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TECHNICAL SPECIFICATION

Doc No: DSF-SPC-PIP-008

Rev. 1

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HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

VENT CLOSURES

JUNE 2021

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1 SCOPE

1.1 GENERAL

This Specification covers the minimum requirements for the design, fabrication and supply of Vent closures. Main purpose of vent closures installation is to allow blow-down of National Natural Gas Transmission System stations, pipeline sections and scraper traps respectively. Vent closures will service sweet, natural gas with sporadic passage of water and glycol.

1.2 ADDITIONAL INFORMATION

Additional information may be given in the project's requirements, basic design documents and drawings, and should be read in conjunction with this Technical Specification.

Vendor shall be responsible to design vent closures and their components in accordance with requirements of applicable project's documents. In any thicknesses and other design characteristics shall not be less than those shown on the basic design documents and drawings unless specific written approval to the contrary is received from Owner.

Any conflict between requirements of this Technical Specification, basic design documents and drawings, Standards, Material Requisition and Datasheet shall be referred to Owner for clarification before proceeding with fabrication of the subject part.

2 REFERENCES

Items/equipment to be supplied under this Specification shall comply with the requirements of the latest edition of the Codes, Standards, Specifications and Practices as applicable, except if specifically, modified hereafter:

2.1 REFERENCE DOCUMENTS

- Technical Specification DSF-SPC-MEC-006 [External Painting]
- Technical Specification DSF-SPC-QAC-005 [Shop Inspection of Equipment and Materials for NGT Project]
- Technical Specification DSF-SPC-QAC-006 [Inspection and Test Instructions]
- Standard Drawing No STD-00-11-05 [Vent pipe Arrangement with Closure for Pipelines - Sections]



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2.2 REFERENCE CODES AND STANDARDS

- 2014/68/EU [Pressure Equipment Directive (PED) of the European Parliament and of the Council of 15 May 2014 on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment Text with EEA relevance]
- ELOT EN 10204 [Metallic Products – Types of Inspection Documents]
- ELOT EN 13445 series [Unfired Pressure Vessels]
- ELOT EN 1759-1 [Flanges and their joint – Circular flanges for pipes, valves, fittings and accessories, Class designated–Part 1: Steel flanges, NPS ½ to 24.]
- ELOT EN 14870-3 [Petroleum and natural gas industries –Induction bends, fittings and flanges for pipeline transportation systems – Part 3: Flanges.]
- ELOT EN 1514 [Flanges and their joints - Dimensions of gaskets for PN – designated flanges]
- ELOT EN ISO 3183 [Petroleum and natural gas industries. Steel pipe for pipeline transportation systems]
- ELOT EN 1759-1 [Flanges and their joint – Circular flanges for pipes, valves, fittings and accessories, class designated – Part 1: Steel flanges, NPS ½ to 24"]
- ELOT EN 13480-series [Metallic industrial piping]



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3 GENERAL REQUIREMENTS

3.1 DESIGN LEGISLATION AND STANDARDS

Vent closures shall be designed, constructed, inspected and tested in accordance with:

- a. EU Directive 2014/68/EU
- b. ELOT EN 13445
- c. Requirements mandatory as accepted by the National or Local Authorities where the vent closures is to be located.
- d. Insurance requirements.

3.1.1 DESIGN DATA

Refer to project's requirements, basic design documents, drawings and Std drawing No. STD-00-11-05.

3.1.2 CALCULATIONS

According to ELOT EN 13445.

Reinforcement pads, shall be calculated and provided by the Vendor for all openings and shall not be less than ELOT EN 13445 requirements as a minimum.

Reinforcement shall be equal to the greater of the requirements obtained from the following:

- New vent closures subject to testing conditions with no corrosion allowance
- Vent closures subject to design condition with the Corrosion allowance specified in project's requirements.

3.2 UNITS

Metric.

3.3 OPERATING TEMP. RANGE

As per project's requirements, basic design documents and drawings

3.4 PRESSURE RATING

As per project's requirements, basic design documents and drawings



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3.5 CONSTRUCTION

3.5.1 GENERAL

For information concerning dimensions and general layout, refer to project's requirement, basic design documents and drawings. Pipes and components shall have minimum thickness of not less than the requirements of ELOT EN 13445.

In any event the minimum thickness shall not be less than 5 mm for Carbon and Low-alloy steel parts.

3.5.2 CLOSURES

Closure shall be constructed of quick-closing type, equipped with self-sealing gasket.

The closure shall be absolutely tight in closed position. Only silicone-based grease may be used for treating the self-sealing gasket.

Gaskets will be of asbestos free type and they shall be specified on basic design documents and drawings.

