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**TECHNICAL JOB
SPECIFICATION**

552/1

REVISION 0

DATE 05/04/2011

HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

BUTT WELDING STEEL FITTINGS DN ≤ 300

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QUALITY ASSURANCE PAGE

CHANGES LOG

REVISIONS LOG

0	05-04-2011	FIRST ISSUE	PQ DPT	V.G.
Rev. No	Rev. Date	REASON FOR CHANGE	Made By	Approved By

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REFERENCE DOCUMENTS

Job Spec. No. 970/2

[Shop Inspection of Equipment and Materials for NGT project]

EN 10253-2

[Butt welding pipe fittings – Part 2: Wrought carbon and ferritic alloy steel with specific inspection requirements]

ELOT EN 10208-2

[Steel pipes for pipelines for combustible fluids - Technical delivery conditions - Part 2: Pipes of requirements class B]

1.0 SCOPE

1.1 ITEM

Butt welding fittings DN ≤ 300.

1.2 SERVICE

Sweet natural gas with sporadic passage of water and glycol.

1.3 ADDITIONAL INFORMATION

Additional information may be given in the Material Requisition and should be read in conjunction with this material specification.

Any conflict between requirements of this specification and Material Requisition supplementary design data, or Codes, shall be referred to Owner for clarification, before proceeding with fabrication of affected part.

Fitting supplier shall be responsible to design, fabricate and supply fittings in accordance with the requirements of applicable documents.

In no event however, dimensions, thicknesses, e.t.c., are to be less than those required by standards, unless specific written approval to the contrary is received from Owner.

2.0 GENERAL REQUIREMENTS

2.1 STANDARD

EN 10253-2.

2.2 UNITS

Metric for all units.

2.3 FITTING MATERIAL

As per **EN 10253-2**

- Carbon content C shall be ≤ 0.21% on heat analysis.
- Carbon equivalent as per **EN 10253-2**.
- Repair by welding is not permitted in the base material.

2.4 SIZE AND SCHEDULE NO. / WALL THICKNESS

As per Material Requisition.

2.5 CONSTRUCTION

2.5.1 ELBOWS

Seamless. Long radius. Angle as per material requisition.

2.5.2 TEES

Seamless, extruded branch.

Tees with run DN ≤ 80 may be die- forged.

2.5.3 REDUCERS

Seamless, concentric.

2.5.4 CAPS

Seamless.

2.6 **HEAT TREATMENT OF COLD-FORMED FITTINGS**

Normalizing

2.7 **NOTCH TOUGHNESS**

All materials shall be impact tested at a temperature not higher than -20°C testing according to EN 10253-2.

Charpy V-notch impact tests shall be taken for each heat with all specimens being removed transverse to the longitudinal axis.

Acceptance criteria shall be:

- Mean value from the 3 specimens > 31 Joules, with the lowest single value > 24 Joules.

For subsize specimens, the acceptability levels shall be reduced proportionally with the reduction in cross-sectional area below the notch.

2.8 **INSIDE DIAMETER AT ENDS**

Equal to inside diameter of pipe of same wall thickness (re. clause 2.4 above) within tolerances as per EN 10253-2.

2.9 **NON-DESTRUCTIVE TEST**

As per EN 10253-2

- All extruded fittings shall be magnetic particle examined over the extruded area.

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- Welded elbows and caps made from plate material shall be ultrasonically examined on the welding ends to a minimum distance of 25 mm from, and including the bevel.
- Any indication shall be cause for rejection.

2.10 SURFACE TREATMENT

Internal: Untreated, free of dirt-grease oil e.t.c.
External: Soluble rust-preventive varnish.

2.11 MARKING

As per EN 10253-2.
Fittings shall additionally bear Owner Supply Contract Number.

3.0 SUPPLEMENTARY REQUIREMENTS

3.1 GENERAL

Further requirements, if specifically mentioned in the Material Requisition, shall be valid. In case of conflict between such requirements and the requirements contained herein, the former shall prevail.

3.2 SUPPLEMENTARY REQUIREMENTS - SR1

Notch toughness shall be satisfied according to para 2.7 here above at test temperature lower than -20°C, at minimum design temperature as mentioned in Material Requisition.

3.3 SUPPLEMENTARY REQUIREMENTS-SR2

Tees shall be furnished with guide bars as per attachment 1 for scraper passage in accordance with Table 1 below.
The guide bars shall be welded together with two crossrails that shall be fixed to the branch wall by fillet welds. All edges that may be rubbed by scrapers shall be rounded with radius equal to one-half the bar thickness. Guide bars shall be mounted flush with the bore of the run and shall further have their ends shaped so that they follow the contour of the outlet as closely as possible. Guide bars and cross-rails shall be made of killed carbon steel.

B	Wt	h	R											
			< 1050	900	750	700	650	600	550	500	450	400	> 350	
DN 50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN 100	8	30	-	-	-	-	-	-	-	-	-	-	-	2
DN 150	8	35	-	-	-	-	.	.	2	2	2	2	2	2
DN 200	8	40	-	-	2	2	2	2	2	2	2	2	2	3
DN 250	8	50	-	2	2	2	2	2	2	2	2	3	3	3
DN 300	10	55	2	2	2	2	2	2	3	3	3	3	3	3
DN 350	10	55	3	3	3	3	3	3	3	3	3	3	3	3
DN 400	10	60	3	3	3	3	3	3	3	3	3	3	3	-
DN 450	10	65	3	3	3	3	3	3	3	3	3	3	-	-
DN 500	10	70	3	3	3	3	3	3	3	3	3	-	-	-
DN 550	15	70	3	3	3	3	3	3	3	3	-	-	-	-
DN 600	15	75	3	3	3	3	3	3	-	-	-	-	-	-
DN 650	15	80	3	3	3	3	3	-	-	-	-	-	-	-
DN 700	15	85	3	3	3	3	-	-	-	-	-	-	-	-
DN 750	15	90	4	4	4	-	-	-	-	-	-	-	-	-
DN 900	20	100	4	4										
DN 1050	20	120	5											

No. of bars

B = Nominal branch dia.(mm)
R = Nominal run diameter(mm)

wt = Guide bar wall thickness h = Guide bar height

TABLE 1

D NUMBER OF GUIDE BARS AND GUIDE BAR DIMENSIONS (mm)

4.0 TECHNICAL DOCUMENTATION

4.1 QUANTITY

Four copies of each, inclusive of original, for all documents and certificates. Also electronic files of all Documents and Certificates must be submitted by Contractor to the Owner.

4.2 DOCUMENT REQUIREMENTS

4.2.1 WITH TENDER

Information about type of varnish offered and recommended method for later removal of varnish.

Statement/copy of proof test record or design calculations in accordance with **EN 10253-2**.

Statement regarding starting material, with reference to Material Standard.

Statement regarding seamless or welded construction, and bending process for elbows.

Statement regarding non-destructive test methods used, as per para. 2.9 herein.

4.2.2 ON DELIVERY

Fitting Certification Package.

5.0 INSPECTION AND CERTIFICATION

Inspection requirements are defined in the following documents.

- a. Material requisition
- b. DESFA Job Specification No. **970/2** "Shop inspection of equipment and material for NGT project".
- c. Relevant project specifications
- d. Inspection clauses of applicable Codes

Inspection procedures to be followed are detailed in Owner document "Inspection and Test instructions".

6.0 SHIPMENT

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