MATERIAL DATA SHEET MDS D51 Rev. 4

TYPE OF MATERIAL: Ferritic / Austenitic Stainless Steel, Type 25Cr duplex

PRODUCT	*STANDARD*	*GRADE*	*ACCEPT. CLASS*	*SUPPL. REQ.*
Seamless pipes	ASTM A 790	UNS S32550 UNS S32750 UNS S32760 UNS S39274	-	-

1. SCOPE	This MDS specifies the selected options in the referred standard and additional requirements which shall be added or supersede the corresponding requirements in the referred standard. This MDS is based on the mechanical properties of UNS S32760.
2. QUALIFICATION	Manufacturers and the manufacturing process used for manufacturing of product to this MDS shall be qualified in accordance with NORSOK Standard M-650.
3. MANUFACTURING PROCESS	The manufacturing of products according to this MDS shall be carried out according to the M-650 qualified manufacturing procedure.
4. STEEL MAKING	The steel melt shall be refined with AOD or equivalent.
5. HEAT TREATMENT	The pipes shall be solution annealed followed by water quenching.
6. CHEMICAL COMPOSITION	PREN = % Cr + 3.3 % Mo + 16 % N ≥ 40.0
7. TENSILE TESTING	$R_{p0.2} \geq 550$ MPa; $R_m \geq 750$ MPa; A ≥ 25%
8. IMPACT TESTING	Charpy V-notch testing according to ASTM A 370 at - 46 °C is required for thickness ≥ 6 mm. The minimum absorbed energy shall be 45 J average / 35 J single. Reduction factors for sub-size specimens shall be: 7.5 mm - 5/6 and 5 mm - 2/3.
9. CORROSION TEST	Corrosion test according to ASTM G 48 Method A is required. Test temperature shall be 50 °C and the exposure time 24 hours. The test shall expose the external and internal surfaces and a cross section surface in full wall thickness. Cut edges shall be prepared according to ASTM G 48. The whole specimen shall be pickled before weighed and tested. Pickling may be performed for 5 minutes at 60 ºC in a solution of 20 % HNO_3 + 5 % HF. The acceptance criteria are: - No pitting 20 X magnification. - The weight loss shall be less than 4.0 g/m^2.
10. MICROGRAPHIC EXAMINATION	The micrographic examination shall cover the near surfaces and mid-thickness region of the pipe. The ferrite content shall be determined according to ASTM E 562 or equivalent and shall be within 35-55 %. The microstructure, as examined at minimum 400 X magnification on a suitably etched specimen, and shall be free from intermetallic phases and precipitates.
11. EXTENT OF TESTING	Charpy V-notch impact, microstructure, hardness, corrosion and tensile testing shall be carried out for each lot as defined in the referred standard.
12. TEST SAMPLING	Samples for production testing shall realistically reflect the properties in the actual components.
13. SURFACE FINISH	White pickled.
14. REPAIR OF DEFECTS	Weld repair is not acceptable.
15. MARKING	The component shall be marked to ensure full traceability to melt and heat treatment lot.
16. CERTIFICATION	The material manufacturer shall have a quality system certified in accordance with ISO 9001 and the system shall have undergone a specific assessment for the relevant materials. The material certificate shall be accordance with EN 10 204 Type 3.1, and shall include the following information: - Steel producer, melting practice and refining method. - Heat treatment condition (Solution annealing temperature and holding time shall be stated.)