breaking some parts) the substance/mixture could be physically separated from the object with different technical procedures e.g. jetting with air or fluid, melting, mechanical deconstruction

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case pyrotechnic material) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave).

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case pyrotechnic material) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a*:** If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture (in this case pyrotechnic material) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave)).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to provide gases to transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave) and not to deliver the substance/mixture (in this case pyrotechnic material) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case pyrotechnic material) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 8b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Explosive cords

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    It contains an energetic material as substance/mixture (generally a secondary explosive)

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as described in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (generally a secondary explosive) is ignited and transforms chemically during the use phase of the object. The substance/mixture is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition, if any, are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article**" and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect, and not to deliver the substance/mixture or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 9 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Propelling charge with initiation system

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher)

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or

gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant)*.

The propellant is considered as "the substance/mixture" contained in the object

Note : Characterising in this case the propellant as "substance/mixture" is merely for the purposes of answering question 3 i.e. if it can be separated from the object, and not to denote that the propellant should be classified as a "substance/mixture" per se, under REACH. There are specific propellant types e.g. with a defined shape (Category 2) that are classified as "Articles".

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The propellant can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case propellant) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher).

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case propellant) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher)).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher) and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case propellant) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 10a *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Self-propelled munition engine

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, pre-casted externally in a mould.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design, shape and surface to be able to achieve its main function. The chemical composition of the substance/mixture is also relevant/important but shape/surface/design is more relevant for the function, than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

Propellant with a defined shape is the substance/mixture

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

  If the substance/mixture (in this case propellant with a defined shape) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance/mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  The flow of the gases released is guided by the shape of the propellant. The substances are burnt during the process and the reaction products are non-hazardous gases. According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, pre-casted externally in a mould.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case propellant with a defined shape) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, pre-casted externally in a mould.)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to provide gases to propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, pre-casted externally in a mould, and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

The substance/mixture (in this case propellant with a defined shape) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 10b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Self-propelled munition engine

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, casted internally to the engine .

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design, shape and surface to be able to achieve its main function. The chemical composition of the substance/mixture is also relevant/important but shape/surface/design is more relevant for the function, than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

No

(Fill in with "Yes" or "No") (*)

The solid propellant casted inside the engine cannot be removed without destruction of the engine.

- If the answer is "**No**", then proceed to Step 6.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

- ***Question 6a***: Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  Once the propellant has been casted and cured in the engine, the propellant is not processed any more but ignited inside the engine in order to provide the push which is the end use function of the engine. The object has a function other than being further processed. It is to propel munitions at a specific distance, in an autonomous way, with solid propellant with a defined shape, casted internally to the engine .

- ***Question 6b***: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/ design (and less because of its chemical composition)?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  The shape/surface/design is more important to achieve the main function than chemical composition. In the market there are different substances/mixtures that can be used in the object to achieve the main function. The seller places the object on the market and the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition).

- ***Question 6c***: When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  Only in the exceptional cases it needs to fit some adjustment in the shape, the changes are minimum.

- ***Question 6d*:** When further processed, does the chemical composition of the object remain the same?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

  Even in cases that the shape needs to be adjusted, the chemical composition does not change.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 10c *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Self-propelled munition engine

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel munitions at a specific distance, in an autonomous way, designed to function with liquid propellant (procured without the liquid propellant)

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:
  - The object is extremely complex with special engineering design, shape and surface to be able to achieve its main function. The substance/mixture used to propel the engine is fuel, however the object is considered for classification empty i.e. without fuel. In most cases, the engine is either filled with fuel before use, or the engine uses a separate fuel tank. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.
  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

No

(Fill in with "Yes" or "No") (*)

The object is considered for classification empty i.e. without fuel. In most cases, the engine is either filled with fuel before use, or the engine uses a separate fuel tank.

- If the answer is "**No**", then proceed to Step 6.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

- ***Question 6a***: Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  The object has a function other than being further processed. It is to propel munitions at a specific distance, in an autonomous way, designed to function with liquid propellant (procured without the liquid propellant)

- ***Question 6b***: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/ design (and less because of its chemical composition)?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  The shape/surface/design is more important to achieve the main function than chemical composition, since there is no chemical composition (engine is considered without fuel).

- ***Question 6c***: When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  Not Applicable *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  The object is not further processed/the shape of the engine does not change. The object is considered without substance/mixture (fuel) inside

- ***Question 6d***: When further processed, does the chemical composition of the object remain the same?

Not Applicable	*(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

The object is not further processed. There is no chemical composition (no fuel).

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 10d *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Self-propelled munition engine

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel munitions at a specific distance, in an autonomous way, by using electric power

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:
  - The object is extremely complex with special engineering design, shape and surface to be able to achieve its main function. It is an engine propelled by using a source of electric power e.g. with one or more electric batteries. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition
  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

No

(Fill in with "Yes" or "No") (*)

The object is an engine which functions with electrical power from a source (e.g. battery) which may be internal or external to it. The battery is considered an Article (ECHA guidance). As a result there are no substances/mixtures contained in the object, to be able to be separated.

- If the answer is "**No**", then proceed to Step 6.

Step 6: According to the assessment made under Step 3, the object does not contain a substance or mixture that can be physically separated. These questions can only be used to support the evaluation of the importance of the chemical composition versus the shape/surface/design in relation to the function and thus facilitate the application of the article definition.

- ***Question 6a***: Does the object have a function other than being further processed? If the object predominantly has other functions (*i.e. end-use functions*), then this may be an indication that it is an article according to the definition of REACH.

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object has its primary function of creating explosive effect in a Shell/Cartridge)*:

  The object has a function other than being further processed. It is to propel munitions at a specific distance, in an autonomous way, by using electric power

- ***Question 6b***: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/ design (and less because of its chemical composition)?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, the mixtures' explosive properties are more important)*:

  The shape/surface/design is more important to achieve the main function than chemical composition, since there is no chemical composition (engine functions with with electrical power from a source (e.g. battery) which may be internal or external to it.)

- ***Question 6c***: When further processed, does the object undergo only "light processing", (i.e. no gross changes in shape)?

  Not Applicable *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, only processing is filling the shell/cartridge)*:

  The object is not further processed/the shape of the engine does not change. The object is considered without a substance/mixture

- ***Question 6d***: When further processed, does the chemical composition of the object remain the same?

  Not Applicable *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, no change as only processing is filling the shell/cartridge)*:

The object is not further processed. The object is considered without a substance/mixture

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 3 of 4, or, 4 of 4 are "Yes"*), then the object should be regarded as an "**Article**".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 11 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Warhead with initiation system

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To destruct a defined target by the projection of solid and inert materials and/or by generating a shock wave or blast effect (blast overpressure)

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design/shape and surface to be able to achieve its main function. The design, the shape of the warhead are responsible, at the given time, for the projection of solid and inert materials (fragments, core of a core generating charge, projectiles, shaped charge jet, plate, etc.) and their control movement, thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target while various explosives substances / mixtures could be used to obtain similar effects. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

Explosive substance/mixture

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case explosive) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to destruct a defined target by the projection of solid and inert materials and/or by generating a shock wave or blast effect (blast overpressure)

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case explosive) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case explosive) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to destruct a defined target by the projection of solid and inert materials and/or by generating a shock wave or blast effect (blast overpressure))

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to destruct a defined target by the projection of solid and inert materials and/or by generating a shock wave or blast effect (blast overpressure) and not to deliver the substance/mixture (in this case explosive) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

No	*(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

The substance/mixture (in this case explosive) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 12 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

(Armor-) piercing / kinetic energy ammunition

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design/shape and surface to be able to achieve its main function. The design, the shape of the warhead are responsible, at the given time, for the projection of projectiles and their control movement, thanks to their specific properties such as their shape, mass, and kinetic energy in order to pierce the defined target, while various explosives substances / mixtures could be used to obtain similar effects. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

The object contains a propellant which is the substance/mixture.

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case propellant) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture (in this case propellant) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.)

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

The main purpose of the object is to propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target, and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

No

(Fill in with "Yes" or "No") (*)

Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

The substance/mixture (in this case propellant) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 13a *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

High Explosive (HE) ammunition and munitions

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet).

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design/shape and surface to be able to achieve its main function. The design, the shape of the object are responsible, at the given time, for the projection of projectiles and their control movement, thanks to their specific properties such as their shape, mass, and kinetic energy in order to destroy or create damage to a target, while various explosives substances / mixtures could be used to obtain similar effects. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

High explosive substance/mixture

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case high explosive) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet).

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case high explosive) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case high explosive) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet)).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet), and not to deliver the substance/mixture (in this case high explosive) or its reaction products

- ***Question 5c*:** Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case explosive) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 13b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

High Explosive (HE) ammunition and munitions

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate a shock wave under the effect of a stimulus (electric, mechanical shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure).

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is extremely complex with special engineering design/shape and surface to be able to achieve its main function. The design, the shape of the object are responsible, at the given time, for the destruction or damage to of a defined target, by a shock wave or a blast effect, while various explosives substances / mixtures could be used to obtain similar effects. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

High explosive substance/mixture

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case high explosive) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to generate a shock wave under the effect of a stimulus (electric, mechanical shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure).

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case high explosive) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case high explosive) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (generate a shock wave under the effect of a stimulus (electric, mechanical shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure)).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to generate a shock wave under the effect of a stimulus (electric, mechanical shock, heat) triggered by an initiation system: destruction or damage to of a defined target, by a shock wave or a blast effect (blast over-pressure), and not to deliver the substance/mixture (in this case high explosive) or its reaction products

- ***Question 5c*:** Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case explosive) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 17 *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Passive decoys

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object is very complex with special engineering design/shape and surface to be able to achieve its main function. The design, the shape of the object are responsible to deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics. The object contains and ejects when used small objects/foils (e.g. made of aluminium or other substances). Only the propellant and igniter contain chemical substances, which are not the substances that create the main function (to confuse missile guidance electronics). Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

Only the propellant and igniter contain chemical substances/mixtures

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

  If the substance/mixture (in this case propellant and igniter substance) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b*:** Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics.

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case propellant and igniter substance) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case propellant and igniter substance) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics, and not to deliver the substance/mixture (in this case propellant and igniter substance) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

No	*(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

The substance/mixture (in this case propellant and igniter substance) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 18a(i) *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Physiological-effect ammunition

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To produce a non-lethal physiological effect by dispersal of a substance / mixture: (i) in form of an aerosol emitted from a spray can.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g.*

by pouring or wringing out). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    The substance / mixture is an irritant material filled in loosely into the can.

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    The substance/mixture can be physically separated from the object. It is a liquid or gaseous material which is set free autonomously / evaporates when the can is opened.

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case irritant material) was removed or separated from the object and used independently, the substance/mixture would still be capable to perform the main function as describe in Step 1 above. The substance / mixture separated from the object keeps its irritant character.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object acts mainly as a container or carrier for release or controlled delivery of the substance/mixture. The spray can serve to emit the substance / mixture in direction to the target.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case irritant material) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3, or, 3 of 3 are "Yes"*), then the object should be regarded as a "**Combination of an Article and a Substance/Mixture**". Ignore rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Combination of an Article and a Substance/Mixture

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 18b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Physiological-effect ammunition

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To propel non-lethal bullets

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Yes *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is unambiguously "**Yes**", then:
  - Provide clear justification:

    The object functions similar to small calibre ammunition, only in this case propelling a rubber and not metal bullet. Therefore the design/shape/surface of the object is clearly more relevant for the function than the chemical composition.

  - The specific ammunition (sub)category/type is an "**Article**". Disregard rest of steps/questions and go to Part D "Conclusion".

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

POTENTIAL ANSWERS TO FOLLOW-UP QUESTIONS IF ANSWER TO STEP 2 WOULD BE "INCONCLUSIVE"

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive

(Fill in with "Yes", "No", or "Inconclusive".) (*)

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes

(Fill in with "Yes" or "No") (*)

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

The propellant is considered as "the substance/mixture" contained in the object Note : Characterising in this case the propellant as "substance/mixture" is merely for the purposes of answering question 3 i.e. if it can be separated from the object, and not to denote that the propellant should be classified as a "substance/mixture" per se, under REACH. There are specific propellant types e.g. with a defined shape (Category 2) that are classified as "Articles".

- Provide justification *(clarify how the substance/mixture can be separated from the object).*

The propellant can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

- Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case propellant) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to propel non-lethal bullets

- ***Question 4c*:** Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (in this case propellant) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a*:** If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

  If the substance/mixture (in this case propellant) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (to propel non-lethal bullets.)

- ***Question 5b*:** Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to propel non-lethal bullets, and not to deliver the substance/mixture (in this case propellant) or its reaction products

- ***Question 5c*:** Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case propellant) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 19b *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Special-effect ammunition

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To generate a special effect such as incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time.

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:
  - Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.
  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g.*

by pouring or wringing out). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    The object contains a substance/mixture designed to produce high temperatures through combustion reactions.

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    The substance/mixture can be physically separated from the object, even though in some cases with great difficulty, by using different techniques e.g. jetting with air or fluid, melting, mechanical deconstruction

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a***: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case substance / mixture designed to produce high temperatures through combustion reactions) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above. On the contrary, using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The main function of the object is to generate a special effect such as incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

The substance/mixture (in this case substance / mixture designed to produce high temperatures through combustion reactions) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article**" and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture (in this case substance / mixture designed to produce high temperatures through combustion reactions) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function (generate a special effect such as incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time).

