

norm**NEN-EN-ISO 13710**

Verdringerpompen met zuigers voor gebruik in de aardolie- en aardgasindustrie - Technische specificaties (ISO/DIS 13710:1999, IDT)

Publicatie uitsluitend voor commentaar

Reciprocating positive displacement pumps for use in the petroleum and natural gas industries. Technical specifications (ISO/DIS 13710:1999, IDT)

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Voorbeeld
Preview



Reciprocating positive displacement pumps for use in the petroleum and natural gas industries — Technical specifications

Pompes volumétriques alternatives pour utilisation dans les industries du pétrole et du gaz naturel — Spécifications techniques

ICS 75.180.20

ISO/CEN PARALLEL ENQUIRY

The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with subclause 5.1 of the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13710 was prepared by the Joint Working Group *JWG 2 Reciprocating pumps* within Technical Committee *ISO/TC 115 Pumps*, together with Technical Committee *ISO/TC 67 Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee *SC 6 Processing equipment and systems* and is intended as a guide for users and manufacturers/suppliers.

Annexes A, B, C, D, E, F and G are for information only.

Preview
ISO/DIS 13710

Introduction

This International Standard has been based on the parts of API 674, Second Edition, June 1995, Positive Displacement Pumps – Reciprocating, that apply to the scope of this International Standard.

Users of this International Standard should be aware that further or differing requirements may be needed for individual applications.

Forbiede
Preview

1 Scope

This standard covers the minimum requirements for reciprocating positive displacement pumps and pump units for use in petroleum and natural gas industries. Both direct-acting and power pump types are included.

2 Normative reference(s)

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

EN 287-2, *Approval testing of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

EN 288-1, *Specification and qualification of welding procedures for metallic materials — Part 1: General rules for fusion welding*

EN 288-2, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedure specification for arc welding*

EN 288-3, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels*

EN 809, *Pumps and pump units for liquids — Common safety requirements*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 12262, *Rotodynamic pumps — Technical documents — Terms, delivery range, layout*

prEN 12723, *Liquid pumps — General terms for pumps and installations — Definitions, quantities, letter symbols and units*

EN 50014, *Electrical apparatus for potentially explosive atmospheres — General requirements*

EN 50016, *Electrical apparatus for potentially explosive atmospheres — Pressurized apparatus "p"*

EN 50018, *Electrical apparatus for potentially explosive atmospheres — Flameproof enclosure "d"*

EN 50019, *Electrical apparatus for potentially explosive atmospheres — Increased safety "e"*

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety "i"*

- ISO ..., *Positive displacement pumps and pump units — Code for acceptance tests (doc. ISO/TC 115/SC 2 N 206)*
- ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*
- ISO 128, *Technical drawings — General principles of presentation*
- ISO 129, *Technical drawings — Dimensioning; General principles, definitions, methods of execution and special indications*
- ISO 185, *Grey cast iron — Classification*
- ISO 281, *Rolling bearings — Dynamic load ratings and rating life*
- ISO 427, *Wrought copper-tin alloys — Chemical composition and forms of wrought products*
- ISO 546:1975, *Drawn or extruded filler rods for welding, supplied in straight lengths — Lengths and tolerance*
- ISO 683-1, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Direct-hardening unalloyed and low alloyed wrought steel in form of different black products*
- ISO 898-1, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs*
- ISO 1083, *Spheroidal graphite cast iron — Classification*
- ISO 1338:1977, *Cast copper alloys — Composition and mechanical properties*
- ISO 1680-1, *Acoustics — Test code for the measurement of airborne noise emitted by rotating electrical machinery — Part 1: Engineering method for free-field conditions over a reflecting plane*
- ISO 1680-2, *Acoustics — Test code for the measurement of airborne noise emitted by rotating electrical machinery — Part 2: Survey method*
- ISO 2373:1987, *Mechanical vibration (of certain rotating electrical machinery with shaft heights between 80 and 400 mm — Measurement and evaluation of the vibration severity*
- ISO 3452, *Non-destructive testing — Penetrant inspection — General principles*
- ISO 3453, *Non-destructive testing — Liquid penetrant inspection — Means of verification*
- ISO 3506:1979, *Corrosion-resistant stainless steel fasteners — Specifications*
- ISO 3755, *Cast carbon steels for general engineering purposes*
- ISO 4986, *Steel castings — Magnetic particle inspection*
- ISO 5457, *Technical drawings — Sizes and layouts of drawing sheets*
- ISO 7574-1, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 1: General considerations and definitions*
- ISO 7574-2, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 2: Methods for stated values for individual machines*
- ISO 7574-3, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 3: Simple (transition) method for stated values for batches of machines*
- ISO 7574-4, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 4: Methods for stated values for batches of machines*

