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High-pressure water jet machines – Safety requirements – Part 2: Hoses, hose lines and connectors

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The European Standard EN 1829-2:2008 has the status of a Swedish Standard. This document contains the official English version of EN 1829-2:2008.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1829-2

April 2008

ICS 97.080

English Version

High-pressure water jet machines - Safety requirements - Part 2: Hoses, hose lines and connectors

Machines à jet d'eau à haute pression - Prescriptions de sécurité - Partie 2 : Tuyaux flexibles, lignes de tuyauteries flexibles et éléments de raccordement

Hochdruckwasserstrahlmaschinen - Sicherheitstechnische Anforderungen - Teil 2: Schläuche, Schlauchleitungen und Verbindungselemente

This European Standard was approved by CEN on 23 February 2008.

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Foreword

This document (EN 1829-2:2008) has been prepared by Technical Committee CEN/TC 197 “Pumps”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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 annexes ZA and ZB, which are an integral part of this document.

EN 1829 consists of the following parts, under the general title ‘High-pressure water jet machines – Safety requirements’:

– Part 1: Machines

– Part 2: Hoses, hose lines and connectors

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100-1.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard applies to hoses, hose lines and connectors intended to be used with high-pressure water jet machines within the scope of prEN 1829-1.

This European Standard deals with all significant hazards, hazardous situations and events relevant to the equipment in the scope, when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see clause 4).

This European Standard deals with safety requirements to minimise the significant hazards which can arise from assembling, operating and servicing of hoses, hose lines and connectors for use with high pressure water jet machines (see clause 5).

NOTE 1 This European Standard does not cover leak shields since they are not part of a hose line.

The hazard due to scalding from hot liquid or from irritation / burning of any added chemicals is not covered in this European Standard.

This European Standard is not applicable to hoses, hose lines and their accessories, which are manufactured before the date of its publication as EN.

NOTE 2 For products of similar application that are outside of the scope of this European Standard and for which there is no alternative document available the relevant Clauses of this European Standard may be used.

2 Normative references

The following referenced documents are indispensable for the application 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.

prEN 1829-1:2007, *High-pressure water jet machines – Safety requirements – Part 1: Machines*

EN ISO 1402:1996, *Rubber and plastics hoses and hose assemblies – Hydrostatic testing (ISO 1402:1994)*

EN ISO 4672:1999, *Rubber and plastics hoses – Sub-ambient temperature flexibility tests (ISO 4672:1997)*

EN ISO 6803, *Rubber or plastics hoses and hose assemblies – Hydraulic-pressure impulse test without flexing (ISO 6803:1994)*

EN ISO 12100-1:2003, *Safety of machinery - Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2, *Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)*

ISO 7010:2003, *Graphical symbols – Safety colours and safety signs – Safety signs used in workplaces and public areas*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003, prEN 1829-1:2007 and the following apply.

3.1
burst pressure
static pressure that destroys the hose line and allows the liquid to escape

3.2
interconnected hose lines
several hose lines which have been connected to each other

3.3
connector safety devices
parts or components to restrain movement of the hose line if the connector fails (e.g. locking collars, hose sleeves, etc.)

4 List of significant hazards

4.1 General

This Clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

4.2 Hazards due to bursting or leaking of hoses

Hazards can occur when a hose bursts or leaks. The escaping stream of liquid can cause physical damage and also a sudden repositioning of the hose line in a dangerous manner (whip).

4.3 Hazards due to failure of connectors

Hazards can occur when a connector fails. The escaping stream of liquid can cause physical damage and also a sudden repositioning of the hose line in a dangerous manner (whip).

4.4 Hazards due to errors by the operator

Hazards can occur if the operator uses incompatible substances or incompatible components. Hazards can also occur if the operator exceeds the limits of use specified by the manufacturer (e.g. too high pressure, too high tensile stress).

4.5 Hazards due to change in length of hose line

Hazardous situations occur when there is a sudden change of pressure in the hose line causing a change in length resulting in the operators losing their firm hold.

5 Safety requirements and/or protective measures

5.1 General

Hoses, hose lines and their connectors shall comply with the safety requirements and/or protective measures of this Clause. In addition, they shall be designed according to the principles of EN ISO 12100-2 for relevant but not significant hazards, which are not dealt with by this European Standard.

Hoses, hose lines, and connectors have to feature a certain structure in order to guarantee safe operation when used properly. They must not bear any risks for the operator or for the workplace and its environment. The design of any connector safety devices has to provide safe operational performance to eliminate any risk or hazard for the operator or their environment. However, improper use of a hose line or the connectors may result in hazardous situations and must be avoided.

NOTE Correct assembly of hose lines requires specific knowledge and skills and also specific equipment.

5.2 Requirements for compatibility of components

The hoses and connectors combined to hose lines have to match each other in terms of structure, composition, and design.

NOTE Hoses of one manufacturer do not necessarily match connectors of another manufacturer.

5.3 Mechanical requirements

All components of a hose line as well as the connectors and the hose line itself shall not fail under the burst pressure specified by the manufacturer.

5.4 Requirements concerning the maximum allowable working pressure for hose lines

For hose lines with maximum allowable working pressure up to or equal to 3 000 bar the burst pressure shall be at least 2,5 times the maximum allowable working pressure. For hose lines with maximum allowable working pressure above 3 000 bar the burst pressure shall be at least two times the maximum allowable working pressure. (See also EN ISO 7751.)

5.5 Thermal requirements

The hose lines shall be suitable for operating temperatures above -10 ºC and below +70 ºC.