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to generate a special effect such as incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time, and not to deliver the substance/mixture (in this case pyrotechnic material) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (in this case substance / mixture designed to produce high temperatures through combustion reactions) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

AMMUNITION CLASSIFICATION UNDER REACH - EVIDENCE FORM

A. Category/Subcategory/Type under Classification

Item Number: 20a *(Type here the ammunition (sub)category/type **number**) (*)*

Item (Sub)Category/Type: *(Type below the ammunition (sub)category/type **title**,) (*)*

Practice (or training) ammunition

B. The ECHA Guidance is to be used to support the EDA and Member States conclusion on Ammunition Classification under REACH. ECHA Guidance also identifies that the shape, surface and design of an object are not to be confused with physical characteristics that result from the chemistry of the material(s) the object is made of.

C. Using the ECHA Guidance to identify Ammunition definition.

Step 1: Define the function of the object *(It is important that the function is correctly defined e.g. destruction of a defined target by explosive delivery of high energy metal fragments)*.

Main Function: *(State the main function of the specific ammunition (sub)category) (*)*

To simulate real ammunition for training purposes by simulating the lethal effect (which differs/depends on each type of ammunition based on its design/purpose), without release of a substance mixture

Step 2: Are shape/surface/design more relevant for function than chemical composition?

Inconclusive *(Fill in with "Yes", "No", or "Inconclusive".) (*)*

- If the answer is "**Inconclusive**" (*i.e. it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not*) then :
  - Provide clear justification:

    Following in-depth assessment and analysis of the technical information gathered for this ammunition (sub)category, it became obvious that both design/shape and chemical composition play an important role. However, it was not possible to unambiguously conclude if shape/surface/design is more, equally or less relevant for the function, than the chemical composition.

  - Proceed with Step 3 for a deeper assessment.

Step 3: Determine if the object, which may be constructed in a very simple or highly sophisticated manner, contains a substance or mixture that can be physically separated from the object (*e.g. by pouring or wringing out*). The substance or mixture in question, which can be solid, liquid or gaseous, can be enclosed in the object (*like e.g. the liquid in a thermometer or the aerosol in a spray can*).

Does this apply to the object?

Yes *(Fill in with "Yes" or "No") (*)*

- If the answer is "**Yes**", then:
  - Identify the Substance/Mixture *(relevant to this analysis e.g. Propellant*).

    The object contains substances/mixtures, which differ/depend on each type of ammunition based on its design, which are used to produce the effects of real ammunition of the same category.

  - Provide justification *(clarify how the substance/mixture can be separated from the object).*

    In general the substance/mixture can be physically separated from the object with different technical procedures e.g. jetting with air or fluid, melting, mechanical deconstruction. The exact procedure needed to separate the substances from the object differ/depend on each type of ammunition based on its design.

  - Proceed to Step 4.

Step 4: For determining whether the chemical content of the object is an integral part (thereof and therefore the object as a whole is an article as defined under REACH) or if it is a substance/mixture for which the rest of the object functions as a container or carrier material, the following indicative questions should be answered.

- ***Question 4a*:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable in principle (though perhaps without convenience or sophistication) of carrying out the function defined under Step 1?

  No *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. No, it will not deliver object to target)*:

If the substance/mixture (in this case substance / mixture that produces the acoustic effect) was removed or separated from the object and used independently, the substance/mixture would not be capable to perform the main function as describe in Step 1 above (it would not be possible to produce/simulate the effects of real ammunition of the same category). It may be the case that using the substance /mixture independently may lead to undesired situations e.g. explosion, which could pose grave danger for the user of the object.

- ***Question 4b***: Does the object act mainly (i.e. according to the function defined under Step 1) as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. No, there is no intended release of the substance/mixture)*:

  According to the function defined under Step 1, the object does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or its reaction products. The intention of the chemical reaction is to produce/simulate the effects of real ammunition of the same category, without release of a substance/mixture.

- ***Question 4c***: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance mixture is consumed by the explosive reaction)*:

  The substance/mixture (responsible during use to simulate the effects of real ammunition) is consumed during the use phase of the object. After the use phase of the specific ammunition category, the remaining parts of the ammunition are not able of performing the function of the object as a whole, as described in Step 1, thus rendering the object useless and leading to the end of its service life.

- If the answers to the above questions are predominantly "**No**" (*i.e. 2 of 3, or, 3 of 3 are "No"*), then proceed to Step 5.

Step 5: Use the following questions to cross-check whether the object as a whole should indeed be considered as an "**Article"** and not as a "**Combination of an Article and a Substance/Mixture**":

- ***Question 5a***: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfil its intended purpose?

  Yes *(Fill in with "Yes" or "No") (*)*

Identify the reason for your selection *(e.g. Yes, the object would not deliver the fragments to the target)*:

If the substance/mixture (responsible during use to simulate the effects of real ammunition) was removed or separated from the object, the object would not be capable to perform the main function as describe in Step 1 above. The substance/mixture is absolutely necessary to be inside the object, as part of an integrated system, in order the object to be able to perform the main function. Without the substance/mixture the object would not be able to produce/simulate the effects of real ammunition of the same category.

- ***Question 5b***: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?

  Yes *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the substance/mixture is intended to deliver the warhead to the target)*:

  The main purpose of the object is to produce/simulate the effects of real ammunition of the same category, without release of a substance/mixture, and not to deliver the substance/mixture (in this case pyrotechnic material) or its reaction products

- ***Question 5c***: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?

  No *(Fill in with "Yes" or "No") (*)*

  Identify the reason for your selection *(e.g. Yes, the object is discarded with the substance/mixture at the end of its service life) :*

  The substance/mixture (responsible during use to simulate the effects of real ammunition) is consumed during phase use of the object. Therefore the object is not normally discarded with the substance/mixture at the end of its service life.

- If the answers to the above questions are predominantly "**Yes**" (*i.e. 2 of 3 or 3 of 3 are "Yes"*), then the object should be regarded as an "**Article**". Ignore rest of steps/questions and go to Part D "Conclusion.

CONCLUSION

D. Based on the answers to the ECHA guidance steps/questions, this type of ammunition, having the specific main function, is classified as:

Article

*(Fill in accordingly with "**Article**", or "**Combination of an Article and a Substance/Mixture**", or "**Substance or Mixture**") (*)*

ANNEX C, Attachment 3:
OVERVIEW OF EVIDENCE FORMS ANSWERS TO ECHA QUESTIONS PER AMMUNITION (SUB-)CATEGORY

Overview of Evidence Forms Answers to ECHA Questions per Ammunition (Sub-)Category

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
1	**Energetic Materials without a defined shape**	To generate gases or flames.	No												**Substance/ Mixture**
2	**Energetic Materials/ Propellants with a defined shape**	To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in a manner compatible with the weapon system.	Inc	No							Yes	Yes	Yes or N/A	Yes or N/A	**Article**
3	**Energetic Materials/ Explosives without a defined shape**	To generate a shock wave.	No												**Substance/ Mixture**
4a	**Energetic Materials/ Explosives with a defined shape**	a. To produce energetic effects.													**To be determined by the supplier on a case-by-case basis**
4b		b. To obtain / initiate / support / reinforce the explosive reaction of a main charge, through a specific reaction rate or delay time.	Inc	No							Yes	Yes /No Inc	Yes or N/A	Yes or N/A	**Article**

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
5	Propelling Charge without initiation system	To provide gases to propel a projectile. The modular charges could be added to govern the specific combustion law (speed, duration, gas volume) and their number is calculated to reach a target at a specific distance.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
6a	Charges/High explosive charge with defined shape (engineering charge) without its initiation system	a. To destruct or damage a defined target by the projection of fragments, solid and inert materials.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
6b		b. To generate exclusively a shock wave or a blast effect (blast over-pressure) for the destruction of a defined target.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
7a	Pyrotechnic (or energetic) components and devices used in ammunition	a. To transform an external action (e.g. mechanical, heat, electrical, optical, electromagnetic) into a pyrotechnic action which produces or transmits an effect (e.g. push, pull, perforate, break, delay, pressure generation) **not related to gas generation**.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
7b		b. To transform a pyrotechnical action into a mechanical force (e.g. heat, shock wave).	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
8a	Pyrotechnic and Explosive Cords	Pyrotechnic Cords: To transmit a pyrotechnic reaction, to generate a time delay and/or transmit an initiation effect.													To be determined by the supplier on a case-by-case basis
8b		Explosive Cords: To transmit a detonation, to cut by shaped charge effect, to generate a time delay and/or transmit an initiation effect.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
9	**Propelling charge with initiation system**	To project ammunition at a specific distance, in a non-autonomous way (e.g. through a launcher).	Yes	No	No	Yes	Yes	Yes	No					Yes	**Article**
10a	**Self-propelled munition engine**	a. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a defined shape, pre-casted externally in a mould.**	Yes	No	No	Yes	Yes	Yes	No					Yes	**Article**
10b		b. To propel munitions at a specific distance, in an autonomous way, **with solid propellant with a defined shape, casted internally to the engine**.	No							Yes	Yes	Yes	Yes	No	**Article**
10c		c. To propel munitions at a specific distance, in an autonomous way, **designed to function with liquid propellant (procured without the liquid propellant)**.	No							Yes	Yes	N/A	N/A	No	**Article**
10d		d. To propel munitions at a specific distance, in an autonomous way, **by using electric power**.	No							Yes	Yes	N/A	N/A	No	**Article**

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
11	**Warhead with initiation system**	To destruct a defined target by the projection of solid and inert materials and/or by the generation of a shock wave or a blast effect (blast over-pressure).	Yes	No	No	Yes	Yes	Yes	No					Yes	**Article**
12	**(Armor-) piercing / kinetic energy ammunition**	To propel an appropriate geometry projectile in an optimized manner, at a specific speed and distance to pierce a target.	Yes	Yes	No	No	Yes	Yes	Yes	No					**Article**
13a	**High Explosive (HE) ammunition and munitions**	a. To destroy or create damage to a target by controlled movement of a solid and inert material (high velocity fragments, self-forging projectiles or plasma jet).	Yes	Yes	No	No	Yes	Yes	Yes	No					**Article**
13b		b. To generate a shock wave under the effect of a stimulus (electric, mechanical, shock, heat) triggered by an initiation system: destruction or damage to of a defined target,	Yes	Yes	No	No	Yes	Yes	Yes	No					**Article**

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
		by a shock wave or a blast effect (blast over-pressure).													
14	**Fixed or projected illuminating ammunition**	To emit a light with a specific spectrum to illuminate a defined target, or give a signal, for a given duration, at a given point or at a specific distance.													**To be determined by the supplier on a case-by-case basis**
15a(i)	**Screening smoke and coloured smoke ammunition**	a. To produce an opaque screen in a specific wave band, for a determined duration, to obscure a defined target at a specific distance: (i) by combustion reaction.													**To be determined by the supplier on a case-by-case basis**
15a(ii)		(ii) by dispersal of a suitable material propelled out of the container.													**To be determined by the supplier on a case-by-case basis**
15a(iii)		(iii) by dispersal of a suitable material and by releasing smoke.													**To be determined by the supplier on a case-by-case basis**

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
15a(iv)		(iv) by a substance reacting with the ambient environment.													**To be determined by the supplier on a case-by-case basis**
15b(i)		b. To produce a coloured or white smoke in a specific wave band, for a determined duration, to "mark" a position or provide information: (i) by combustion reaction or by sublimation of a colourant.													**To be determined by the supplier on a case-by-case basis**
15b(ii)		(ii) by a substance reacting with the ambient environment.													**To be determined by the supplier on a case-by-case basis**
16a	**Emissive decoys**	To deliver a signal with specified spectral outputs and temperatures for a specified time, of a given power according to a given time law and frequency bands, to													**To be determined by the supplier on a case-by-case basis**

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
		confuse missile guidance electronics a. pyrotechnic flares.													
16b		b. pyrophoric flares (solid in the container).													To be determined by the supplier on a case-by-case basis
17	Passive decoys	To deploy an object or group of objects liable to generate a specific electromagnetic signature, intended to confuse missile guidance electronics.	Yes	Yes	No	No	Yes	Yes	Yes	No					Article
18a(i)	Physiological-effect ammunition	a. To produce a non-lethal physiological effect by dispersal of a substance / mixture: (i) in form of an aerosol emitted	Inc	Yes	Yes	Yes	Yes								Combination of Article and a Substance/Mixture
18a(ii)		a. To produce a non-lethal physiological effect by dispersal of a substance / mixture: (ii) from a grenade by reaction gases evolved from a pyrotechnic fuel composition.													To be determined by the supplier on a case-by-case basis

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
18b		b. To propel non-lethal bullets.	Yes	Yes	No	No	Yes	Yes	Yes	No					Article
19a	Special-effect ammunition	a. To generate a special effect such as: acoustic (thunder flash) effect in a given volume.													To be determined by the supplier on a case-by-case basis
19b		b. To generate a special effect such as: incendiary to produce high temperatures on combustion to cause the ignition of flammable material in a given volume and for a given duration of time.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
19c		c. To generate a temporary blinding effect with a flash of a given duration and intensity to get the enemy stunned by instant and surprising high brightness and noise.													To be determined by the supplier on a case-by-case basis
19d		d. To generate a special effect in order to simulate an under-													To be determined by the supplier on