The quick-opening closure mechanism shall be such that pressure equalization is achieved before the closure can be opened.

The closure shall be easily operable by one man. Closures with nominal diameter $D > 200$ mm shall be equipped with balance weight. Closures will be equipped with handles.

If so specified in basic design documents and drawings, the closure shall be welded on to a pipe stub and a welding neck flange. Closures for blow-down of landlines sections shall further be supplied with a venting valve.

3.5.3 PIPES

Piping shall comply with EN 13480 requirements.

3.5.4 FLANGES

Raised face welding neck flanges in accordance with ELOT EN 13445, ELOT EN 1759-1 and ELOT EN 1514 series. Bolt holes shall straddle the centerline of the Vent Closure.

3.5.5 TOLERANCES

The out of roundness U at butt-welding ends shall not exceed 0.5%.



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3.5.6 VALVES

The venting valve (if applied) shall be a plug valve type. Only valves manufactured in accordance with ELOT EN 13445 may be used.

3.6 MATERIALS

3.6.1 GENERAL

Materials shall fulfill the requirements of ELOT EN 13445 and EU Directive 2014/68/EU requirements (when applicable), unless otherwise specified on drawings or Data Sheet. Substitutions of materials, shapes and dimensions for those specified, shall be made only after written approval of Owner.

Plate material according to ELOT EN 13445. Casting shall not be used.

The steel shall comply with the requirements of ELOT EN 13445.

Only steel with specified minimum yield strength not higher than 360 N/mm² shall be used.

Forged steel and pipe material shall be normalized, killed and fine grained.

RI-, retaining components impact tests shall be performed on each material used according to ELOT EN 13445, consisting of three test specimens from the same heat as the actual delivery.

The test temperature shall be -20°C or lower with acceptance criteria of:

Mean value from 3 tests 28 joules or better with the lowest single value 22 Joules with all test-specimens being removed transverse to the longitudinal axis.

Tolerances on out-of-roundness of equipments shall conform to ELOT EN 13445 and above-mentioned requirements. All tolerances must be referred to the completed Vent Closure, after heat treatment if required.

3.7 FABRICATION

3.7.1 GENERAL

Closures shall be manufactured in accordance with the requirements of the ELOT EN 13445.

3.7.2 HEAT TREATMENT

Forged closures with greatest wall thickness exceeding 30 mm, shall be stress relieved after the completion of all forming and welding work.



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Any heat treatment operations performed by Vent Closure Vendor and intended to enhance mechanical properties, shall obtain Owner approval.

The tempering temperature shall be 10° C higher than that required for PWHT, unless otherwise specified. Vent closures which have been submitted to PWHT shall have a warning notice painted on it at a convenient location stating:

STRESS RELIEVED NO WELDING PERMITTED.

Cold forming shall be followed by a normalizing.

3.7.3 BEVELING

Welding ends shall be beveled in accordance with ELOT EN 13445.

Dimensions of abutting pipe as per project's requirements and basic design documents.

3.7.4 REPAIR OF SURFACE DEFECTS

Minor surface defects in the parent material may be removed by grinding, provided min. wall thickness after grinding > calculated min. wall thickness.

3.7.5 WELDING PROCEDURES/WELDERS QUALIFICATIONS

WPS, PQR, WQR shall be in accordance with the requirements of ELOT EN 15609 and ELOT EN 15614-1 level 2.

3.7.6 WELDING

The hardness of the weld seam and the heat-affected zone may not exceed 300 HV 10.

Arc burns are not permitted.

3.7.7 REPAIR BY WELDING

Repair of weld seams are only permitted provided the repair procedure has been approved by the independent Accredited Inspection Body.

3.8 NON-DESTRUCTIVE EXAMINATION

3.8.1 GENERAL

All joints on pressure retaining parts, except for nozzle weld seams with sizes below DN 100, shall be 100% radiographed and found acceptable in accordance with ELOT EN 13445.

Attachment welds shall be magnetic particle examined.



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3.8.2 NOZZLES DN <100

Nozzle weld seams shall be 100% magnetic particle or dye penetrant examines in accordance with ELOT EN 13445.

For weld-on nozzles the affected area of the shell plate shall be ultrasonically examined for laminations before welding. Laminations are not allowed.

3.8.3 FORGINS

Forged caps shall be ultrasonically inspected over their whole area according to ELOT EN 13445.

3.8.4 PIPES

Pipes shall be ultrasonically examined according to ELOT EN 13480-5.

3.8.5 BEVELED EDGES

For all beveled edges (plate and branches), which are to be welded, the closer 50 mm shall be ultrasonically inspected for laminations and other defects, according to ELOT EN 13445 and ELOT EN 13480 respectively.

