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TECHNICAL SPECIFICATION

HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

CONDENSATE COLLECTORS

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0	05/04/2011	First Issue (as Spec 131/1)
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1 SCOPE

1.1 GENERAL

This Specification covers the minimum requirements for the design, fabrication and supply of Condensate collectors. Main purpose of Condensate collectors' installation is the collection of condensates from the natural gas piping system. Condensate collectors 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 collectors 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-PIP-013 and [Corrosion protection of field joints uncoated pipeline components]
- Technical Specification DSF-SPC-MEC-007 [Insulating Coating Materials]
- 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-00-11-03 and [Condensate Collectors Sections Details]

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]
- EN 10204 [Metallic Products – Types of Inspection Documents]
- EN 13445 series [Unfired Pressure Vessels]
- 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.]
- EN 14870-3 [Petroleum and natural gas industries –Induction bends, fittings and flanges for pipeline transportation systems – Part 3: Flanges.]
- EN 1514 series [Flanges and their joints - Dimensions of gaskets for PN – designated flanges]
- EN 1591-1 [Flanges and their joints - Design rules for gasketed circular flange connections – Part 1: Calculation method]
- EN 12560 series [Flanges and their joints - Gaskets for class-designated flanges]
- EN ISO 8501-1 [Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings]

3 GENERAL REQUIREMENTS

3.1 DESIGN LEGISLATION AND STANDARDS

Pressure vessels shall be designed, constructed, inspected and tested in accordance with:

a. EU Directive 2014/68/EU

b. EN 13445

c. Requirements mandatory as accepted by the National or Local Authorities where the filter is to be located.

d. Insurance requirements.

3.1.1 DESIGN DATA

Refer to project's requirements, basic design documents and drawings.

3.1.2 CALCULATIONS

All calculations shall comply with the design Standard. Maximum stress value in design calculations shall be defined as per applicable Standards.

Reinforcement pads, shall be calculated and provided by the Vendor for all openings and shall not be less than the required in the applicable standard.

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

- New vessel subject to testing conditions with no corrosion allowance.
- Vessel subject to design condition with corrosion allowance specified in the Data Sheet.

3.2 UNITS

Metric.

3.3 OPERATING TEMPERATURE RANGE

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

3.4 DESIGN PRESSURE

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

3.5 CONSTRUCTION

3.5.1 GENERAL

General layout as per Std Drawing No. STD-00-11-03. Vessel shells and caps shall have minimum thickness of not less than the requirements of Standard.

In any event the minimum thickness, shall not be less than 5 mm for carbon and low-alloy steel vessels, excluded of corrosion allowance specified.

3.5.2 CAPS

End caps shall conform to EN 13445. Caps shall be spun or pressed from blanks of sufficient thickness, to obtain the minimum thickness as shown on drawings.

3.5.3 FLANGES (if any)

Flange facing shall be raised face, according to EN 13445, EN 1759-1, EN 14870-3 and EN 1514 series. Flanges shall be of weld neck type unless otherwise specified. Bolt holes shall straddle the centerline of the collector.

3.5.4 GASKETS (if any)

All gaskets and seals shall be asbestos free and be resistant to natural gas and gas condensates and they shall be specified on the drawings.

Gasket surface finished in accordance with EN 13445, EN 1759-1, EN 1514 series and EN 12560 as follows:

FLANGE FACE	GASKET TYPE	FACE FINISH
Raised & flat face	1.5 mm soft ring	"Stock"
Raised face	Spiral wound	Smooth (>3,6μm Ra)

Raised face	Metal jacketed	Very smooth (<1,6μm Ra)

3.6 MATERIALS

3.6.1 GENERAL

Materials shall fulfill the requirements of EN 13445-2 unless otherwise specified on drawings or Data Sheets.

Plate material according to EN 13445. For the plate material to be used for reinforcing pads applies the applicable specification for the vessel parts to which they are connected. Plate materials P295GH are not accepted. Casting will not be acceptable.

No other material will be used unless specifically written and approved by Owner. Welding fittings for pressure parts shall be of seamless steel.

3.6.2 IMPACT TESTS

On all pressure retaining components impact tests shall be performed according to EN 13445 on each material used, 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 as follows:

Impact test values from three (3) tests shall be according to material specification, but not lower than 27 joules for the average value, with the lowest single value not less than 21 joules. All test specimens shall be removed transverse to the longitudinal axis.

3.7 FABRICATION

3.7.1 GENERAL

Pressure vessels shall be manufactured in accordance with the requirements of EU Directive 2014/68/EU and EN 13445 and any additional requirements stated in this Specification.

Tolerances on out-of-roundness of vessels shall conform to EN 13445 and Owner requirements.

