SLOVENSKI STANDARD
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Varnostne zahteve - Oprema za čiščenje vozil

Safety requirements - Vehicle cleaning equipment

Fahrzeugwaschanlagen - Sicherheitsanforderungen

Systèmes de lavage de véhicules - Exigences de sécurité

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Safety requirements - Vehicle cleaning equipment

Fahrzeugwaschanlagen - Sicherheitsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 197.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17281:2018) has been prepared by Technical Committee CEN/TC 197 “Pumps”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This standard contains requirements and verifications, on the basis of which vehicle washing systems can be granted the CE mark.

Introduction

The scope of this standard describes the hazards dealt with. For hazards, which are not dealt with in this standard, it is essential that the machines comply with EN ISO 12100, if appropriate.

Where an example is given for the clarification of the text, it should not be considered as the only authorized solution. Each other solution is admitted provided the same result is achieved and an equal level of safety for equal function is guaranteed.

It is not the purpose of this standard to exclude new designs of vehicle washing systems from a later integration. It is essential that a new design at least complies with the safety requirements of this standard.

If vehicle washing systems are operated under special conditions e.g. under the influence of the weather, it is essential that the constructive measures, components and materials as well as service lines are adapted to these conditions.

This standard does not contain requirements for the service life of vehicle washing systems, as it depends on the site and on special demands of the clients.

When preparing the standard, carelessness of the user has partly been taken into account. The basis, however, is intended, not unintended use.

1 Scope

This document contains technical safety requirements for the design, equipment and testing of brushless vehicle washing systems and vehicle washing systems with brushes for, indoor and outdoor operation e.g. roll-over vehicle washing systems, vehicle washing tunnels, manually movable vehicle washing facilities.

This standard does not apply to hand-guided high pressure cleaners which are covered by EN 60335-2-79, to water recycling systems, buildings and doors for entering the traffic zone, for powered ride-on machines and powered walk-behind machines with a traction drive.

NOTE Signals (example doors, lighting systems) may be provided by the vehicle washing system.

This standard contains requirements for the protection of persons and objects from accidents and damages during use and operation of vehicle washing systems.

Persons to be protected are

– operators,

– maintenance and monitoring personnel,

– persons in the vicinity of vehicle washing systems,

– persons sitting in the vehicle during cleaning.

Objects to be protected are

– vehicles.

Significant hazards associated with vehicle washing systems are listed in Clause 4. These hazards have been established by a risk assessment according to EN ISO 12100 and require measures to eliminate the hazard or to reduce the risk. These measures are specified in Clause 5 of this standard.

The safety requirements assume that vehicle washing systems are regularly maintained by trained and competent persons according to the manufacturer's information and that the operators, with the exception of users of self-service washing systems, have been instructed in the handling of vehicle washing systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 81-20, *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts*

EN 81-50, *Safety rules for the construction and installation of lifts — Examinations and tests — Part 50: Design rules, calculations, examinations and tests of lift components*

EN 280, *Mobile elevating work platforms — Design calculations — Stability criteria — Construction — Safety — Examinations and tests*

EN 349, *Safety of machinery — minimum gaps to avoid crushing of parts of the human body*

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1)*

EN 60335-2-79, *Household and similar electrical appliances — Safety — Part 2-79: Particular requirements for high pressure cleaners and steam cleaners (IEC 60335-2-79)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 11200, *Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions (ISO 11200)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11203:2009, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 11205:2009, *Acoustics — Noise emitted by machinery and equipment — Engineering method for the determination of emission sound pressure levels in situ at the work station and at other specified positions using sound intensity (ISO 11205:2003)*

EN ISO 13850, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850)*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

EN ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access (ISO 14122-1)*

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
work and traffic zone
area which is assigned to one or several persons for the execution of the work task (from EN 614-1)

3.2
traffic zone (of a vehicle washing system)
area used for pedestrian or vehicular traffic from which the vehicle washing system can be entered and exited

3.3
operating temperature (of the washing liquid)
temperature of the liquid supplied to the spraying device or to another part of the liquid system during operation

3.4
operating pressure
pressure resulting at the pressure generator from a given volume flow with the corresponding nozzle

3.5
flammable liquid
liquid which can react exothermally with air when ignited

3.6
brushless vehicle washing system
vehicle washing system, where the cleaning is carried out without mechanical contact between washing system and vehicle

Note 1 to entry: In general, the cleaning is carried out contactless, e.g. with liquid from nozzles.