No.	Category/ Type Title	Main Function/ Step 1	Step 2	Step 3	Step 4			Step 5			Step 6				Final Classification
					4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	
		water acoustic signature.													a case-by-case basis
20a	Practice (or training) ammunition	To simulate real ammunition for training purposes by simulating the lethal effect (which differs/depends on each type of ammunition based on its design/purpose): a. without release of a substance/mixture.	Inc	Yes	No	No	Yes	Yes	Yes	No					Article
20b		b. with / through release of a substance/mixture.													To be determined by the supplier on a case-by-case basis
21a	Location Markers	a. To generate a visual effect for a specific duration, visible at a specific distance, by combustion reaction or reaction with the ambient environment (e.g. water).													To be determined by the supplier on a case-by-case basis
21b		b. To signal a position by releasing substances such as a dye to obtain a visual effect.													To be determined by the supplier on a case-by-case basis

Nomenclature for Columns Step2 – Step 6

xx	White background colour (cell filled) denotes a Step that an answer is required, per the ECHA Guidance flowchart
	Grey background colour (cell not filled) denotes a Step that an answer is not required, per the ECHA Guidance flowchart
xx	Grey background colour (cell filled) denotes a Step that while an answer is not required, per the ECHA Guidance flowchart, the Step is answered for back-up support (refer to Section 6.3 of the main Common Position document)
	Blue background colour (cell filled) denotes that the process for answering the questions was not followed – no evidence form was filled (classification "To be determined by the supplier on a case-by-case basis")

"xx" can be :

Inc: The answer to the respective Step question is inconclusive (it cannot be answered unambiguously with Yes or No)
Yes: The answer to the respective Step question is Yes
Yes or **N/A**: Different answer depending on the interpretation of certain aspects of the question (e.g. what is considered light processing)
No: The answer to the respective Step question is No
N/A: The respective Step/Question is Not Applicable to the respective category/type of Ammunition, due to its specific characteristics.

ANNEX D: ADDITIONAL INFORMATION ON AMMUNITION CATEGORY "ENERGETIC MATERIALS/PROPELLANTS WITH A DEFINED SHAPE"

ANNEX D: ADDITIONAL INFORMATION ON AMMUNITION CATEGORY "ENERGETIC MATERIALS/ PROPELLANTS WITH A DEFINED SHAPE"

Background

The specific ammunition category "Energetic Materials/Propellants with a Defined Shape" was examined as part of the scope of EDA work on ammunition classification, since its initiation in 2014 (Category No. 2 in the overall list of types/categories of ammunition).

EDA was made aware of views of different stakeholders that classified the specific ammunition category as "Mixtures" under REACH, including one specific case of a company (Czech manufacturer DEZA) that had classified propellant in general as a mixture in its authorisation application (no. 0005-02) for the substance Dibutyl phthalate (DBP)[1]. On the other hand, a wide part of defence industry/ammunition manufacturers had a different opinion: that "Propellants with a Defined Shape" should be classified as "Articles" under REACH[2].

EDA Actions/Activities to Gather Required Technical information

On the basis of the above mentioned, in order to be able to gather and assess all information necessary to be able to conclude work on the classification of "Energetic materials/Propellants with a defined shape", in November 2016, EDA requested defence industry stakeholders with prior in-depth knowledge and expertise on the design/manufacture of ammunition and on ammunition classification under REACH, including Aerospace and Defence Industries Association of Europe (ASD)/REACH Implementation Working Group (RIWG), FR GICAT, DE BDSV, Nexter Munitions, Etienne-Lacroix, BAE Systems, MBDA Systems and Rheinmetall, to support EDA's further examination of the issue, by providing detailed technical information on "propellants with a defined shape" function, shape, design, composition and important factors for their classification under REACH.

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[1] Refer to https://echa.europa.eu/addressing-chemicals-of-concern/authorisation/applications-for-authorisation-previous-consultations/-/substance-rev/1615/term . In page 23 of the Analysis of Alternatives (AoA) it is stated:

"2.2.3.2 Article vs. mixture in a container

Consideration has been given to whether products that contain DBP-based propellants (ammunition and pyrocartridges) should be considered articles under the REACH Regulation or mixtures in containers.

It appears that there has been an on-going debate within the EU explosives industry. Communication with the Association of European Manufacturers of Sporting Ammunition (AFEMS) suggests that in the Association's view, ammunition is an article (AFEMS, 2012). The same belief is apparently held by more than 90% of AFEMS' associated members, although it is recognised that not all ammunition manufacturers agree with this view.

On the other hand, clarification on the issue has been sought from Authorities. A question was submitted to the UK REACH Helpdesk and a response was returned on 26 November 2012. In the Helpdesk's opinion, "ammunition (bullets, shotgun cartridges, etc.) should be regarded as composite objects. The casing and projectile would be regarded as articles, which together form a container holding the propellant and primer. The propellant and primer are mixtures of substances".

Following this advice (and associated discussions with officers of ECHA), the applicant has decided to consider the ammunition and the pyrocartridges mixtures of DBP in containers.

Key point 5: This AoA (and the accompanying SEA) assumes that final products that contain DBP-based propellants (finished military and civilian ammunition and finished aircraft pyrocartridges) are mixtures in containers rather than articles."

[2] For example, refer to FR GICAT guidance "Status of Ammunition and Components of Ammunition in the REACH Regulation – Professional Guidance"/Issue No. 4/18 December 2020.

In response to the EDA request, on 21 December 2016 industry/ASD submitted to EDA a supporting document, providing interim detailed information, at technical level.

On 25 January 2017, a special meeting with European defence industry associations and ammunition manufacturers took place at Nexter-Munition's facilities in France, during which detailed discussion with industry, including on its interim input mentioned above, took place on the topic. This was followed by a Task Force meeting at FR MoD (Ammunition) Training Centre in Bourges on 26 January 2017. Further to discussions, live firing of certain types of ammunition by industry, as well as extensive demonstration of various types of ammunition mock-ups took place during the meetings, providing to EDA REACH Task Force experts in-depth insight on the function, shape, design and composition of Ammunition, including on "propellants with a defined shape".

On the basis of its expertise on ammunition, the FR MoD/Direction Générale de l' Armement (DGA) developed a technical paper titled "*Propellant with a defined shape: The reason why the relative importance between the chemical composition and the shape cannot be determined*" which was provided to EDA in May 2017 and is attached hereby as Attachment 1.

The main conclusion of this document was: **whatever the weapon is, the choice of the chemical composition is not sufficient to complete the needed function, and the shape is crucial. Therefore, it is not possible to conclude on the relative importance between the chemical composition and the shape of grain propellants.**

The contents and conclusion of the FR MoD/DGA assessment were fully supported and accepted by the EDA REACH Task Force members. In terms of the ECHA Guidance (v.4.0/June 2017) Step 2 question, this essentially means that for the EDA REACH Task Force: **it is not possible to unambiguously conclude if the shape, surface or design of the object is more, equally, or less[3] relevant for the function than its chemical composition (or in other words, it is not possible to unambiguously conclude whether the object fulfils the REACH definition of an article or not). As a consequence, a deeper assessment is needed, through proceeding with step 3, in accordance to the ECHA guidance.**

Furthermore, the mentioned, EDA REACH Task Force experts individually reviewed the issue at national level and provided inputs, for further consideration, which were discussed through electronic means (e-mail) and also during EDA REACH Task Force meetings on 5 - 6 April 2017 and 13 June 2017.

In parallel, in May 2017 EDA requested from defence industry, building on the interim information they had provided in December 2016, to provide to EDA a final paper with industry views, to further support EDA on this issue. On 28 June 2017, the industry (ASD in agreement with FR GICAT and DE BDSV) responding to this call, provided to EDA an ASD paper titled "*Industry input on the classification of solid Shaped Propellant Items (for use in ammunition) as "articles" under REACH*", attached hereby as Attachment 2[4].

[3] When answering Step 2 question: "more" would result in classifying "Propellants with a Defined Shape" as "Article", while "less" or "equally" would result in classifying them as "Substance or Mixture".

[4] While the formal ASD paper was forwarded to EDA on 28 June 2017, the main elements and technical information contained therein had been passed by industry to EDA during exchanges that took place between December 2016 and 14 June 2017 (date of the last

In this comprehensive and detailed paper, the industry elaborates on specific important issues which have potential for misinterpretation or confusion by stakeholders, as follows:

- The use of the NATO definition of 'Propellant';
- The function, defined as generating gases to produce propulsion;
- The need for certain chemical groups;
- The shape determining the 'quality of the result'; and finally
- The (wrong) hypotheses that propellants with/without shape have the same function;

In addition, the industry provides input on the following issues:

- Are the shape, surface and design more relevant for the function of a Shaped Propellant Item than its chemical composition; and
- When does a formulated mixture become a Shaped Propellant Item.

With the arguments provided in the paper, the manufacturers tried to show that, in their opinion, there is no ambiguity as to whether the chemical composition or the surface/shape/design of a Shaped Propellant Item is more important for its function, and that with Shaped Propellant Items for use in ammunition, it can be demonstrated that the shape is more important than the chemical composition.

The main industry conclusions are as follows:

- Under REACH, it is the sole responsibility of the propellant manufacturers to determine the classification of their products[5].
- The shape, surface, and/or design of a Shaped Propellant Item are key and critical aspects that are more important for its function (to be integrated into a propelling charge, which is meant to produce gas, and to be integrated in, to propel, to withstand, to fulfil et al.) than its chemical composition. The shape is not a factor relating only to the quality of the result.
- The propellant manufacturers have developed their classification of Shaped Propellant Items for use in ammunition, as being an article under REACH based on various valid arguments that are all in line with the legal requirements and explanations of the applicable ECHA Guidance.

EDA REACH Plenary Meeting/Session with industry), thus were taken into account by the EDA/EDA REACH Task Force, during the course of the work, before its finalisation.

[5] Note: It is known that the REACH national enforcement authorities (NEAs) may agree or not with the producers' conclusions and their reasoning. The Commission may also decide if an object should be considered an article or not.

Important Factors

On the basis of all information gathered and expertise gained from all above actions and activities, the EDA REACH Task Force proceeded to finalise a proposed classification of "Energetic Materials/Propellants with a Defined Shape" under REACH.

The following important factors, requiring consideration, were identified:

- Using a current/contemporary definition of a "propellant" is very important when examining their classification under REACH. Substances and/or mixtures without a defined shape (e.g. black powder) may have been considered as "Propellants" in the long past (in 18th and 19th century when e.g. cannonballs were fired out of a cannon), but, considering the advances of ammunition technology and design, this is not valid anymore. Based on this fact "black powder" type of ammunition were eventually categorised by EDA/Task Force under the title "Energetic materials without a defined shape" (Category No. 1 – Classified as "Substance/Mixture") and not "Energetic materials/Propellants without a defined shape".

- It is important to consider all related aspects/levels: the potential substances inside the ammunition, the ammunition as a system which includes the substances, but also compliance characteristics and requirements of ammunition towards the weapon systems that they will be used/fired from. Such requirements could not be fulfilled without previously being taken into account in the design of the propellant by itself, its shape, surface and size. On the other hand, it is also necessary to take in account in its design the propellant deflagration rate, which is more related to the propellant composition, however the designer have very few possibilities to vary this parameter.

- Identifying the "main function" of an object correctly, is crucial for its eventual classification under REACH. The main function of "Energetic materials/Propellants with a defined shape" is not to simply "generate gas(es) to provide propulsion". This main function would be applicable only to "Energetic materials without a defined shape" such as e.g. gun powder. On the other hand, the main function of "Energetic materials/Propellants with a defined shape" is much more complex. The EDA REACH Task Force identified "*To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in manner compatible with the weapon system.*" as the main function for "Energetic materials/Propellants with a defined shape"[6], based on which this category of ammunition needs to be classified under REACH.

- Thus, a potential hypothesis that a Propellant with a defined shape (grain propellant) has the same function as a propellant without shape, is false.

[6] The FR GICAT Guidance uses "*Designed: to be integrated in a specific ammunition to deliver defined ballistic performances (depending of the type of projectile, mass, volume of the gun chamber, ..) in order to propel a projectile by generating gas according to a specific combustion law in order to achieve an appropriate distribution of pressure (for example along the gun tube so that it can support it without breaking.); to ensure safety and reliability specifications"* as main function for the category "Propellant with a defined shape".