All tolerances must be referred to the completed vessel, after heat treatment, if required.

3.7.2 HEAT TREATMENT

Cold formed dished heads shall after forming undergo appropriate heat treatment.

Any heat treatment operations performed by vessel Vendor and intended to enhance mechanical properties, shall obtain Owner approval. When normalized and tempered materials are specified, the tempering shall be performed prior to any welding unless specifically otherwise authorized in writing by Owner.

The tempering temperature shall be 10^{o}C higher than that required for PWHT, unless otherwise specified on vessel basic design documents and drawings.

Vessels which have been submitted to PWHT shall have a large warning notice painted on shell at convenient locations stating:

STRESS RELIEVED VESSEL NO WELDING PERMITTED.

3.7.3 WELDING PROCEDURES/WELDERS QUALIFICATIONS

WPS, PQR, WQR shall be in accordance with the requirements of EN ISO 15609, EN ISO 15614-1 level 2, EN ISO 9606-1 for welder qualifications and EN ISO 14732 for welding operators.

3.7.4 WELDING

Hardness of the weld seam and the heat affected zone may nowhere exceed 300 HV10.

Repair by welding:

Arc burns are not permitted.

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. However, where radiography is unfit for detection of defects, joints shall be ultrasonically examined.

3.8.2 NOZZLES DN <100

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

3.8.3 RT EXAMINATION

As per ELOT EN 13445**.** All weld seams shall be 100% RT examined.

3.8.4 PLATES

Plate material shall be ultrasonically inspected and shall satisfy the requirements of EN 13445.

3.8.5 WELDING ENDS

The finished welding ends on branches shall be ultrasonically examined to a minimum distance of 50 mm, and including the bevel, and shall satisfy all requirements of EN 13445.

3.9 TESTING

3.9.1 HYDROSTATIC TEST

Each unit shall be hydrostatic tested with a minimum test pressure of 2.0 x design pressure. Minimum hold time is 60 minutes. This requirement shall be taken into consideration during design phase. Stress during hydrotest shall not exceed 95% of SMYS.

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

Field hydrostatic testing for shop-fabricated items will be made, unless otherwise specified in Data Sheet.

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

The vessel shall be delivered in primed condition. Before the application of primer, surfaces shall be cleaned of dirt, millscale, weld spatter, grease and oil. Sharp edges shall be rounded to radius > 2 mm. Thereafter the surfaces shall be grit or sandblasted to degree Sa 2 1/2 as per ELOT EN ISO 8501-1 (near white).

Priming shall be carried out with a solvent-based polyamide cured epoxy primer of best quality, that does not contain chromate or lead based anti-corrosive pigments.

The method of application shall be as recommended by the paint supplier. A uniform thickness and proper adhesion shall be ensured.

The dry film thickness of the epoxy primer shall be as per paint supplier's recommendation, however, not less than 50 μm, according to all relevant codes and standards.

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.

When required, in order to allow for over-coating after 6 months of stocking on site, 1 coat (nominal 40 μm) of vinyl primer sealer shall be applied. The sealer shall have a color deviating from the color of the primer. Machined surfaces shall not be painted.

Item shall be grit blasting cleaned, according to EN ISO 8501-1 (near white) followed by coating, according to Tech. Specification No. DSF-SPC-MEC-007**.**

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

Tech. Specification No. DSF-SPC-PIP-013 shall dictate corrosion protection required.

3.10.2 EXTERNAL

Refer to project's requirements, basic design documents and drawings.

3.11 MARKING

Condensate collector shall be fitted with a stainless steel identification plate riveted to a hanaper and containing the item number and the information required by EU Directive 2014/68/EU and EN 13445.

The text shall be in English, as per Std Drawing STD-00-11-08.

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.

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:

- Technical file certified by Notified Body as per requirements of EU Directive 2014/68/EU (section 4).
- 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.
- heat treatment specification,
- non-destructive testing specification,
- pressure test specification,
- identification plate text,
- Comprehensive operation, maintenance and reconditioning manuals in Greek and English,
- List of recommended tools, spare parts, etc.,
- EEx-approval- and conformity certificates for level alarm switches (if any).
- As-built drawings,
- CONDENSATE COLLECTOR 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.

5 INSPECTION AND CERTIFICATION

Inspection will be performed by a Notified Body.

Inspection requirements are defined in the following:

a. EU Directive 2014/68/EU

b. Material requisition and Datasheet.

c. DESFA Tech. Spec. No. DSF-SPC-QAC-005 "Shop inspection of equipment and materials for NGT project",

d. Relevant project specifications.

e. Inspection clauses of EN 13445.

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 collector shall be completely equipped with all external attachments before shipment unless otherwise specified on the drawings and project's requirements.

Where necessary, collector 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.