

NO-46-A002 DRAFT

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Introduces

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Supersedes

**Terminology and classification of field water
treatment, supply and storage equipment**

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Preface

The present standard has been developed by Technical Committee No. 176.

The standard standardises the terminology and classification regarding military water supply under field conditions.

Any comments concerning this publication should be directed to Wojskowe Centrum Normalizacji, Jakości i Kodyfikacji (Military Centre for Standardization, Quality and Codification).

Abstract

The terminology concerning field water treatment-, supply- and storage equipment is provided. Additionally, classification of military field water supply equipment is provided.

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1 Introduction

1.1 Scope of standard

This standard presents terminology used in military water supply technology. The standard provisions concern particularly:

- water treatment technology;
- water abstraction equipment;
- water treatment equipment;
- water quality assessment;
- water storage and water transport equipment;
- consumables used in water treatment;

and

- classification of field water treatment equipment.

2 Terms and definitions

2.1 Water treatment technology

2.1.1

water abstraction

drawing up water from drilled wells and dug wells, as well as from open bodies of water and watercourses

2.1.2

water supply

all the activities pertaining to delivery of water from water distribution network or water intake point to or from the consumer

2.1.3

water source

water intake source

natural or artificial body of water or groundwater reservoir which facilitates drawing up of **raw water** (2.1.6)

2.1.4

water point

an area where **water abstraction** (2.1.1), **water treatment** (2.1.10) and water distribution takes place under field conditions

2.1.5

water intake

an isolated, previously prepared and properly equipped area in the **water source** (2.1.3) used for **water abstraction** (2.1.1)

2.1.6

raw water

water in its natural state (surface water or groundwater) prior to **water treatment** (2.1.10) or water drawn for further treatment

2.1.7

potable water

drinking water

water of sufficiently high quality that it can be drunk

2.1.8**water potable in crisis situation**

water which fulfils the requirements specified in standards pertaining to crisis situations

2.1.9**water for livelihood needs**

potable water, water for sanitary and hygienic purposes, water used in the industrial processes and medical purposes

2.1.10**water treatment**

those organizational-, technical and technological processes, the goal of which is the increase of **raw water** (2.1.6) quality until it complies with a defined set of standards

2.1.11**simple water treatment**

removal of **natural contaminants** (2.1.15) and **anthropogenic contaminants** (2.1.16) in the **water treatment** (2.1.10) process

2.1.12**special water treatment**

removal of **natural contaminants** (2.1.15), **anthropogenic contaminants** (2.1.16) and **deliberate contaminants** (2.1.17) in the **water treatment** (2.1.10) process

2.1.13**water decontamination**

removal of radioactive substances and removal or neutralization of chemical or biological contaminants

2.1.14**water disinfection**

removal, deactivation or killing of pathogenic microorganisms found in water (vegetative forms, viruses and spores), including biological warfare agents

2.1.15**natural contaminants**

natural, organic and non-organic additives found in water in solved, colloidal or slurry form

2.1.16**anthropogenic contamination**

organic, non-organic and biological agents in solved form, colloids or slurry introduced into water by the activity of humans

2.1.17**deliberate contaminations**

noxious, biological and radioactive agents introduced into water in order to contaminate or infect it

2.1.18**technological processes****water treatment processes**

all the physical and chemical processes aimed at improving the quality of **raw water** (2.1.6) so that this parameter corresponds with the one characterising **drinking** (treated) **water** (2.1.5), including such processes as: **chlorination** (2.1.19), **coagulation** (2.1.20), **flocculation** (2.1.21), **sedimentation** (2.1.22), **filtration** (2.1.23), **adsorption** (2.1.24), **ion exchange** (2.1.25), **membrane processes** (2.1.26) and final **water disinfection** (2.1.14)

2.1.19**chlorination**

a process of applying chlorine compounds to water in order to oxidize ions, organic substances, CWA, kill microorganisms (including BWA) and aid in **coagulation** process (2.1.20)

