

# LNG Terminal

## Production & Type Tests for Cryogenic Valves

### QA | Standard Tests Matrix

Test	Per Standard	Success Criteria	Frequency
Shell 1.5 x Design Pressure	API 598 ASME B16.34 EN 12266-1 P10-P11	No Visible Leakage	100%
Radiographic For Fabricated (Welded) Parts	ASME B31.3 Severe Cyclic Conditions	BPV Code, Section V, Article 2	100%
Body Leakage	EN 12266-1 Method EN 1779 Vacuum Technique – A.3	Leakage $\leq 10^{-6}$ Pa*m <sup>3</sup> /s	100%
Seat tightness	EN 12266-1 Method EN 1779 Vacuum Technique – A.3	Leakage $\leq 10^{-6}$ Pa*m <sup>3</sup> /s	100%
Cleaning	LINDE LS-141-74-S2 CGA G4.1 PRAXAIR GS-38	Per standard	100%



**QA | Optional Tests Matrix**

Additional Tests	Per Standard	Success Criteria	Per agreement
Cryogenic Impact Charpy Test	EN12567 ASTM A370 Testing Methods	EN 10045-1 Kv > 60J	
Visual Test For Casting MSS-SP55	MSS-SP55	Per Table	
Liquid Penetrant Fabricated Parts	ASME B31.3 Severe Cyclic Conditions	Per Table	
Liquid Penetrant Cast Parts	ASTM E165	B16.34 Mandatory Appendix III	
Cryogenic Tests	BS6364	Per STD	10-20%
Witnessing of production and cold tests by TUV \ GL DNV \ LR \ ABS \ BV	Per Society standards & rules	Per Society & Prior Agreement	

**QA | Optional Type Tests Matrix**

Stage	Test	During	Per Standard	Success Criteria	Frequency
Performance Tests	Endurance Test	Type approval	BS6364	No leakage @ 2000 cycles	Type Test
Performance Tests	Antistatic Test	Type approval	EN 12266-2	Electrical resistance ≤ 10 Ω	Type Test
Performance Tests	Cold Shock Test	Type approval	BS6364	No Visible Cracks After Cryogenic Test	Type Test
FAT Tests	Body tightness test	Post Assembly & Production Tests	BS6364 appendix A	Per standard	10%
FAT Tests	Seat tightness test	Post Assembly & Production Tests	BS6364 appendix A	Per standard	10%
FAT Tests	Torques Measured Cold	Post Assembly & Production Tests	BS6364 appendix A	Per standard, Force of Operation will not exceed 360 N	10%

