

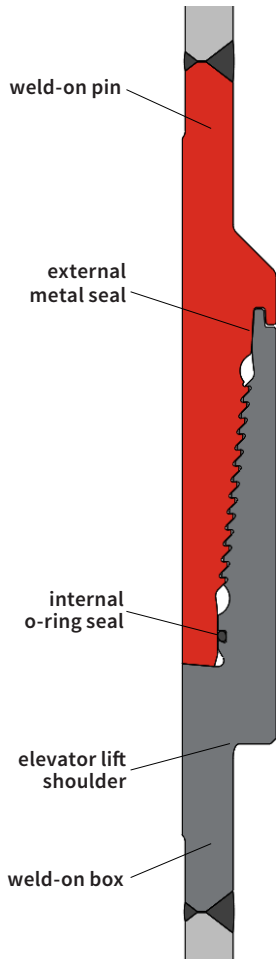
XL Systems 22 x 1.50 X80 GP-95 Viper Connector

In response to the increasing demand for gas tight sealability in offshore surface casing applications, NOV XL Systems has further expanded the Viper weld-on connector physical test program to include gas pressure sealability on 20- and 22-inch sizes. Combined load testing is complete on 22 x 1.50 X80 GP-95 Viper connectors to ISO 13679:2011 CAL I-E (with gas) requirements with internal gas pressure to 95% of actual pipe body ratings, verifying the robust dual-seal design of the Viper connection.

ISO 13679:2011 CAL I-E (with Gas)

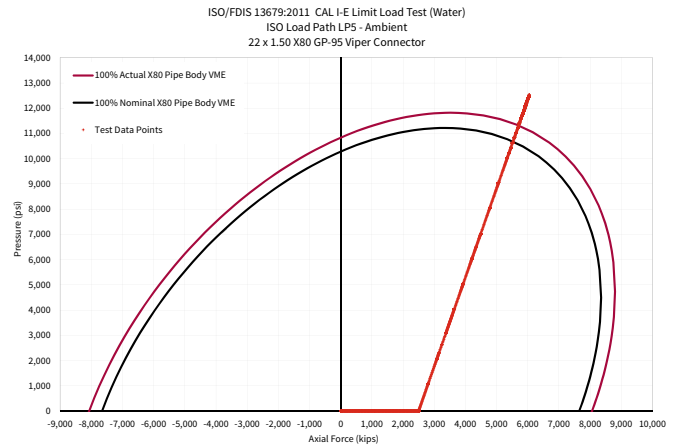
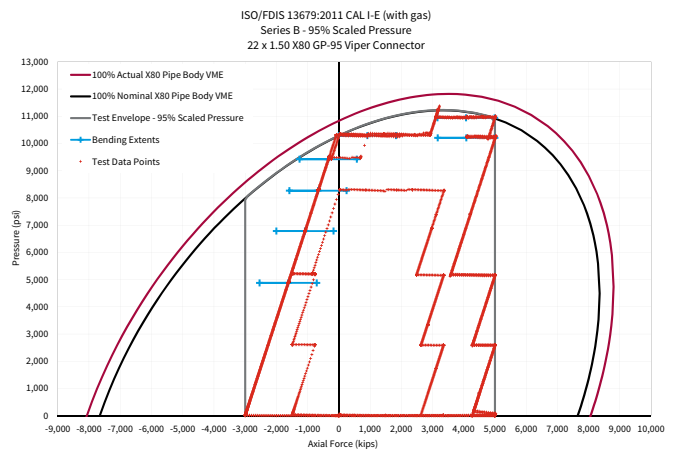
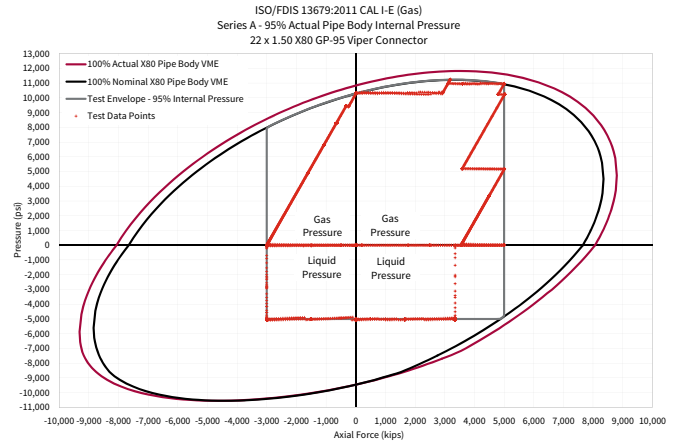
Summary of Test Requirements

Testing Requirement	ISO Specimen 1	ISO Specimen 5
Objective	thread galling and sealing	galling
Made-up condition	minimum seal interference	maximum overall tightness
Specimen geometry	extreme high thread interference extreme low seal interference	high thread interference high seal interference
Make-and-break	two M&B plus final make-up	three M&B
Test series B	internal gas pressure with bending	not required
Test series A	internal gas and external liquid	not required
Limit load testing	LL3 tension to failure	not required



Viper unique advantages:

- internal o-ring seal with optimized groove and land geometry for gas pressure sealability
- successfully tested with gas to ISO 13679:2011 requirements
- extensive fatigue testing and analyses support industry leading stress amplification factors
- greater than 100% pipe body ratings in tension, compression, and bending in this size and grade
- ViperLock anti-rotation maintains connector final make-up position in extreme environment conditions
- robust internal torque shoulder design allows for higher preloads



Successfully qualified to 95% of X80 grade actual pipe body internal pressure ratings to ISO/FDIS 13679:2011 CAL I-E (with gas)



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