Laminations extending into the face of the bevel end having a transverse dimension > 6 mm are not acceptable.

3.9 TESTING

3.9.1 HYDROSTATIC TEST

Before delivery, closures shall undergo a hydrostatic pressure test at a test pressure as specified in basic design documents. The test pressure shall be maintained and recorded for at least one hour.

Temperature of water shall never be less than 5°C. Vendor shall take all necessary precautions to avoid brittle fracture of vent closures during the hydrotest.

In addition, the equipment shall be immediately drained after hydrotest and carefully dried by blowing with air and an absolute absence of any pocket water must be ensured.

3.10 SURFACE TREATMENT

3.10.1 EXTERNAL

Closures shall be delivered in primed condition. Closures shall be painted as specified on basic design documents.



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Technical specification No. DSF-SPC-MEC-006 shall dictate surface preparation and painting required.

All parts painted with rich zinc paints or hot dip galvanized shall not be welded to the equipment.

The primer shall allow over-coating after 6 months of stocking on site without any significant reduction in adhesion of the following coats. If necessary, this shall be achieved by the additional application of a sealer.

Machined surfaces shall not be painted.

Welding ends shall be capped and protected against corrosion or damage in transit.

3.10.2 INTERNAL

As ordered in basic design documents.

3.11 MARKING

Vent closures shall be marked with Vendors trade mark, Owner contract number, design pressure in bar, design temperature, test pressure in bar gauge, design factor, manufacturing number, and Independent Accredited Inspection Body's mark.

The text shall be in English.

Marking shall be stamped using rounded dies with type at least 4 mm high. The marked area shall be covered with a weather resistant clear lacquer and surrounded with a frame of reflective white paint.

4 TECHNICAL DOCUMENTATION

4.1 QUANTITY

Three (3) copies of each inclusive of original for all Documents and Certificates, except otherwise specified.

Three (3) of each inclusive of one reproducible for all drawings, except otherwise specified.

Also electronic files (word documents and/or AutoCAD documents as applicable and scanned PDF files) of all Documents and Certificates must be submitted by Vendor to the Owner.



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4.2 DOCUMENT REQUIREMENTS

All drawings must be marked with Owner purchase order number and with the part number to which they apply. Design data, design and construction applied European Standards shall be noted on these drawings.

All drawings (except those with tender) shall be addressed to Owner Document Control Department.

4.3 MINIMUM DERIVERABLE REQUIREMENTS

The following documentation / drawings are the minimum requirements for the deliverables by the Vendor, at three (3) copies, unless otherwise specified:

- Detailed construction drawings including parts list detailing material standard and grade, item description, and certification level, dimensions, location and size of nozzles, materials, overall weight, indication of accessories (type of valves, level gauges, level switches, etc.), internal design, etc.
- Design calculations, including completed material requisitions and datasheets.
- WPS & PQR,
- Heat treatment specification,
- Non-destructive testing specification,
- Pressure test specification,
- Identification plate text,
- Surface treatment specification,
- Comprehensive operation, maintenance and reconditioning manuals in Greek and English,
- List of recommended tools, spare parts, etc.,
- As-built drawings,
- VENT CLOSURE CERTIFICATION PACKAGE as listed above. Certified drawings required within two weeks after return of "For Approval" drawings.
- Electronic files (word documents and/or AutoCAD documents as applicable and scanned PDF files) of all Documents, Drawings and Certificates.



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5 INSPECTION AND CERTIFICATION

Inspection will be performed by an Independent Accredited Inspection Body.

Inspection requirements are defined in the following:

- a.** Material requisition and Datasheet.
- b.** DESFA Tech. Spec. No. DSF-SPC-QAC-005 "Shop inspection of equipment and materials for NGT project",
- c.** Relevant project specifications.
- d.** Inspection clauses of ELOT EN 13445 and ELOT EN 13480.

Inspection procedures to be followed are detailed in DESFA Tech. Spec. DSF-SPC-QAC-006 "Inspection and Test Instructions".

6 SPARE PARTS

As a minimum two (2) spare gaskets plus 10% bolts and nuts (if any) shall be supplied.

7 SHIPMENT

One-piece vent closure shall be completely equipped with all external/internal (if any) attachments before shipment unless otherwise specified on the drawings and project's requirements.

Where necessary, closures and its components shall be supported by temporary stiffeners to avoid distortion and damage during transportation and erection.

All exposed machined surfaces shall be coated with rust preventive. All ends (flanges, welding, etc.) shall be protected with plastic covers and all threaded connections (if any) shall be plugged.

8 GUARANTEES

For guarantee requirements see the Purchase Order.