2.1.20**coagulation**

a process settling out fine suspended matter (colloids) by means of adding coagulating agents – chemical agents causing **flocculation** (2.1.21) of contaminant particles

2.1.21**flocculation**

a process of contact and adhesion, whereby the water-dispersed contaminating particles form larger-size clusters (flock) or flakes, easy to remove in **sedimentation** (2.1.22) or **filtration** (2.1.23) process

2.1.22**sedimentation**

a process of removing impurities through precipitating and settling out the suspended particles at the bottom of a container

2.1.23**filtration**

a process of removing particles as the result of water flow through a porous material called filter bed

2.1.24**adsorption**

a process of attraction of removable molecules from an adjacent gas or liquid to an exposed solid (adsorbent) surface

2.1.25**ion exchange**

a process of exchanging harmful ions with harmless ions during the water flow through ion-exchange bed whereby contaminants in the form of cations are removed by cation exchangers and the contaminants in the form of anions – by anion exchangers

2.1.26**membrane processes****membrane operations**

techniques allowing separation of contaminants on molecular or ion-level whereby the kind of membrane is the deciding factor, as far as the both the size of removed particles, and the type of process employed are concerned.

Note: among the membrane processes, one can distinguish: microfiltration, ultrafiltration, nanofiltration and reverse osmosis.

2.2 Well-drilling and water abstraction equipment**2.2.1****well-drilling set**

all the equipment and machinery used for drilling holes in the ground, as well as the equipment for casing and mounting the water well itself

2.2.2**water lift**

a machine used to draw up and transport water without the need to create pressure difference between the water intake point and water discharge point of the machine

2.2.3**water pump**

a machine used to draw up and transport water operating based on the difference in pressure between the suction (intake) part of the pump and the forcing part of the pump (discharge)

2.3 Water treatment equipment**2.3.1****military water treatment equipment****WUUW PL**

equipment used for **water treatment** (2.1.10) under field conditions, including the **water decontamination** equipment (2.1.13)

2.3.2**military water treatment station****WSUW PL**

equipment with minimal rated flow rate of 2 m³/h which are used for **water treatment** (2.1.10) **water decontamination** equipment (2.1.13)

2.3.3

military water treatment sets

WZUW PL

equipment with maximal rated flow rate of 2 m³/h which are used for **water treatment** (2.1.10) **water decontamination** equipment (2.1.13)

2.3.4

personal water purifier

water treatment (2.1.10) filter being part of individual soldier pack

2.4 Water quality assessment

2.4.1

field water quality control laboratory

laboratory equipment, laboratory glassware and reagents for designation of physical and chemical parameters of water, particularly of toxic agents, under field condition

2.4.2

full water quality assessment

assessment of water usability as determined basing on the results of dosimetric-, toxic-, physiochemical- and microbiological tests conducted by a specialist field- or land-based (stationary) laboratory

2.4.3

reduced water quality assessment

assessment of water usability as determined basing on the results of dosimetric- and toxic tests, as well as on selected physiochemical indicators

2.4.4

sampling

a process of taking a specific representative part of the mass of water in order to analyse its various parameters

2.4.5

water sample

a specific volume of water required to conduct intended analyses, sampled and prepared and delivered for the tests in such a way that it is representative and protected against the composition change

2.4.6

analytical sample

certain portion of a water sample (2.4.5) intended for analysis

2.5 Water storage and distribution equipment

2.5.1

military water truck

military road vehicle equipped with a **military water unit** (2.5.2) or **military isothermal tank** (2.5.3) used for storage and transport of drinking water under field conditions

2.5.2

military water unit

military water truck (2.5.1) unit divided into compartments (chambers) and equipped with devices enabling its filling and emptying (including distribution), storage and transport of drinking water under field conditions

