



T M K U P C E N T U M



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Section 1: Executive Summary

Report Date: October 31, 2018

Test Dates: September 28, 2018 – October 16, 2018

Client: TMK–Premium Services
 Morozova Str. 30, Taganrog, RUSSIA 347928

Project Number: RDP–105–18–1014

Pipe Specifications: 10.75 In. OD–60.7 lb.–P110

Connection Identification:

Connection Specifications and Ratings		
Connection OD:	11.75 in	
Connection Length:	13.871 in	
Make – Up Loss:	5.591 in	
Drift:	9.504 in	
Connection ID:	9.660 in	
Thread Compound Used:	BESTOLIFE 72733	
Torque (min. /opt. /max.):	37,800 / 42,000 / 46,200 ft–lbs	
	Connection data sheet ratings	Min. Test Rating (% of SMYS)
API Burst Pressure:	9,750 psi	112%
API Collapse Pressure:	5,870 psi	N/A
Tensile Load:	1,922,000 lbs	100%
Compression Load:	1,922,000 lbs	100%
Bending (Dogleg):	46° / 100 ft	10° / 100 ft

Table 1-1: Connection Specifications

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Specimen Preparation & Test Locations

Mechanical Property Testing:	TMK–IPSCO R&D Center, 10120 Houston Oaks Dr., Houston, TX 77064
Specimen Machining and Surface Treatments:	Custom Threading (CTI), 5835 Cheswood, Houston, TX 77087
Make and Breaks:	TMK–IPSCO R&D Center, 10120 Houston Oaks Dr., Houston, TX 77064
Sealability Testing:	TMK–IPSCO R&D Center, 10120 Houston Oaks Dr., Houston, TX 77064

Table 1-2: Specimen Preparation and Test Locations

Test Procedure

Test Type:	EMCEP
Planned deviations from EMCEP:	Testing is planned for Specimen 26 only
Number of Specimens:	1 (Specimen 26)
Test Temperatures:	96°F (35.5°C) for Ambient Temperature Testing 300 °F (149 °C) for Elevated Temperature Testing/ Bake Out
Fluid Medium for Sealability Testing:	Nitrogen

Testing Dates & Location

Specimen	Make & Break	Bake-Out	Sealability
Location	TMK IPSCO	TMK IPSCO	TMK IPSCO
26	09/28/2018	10/09/2018	10/16/2018

Table 1-3: Test Schedule

Identification of Test Personnel

Engineer in Charge (EIC):	Alexey Prokofyev
Project Manager:	Manish Nawal
Test Engineer:	Kevin Henry
Technicians:	Justin Cumberledge, Jason Park, Steven Waters, Donald Anderson, Christopher Coode, Kenneth Brown, Guy Forester, Barry Fisher, Alejandro Ruiz, David Tchamanzar, Jose Zapata.

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3rd Party Monitoring

Not Applicable

Deviations and Anomalies

The total tension load was limited to T_A for load point 7. This equates to reducing the Tension efficiency to 88% at this point.

Testing Summary

Specimen Preparation

Test specimens were machined from JFE (Heat# 7-14682) casing stock and Timken (Heat# W0605) coupling stock. The pins were machined according to drawing no: TMK UP CENTUM 273.001, Revision 1 and couplings were machined according to drawing no: TMK UP CENTUM 273.002, Revision 1. All test specimens satisfied the thread and seal interference ranges outlined in EMCEP First Edition.

Specimen/Side	Box Finish	Pin Finish
Specimen 26	Zn Phosphate	Bead Blasting + Molybdenum Disulfide

Table 1-4: End Surface Finish

Make & Break Testing

Test specimens were made up using horizontal tongs with 2.0 RPM max. API modified thread compound (BestOLife 72733) per the quantities listed in Table 1-5 were used.

Dope Quantity on Pin (g)	Dope Quantity on box (g)
22-29	43-57

Table 1-5: Make & Break Dope Quantity

Recommended torque values ranged between 37,800 and 46,200 ft-lb (51,300 and 62,700 N.m). A detailed description of the recommended make-up torque ranges are indicated in Table 1-6. Make-up and break-out cycles for each full-scale test specimen are shown in Table 1-7.

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	Nm		ft-lb	
Minimum recommended torque	51,300		37,800	
Optimum recommended torque	57,000		42,000	
Maximum recommended torque	62,700		46,200	
	Minimum	Maximum	Minimum	Maximum
High Make-Up Torque range	61,600	62,700	45,400	46,300
Low Make-Up Torque range	51,300	52,400	37,800	38,700

Table 1-6: Make-Up Torque Ranges

Specimen #	End A	End B
26	3+FMU	FMU

Table 1-7: Make-up and Break-out Cycles

Bake out

Specimen 26 was baked out at 375°F (190°C) for 24 hours with load cycles as shown in Table 1-8.

