

Seamless Pipe Line Projects Typical Requirements

SEAMLESS PIPE LINE PROJECTS TYPICAL REQUIREMENTS

PROPERTIES ⁵			C-M-N STEEL GRADES X60 TO X70					C-M-N STEEL GRADE X80 ⁶
			OFFSHORE SERVICE ¹	ARTIC SERVICE	HP/HT SERVICE	GAS SERVICE	SOUR SERVICE	
Steel Design	Carbon Equivalent (IIW) ¹	≤ 1" (25.4 mm)	0.41	0.41	0.41	0.41	0.39	0.45
		> 1" (25.4 mm)	0.43	0.43	0.43	0.43	0.42	
	Carbon Equivalent (Pcm) ¹	≤ 1" (25.4 mm)	0.22	0.22	0.22	0.22	0.21	0.24
		> 1" (25.4 mm)	0.23	0.23	0.23	0.23	0.22	
	P (% max)		0.018	0.018	0.018	0.018	0.015	0.018
	S (% max)		0.008	0.005	0.005	0.005	0.003	0.005
	Nb+V+Ti (% max)		0.12	0.12	0.12	0.12	0.12	0.12
Mechanical Properties	RT Min YS		As applicable					
	RT Min TS		As applicable					
	HT Min YS				2			
	Actual Values RT YS & RT TS variation (Mpa)		100	120	120	120	120	130
	Y/T (max)		0.87 - 0.90	0.90	0.90	0.90	0.90	0.93
	Hardness (max single reading Hv10)		248	260	260	260	248	280
	Minimum Average Toughness (Joules) at -20°C		100	100 at -50°C	100	100	100	100
	CTOD (mm) at -20°C		0.20					
Corrosion Resistance	Tests as per NACE TM0284 & as per ASTM G39 (SIn NACE TM 0177)						As applicable	
	Non Destructive Inspection		5% of Nominal WT					
	L & T Defects (Notch Depth)							
	Laminations		1000			500	1000	
	max area (mm ²)							
Dimensional Tolerances			As applicable ⁴					

Symbols: RT Room Temperature. HP High Pressure. HT High Temperature. YS Yield Strength. TS Tensile Strength. CTOD Crack Tip Opening Displacement. L&T Longitudinal & Transverse. FPBT Four Point Bend Tests

Notes: 1. As applicable according to C content and specific requirements. 2. YS derating values at maximum design temperature as per DNV OS F101 Section 5 Figure 5-1.

3. In case of Reel-Laying RT Min YS and RT Min TS are guaranteed after Laboratory or Full Scale Installation Simulation Tests. 4. In case of Offshore Service restricted ID end Tolerances can be supplied after calibration or machining. 5. 13 Cr Weldable is also available and requirements shall be analyzed on case by case basis. 6. Depending on Specific Project Requirements offered values may change.