- ISO 10436, *Petroleum and natural gas industries — General-purpose steam turbines for refinery service*
- ISO 10437, *Petroleum and natural gas industries — Special-purpose steam turbines for refinery service*
- ISO 10474, *Steel and steel products — inspection documents*
- ISO/WD 12398, *Liquid pumps — Safety requirements — Procedure for hydrostatic testing*
- IEC 60034-1, *Rotating electrical machines — Part 1: Rating and performance*
- IEC 60034-5, *Rotating electrical machines — Part 5: Classification of degrees of protection provided by enclosures of rotating electrical machines*
- IEC 72-1, *Dimensions and output series for rotating electrical machines — Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*
- IEC 72-2, *Dimensions and output series for rotating electrical machines — Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360*
- IEC 79-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements*
- IEC 79-0 AMD 2:1991, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements; Amendment 2*
- IEC 79-1, *Electrical apparatus for explosive gas atmospheres — Part 1: Construction and verification test of flameproof enclosures of electrical apparatus*
- IEC 79-1 AMD 1, *Electrical apparatus for explosive gas atmospheres — Part 1: Construction and verification test of flameproof enclosures of electrical apparatus; Amendment 1*
- IEC 79-1A, *Electrical apparatus for explosive gas atmospheres — Part 1: Construction and test of flameproof enclosures of electrical apparatus, — First supplement — Appendix D Method of test for ascertainment of maximum experimental safe gap*
- IEC 79-2, *Electrical apparatus for explosive gas atmospheres — Part 2: Electrical apparatus-type of protection "p"*
- IEC 79-3, *Electrical apparatus for explosive gas atmospheres — Part 3: Spark-test apparatus for intrinsically-safe circuits*
- IEC 79-4, *Electrical apparatus for explosive gas atmospheres — Part 4: Method of test for ignition temperature*
- IEC 79-4A, *Electrical apparatus for explosive gas atmospheres — Part 4: Method of test for ignition temperature, — First supplement*
- IEC 79-5, *Electrical apparatus for explosive gas atmospheres — Part 5: Powder filling "q"*
- IEC 79-6, *Electrical apparatus for explosive gas atmospheres — Part 6: Oil-immersion "o"*
- IEC 79-7, *Electrical apparatus for explosive gas atmospheres — Part 7: Increased safety "e"*
- IEC 79-7 AMD 1, *Electrical apparatus for explosive gas atmospheres — Part 7: Increased safety "e"; Amendment 1*
- IEC 79-7 AMD 2, *Electrical apparatus for explosive gas atmospheres — Part 7: Increased safety "e"; Amendment 2*
- IEC 79-10, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas*
- IEC 79-11, *Electrical apparatus for explosive gas atmospheres — Part 11: Intrinsic safety "i"*

IEC 79-12, *Electrical apparatus for explosive gas atmospheres — Part 12: Classification of mixtures of gases or vapours with air according to their maximum experimental safe gaps and minimum igniting currents*

IEC 79-13, *Electrical apparatus for explosive gas atmospheres — Part 13: Construction and use of rooms or buildings protected by pressurization*

IEC 79-14, *Electrical apparatus for explosive gas atmospheres — Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 79-15, *Electrical apparatus for explosive gas atmospheres — Part 15: Electrical apparatus with type of protection "n"*

IEC 79-16, *Electrical apparatus for explosive gas atmospheres — Part 16: Artificial ventilation for the protection of analyzer(s) houses*

IEC 79-17, *Electrical apparatus for explosive gas atmospheres — Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)*

IEC 79-18, *Electrical apparatus for explosive gas atmospheres — Part 18: Encapsulation "m"*

IEC 60079-10, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas*

IEC 60085, *Thermal evaluation and classification of electrical insulation*

IEC 60423, *Conduits for electrical purposes — outside diameters of conduits for electrical installations and threads for conduits and fittings*

IEC 60614-1, *Specification for conduits for electrical installations — Part 1: General requirements*

NACE MR 01-90, ...

3 Term(s) and definition(s)

For the purposes of this International Standard the definitions in prEN 12723 apply. Further terms used are defined in 3.1 to 3.30.