Cycle	Machine Load, kips	Internal Pressure, psi	Hold time	Temperature
Heating up to 180±15°C (356 ±27°F)				
1	1400	0	1 hour	180±15°C (356±27°F)
	-700		1 hour	
2	1400		1 hour	
	-700		1 hour	
3	1400		1 hour	
	-700		1 hour	
...	1400		1 hour	
	-700		1 hour	
n	1400		1 hour	
	-700		1 hour	

Table 1-8: Bake-out Loading Cycles

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Sealability Testing

The load ratings specified in Table 1-1 were used on all tested specimens (26). The applied loads (tension/compression) and Internal pressures are provided in Figure 1-1 through Figure 1-3. All specimens met the displacement requirements per API RP 5C5:2017.

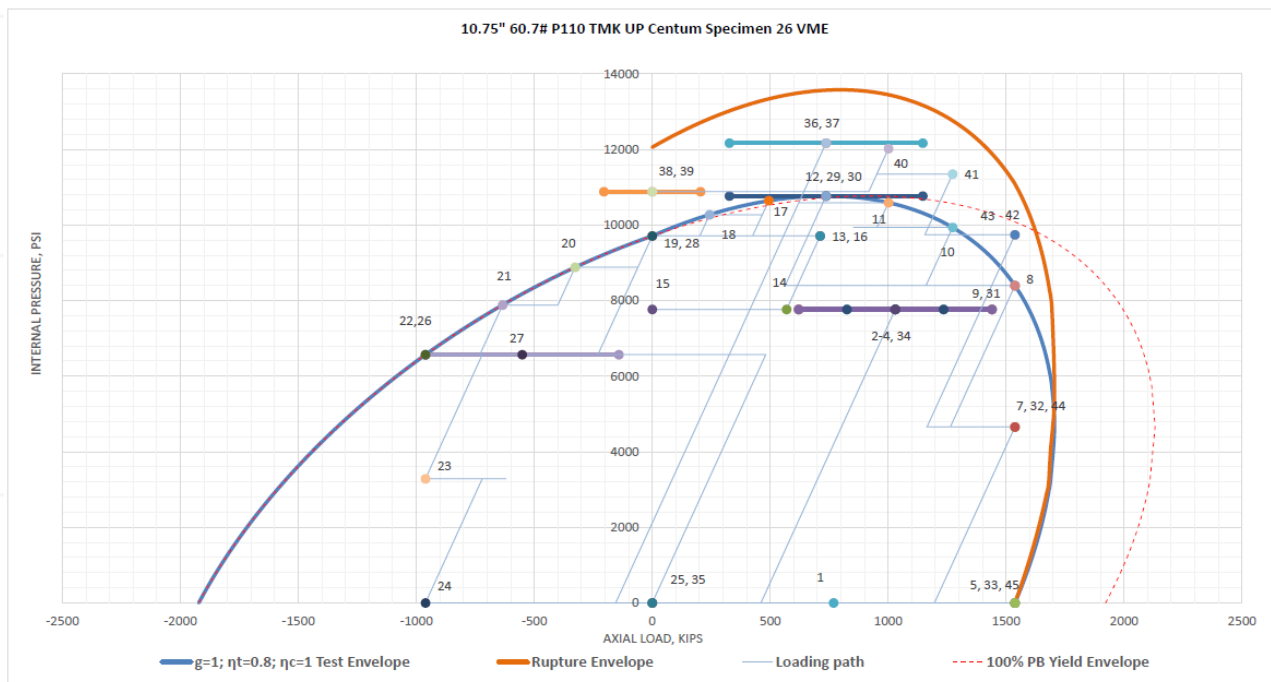


Figure 1-1: Test Envelope for TMK UP Centum Specimen 26 (80% Tension)