2.5.3

military isothermal (thermoinsulating) tank

military water tank (2.5.2) specially constructed in such a way that a thermoinsulating material is inserted between the double walls of a tank, and the material limits heat transfer between the insides of the tank and the environment and hence the required temperature range for the stored and transported water is maintained

2.5.4

water tank

a vessel for water collection and temporary or continuous storage and sometimes for water transport and temporary storage

2.5.5**flexible water tank**

a **water tank** (2.5.4) made of elastic materials which, when emptied, can be folded in order to decrease its dimensions for the duration of transport

2.5.6**rigid water tank**

a **water tank** (2.5.4) made of materials which preclude changes in the dimensions of the tank

2.5.7**nominal capacity**

a volume corresponding with the volume of water at temperature (15-20) °C which fills up the entire **military water unit** (2.5.2) or **water tank** (2.5.4)

2.6 Consumables used for water treatment**2.6.1****consumables**

chemical reagents and other materials which are consumed and undergo **rotation** (2.6.3) which are part of **field water quality control laboratory** (2.4.1) and **military water treatment equipment** (2.3.1)

2.6.2**consumable rotation set**

materials which are consumed or undergo rotation and which enable constant operation of **military water treatment equipment** (2.3.1), or operation of **water quality control laboratory** (2.4.1) for a certain period of time

2.6.3**consumable rotation**

exchange of the used-up **consumables** (2.6.1) or the ones past their expiration date for new ones

3 Classification of field water treatment, distribution and storage equipment**3.1 General classification**

Taking the equipment's destination (function performed) as a criterion, military field water treatment equipment can be divided into:

- well drilling sets;
- water abstraction equipment;
- water treatment equipment;
- field water quality control laboratory;
- drinking water containers
- drinking water pipes.

Classification of the above equipment is provided in Appendix A.

This standard does not cover detailed classification of well-drilling sets and field water quality control laboratories.

3.2 Classification of water abstraction equipment

Taking the water drawing up and distribution (transport) method as a criterion, water abstraction equipment can be divided into:

- water lifts (manual, mechanical);
- water pumps (manual, mechanical).

3.3 Classification of field water treatment equipment

Taking the water treatment capability (treatment efficiency) as a criterion, field water treatment equipment can be divided into:

- military water treatment stations with efficiency $\geq 2 \text{ m}^3/\text{h}$,
- military water treatment sets with maximal efficiency $< 2 \text{ m}^3/\text{h}$,
- personal water purifier – efficiency up to few litres per 24 hours.

3.4 Classification of potable water tanks

3.4.1 Division of potable water tanks with respect to manufacturing material

Taking the manufacturing material as a criterion, potable water tanks can be divided into:

- hard (rigid);
- soft (flexible)

3.4.2 Division of potable water tanks with respect to their mobility:

Taking the mobility as a criterion, potable water tanks can be divided into:

- stationary;
- movable.

3.4.3 Division of flexible potable water tanks with respect to their structural features:

Taking the structural features as a criterion, flexible potable water tanks can be divided into:

- frame ones;
- frameless ones.

3.4.4 Division of mobile potable water tanks with respect to their dislocation method:

Taking the dislocation method as a criterion, movable potable water tanks can be divided into:

- mobile ones;
- portable ones.

3.4.5 Division of mobile potable water tanks with respect to their transportation method:

Taking the transportation method as a criterion, mobile potable water tanks can be divided into:

- self-contained systems (military water trucks);
- trailer-mounted ones (military water trailers);
- transportable ones (using any transportation mean).