- More specifically, a propellant has more functional requirements than only the generation of gases, such as:
    - integration in an ammunition / system with specified shape, mass and ballistic properties;
    - endurance through the whole life cycle certified through relevant tests (mechanical, climatic, vibration, corrosion, etc.);
    - avoidance of erosion effects towards the weapon barrel;
    - fulfilment of requirements related to reliability, availability, maintainability and safety through specified values on relevant critical properties (e.g. maximum operating pressure, pressure wave, flammability, ignition delay in use, etc.)].
- The main component of a gum propellant is nitrocellulose. This has fiber structure and as such is an explosive with a decomposition regime in whole mass and detonation velocity of about km/s. To turn the nitrocellulose into a propellant, it is necessary to gelatinize it, in order to change its morphological structure so that the decomposition is changed from a detonation to a deflagration, transmitted by parallel layer and with reaction velocities of cm/s. The gelatinization process is done by solvents, heat and mechanical work. Thanks to this transformation, the deflagration progresses from the surface towards the interior of the propellant and this way it is possible to control the emission gas flow. As a result, the shape, size and surface are very important.
- The chemical properties of such materials are also important, however different chemical compositions of propellants can be used to achieve a similar result. Unlike the past, nowadays there are multiple different substances available in the market to be used as a propellant. All of them are dependent on their shape, surface and design to carry out the main function. Even though it is necessary to have a chemical reaction inside the cartridge, its reaction products are more or less the same regardless of the chemical composition of the propellant that is used. In other words, by varying the geometry of the propellant grains, a very much higher variety of the gas generation in the chamber can be determined than by varying the actual chemical composition. To that end, by default, a propellant has a defined shape, otherwise the rate of gas generation cannot be controlled.
- Additional technical information especially on Rocket and Projectile propellants can be found in Attachment 3.

Based on the above mentioned, and following in-depth review of all technical level information gathered, including those in Attachments 1, 2, and 3, the EDA REACH task Force, concluded on the following:

- For the ammunition category "Energetic materials/Propellants with a defined shape" with main function "*to generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in manner compatible with the weapon system*", **it is not possible**

to unambiguously conclude if the shape, surface or design of the object is more, equally, or less relevant for the function than its chemical composition ;

- Therefore, in accordance with the ECHA guidance, **a deeper assessment is needed, which requires proceeding with step 3**;
- When doing so, the resulting evidence form for the category "Energetic materials/Propellants with a defined shape", which together with rest ammunition categories' evidence forms can be found in Annex C, **clearly resulted in classifying this specific category, as "Article"**.

Conclusion

On basis of the work conducted by EDA, with the support of the EDA REACH Task Force, **the ammunition category "Energetic materials/Propellants with a defined shape" with the main function "*To generate gases (when fitted into a higher assembly) in a controlled manner under a specific combustion law and in manner compatible with the weapon system*" should be classified as an "Article".**

It has to be noted that, as clearly reflected in the ASD paper in Attachment 2, industry/ammunition manufacturers, as sole owners of extensive technical information and in-depth expertise on ammunition, support that, in their opinion, for the category "Propellants with a defined shape", the shape, surface, and/or design of a shaped propellant are key and critical aspects that are more important for its function than its chemical composition" (so their answer to Step 2 question is "Yes"). This leads to the same conclusion that "Energetic materials/Propellants with a defined shape" should be classified as "Articles".

Re-validation of the Article Classification (October 2017 onwards)

The issue was re-examined by the EDA REACH Task Force, based also on further exchanges with/information from industry through follow-up exchanges between EDA/REACH Task Force and industry (ASD, FR GICAT) that took place during stage 2 of the EDA ammunition classification work (October 2017 to December 2020). As a result, the initial conclusion/Article Classification of "Article" was re-validated.

Attachments

1 – FR MoD/DGA paper "Propellant with a defined shape: The reason why the relative importance between the chemical composition and the shape cannot be determined"/May 2017.

2 – ASD paper "Industry input on the classification of solid Shaped Propellant Items (for use in ammunition) as "articles" under REACH"/28 June 2017.

3 – Additional Technical Information on Rocket and Projectile Propellants.

ANNEX D, Attachment 1:
FR MoD/DGA paper "Propellant with a defined shape: The reason why the relative importance between the chemical composition and the shape cannot be determined"

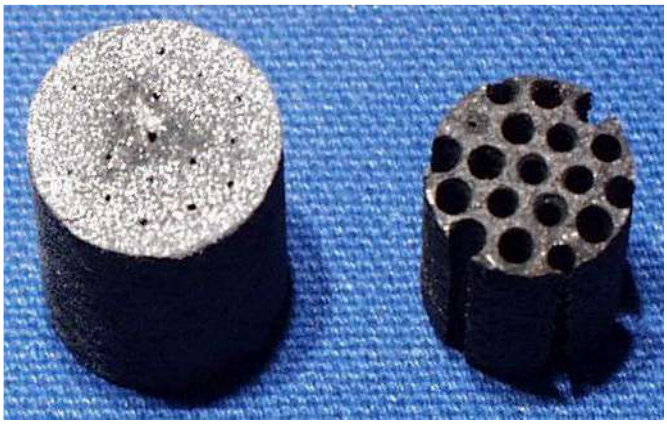
Propellant with a defined shape: The reason why the relative importance between the chemical composition and the shape cannot be determined

This note aims at describing the complexity of grain propellant in order to show that **it is not possible to conclude on the relative importance between the chemical composition and the shape of this ammunition**. It is also an opportunity to explain why the hypothesis that a grain propellant has the same function as a propellant without shape (e.g. to generate gas) is false. A grain propellant is a shaped integral powder (that looks like a paste) which provides propulsion adapted to a specific couple weapon/ammunition. The aim is to give the projectile a required kinetic energy during its travel in the barrel with a specific pressure that doesn't reach the safe maximum pressure of the system (couple weapon/ammunition).

▪ How grain propellant works :

A grain propellant is an object made of an energetic material which is given a specific shape for the purpose of burning in parallel layers in order to maintain this specific shape of the grain propellant during the combustion at a given burning rate. As shown below, this burning rate is determined by the chemical composition of the energetic material and depends on the pressure in the barrel (which is itself correlated to the grain shape).

Grain before combustion



Combustion interrupted

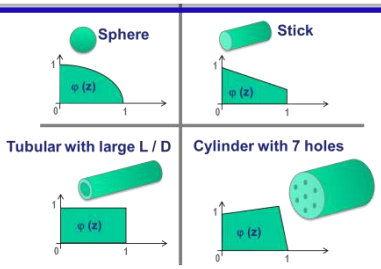
The reaction is a 3D reduction of the grain which appeals at this given burning rate with a gas flow generated by all the surfaces in combustion. The figure below shows the two important parameters to take into account for grain propellant design:

Mixture

The mixture defines <u>the available chemical energy</u> which is characterized by:

- **heat of explosion [cal/g]**
- **burning rate [mm/s] = v(P) = a.P(t)^n+ b with P = Pressure of gas in the barrel**

Grain shape



The propellant grain form monitors the pressure of gas in the barrel (P). <u>The propellant grain form is an accurate mathematical function</u> which describes the changes in the ration of the burning surface area over the initial surface area for a grain propellant: $\varphi = \frac{S(t)}{S_0}$

Propellant characterized by : Vivacity and Dynamic Vivacity

The **<u>vivacity</u>** is the ability of a propellant or a propelling charge to burn quickly depending on its chemical formulation and the geometric shape of its grains. It is given by:

$$A = a_0 S_0/V_0$$

a_0: linear combustion speed of the propellant under reference unit of pressure
S_0: initial surface of the grain propellant
V_0: initial volume of the grain propellant

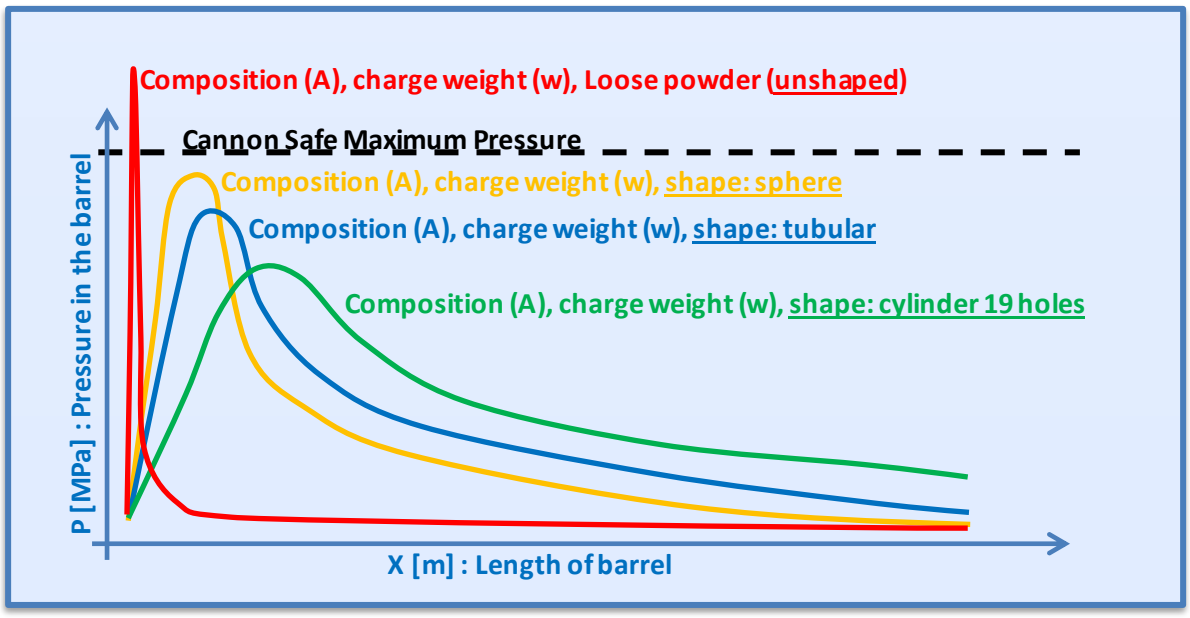
To characterize the ballistic behavior of grain propellant, the **<u>dynamic vivacity</u>** – which is a factor linked to the vivacity of propellant – is also used in interior ballistics. This factor is determined from experimental closed vessel test. The use of this factor is recommended by Stanag 4115. During the closed vessel test, the pressure *vs* time (p=f(t)) and the maximum pressure reached are recorded. When a physical model is used, the fraction of burnt propellant z(t) can be deducted.

This description of the operation of the propellant shows that vivacity depends on both, the burning rate (and therefore on the mixture and the pressure in the barrel) and the shape of the grain which makes the regulation of the gas flow possible. Moreover, **<u>the hypothesis that a grain propellant has the same function as a propellant without shape is false</u>**. This way of reasoning is contrary to the basic principles of interior ballistics. Actually, simple base propellant (composition with 97 at 99 % of Nitrocellulose) is used in small, medium and large caliber. On the basis of this way of reasoning, it would be possible to find the same propellant in several ammunitions in different calibers. The reality is that each ammunition of each

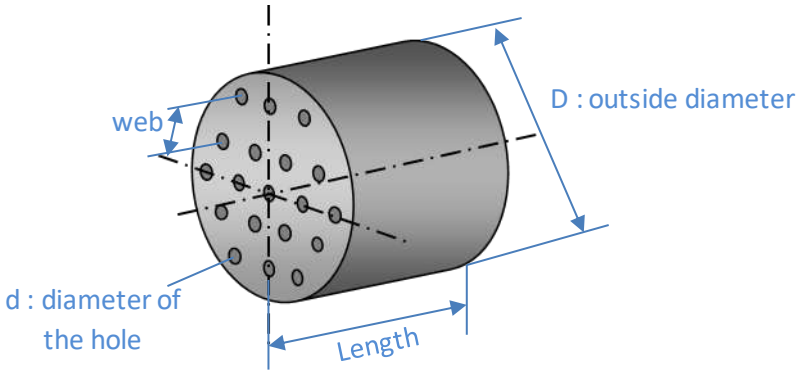
caliber has a specific grain shape that is designed according to the characteristics of the weapon and the projectile in order to reach the expected performance.

The figure below shows the pressure in the barrel *vs* the position of projectile for different shapes of propellant. We see with these examples that the effect of shape is very important using the same gun, projectile, composition of propellant called (A) and weight charge called (w):

- **Loose powder**: never used as a propellant because it generates too high pressure (above the cannon safe maximum pressure) inside the barrel and will damage it.
- **The spherical shape** used in mortars or small caliber for instance, generates too high pressure which can lead to safety problem in large caliber weapons (not enough security margins with the cannon safe maximum pressure).
- **The tubular shape** is ok regarding the cannon safe maximum pressure but it is not the most suitable because it does not able to reach the muzzle velocity required by caliber > 120 mm.
- **The cylinder 19 holes** is the most optimal shape to reduce the maximum pressure and reach the required muzzle velocity in large caliber weapons (> 120 mm), but is not suitable for small caliber.



The figure below shows the various parameters used to design a grain having a cylinder shape with 19 holes.



The regulation of the gas flow is obtained by choosing the most suitable shape with the right dimensions of the propellant grain. Some shapes do not complete the function (like the example of spherical shape for large calibers). Some others do with different efficiency regarding a specific couple weapon/ammunition.

In conclusion, whatever the weapon is, the choice of the chemical composition is not sufficient to complete the needed function, and the shape is crucial: **therefore it is not possible to conclude on the relative importance between the chemical composition and the shape of grain propellants**.

EUROPEAN DEFENCE AGENCY

ANNEX D, Attachment 2:
ASD paper "Industry input on the classification of solid Shaped Propellant Items (for use in ammunition) as "articles" under REACH"

Contact: Barbara Cooreman

Industry input on the classification of solid Shaped Propellant Items (for use in ammunition) as 'articles' under REACH

This information is based on the arguments provided by ASD members, called 'the manufacturers' in this document.