3.1

alarm point

a preset value of a measured parameter at which an alarm is activated to warn of a condition requiring corrective action.

3.2

direct-acting pump

a reciprocating pump consisting of a piston powered drive end connected directly to a liquid end. Power is directly transmitted to the liquid end by the action of the motive fluid on the piston. A direct-acting pump may use steam, air, gas or hydraulic liquid as the motive fluid.

3.3

gauge board

an open bracket or plate used to support gauges, switches and other instrumentation.

3.4

local

means mounted on the equipment skid or baseplate.

3.5**maximum allowable speed**

the highest speed at which the manufacturer's/supplier's design will permit continuous operation (in revolutions per minute for single-acting pumps and strokes per minute for double-acting pumps and direct acting pumps).

3.6**maximum allowable temperature**

the maximum continuous process temperature for which the manufacturer/supplier has designed the equipment (or any part to which the term is referred) when handling the specified liquid at the specified pressure.

3.7**maximum allowable working pressure**

the maximum continuous pressure for which the manufacturer/supplier has designed the equipment (or any part to which the term is referred) when handling the specified liquid at the specified temperature and flow.

3.8**mechanical run**

a running test, at specified conditions, conducted to confirm the satisfactory operation of the pump or pump unit.

3.9**minimum allowable speed**

the lowest speed at which the manufacturer's/supplier's design will permit continuous operation (in revolutions per minute for single-acting pumps and strokes per minute for double-acting pumps and direct acting pumps).

3.10**minimum allowable temperature**

the minimum continuous process temperature for which the manufacturer/supplier has designed the equipment (or any part to which the term is referred).

3.11**Net Positive Inlet Pressure (NPIP)**

the pressure determined at the pump inlet connection including pump acceleration pressure, minus the vapour pressure at the present temperature of the liquid.

3.12**Net Positive Inlet Pressure Available (NPIPA)**

the absolute dynamic inlet pressure from the system minus the liquid vapour pressure at the specified liquid temperature and flow referred to the underside of the baseplate. It is the purchaser's responsibility to evaluate (NPIPA) (see Annex G).

NOTE When the purchaser is completing the pump data sheet he will not know the elevation of the pump inlet connection. It will therefore not be possible to provide an accurate value of (NPIPA) at the inlet connection.

3.13**Net Positive Inlet Pressure Required (NPIPR)**

the minimum net positive inlet pressure required by the pump to achieve a specified performance with specified liquid characteristics at a specified speed without noticeable cavitation effects such as loss of flow or noise, or pressure spikes.

3.14**(NPIP)-test**

a running test conducted to confirm the (NPIPR) according to 3.13.

3.15**observed test**

means that the purchaser shall be notified of the timing of the inspection or test; however, the activity shall be performed as scheduled even if the purchaser or his representative are not present and production shall continue to the next operation.

3.16**panel**

an enclosure used to house and protect gauges, switches and other instrumentation.

3.17**performance test**

a running test conducted to confirm the pump's mechanical and volumetric efficiency.

3.18**piston pump**

a reciprocating pump having a seal attached to the piston and moving in a cylinder.

3.19**piston/plunger load**

the force acting on one piston or plunger during any portion of the pumping cycle.

3.20**plunger pump**

a reciprocating pump having a uniform section plunger that moves in a static seal.

3.21**power pump**

a reciprocating pump consisting of a power end and a liquid end connected by the frame or distance piece. The power end is a mechanism that transmits energy from a rotating shaft to pistons or plungers. The liquid end consists of all components in contact with the liquid between inlet and outlet connections.

3.22**pressure containing part**

a part that acts as a barrier between process or motive fluid and the atmosphere and has inlet or outlet pressure. Such parts include, but are not necessarily limited to, the:

- process liquid cylinder,
- inlet manifold,
- outlet manifold,
- stuffing box,
- cylinder plugs and covers (in contact with process liquid),
- valve seats (in contact with the atmosphere),
- motive cylinder,
- motive cylinder head/diaphragm head,
- valve chest,
- valve chest cover and heads.

3.23**pressure retaining part**

a part whose failure would allow process or motive fluid to escape to the atmosphere and has inlet or outlet pressure. In addition to the pressure containing parts listed in 3.22, pressure retaining parts include, but are not necessarily limited to:

- process cylinder bolting,
- stuffing box bolting,
- gland bolting,

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