3.5 Classification of potable water field distribution systems

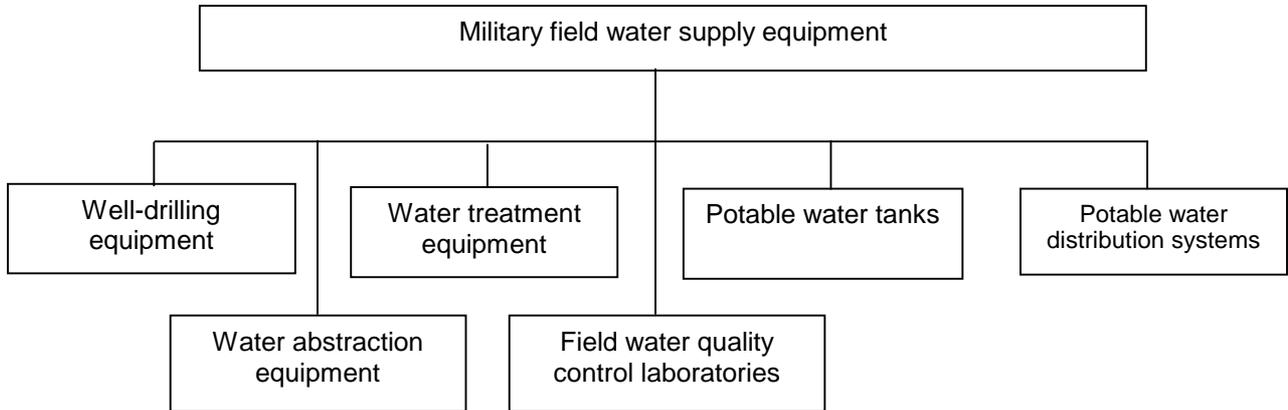
Taking the manufacturing material as a criterion, potable water field distribution systems can be divided into the ones utilizing:

- metal pipes;
 - plastic pipes;
 - hoses.
-

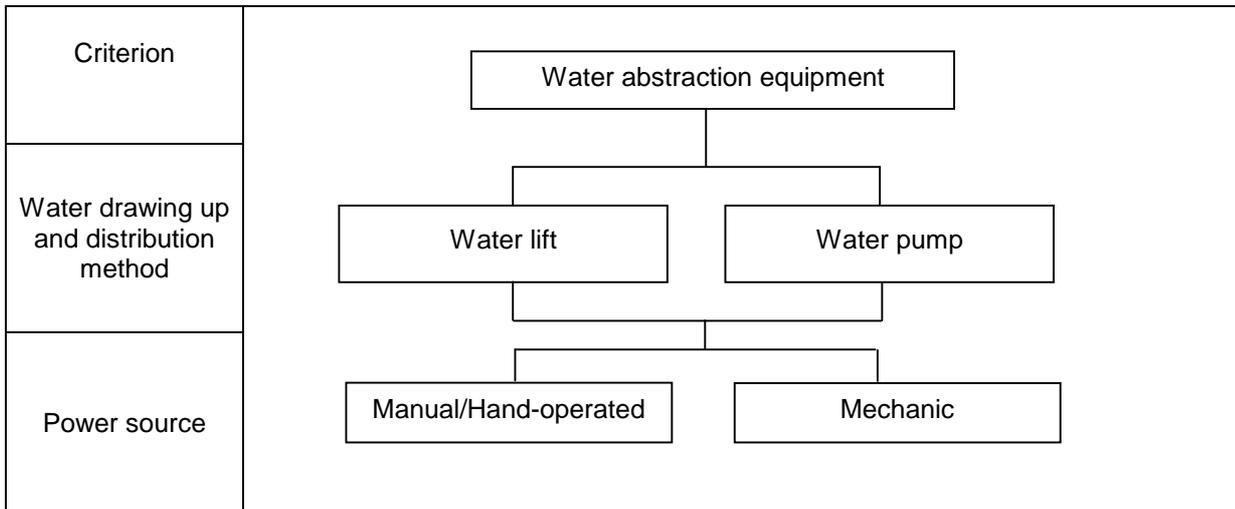
Appendix A
(standard)