1. Introduction and scope of this paper

In May 2017, EDA requested input from industry to support EDA in better understanding the function of solid-based propellant items with a defined shape as used in ammunition (e.g. for defence applications).

In this context, it is important to clarify the terminology used in this ASD paper. Propellant material can be of either solid or liquid nature and is used in a variety of applications in both civilian and defence uses. ASD members have decided to differentiate the following two groups:

- **Unshaped Propellant Material** does not have a defined shape; either because this is impossible (for liquid-based propellant, such as used e.g. in space launchers), or because this is not necessary for its function (for some rare solid-based materials, e.g. Black powder). Furthermore, this category also includes solid-based propellant material that is meant to ultimately become Shaped Propellant Items, but which has not yet reached the according step of the production process (e.g the extrusion process) where it is given its shape. (However, the latter type of Unshaped Propellant Material can be roughly compared to on-site isolated intermediates as it does not exist but for a very short time during the production process and is not sold on the market, nor does it have any use besides continuing further with the production process to become a Shaped Propellant Item.)
- **Shaped Propellant Items** consist, by necessity, of solid material. They have been given a defined shape during the production process in order to fulfil certain functional requirements, described in more detail in this paper. Shaped Propellant Items exist in both civilian applications (e.g. in automotive safety products like airbags, or in small-arms ammunition for sports or hunting), and defence applications (like ammunition used by military forces.)

Unfortunately, both industry manufacturers / suppliers and customers do not always make a clear distinction between these two groups in their terminology, but use the general term 'propellant' to

designate all types. For example, many manufacturers used names such as 'Propellant C7 UV' (see table in Annex 6) when referring to Shaped Propellant Items. Logically, this non-differentiated use of the term 'propellant' may lead to confusion; and products designated as 'propellant' should not be misunderstood as automatically being Unshaped Propellant Material.

The information provided in this ASD document is meant to help EDA in assessing the classification, with regard to the article definition criteria under REACH, of **solid-based Shaped Propellant Items for use in (defence) ammunition only**. After thorough discussion, the manufacturers have come to the conclusion that Unshaped Propellant Material is a substance /mixture under REACH. In contrast, Shaped Propellants Items (for use in ammunition) should be classified as articles under REACH.

While putting together arguments, ASD members identified five issues that might lead to confusion when classifying Shaped Propellant Items (for use in ammunition) as a substance or a mixture, or as articles. These five points are:

1. The use of the NATO definition of 'propellant'
2. The function, defined as generating gases to produce propulsion
3. The need for certain chemical groups
4. The shape determining only the 'quality of the result'
5. Propellant with / without a precise shape having the same function

Therefore, these five issues are thoroughly discussed in this ASD document to provide full transparency on why certain arguments might be misleading or inapplicable with regard to classifying Shaped Propellant Items (for use in ammunition).

These issues apply equally to Shaped Propellant Items used in ammunition as those used in rocket motors.

2. ASD's point of view

In the following sections, each of the five issues with potential for misinterpretation or confusion is considered in more depth.

2.1. Use of the NATO definition of 'Propellant'

When discussing the correct classification of Shaped Propellant Items (for use in ammunition) under REACH, one might be tempted to take into account existing definitions of 'propellant' or refer to such existing definitions. However, using existing definitions can be misleading, as is shown by the example of the NATO definition of 'propellant'.

The NATO definition in AOP-38 (2002 Edition) for propellant says: 'A *substance or mixture of substances used for propelling projectiles and missiles, or to generate gases for powering auxiliary devices. When ignited, propellants burn or deflagrate to produce quantities of gas capable of performing work, but in their application are required not to undergo a deflagration-to-detonation transition.*'

This definition of 'propellant' in general as being substances or mixtures cannot be used as proof when classifying Shaped Propellant Items under REACH. It should be noted that this NATO definition predates the REACH regulation. Therefore, the terminology of the NATO definition is not in line with the REACH terminology. For example, the same NATO document defines black powder as a '*Heterogeneous explosive substance composed of potash nitrate (oxidizer), sulphur, and charcoal reducer. It may come in various forms: coarse or fine grains, powder or pastilles. [gun powder*]', although the term 'substance' under REACH refers to a mono-constituent only and such a classification as substance would thus clearly not be correct under REACH. Furthermore, the NATO definition does not differentiate between Unshaped Propellant Material (like liquid propellant) and solid-based Shaped Propellant Items.

This illustrates that it is not appropriate to apply REACH definitions to pre-REACH documentation or descriptions, as the wording in those documents would not have been determined taking into account the REACH definitions of a substance, mixture, or article; and as such interpretation under current legislation will give rise to errors such as identifying black powder as a substance, when under REACH it is a mixture.

2.2. The function, defined as generating gases to produce propulsion

In order to classify Shaped Propellant Items for use in ammunition under REACH, it is necessary to correctly determine their function. In this context, ASD members are concerned that, without in-depth knowledge of the working mechanisms of Shaped Propellant Items for use in ammunition, one might argue that their function is "to generate gases to produce propulsion" only. Yet, such a definition would be misleading for the following reasons:

The functions of an object can be determined by analysing what the producer/supplier wants it to be used for and what the end user acquiring it expects it to do. The functions of a Shaped Propellant Item for use in ammunition need to be defined by the supplier; and are determined in a way to meet the performance required in the Customer's technical specification (see an example of template in annex 1) and to be controlled by the conditions of ballistic acceptance (see annex 2).

After having reviewed several technical specifications of propellants, ASD members deduced that **the function of a Shaped Propellant Item (for use in ammunition) is to be assembled into a Propelling Charge**. This propelling charge is then acquired for several functions, including those described below:

- To be integrated in an ammunition (or a system) to propel a specified shell in a specified weapon with specified ballistic properties depending on: the type of shell used, the mass to propel, the volume of the weapon chamber, etc. to obtain for example the well-defined initial rate, dispersion, gunshot duration etc., in a specified temperature range;
- To ensure all the required performances, in particular the ballistic performances, and reproducibility;
- To withstand all the stresses encountered during the entire life-cycle (storage, transport, functioning, et al.) according to the specification tests (such as mechanical, climatic, vibration,

drop, impact qualification trials, et al.);

- Not to have too high erosive effect to prevent the wear of the weapon barrel and to ensure a maximum barrel life; and
- To fulfil the requirements of Reliability, Availability, Maintainability and Safety through the specified maximum operating pressure, pressure wave, flammability (no re-ignition, no combustion residues, no dirtying weapon barrel, et al.), ignition delay in use, operating and no-operating rate, useful lifetime without degradation, etc.

Clearly, the Shaped Propellant Items are meant to be integrated into a propelling charge, which then has more functional requirements than only the generation of gases. **The simple generation of gas is not the sole function of a propelling charge; instead, it is only the means used to fulfil one of the functions required of the propelling charge.** However, Shaped Propellant Items have no function relevant for a customer other than being assembled into a propelling charge.

To confirm the function, we also can rely on the Quinchon definition, stating that: 'The weapon propellant creates a propelling effect by generation of a large quantity of gas with high temperature in the closed chamber of the barrel, giving a high pressure rise to propel the projectile to the end of the barrel and beyond in accordance with the internal and external ballistic rules'.[1]

In conclusion, comparing the NATO and the Quinchon definitions of a propelling charge, and the functions required by the technical specifications, it becomes clear that all three at a basic level describe the functions in a similar way. There is no dissent between them. However, both the Quinchon definition and the customer technical specifications place additional requirements above the simple NATO requirement (to produce gas to do work), that can only be met by a solid-based propellant item with a shape, since only Shaped Propellants Items have the ability to produce the required controlled release of the gas under the conditions found in a gun in accordance with internal and external ballistic rules. To conclude, the important point is that the shape of the (Shaped) Propellant Item determines its performance (see 2.4 below for further explanation). Consequently, we can rely on this description of the function of a Shaped Propellant Item – to be assembled into a propelling charge, whose function is then to be integrated in, to propel, to withstand, and to fulfil - when conducting the REACH analysis.

2.3. Need for certain chemical groups

When discussing the classification of Shaped Propellant Items for use in ammunition, one might argue that the chemical composition of a Shaped Propellant Item is more (or equally) relevant for its function because one cannot use other materials than a very specific type of chemicals (i.e. explosives). However, while convincing at the first glance, this argument is misleading.

It is true that there is a requirement for the material composition of the Shaped Propellant Items to have certain functional groups in order to burn, and this is an important requirement of all Unshaped

[1] "Les poudres, propergols et explosifs" written by J. Quinchon, J. Tranchant and E. Cohen-Nir in 1991. Volume 4 "Les propergols".

Propellant Material, too. Yet, numerous chemicals can be (and are) used in Shaped Propellant Items for use in ammunition - including nitrocellulose, nitro-glycerine and nitroguanidine -, and these are used in various combinations to regulate the propelling charge's performance in the weapon, such as improving the power of the Shaped Propellant Item, and reducing flame temperatures to protect the weapon from undue barrel wear. Furthermore, RDX based Shaped Propellant Items are also beginning to become available.

This illustrates that different chemical compositions can be used to achieve a similar result (and therefore be used in Shaped Propellant Items). Accordingly, the chemical properties of all these materials are important, but as it is shown below, the shape, surface and design are more important for the functioning of the Shaped Propellant Items than their chemical composition. Without the Unshaped Propellant Material being given a shape during the production stage, the material produced will not have the burn characteristics to be useable as Shaped Propellant Item in ammunition, even if it has the same chemical composition.

2.4. Shape determining the 'quality of the result'

ASD members have provided various illustrations to EDA that show that Shaped Propellant Items exist in a multitude of different shapes; for example balls, flakes, grains, sticks, multi-tubular items and more. This shows that the shape of a Shaped Propellant Item has importance; otherwise, industry would not produce this variation of shapes.

In section 2.3, and based on the assessment why customers buy Shaped Propellant Items, we determined the function of a Shaped Propellant Item as 'being meant to be assembled into a propelling charge'. Shaped Propellant Items for use in ammunition have no other functional use. Within a propelling charge, the Shaped Propellant Items have to produce gas within very tightly defined criteria in order to propel a projectile from the barrel of a weapon, at the correct muzzle velocity, without that the pressures generated exceed the limits of the barrel; and do so reproducibly. The generation of gases to achieve specified maximum pressures in an exactly defined time frame is determined by the shape of the Shaped Propellant Items within the propelling charge.

From what has just been said, some might deduce that the shape of the Shaped Propellant Items seem to determine only the quality of the result, but not the function itself. However, this is not the case: having in mind the specific rate of gas production that a propelling charge is meant to achieve, and having in mind that this specific rate of gas production is determined by the shape of the Shaped Propellant Items, one can only use such Shaped Propellant Items for assembling the propelling charge that have the correct shape. In other words: the most important property of a propelling charge (the development of a defined amount of gas or gas pressure in an exactly defined time frame) is determined by the shape of the Shaped Propellant Items incorporated.

To illustrate the importance of the shape of the Shaped Propellant Items, we would like to remind readers of the following: in the propelling charge, burning of the propellant takes place over the entire surface area of the individual Shaped Propellant Items in the charge. The generation of gases to produce pressure as the projectile moves within the barrel of the weapon must be within the specified pressure budget of the gun barrel. (If the rate of gas production of the propelling charge is

too high, the weapon pressure limit could be exceeded. This would result in the possibility of damage to the weapon (which would make continued use impossible), or in extreme cases, could lead to an explosion of the barrel, which is a great hazard to the user.) The shape determines the manner in which pressure changes as the projectile moves, because the shape controls the way in which the surface area of the Shaped Propellant Item changes as it burns.

Burning can be progressive (i.e., the Shaped Propellant Item's shape is designed to increase in surface area during burn); constant rate (i.e., the Shaped Propellant Item's shape is designed to minimise change in surface area during burn); or regressive (i.e., the Shaped Propellant Item's shape is designed so that the surface area reduces during burn). Every Shaped Propellant Item burns in parallel layers, and the rate of the front flame is the same on all the surface area of the Shaped Propellant Item in contact with the external environment (see annex 3), allowing to control the pressure rise in the barrel to reach the best muzzle projectile rate. (If the rate of gas production of the propelling charge is too low, insufficient pressure will be developed in the weapon system, either causing the ammunition to fail to be projected, or fail to achieve a sufficient velocity to meet the required ballistic range criteria.)

Thus, it is the shape that determines the pressure profile for any propelling charge / weapon combination. Examples of Shaped Propellant Item geometries and pressure curves are shown in annex 4 from reference (1).

The Shaped Propellant Item's performance and burning characteristics depend on a combination of its formulation/composition and its shape. Without the correct shape, the Shaped Propellant Item (whilst being able to burn and to produce gases) will not do so in a way that meets the design requirements and which enables the Shaped Propellant Item to work safely and correctly within a weapon system. There are many design elements which have to be taken into account to ensure that the pressures, generated when the propelling charge burns to produce gases, do not exceed the design requirements of the barrel in which it is fired, or other burn rate design factors. Being able to control the burn rate throughout the burn phase once the propelling charge is ignited is the most essential requirement of the propelling charge's function.

