MATERIAL SPECIFICATION FOR AISI SS-316/CF8M CASTING

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1.0 PURPOSE

This specification covers the casting prepared in AISI SS-316/CF8M for pressure containing parts.

This material specification is intended to aid the purchasing department in procuring and the vendor in supplying a material which meets the needs of its intended use, and the quality control department in the inspection and release of incoming material.

2.0 REFERENCE DOCUMENTS

2.1 ASTM A 351
2.2 ASTM A 743
2.3 ASTM A 744

3.0 MELTING

The material shall be made by one of the following practices: electric-arc, electric induction or other suitable process.

4.0 REQUIREMENTS

4.1 Chemical Properties: Chemical composition limits are listed below. An analysis of each heat of steel is made by the manufacturer, preferably from a ladle sample taken at or near the time of pouring. The listed elements shall be reported in weight percent. Reporting of residual elements is not required, but total residuals must not exceed 1%.

ELEMENTS	COMPOSITION RANGE (%)
Carbon (C)	0.08 (max.)
Manganese (Mn)	1.50 (max.)
Silicon (Si)	1.50 (max.)
Sulphur (S)	0.04 (max.)
Phosphorus (P)	0.04 (max.)
Nickel (Ni)	9.0-12.0
Chromium (Cr)	18.0-21.0
Molybdenum (Mo)	2.00-3.00

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4.2 Mechanical Properties Mechanical property requirements are listed below:

MECHANICAL PROPERTIES	RANGE
Tensile Strength, PSI	70,000 (485 MPa) Min.
Yield Strength, PSI	30,000 (205 MPa) Min.
Elongation In 2" Gage Length	30 % Min.
Brinell Hardness	146- 212 BHN Max.
Charpy Impact Energy	95J (74 ft-lbs) (Charpy keyhole notch)

5.0 HEAT TREATMENT

Heat treatment to be done as per below

PROCESS	ATMOSPHERE/ MEDIA	TEMPERATURE	TIME AT TEMPERATURE
Normalizing	Air	1900-2050 °F (1040-1120 °C)	1/2 hour per inch of maximum through Thickness. One hour minimum.
Quenching	Water Or Rapid Cooled by other means	100 °F (38 °C) Max at the start of quench	120°F Max. at the completion of the quench

NOTE:

1. Maximum holding time shall not exceed Five times (5X) the maximum holding time. In all case, holding time shall not start until parts or materials have reached specified heat treatment temperature. The 5X rule does not apply to the separate QTC (e.g. ER 5").
2. All casting should be held at temperature for sufficient time to reach uniform heating.
3. X-Ray testing to be done during development and followed by 2% Radioactive Testing to be done for each lot.

6.0 REPAIRS

Repair by welding is not acceptable.

7.0 DOCUMENTATION REQUIRED

Each shipment shall be accompanied by material certifications for each lot of material, certifications must be positively relatable to the lot of material represented. Recheck of Chemical properties to be carried out by Sara Sae.

8.0 WORKMANSHIP

Material shall be inspected in accordance with part QA Plan. Casting shall be free of injurious defects that are detrimental to the integrity of the final product, such as cracks, blowholes, porosity or any other defect.

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