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**TECHNICAL JOB
SPECIFICATION**

500/4

REVISION 1

DATE 02/11/2011

LIQUEFIED NATURAL GAS PLANTS

STEEL PIPES

(CRYOGENIC SERVICES INCLUDED)

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QUALITY ASSURANCE PAGE

CHANGES LOG

-para 2.0
 -para 3.0

REVISIONS LOG

Rev. No	Rev. Date	REASON FOR CHANGE	Made By	Approved By
1	02-11-2011	DESFA INTERNAL COMMENTS	PQ DPT	V.G.
0	29-06-2011	FIRST ISSUE	PQ DPT	V.G.

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REFERENCE DOCUMENTS

DESFA Job Specification No. 900/3
[Material Color Coding]

DESFA Job Specification No. 930/1
[Positive Material Identification (P.M.I.)]

DESFA Job Specification No. 970/2.2
[Shop Inspection of Equipment and Material for LNG Project]

ELOT EN 10216 Series
[Seamless steel tubes for pressure purposes - Technical delivery conditions]

ELOT EN 10217 Series
[Welded steel tubes for pressure purposes - Technical delivery conditions]

ELOT EN 10204
[Metallic products - Types of inspection documents]

ISO 724
[ISO general purpose metric screw threads - Basic dimensions]

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1.0 SCOPE

This specification covers technical requirements for steel pipes, and is to be used to supplement but not detract from the requirements of the pipe standard specified on the requisition.

In the event of conflicts between any requirements or when interpretation of requirements is needed, written clarification shall be obtained from the OWNER before proceeding with the manufacture of the affected parts.

2.0 GENERAL REQUIREMENTS

Pipes shall be delivered in the following lengths:

- Carbon and alloy steel: Double random, except where the ordered quantity is shorter than double random length, single random length shall be delivered.
- Stainless steel: Single random.

Pipes shall have no joints (circumferential butt welds).

Unless otherwise specified, pipes in sizes 40 DN and smaller shall be supplied with square cut plain ends.

Pipes in sizes 50 DN and larger shall be supplied with ends beveled according to the relevant manufacturing standard and the material requisition.

Where threading ends are specified they shall be NPT threads according to **ISO 724**.

Dimensions of pipes shall be according to:

ELOT EN 10220 and the applicable manufacturing standard.

Exceptionally where stainless steel pipe thickness without the suffix "S" is specified it shall conform to **ELOT EN 10220**.

Marking shall be according to the applicable standard valid for the manufacture of the individual pipe stated on the requisition.

Color Coding shall be according to **DESFA Job Specification No. -900/3**

Positive Material Identification (P.M.I.) shall be according to **DESFA Job Specification No. 930/1**.

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Where normal grade stainless steel is specified it shall not be substituted with low carbon grade "L".

All pipes shall be manufactured according to **ELOT EN 10216 series** for seamless pipes and **ELOT EN 10217 series** for welded pipes. Materials shall be selected during design based on the operational characteristics (pressure, temperature, corrosion characteristics of the fluid) of each piping system.

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When seamless pipes according to **ELOT EN 10216 series** for sizes over DN 600 are requested, they can alternatively be substituted with the same material welded pipes manufactured according to the requirements of **ELOT EN 10217 series**.

When seamless stainless steel pipes manufactured of X2CrNi18-9 material are requested the Max. Molibdenum content shall be 0,3%.

1 **3.0** **TECHNICAL DOCUMENTATION, INSPECTION AND CERTIFICATION**

Inspection requirements are defined in **DESFA Job Specification No. 970/2.2**.

A signed manufacturer's inspection certificate type 3.1 according to **ELOT EN 10204** is required. This certificate shall include the following:

- a) Name of manufacturer
- b) Purchase order number, date and item number Material specification and grade
- c) Diameter, schedule number, length quantity Heat number or charge number
- d) Inspection or test number
- e) Chemical composition
- f) Hydrostatic test results
- g) Surface and dimension checks
- h) Mechanical data, certified by the quality control department of the pipe manufacturer, which shall be independent from the production line.

Where an independent quality control does not exist, the above mentioned tests are to be witnessed by an independent inspection authority.