The propelling charge needs to be very carefully adjusted to the requirements of the internal ballistics of the ammunition type. To do so, two main points need to be taken into consideration: on the one hand, when using the ammunition cartridge, the maximum gas pressure in the barrel must not be exceeded. On the other hand, the propellant material must be completely burnt (that is, chemically reacted) before the projectile leaves the barrel muzzle. In order to achieve this, the quantity and geometry of the Shaped Propellant Items are meticulously adjusted to meet the weapon design needs.

By varying the geometry of the Shaped Propellant Items, one is able to determine a very much higher variety of the gas production rate in the chamber than by varying the chemical composition (see also reference in Annex 6). Tests have been undertaken, proving that it is possible to use the same chemical composition of the Shaped Propellant Items (same recipe) for different ammunition calibres by only changing the shape of the Shaped Propellant Items (e.g. by varying the geometrical dimension and shape or wall thickness) in order to adjust it to the specific calibre and ammunition

type. In contrast, it was not possible during these tests to use Shaped Propellant Items of the same shape in different ammunition calibres by only adapting the chemical composition / recipe.

Having in mind the high importance of the Shaped Propellant Item's shape, the ability to exactly reproduce the Shaped Propellant Item's geometry and dimensions during the production process are the most determinant factors for the quality of the Shaped Propellant Items in order to guarantee the required pressure curve in the barrel.

To conclude: the quality of the generation of gases (as determined by the Shaped Propellant Items' shape) is indeed not part of the function of the Shaped Propellant Item. However, the quality of the gas generation is essential for the propelling charge. As Shaped Propellant Items have no other function than being assembled into a propelling charge, having the correct shape is the most important property of the Shaped Propellant Items to fulfil their function.

2.5. Propellant with/without shape having the same function

When discussing the correct classification of Shaped Propellant Item for use in ammunition under REACH, non-experts might assume that solid Shaped Propellant Items and solid Unshaped Propellant Material [that has not (yet) been given a shape] (e.g. powder) would both have the same function and could therefore be classified in the same category, i.e. as mixture. However, this is a misconception.

The following table shows the influences on propellant between the chemistry, shape and quantity of material used. Please take into account that the number of factors in each heading does not indicate any overall importance of the heading relative to each other.

Chemistry	**Shape**	**Quantity (of material in propelling charge)**
Energy content / Force	Pressure profile / Force	Gas volume
Kinetic reaction rate	Gas evolution rate	
Gas / flame temperature		

Accordingly, an (Unshaped) Propellant Material without a specific shape and a specific surface would indeed react:

- by generating gases;
- with a combustion mode.

Yet, the rate of gas production of this solid Unshaped Propellant Material cannot be regulated or controlled. It is possible that under certain burning conditions, the chemical reaction of combustion will transit from a deflagration into a detonation. The safety implications preclude such an Unshaped Propellant Material from having any functional use in the context of ammunition. Because of the uncertainty of the burning characteristics of the material, this Unshaped Propellant Material is unable to perform the functions required for use in ammunition. (This is also illustrated by the fact

that the transport classification for dry (solid), unshaped nitrocellulose is Explosive 1.1 D – could generate a shock wave / mass explosion possible - ; while the same material is classified as Explosive 1.3 C – fire hazard or minor blast only – once turned into a Shaped Propellant Item, due to the increased reliability that is provided by the shape.)

In this context, some might argue that since black powder (being considered as solid but 'Unshaped Propellant Material') can be used in ammunition, so can other Unshaped Propellant Materials. In other words: Shaped Propellant Items and solid Unshaped Propellant Material might seem to have the same function since both can be used in ammunition.

However, in our belief, this is a misunderstanding. It is true that black powder is used as an Unshaped Propellant Material in muzzle loaded weapons (e.g. pistols and cannon, representative of early 19th century weaponry) and in fireworks (e.g. rockets and mortar shell). However, while black powder or gunpowder was historically used as a gun propellant up to the middle of the 19th century in cannon and small arms, the technology changes in weaponry in the late 19th century (breech loading weapons with obturation systems) made the use of black powder as a propellant impossible. It cannot be used in modern breech loading weapon systems, because as well as producing gases to provide propulsion, it also produces large quantities of solid chemical products including the potassium salts of sulphate and carbonate. These are deposited in the weapon, on the walls of the barrel, eventually making it impossible to reload the weapon, and also accumulate to prevent the obturation system working, causing failure of the weapon. Because of these issues, black powder cannot be used as a propellant in modern weapon systems. Instead, all modern propellants are given a shape during the production stage, thus turning them into Shaped Propellant Items, to ensure that they burn to produce gas in a specified manner. This illustrates that solid Unshaped Propellant Materials (like black powder) have not the same function as Shaped Propellant Items (as used nowadays).

(For clarity: black powder is still used in current ammunition, but in very small quantities as a component in the initiation train, between the cap and the main charge to transfer flame or flash, or to act as a delay within the system. However, in these cases, black powder does not act as propelling charge.)

To conclude, while black powder is indeed a mixture under REACH (except when used in pellet form), it is not used in modern systems as the propelling charge. Its principle use is to transfer a flash or a flame as part of the explosive train. Accordingly, one cannot deduce from the example of black powder that Unshaped Propellant Materials work in the same manner as Shaped Propellant Items with a specific shape.

2.6. Other issues

2.6.1 Are the shape, surface and design more relevant for the function of a Shaped Propellant Item than its chemical composition?

When discussing the classification of Shaped Propellant Items under REACH, some might claim that:

Whilst the specific shape, surface or design provided during manufacture to the propellant or

propellant grains can be used to somewhat adjust the combustion reaction, it cannot be more relevant than the chemical composition of the propellant which leads to the combustion reaction itself.

The manufacturers think that there is a great misunderstanding of the functioning of Shaped Propellant Item by those who might advance such an argument. If one takes the ingredients usually used to manufacture a Shaped Propellant Item and formulates a mixture of them, but without giving the mixture / Unshaped Propellant Material a defined shape and size by the further processes, one does not obtain a Shaped Propellant Item, but a mixture without function. Yes, such a mixture can burn to produce gases, but the burn rate is not controllable, and as such, the material produced has no functional use. If the mixture is used, it could lead to undesirable, possibly catastrophic consequences when fired in a weapon.

The importance of the shape is furthermore underlined by the fact that any geometric deviation of size of the Shaped Propellant Items may lead to severe malfunctioning with undesired pressure waves and even destruction of the barrel by explosion. That is why the Shaped Propellant Items must also be designed to withstand shock pressure during ignition; by default the Shaped Propellant Items could shatter resulting in an increase of the combustion area, and therefore of the gas generation rate and pressure, leading to a potential explosion of the breech of the weapon.

For the manufacturers, a defined shape, design and surface are the essential points to all the requirements of the functions assigned to a Shaped Propellant Item that shall be used in ammunition.

The following example illustrates how very specifically and thoroughly the shape of the Shaped Propellant Items must be adjusted to the ammunition in use: if the propelling charge of a tank cannon is filled with Shaped Propellant Items consisting e.g. of 19-hole Shaped Propellant Items, when ignited the Shaped Propellant Items burn vertically into the surface (see annex 2), from their outer surface and inner surface (hole channels) and thereby produce the required gas pressure and accelerate the projectile whilst it is in the barrel. In contrast, if one uses the same amount (weight) of the Shaped Propellant Items, but crush them and fill the crushed propellant material ('powder') into the ammunition, the weapon will most probably be destroyed by overpressure or explosion. The same effect occurs if the Shaped Propellant Items in a propelling charge become rough / chapped / brittle during cold weather due to missing or unsuitable softeners in the composition and is shattered in the chamber by the ignition shock. Because of the larger than usual surface area of the Shaped Propellant Items, an inappropriate high increase of the gas pressure curve will happen, which again may lead to the destruction of the weapon when the maximum pressure allowed for the weapon is exceeded.

Another example of the importance of the shape is the following: usually, in small calibre weapons like a 5.56 mm gun (for example German gun G36), around 1.6 g of propellant can be loaded. Usually, Shaped Propellant Items in ball-shape with a diameter of 0.7 mm are used for that application. This leads to a gas pressure of approximately 3500 to 4000 bar and a muzzle velocity of the projectile (weight 3,6g) of 1000 m/s. If one wanted to replace these ball-Shaped Propellant Items by Shaped Propellant Items as used for tank guns, this would not be possible because the Shaped Propellant

Items could not be loaded in the cartridges as they are far too large (although from a chemical point of view, the composition of the Shaped Propellant Items for tanks would, while not being ideal, work).

The other way round: If the ball-Shaped Propellant Items would be placed in ammunition for tank guns (for example 120 mm KE DM63), this round would not be safe to fire. Due to the high surface of the ball-Shaped Propellant Items, with only 3.5 kg of propelling charge, the maximum operating pressure would already be reached. The theoretical muzzle velocity would be only 963 m/s instead of 1650 m/s. This huge velocity decrease would mean that the projectile would not even hit the target. But even worse: with 3.5 kg of the ball-Shaped Propellant Items, the filling rate of the cartridge would be so low that the round would be less than half filled. This is a very dangerous situation. Such empty cartridges are well known to produce pressure waves so high that the design pressure of the gun is exceeded and the gun is destroyed. To conclude: while the same chemical composition could be used in both the tank gun and the small calibre ammunition, the different requirements with regard to the shape of the Shaped Propellant Items make such an exchange absolutely impossible due to safety issues.

Accordingly, it is the geometric shape that determines the choice of the customer for a specific use in weapon, while the chemical composition of the Shaped Propellant Items is only a side criterion for the choice.

2.6.2 When does a formulated mixture become a Shaped Propellant Item?

A Shaped Propellant Item is manufactured using a batch process, by mixing together various substances to make the correct formulation, or Unshaped Propellant Material. For illustration, let us assume that such a mix is split at the end of the mixing process, and one half is being poured into a tray and allowed to dry, while the other half continues with the extrusion and drying process.

The first half of the material so made will dry into a solid lump of material and stay Unshaped Propellant Material. If ignited, it will burn and produce gas. However, it cannot be cut to form, nor loaded as a bulk into a propelling charge. Theoretically (but possibly not in practice) it could be crushed down into a powder. The powder will also burn to produce gas. The powder could be weighed and loaded into a propelling charge. However, the granular mixture will have a very high surface area, and as such would not be safe to ignite in the closed confines of a barrel, and at the required weight to propel the ammunition, because the burning would probably transition from deflagration to detonation. This material (an Unshaped Propellant Material) would indeed be classified as a mixture, but it is not a Shaped Propellant Item useable in ammunition.

The second half of the mixture goes through further operations including a production process which gives the material a specific shape. Extrusion is a common process, but other processes can be used, too. After shaping, the material goes through a drying process, and is possibly cut to the required length. It is at this point that the material can be described as a Shaped Propellant Item.

Accordingly, the mixture only becomes a Shaped Propellant Item once it has been given a defined shape and surface as part of the manufacturing process, and only then it will burn in a manner which is controlled and safe to use when assembled into ammunition and fired from a gun. (There are

similar design requirements for burn rate in all ammunition natures in which a propelling charge is used, including rocket motors.)

The transition from Unshaped Propellant Mixture (i.e. mixture) to Shaped Propellant Item (i.e. article) is described in further detail in Annex 5 (reference (2)).

3. Summary of industry argument and proposed way forward

With the arguments described above, the manufacturers tried to show that there is no ambiguity as to whether the chemical composition or the surface/shape/design of a Shaped Propellant Item is more important for its function. With Shaped Propellant Items for use in ammunition, it can be demonstrated that the shape is more important than the chemical composition.

It is important to understand that the shape of Shaped Propellant Items has a critical safety function in munitions. Without this safety function (and without the shape), the Shaped Propellant Items could not be used for their function, that is, to be included into a propelling charge, which is then used in ammunition.

In conclusion:

- Under REACH, it is the sole responsibility of the propellant manufacturers to determine the classification of their products.
- The shape, surface, and/or design of a Shaped Propellant Item are key and critical aspects that are more important for its function (to be integrated into a propelling charge, which is meant to produce gas, and to be integrated in, to propel, to withstand, to fulfil et al.) than its chemical composition. The shape is not a factor relating only to the quality of the result.
- The propellant manufacturers have developed their classification of Shaped Propellant Items for use in ammunition as being articles under REACH based on various valid arguments that are all in line with the legal requirements and explanations of the applicable ECHA Guidance.

Final remark: The manufacturers are aware that the company DEZA a.s. has classified propellant in general as a mixture in its authorisation application for DBP (application 0005-02, see page 23 AoA). However, the manufacturers would like to highlight that, while DEZA has certainly prepared the authorisation application to its best knowledge, DEZA is not an expert in the workings and functions of Shaped Propellant Items or ammunition. Therefore, despite being downstream users of DEZA DBP and relying on DEZA's authorisation, various propellant manufacturers have contributed to the present position paper and agree with our conclusion that Shaped Propellant Items should be classified as an article under REACH.