DIAGRAM OF CLASSIFICATION OF MILITARY FIELD WATER SUPPLY EQUIPMENT

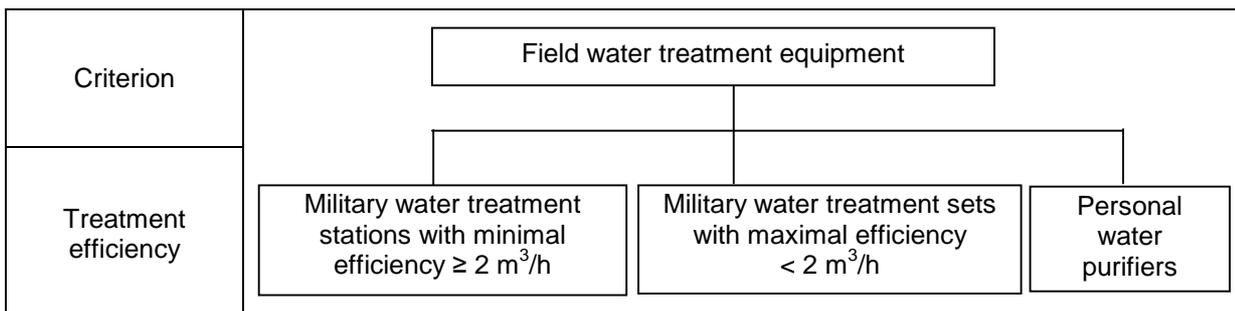
A.1 Diagram of general classification



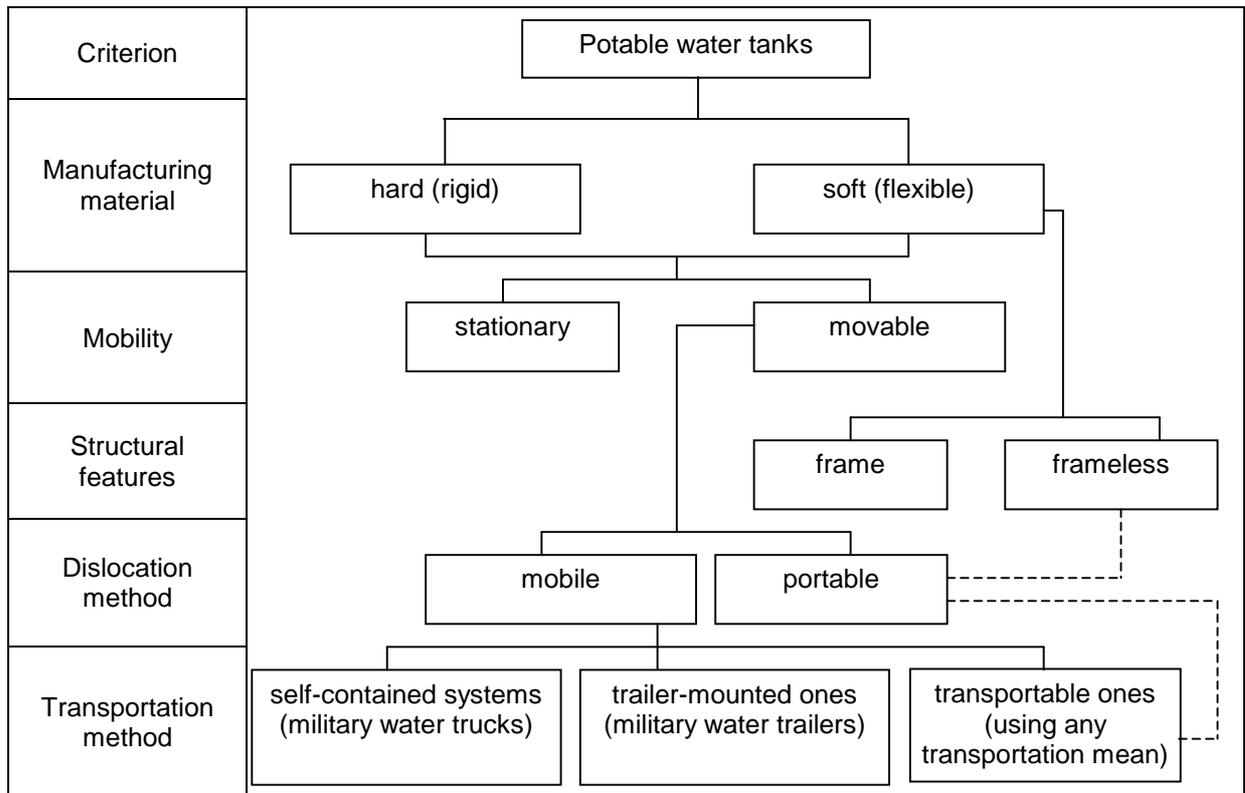
A.2 Diagram of water abstraction equipment classification