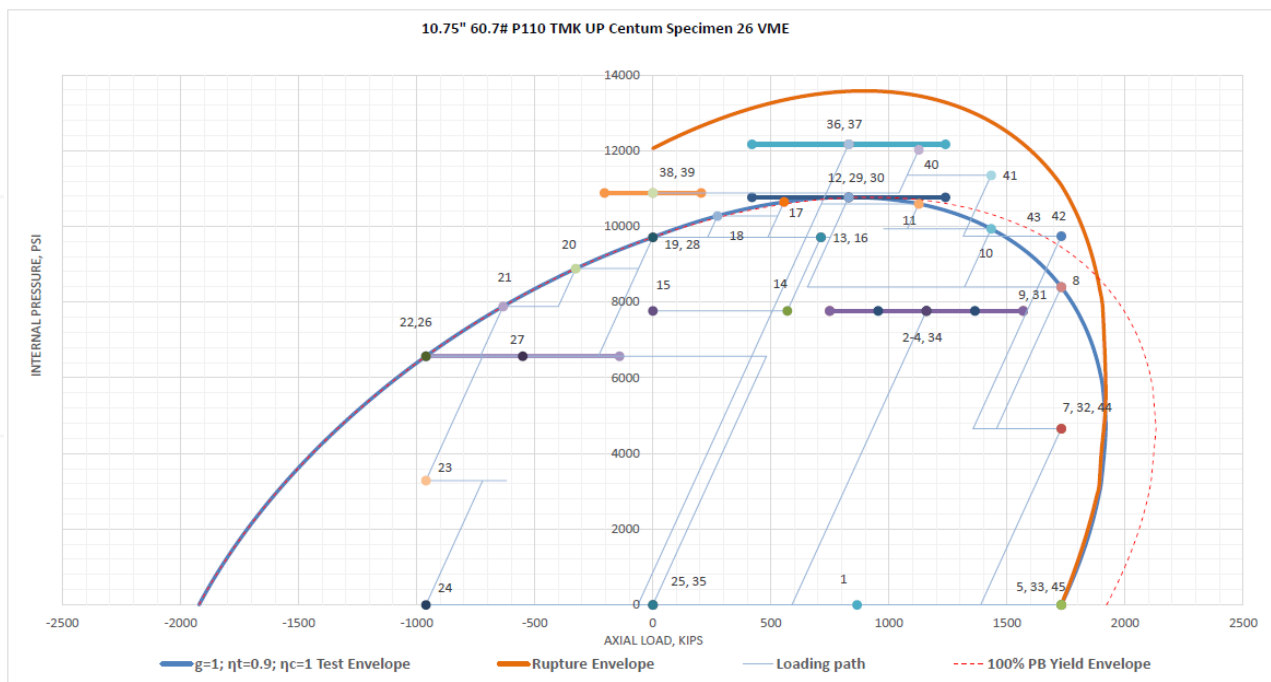


Figure 1-2: Test Envelope for TMK UP Centum Specimen 26 (90% Tension)

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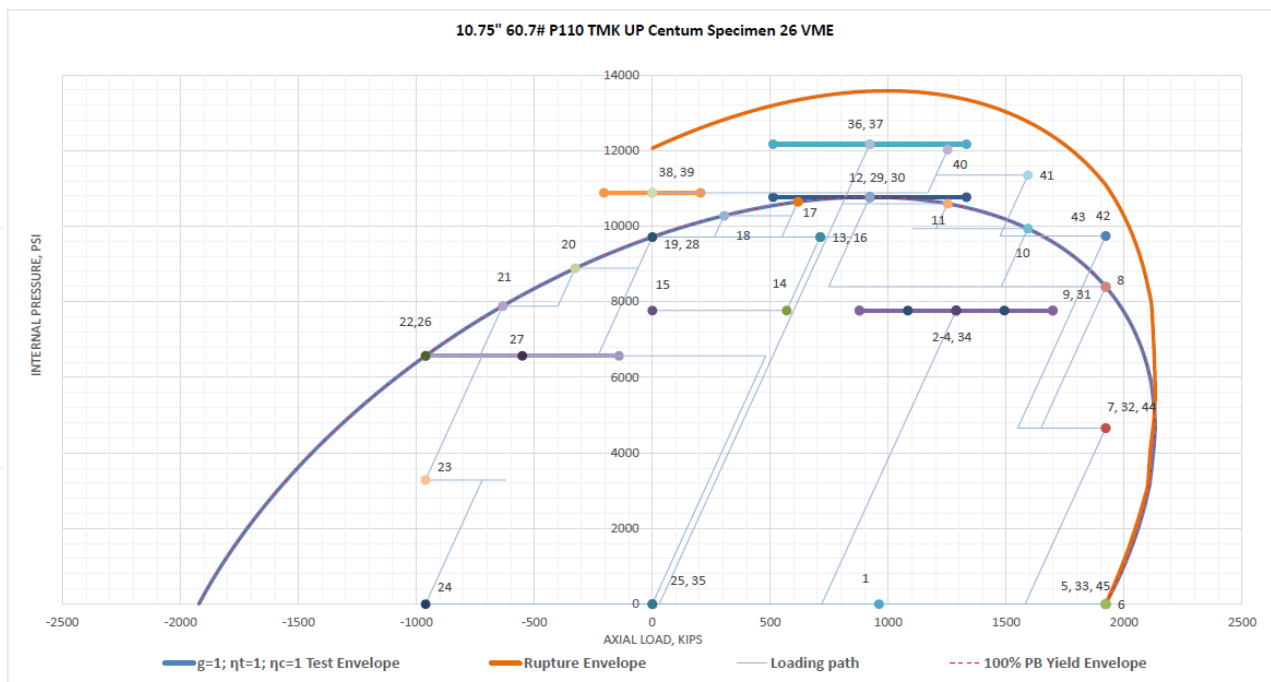


Figure 1-3: Test Envelope for TMK UP Centum Specimen 26 (100% Tension)

Supplemental Testing

Not Applicable

Conclusion

The 10.75" x 60.7# P110 TMK UP Centum connection Specimen 26 was successfully qualified in accordance with applicable EMCEP First Edition requirements per the test proposal TP PS-66-01-2018 Revision 3 with 100% tension and 100% compression efficiencies. The internal pressures correspond to 100% PBYS respectively.

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TMK UP CENTUM



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Approval Signatures

**Prepared By:
Connection Test Engineer**

Kevin Henry

Date

**Reviewed By:
Design Engineer (EIC)**

Alexey Prokofyev

Date

**Approved By:
General Manager of R&D**

Dhiren Panda

Date

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