As signed by Jan Pie, ASD Secretary General, on 28th June 2017

Attached:

Annex 1: Propellant Customer's Technical Specifications

Annex 2: Conditions of ballistic acceptance

Annex 3: Example of a combustion propellant by parallel layers

Annex 4: Propellant geometries/pressure curves

Annex 5: Example of propellant manufacture process

Annex 6: Direct correlation between the shape and bulk density, and the ballistic properties of several simple base propellants

References:

(1): “Les poudres, propergols et explosifs” written by J. Quinchon, J. Tranchant and E. Cohen-Nir in 1991. Volume 4 "Les propergols"

(2): SAE internship "propellant for weapon"

ANNEX 1: Customer's Technical Specifications for Shaped Propellant Items (for use in ammunition)

Propellant for Cartridge designed to be fired by the XXX Gun

1 Gun main characteristics

- Total gun volume (barrel + chamber): --- dm^3
- Length of internal ballistic travel: Lb = --- m

2 Cartridge main characteristics

- Projectile mass: Mp = --- kg
- Available volume in the case for propellant combustion: C' = --- dm^3
- Primer type: ---

3 Internal Ballistics main specifications

The ballistic performances will be obtained in ----weapon.

The propellant and its tactical packaging should be stored, handled, transported and used in climatic environment----------specified in STANAG ---

- Muzzle Velocity at +21°C:

  MV = --- m/s

  Sd ≤ --- m/s
- Charge weight / max charge weight: --- ≤ ≤ ---
- Maximum Pressure (over the temperature range of –----°C to +---°C):

  Pmax + 3 xSdPmax ≤ --- MPa
- Maximum Pressure (over the temperature range of –----°C to +---°C):

  Pmax + 4,75xSdPmax ≤ --- MPa
- Action time :

  Over the temperature range of –----°C to +---°C):

  T < --- ms

  Sd ≤ --- ms
- Maximum Impulse (over the temperature range of –----°C to +---°C):

  Imax ≤ --- N.s
- Differential coefficients :

between –---°C and +---°C : ΔMV / Δθ : --- m/s/°C

between +---°C and +---°C : ΔMV / Δθ : --- m/s/°C

4 Operational firing temperature range

- Min: –---°C Max: +---°C

5 Safety firing temperature range

- Min: –---°C Max: +---°C

6 Storage and transportation temperature range

- Min: –---°C Max: +---°C

7 Erosivity

- Minimum service life of the barrel: --- shots at ---°C

8 RAMS

- Requirements for maximal pressure:

  Used at ---°C with ---weapon: maximal pressure< ---MPa with ---shell

- Requirements for shock wave:

  Used with --- shell, none negative DP higher than ---MPa more than ---times per million

- Requirements for flammability:

  None re-ignition after firing, neither in the chamber nor in the muzzle

  After firing, no combustion residues, which could disturb loading, affect the safety and the functioning, are permitted

  The propellant combustion should not leads to dirtying the barrel and affects the functioning : the weapon --- must fire ---shots without dirtying that leads to the cleaning of the barrel chamber

- Requirements for ignition delay:

  On all the field of use, the ignition delay should not exceed ---ms

- Requirements for reliability, availability:

  The rate of non-functioning does not exceed ---per 10000 with a threshold of ---%

- Requirements of maintainability:

  The propellant performances should not require particular maintenance operation

- Life duration :

  --- years in temperate or cold climate and --- years in hot climate

During the service life, in normal conditions of use, none event related to person or equipment safety is permitted

9 Qualification

- Firing tests without climatic and mechanical environments, at different temperatures
- Firing test with climatic and mechanical environmental sequence at different temperatures
- Laboratory tests:

  - stability

  - characterization of the mechanical and chemical properties

  - chemical compatibilities
- Propellant shall be qualified versus with STANAG 4170 requirements or equivalent
- Packaging and Transportation
- For storage and transportation, the propellant shall be packed into approved and qualified packaging that fulfils the UNO regulation for transportation of Hazardous Material.
- Reference document: STANAG -----
- Furniture of Safety Data Sheet
- Propellant will be compliant with REACH specifications

ANNEX 2: Conditions of ballistic acceptance

Explosia a.s. Pardubice-Semtin	Smokeless powder D 051	TDV 365.3/04 Effectiveness since: 15.8.2004

Změna: 0

CONDITONS OF BALLISTIC ACCEPTANCE TESTING OF POWDER D051-03

Part A: Condition of ballistic testing

1.	Ballistic guns	Type		UZ-H-67; 45 Auto; CIP
	Lenght of barrel	Velocity	mm	150
		Pressure	mm	150
	Thread pitch			406
2.	Measurement of speed			
	V1 –non-contact breaker	START - 1.breaker from muzzle	m	4
		STOP - 2 breaker from 1	m	2
	V2 - mechanical breakers	START - 1 contact from muzzle	mm	5
		STOP - 2 contact od 1	m	25
3.	Measurement of time			
		START of measurement		
		STOP of measurement		
		NEXT measured time		
4.	Measurement of pressure - CRUSHER			
		Cylinders pressure measurement	mm	
		Inlet pressure		
		Gauge piston (∅ weight)	mm/g	
		Point of pressure sensing (∅ hole)	mm	
5.	Measurement of pressure – electro-mechanical sensors			
		Sensor		KISTLER 6215
		Filter	kHz	22
		Point of pressure sensing (∅ hole)	mm	12,5 (2)
6.	Parts for testing			
		Case (type, producer)		45 Auto, V 2031, SB
		Primer		5,3 LP
		Bullet (type, producer, length)		FMJ, SB, V 2746
		Weight of bullet	g	14,8 - 15,0
		Length of cartridge	mm	31,9 - 32,20
		Lifting force	N	
		Initial combustion space	cm^3	
7.	Powder charge			
		Weight	g	0,450
		Rounded to	g	0,002
8.	Reference powder or cartridge			
		Type, producer		
		Weight		
		Number of shots		
9.	Test procedure			
		Reference		D 051 VZ 1/10
		Tested		10 V + P

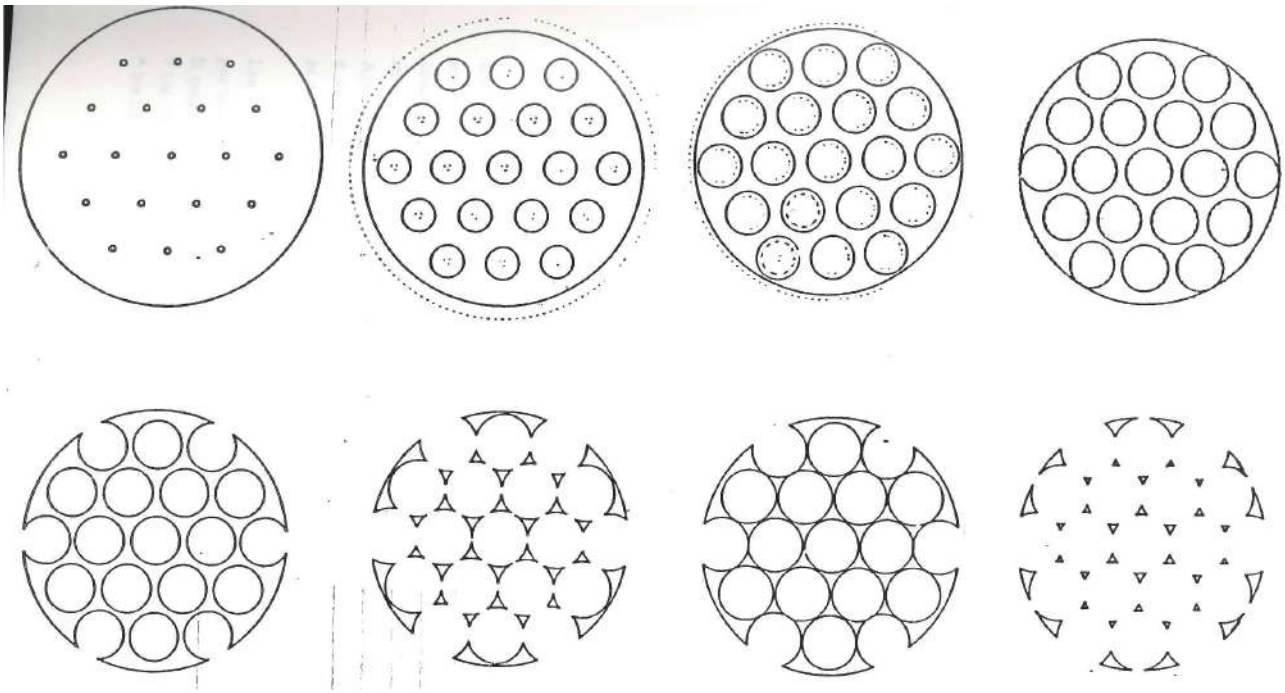
Part B: Prescribed inter-ballistic values:

1.	Temperature of powder	°C	21 ±1		
2.	Number of shots for velocity		10		
	Mean velocity (1) V_0		V_0/ref. ± 3 %		
	Mean velocity (2) $V_{12,5}$	$m.s^{-1}$	$V_{12,5}$/ref. ± 3 %		
	Difference $V_{max.} - V_{min.}$ (ΔV)	$m.s^{-1}$	15		
	SDV				
3.	Number of shots for pressure - Crusher		10		
	Mean pressure – P_{mean} CR	MPa			
	$P_{max.} - P_{min.}$ (ΔP_{mean})				
	SDP				
	P_{mean} + 3,98 SDP	MPa			
4.	Number of shots for pressure – electromechanical sensor		10		
	Mean pressure – P_{mean} PIEZO	MPa	P_{max}/ref. ± 5 %		
	$P_{max.} - P_{min.}$ (ΔP_{mean})				
	SDP				
	P_{mean} + 3,98 SDP	MPa			
5.	Temperature of powder	°C	21 ±1	+52 ±3	-54 ±3
	Number of shots		10	-	-
	Ballistická time of shot	ms	informative		

Remarks:

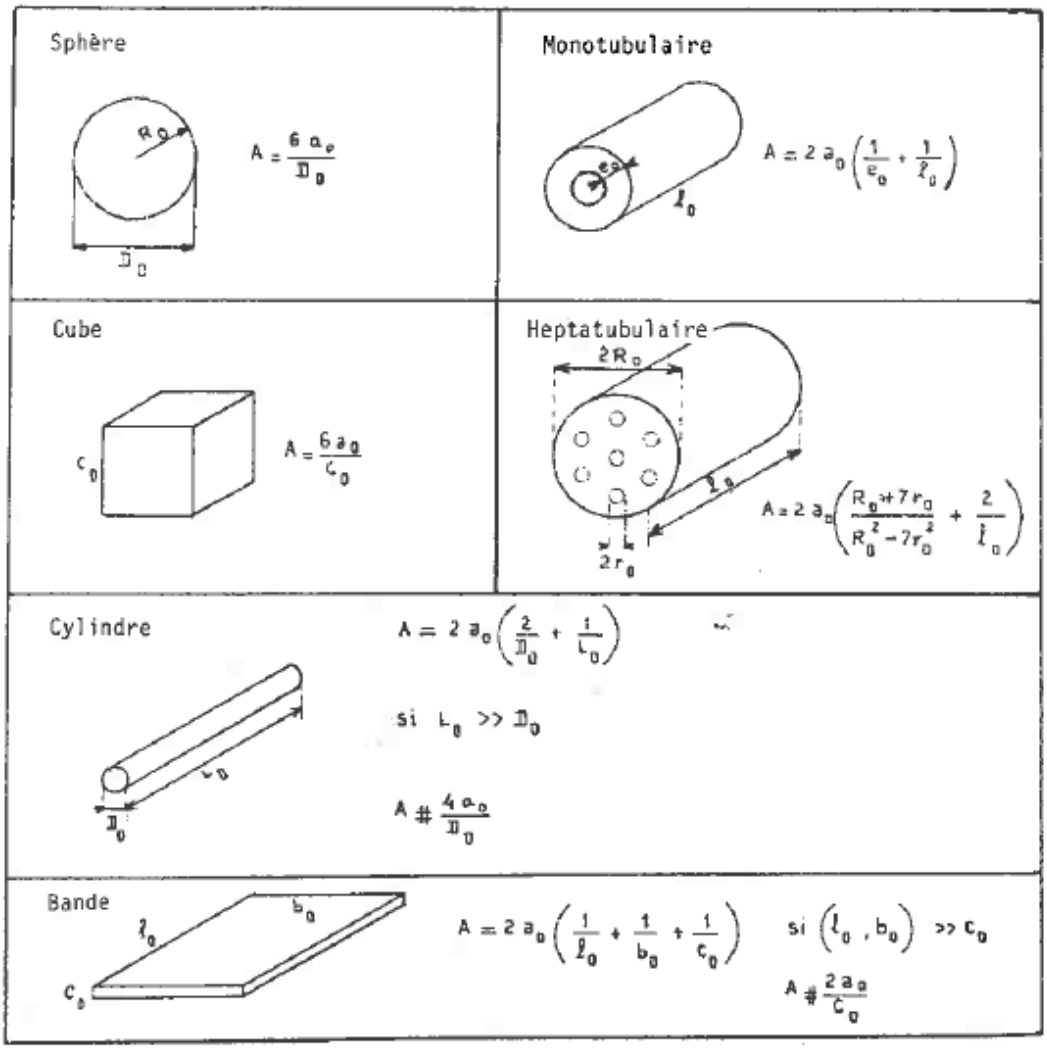
1) Acceptance testing is performed with cartridge parts delivered by customer and corresponding to his TTD.
2) Measurement of velocity of the bullet and pressure of gases is performed by standard ČSN 39 5105. During measurement there must be prevented a discharge of gases from the cartridge chamber.
3) Dimensions of chambre and boring of ballistic gauge´s barrel must be in accordance to standard CIP.
4) Ballistic acceptance test of the powder is performed 7 days from technical acceptance at least.