3.7
pressure generator
device generating an overpressure

3.8
tandem roll-over vehicle washing system
two or more roll-over vehicle washing systems which wash and/or dry the same car, and move independently

3.9
liquid heater
device for the heating of the liquids to the operating temperature

3.10
vehicle ground conveyor
device for the horizontal movement (trailing) of vehicles on a track or on rails

3.11
vehicle displacement device
platform or access rails on which vehicles are mechanically moved in the washing system so that they can be cleaned in their entire length even in short washing bays

3.12
vehicle washing system
system for the external cleaning of vehicles or parts of vehicles, where cleaning, drying or special treatment devices and/or vehicles are mechanically moved and where the vehicle is placed in the system by the vehicle driver

3.13
vehicle washing tunnel/street
vehicle washing system where the vehicles to be cleaned are moved through washing, drying or special treatment points by means of power driven vehicle ground conveyor devices

3.14
liquid jet
device or system where the liquid, also with additives, is ejected in a free jet from devices equipped with nozzles or from other devices equipped with speed increasing outlets

3.15
high pressure pipework
pipeline or hose pipe in which the liquid is conducted from the pressure generator to the consumption points with a minimum pressure of 2,5 MPa and not exceeding 35 MPa

3.16
vehicle washing system with brushes
system, where the washing unit consists of rotating or moving bodies equipped with bristles, stripes or similar elements

3.17
roll-over washing system
mobile, rail mounted vehicle washing system, where a gantry with mounted or integrated washing, drying and special treatment devices is mechanically moved over the standing vehicle

Note 1 to entry: Also, rigidly coupled machines are considered as roll-over washing systems.

3.18
hose fittings
connecting elements for hoses or hose pipes

3.19
instructed service person driven vehicle washing system
vehicle cleaning facility which is started by an instructed service person

3.20
automatic vehicle washing system
vehicle cleaning facility which is started without an instructed service person

3.21
self-service vehicle washing system
vehicle cleaning facility which is started and operated by the customer

3.22
instructed service person
capable of conducting the tasks as defined in the operator's manual of the manufacturer

3.23
automatic safeguard
automatic guard or protective device provided to protect persons from a hazard

3.24
protection devices
protection devices which guarantee the safe operation of the system

Note 1 to entry: This may e.g. be achieved by preventing the surpassing of the maximum recommended operating parameters as e.g. pressure, temperature etc.

3.25
takt/batch washing system
mobile, rail mounted vehicle washing system of the roll over type, where the washing and drying units are separately mounted on different gantries

Note 1 to entry: Both gantries are consecutively mounted. They move mechanically over the vehicle being either in washing or drying position.

Note 2 to entry: The vehicle shall be moved from the washing to the drying position. In intermittent washing systems, no continuous vehicle advance is carried out.

3.26
under chassis wash
device for cleaning the underside of vehicles

3.27
manually movable vehicle washing system
system which is manually moved along or around the standing vehicle

3.28
maximum operating pressure
pressure which is permitted for a component on the basis of the material and the calculation documents at the permissible temperature

3.29
drive-through washing system
during cleaning, the vehicle is moved by its own power

4 List of hazards

The list of hazards given in Table B.1 is based on harmonised standards to the Machinery Directive 2006/42/EC. The numbering is taken from the Machinery Directive. The list contains significant hazards, danger points and hazardous operating conditions related to vehicle washing systems. The relevant requirements according to Clause 5 are intended to avoid hazards, to protect from dangers or to reduce the risk.

5 Safety requirements and safety measures

5.1 General safety requirements

5.1.1 Shearing and crushing points at power-operated movable parts

Crushing and shearing points at power operated parts shall be avoided in the work and traffic zones up to a height of 2 m above the respective floor space for persons or, if this is not possible, they shall be protected. The hazard points may be avoided or protected by e.g.:

– Safety distances according to EN 349 and EN ISO 13857;

– Guards;

– Safety devices;

– Deterring devices.

NOTE 1 Counterweights could be a point of crushing and shearing.

NOTE 2 The space between two independent moving tandem roll over vehicle washing systems could be a point of crushing.

5.1.2 Tripping and twisting points

Tripping and twisting points in the work or traffic zones shall be avoided or protected.

Tripping points caused by ground rails are avoided if the rails are laid evenly with the ground. Nevertheless, all necessary steps shall be taken to ensure that tripping and twisting points are avoided.

Twisting points are considered to be protected if they are made visible by appropriate surrounding conditions, e.g. by sufficient lighting and/or coloured design.

Equipment such as e.g. wheel entering devices and on-floor under-chassis washing systems, which cannot be realised below a certain level for functional reasons shall be visible by appropriate surrounding conditions, e.g. by sufficient lighting and/or coloured design.

5.1.3 Gears and sprocket wheels

Enclosures for gears and sprocket wheels in the work and traffic zones shall not have openings not in compliance with EN ISO 13857. If they are positioned outside the work and traffic zones, at least the nip points shall be protected against contact.

5.1.4 Belt and rope drives

The nip points at belt and rope drives within the work and traffic zones shall be protected by guards or deterring devices.

5.1.5 Supporting means

The supporting means for horizontal system components shall be designed with a safety factor for breaking load divided by load bearing capacity of at least 6 to ensure the safety of the machine.

NOTE The factor is in conformity with EN 14492-2.

In the event of breaking of a supporting means, roof brushes or roof nozzles shall not fall down uncontrolled. The drop distance shall only be 0,3 m at maximum within the work and traffic zone.