MATERIAL DATA SHEET			**MDS D47**	**Rev. 4**
TYPE OF MATERIAL: Ferritic / Austenitic Stainless Steel, Type 22Cr duplex				
PRODUCT	***STANDARD***	***GRADE***	***ACCEPT. CLASS***	***SUPPL. REQ.***
Bars	ASTM A 479 ASTM A 988	UNS S31803 UNS S32205	-	-

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 intended for bars with maximum section thickness of 300 mm. For larger thickness special agreements shall be made in each case.
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. STEEL MAKING	The steel melt shall be refined with AOD or equivalent.
4. MANUFACTURING PROCESS	The manufacturing of products according to this MDS shall be carried out according to the M-650 qualified Manufacturing Procedure. The Hot Isostatic Pressed (HIP) process is an acceptable alternative to forging.
5. HEAT TREATMENT	The bars shall be solution annealed followed by water quenching. The solution annealing temperature shall be as defined in ASTM A 182 for the actual grade/UNS number. Bars shall be placed in such a way as to ensure free circulation of air and water around each bar during the heat treatment process including quenching.
6. CHEMICAL COMPOSITION	*UNS S31803:* N = 0.14 – 0.20 %
7. IMPACT TESTING	Charpy V-notch testing is required according to ASTM A 370 at - 46 °C. The minimum absorbed energy shall satisfy 45 J average and 35 J single.
8. MICROGRAPHIC EXAMINATION	The micrographic examination shall be carried out at the same area as location of specimens for mechanical testing and near surface. The area shall be minimum 10 x 10 mm. 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, shall be free from intermetallic phases and precipitates.
9. EXTENT OF TESTING	One set of impact test, tensile test, hardness test and microstructure examination shall be carried out for each heat and heat treatment load.
10. TEST SAMPLING	Samples for production testing shall realistically reflect the properties in the actual components. Test location and orientation shall be: - For bars having section thickness, T ≤ 50 mm, the test specimens shall be taken in longitudinal direction at mid thickness and its mid length shall be at least 50 mm from any second surface. - For bars having section thickness, T > 50mm, the test specimen shall be taken in longitudinal direction at least ¼ T from the nearest surface and at least T or 100 mm, whichever is less, from any second surface.
11. SURFACE FINISH	Finished products shall be white pickled. Machined surfaces do not require pickling.
12. REPAIR OF DEFECTS	Weld repair is not acceptable.
13. MARKING	The component shall be marked to ensure full traceability to melt and heat treatment lot.
14. 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 in accordance with EN 10204 Type 3.1, and shall include the following information: - Steel manufacturer, melting and refining practice. - Heat treatment condition (Solution annealing temperature and holding time shall be stated.)