ANNEX 3: Example of the combustion process by parallel layers of a Shaped Propellant Item (multi-tubular shape)



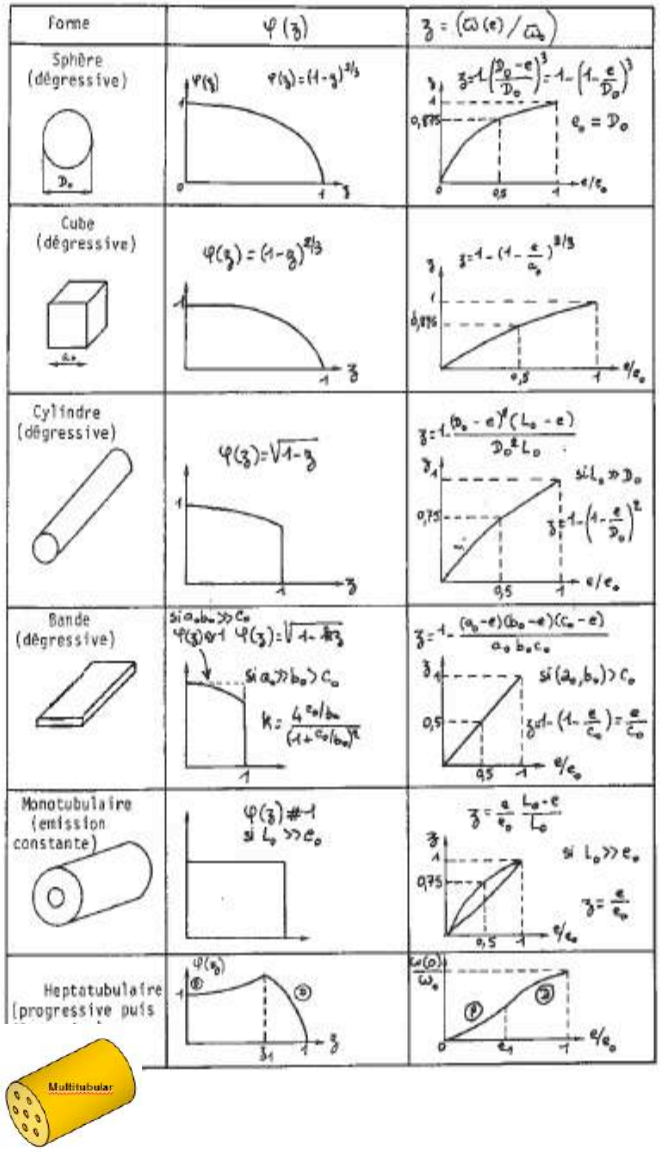
ANNEX 4: Shaped Propellant Items' geometries/pressure curves

Tableau XI.2
Vivacité en fonction de la forme des grains de poudre



Vivacity function of the propellant design

Tableau XI.3
Fonction de forme de grains classiques



Regressive
Cord: surface decreases as propellant burns

Constant
Monotubular: surface remains constant as propellant burns

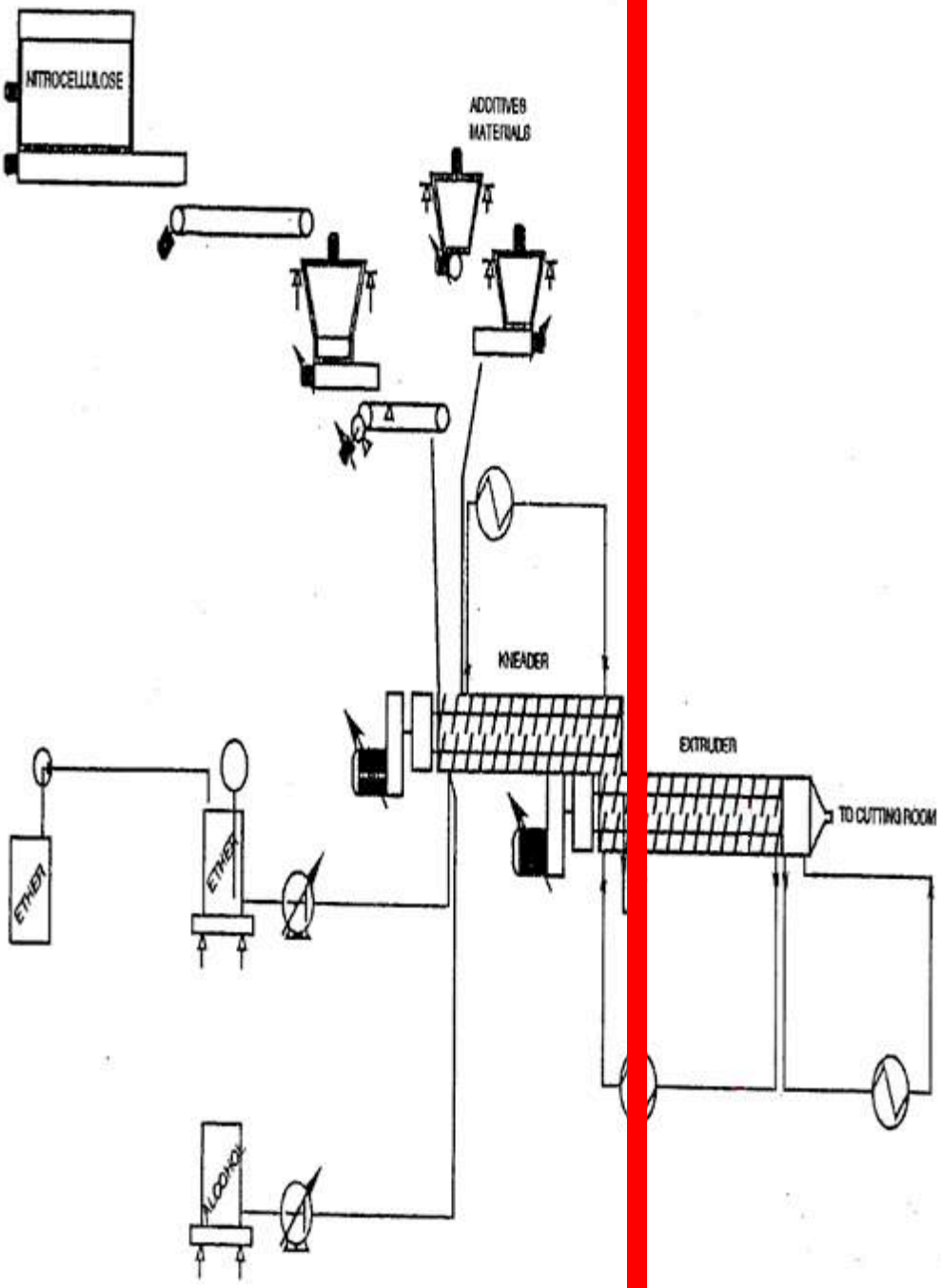
Progressive
Multitubular: surface increases as propellant burns

Shaped Propellant Items' geometries and shape function (evolution of the emission gases in relation with the progression of the flame front)

ANNEX 5 : Example of the manufacturing process of Shaped Propellant Items

MIXING PROCESS

EXTRUSION PROCESS



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ANNEX 6 : Direct correlation between the shape and bulk density, and the ballistic properties of several single-base Shaped Propellant Items (where the chemical composition consists of nitrocellulose only)

Calibre 12 Projectile weight	**Propellant Shaped Propellant Items type A**	**Shaped Propellant Items Propellant type D/206**	**Shaped Propellant Items Propellant type C7**	**Shaped Propellant Items Propellant type GM3/PRIMA**
Lowsonic	Propellant Lowsonic Bulk density = 410 kg/m^3 Charge propellant = 0,9 g Muzzle velocity at 2,5 m = 330 m/s Pressure = 500 Bars			Propellant Prima Lowsonic Bulk density = 520 kg/m^3 Charge propellant =0,9 g Muzzle velocity at 2,5 m = 330 m/s Pressure = 500 Bars
24 g	Propellant A24 Bulk density = 430 kg/m^3 Charge propellant =1,25 g Muzzle velocity at 2,5 m = 405 m/s Pressure = 630 Bars	Propellant 206 SV Bulk density = 440 kg/m^3 Charge propellant =1,25 g Muzzle velocity at 2,5 m = 402 m/s Pressure = 600 Bars	Propellant C7 UV Bulk density = 460 kg/m^3 Charge propellant =1,25 g Muzzle velocity at 2,5 m = 402 m/s Pressure = 630 Bars	
				Propellant Prima SV Bulk density = 540 kg/m^3 Charge propellant =1,33 g Muzzle velocity at 2,5 m = 412 m/s Pressure = 620 Bars
			Propellant C7 SV Bulk density = 460 kg/m^3 Charge propellant =1,33 g Muzzle velocity at 2,5 m = 405 m/s Pressure = 580 Bars	
28 g		Propellant D20 Bulk density = 475 kg/m^3 Charge propellant =1,36 g Muzzle velocity at 2,5 m = 392 m/s Pressure = 670 Bars		
	Propellant AS Bulk density = 470 kg/m^3 Charge propellant =1,37 g Muzzle velocity at 2,5 m = 395 m/s Pressure = 640 Bars			Propellant Prima V Bulk density = 560 kg/m^3 Charge propellant =1,4 g Muzzle velocity at 2,5 m = 394 m/s Pressure = 645 Bars
		Propellant 206V Bulk density = 500 kg/m^3 Charge propellant =1,46 g Muzzle velocity at 2,5 m = 397 m/s Pressure = 600 Bars	Propellant C7V Bulk density = 500 kg/m^3 Charge propellant =1,37 g Muzzle velocity at 2,5 m = 392 m/s Pressure = 640 Bars	

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ANNEX D, Attachment 3: Additional Technical Information on Rocket and Projectile Propellants

ANNEX D, Attachment 3: Additional Technical Information on Rocket and Projectile propellants

PROJECTILE PROPELLANT

a) Substances

For several centuries and until three decades ago, gun propellants were based in a only substance: gelatinized nitrocellulose. Nitrocellulose has fiber structure, as such is an explosive with a decomposition regime in whole mass and detonation velocity of about km/s.

To turn this into a propellant, it is necessary to gelatinize it, to change its morphological structure so that the decomposition is transmitted by parallel layer with reaction velocities of cm/s. Gelatinization is done by solvents, heat and mechanical work.

For several decades the number of substances that can be used as propellants for propulsion of projectiles, has increased. In fact there are efforts to replace nitrocellulose by other substances with less vulnerability and danger, called LOVA Propellant (Low vulnerability propellant). Therefore, currently to carry out the main function there are multiple substances available in the market.

b) The weapon

Formerly very heavy weapons were used, even though these launched the projectiles in very short distances. This was due to the fact that the tube of the gun should be very thick to withstand the large amount of gases produced in a very short time and under sudden very high pressure, that propellant generated.

Over time the scope, the distance and accuracy have been improved and weapons are not as heavy. This is achieved not only with improved materials, but also with the design of all the elements involved in the shooting, through internal ballistics, a discipline that studies all the thermodynamic process inside the barrel and for which it is essential to have a thorough control of the curve of pressures inside the tube and curve of velocity in the interior of the tube, to reach the designed muzzle speed of the projectile.

The gun and the shot is a combination that should be studied as a whole.

It is necessary to study the thermochemical characteristics of the produced gases, their heat transfer rate and rate of formation, the amount of gases per unit of time (flow of gases), the burning time, and other factors. Therefore the burning rate, the combustion surface, the minimum dimension of combustion (web) and grain shape and thickness are key parameters to obtain the vivacity, the size function and the type of progressivity taking part in the formulas of interior ballistics, to fit the designed curve of pressures of the barrel and to achieve the designed muzzle velocity.

If these parameters are not properly adjusted, in the best case, the projectile muzzle speed is not reached and cannot fulfill the main function, in addition to fire and smoke in the muzzle occurs, a very rapid gun deterioration of the barrel occurs. In the worst case, this can lead to an explosion inside the weapon.

ROCKET PROPELLANT

a) Substances

The designer has a wider range of substances to choose than in the case of projectiles. For small rocket, they are, mainly, the mixtures based in nitrocellulose and nitroglycerine, medium and big rockets use, mainly, composites propellants with a very wide range of substances possible both for oxidants and reducing agents.

b) The rocket engine

The rocket is moved ahead by the thrust provided by the gases produced in the deflagration of the propellants. They exit through the nozzle of the rocket engine, which should support the high temperatures and pressure produced. The flow of the gases should fit at all times with the design pressure into the engine and with the flow of exhausted gases through the nozzle, otherwise the rocket will suffer an explosion, if the pressure is higher, or it will burn out, if it is smaller.