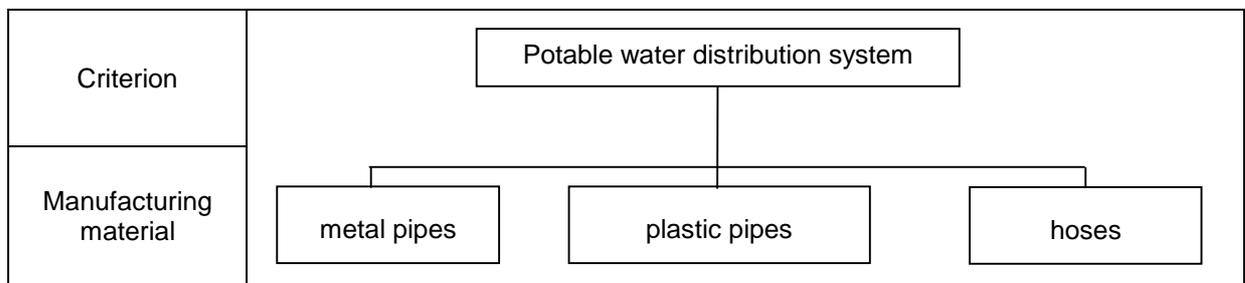
A.3 Diagram of treatment equipment classification



A.4 Diagram of potable water tank classification



A.5 Diagram of field potable water distribution systems classification



Alphabetic index of English terms

A

adsorption **2.1.4**
analytical sample **2.4.6**
anthropogenic contaminants **2.1.16**

C

chlorination **2.1.20**
coagulation **3.1.19**
consumable rotation **2.6.3**
consumable rotation set **2.6.2**
consumables **2.6.1**

D

deliberate contaminations **2.1.17**
drinking water **2.1.7**

F

field water quality control laboratory **2.4.1**
filtration **2.1.23**
flexible water tank **2.5.5**
flocculation **2.1.21**
full water quality assessment **2.4.2**

I

ion exchange **2.1.24**

M

membrane processes **2.1.26**
military isothermal tank **2.5.3**
military water treatment equipment (WUUW) **2.3.1**
military water treatment stations **2.3.2**
military water treatment set (WZUW) **2.3.3**
military water treatment station (WSUW) **3.3.2**
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N

natural contaminants **2.1.13**

P

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potable water (drinking water) **2.1.7**

R

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reduced water quality assessment **2.4.3**
rigid water tank **2.5.6**

S

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sedimentation **2.1.22**
simple water treatment **2.1.9**
special water treatment **2.1.12**

T

technological processes **2.1.18**

W

water abstraction **2.1.1**
water disinfection **2.1.13**
water decontamination **2.1.13**
water for livelihood needs **2.1.9**
water intake **2.3.5**
water intake source **2.1.3**
water lift **2.2.2**
water point **2.1.4**
water potable in crisis situations **2.1.8**
water pump **2.2.3**
water sample **2.4.5**
water source **2.1.3**
water supply **2.1.2**
water tank **2.5.4**
water treatment **2.1.10**
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well-drilling set **2.2.21**water source **3.1.3**
WSUW **2.3.2**
WUUW **2.3.1**
WZUW **2.3.3**