



# T M K U P C E N T U M



10120 Houston Oaks Dr., Houston, TX 77064  
 Phone: +1(281) 949 1023 Website: tmk-ipsco.com Fax: +1(281) 445 4040

## Section 1: Executive Summary

**Report Date:** August 13, 2018

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

**Project Number:** RDP–105–18–xxx-Spec1

**Pipe Specifications:** 5.5 In. OD–23 lb.–L80

**Connection Identification:**

Connection Specifications and Ratings		
<b>Connection OD:</b>	6.300 in	
<b>Connection Length:</b>	12.598 in	
<b>Make – Up Loss:</b>	5.898 in	
<b>Drift:</b>	4.545 in	
<b>Connection ID:</b>	4.587 in	
<b>Thread Compound Used:</b>	BESTOLIFE 72733	
<b>Torque (min. /opt. /max.):</b>	11,300 / 12,500 / 13,800 ft–lbs	
	<b>Connection data sheet ratings</b>	<b>Min. Test Rating (% of PBYS)</b>
<b>API Burst Pressure:</b>	10,570 psi	125%
<b>API Collapse Pressure:</b>	12,930 psi	N/A
<b>Tensile Load:</b>	530,000 lbs	95%
<b>Compression Load:</b>	530,000 lbs	50%
<b>Bending (Dogleg):</b>	65.7° / 100 ft	10° / 100 ft

Table 1-1: Connection Specifications

TMK IPSCO Confidential and Proprietary Information	TEST: TMK UP Centum 5.5X23 L80			PG:  1.1 of 1.6
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## Specimen Preparation & Test Locations

<b>Mechanical Property Testing:</b>	Element Materials Technology, 14805 Yorktown Plaza Dr., Houston, TX 77040
<b>Specimen Machining and Surface Treatments:</b>	Custom Threading (CTI), 5835 Cheswood, Houston, TX 77087
<b>Make and Breaks:</b>	TMK-IPSCO R&D Center, 10120 Houston Oaks Dr., Houston, TX 77064
<b>Sealability Testing:</b>	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 (1 specimen rehearsal)

**Planned deviations from EMCEP First Edition:** Testing is planned for Specimen 46 only

**Number of Specimens:** 1 (Specimen 46)

**Test Temperatures:** 356 °F (180 °C) for Bake Out  
300 °F (149 °C) for Elevated Temperature Testing

Test Pressure	
	<b>Sealability</b>
<b>Internal Pressure</b>	Nitrogen

Table 1-3: Fluid Mediums Used

## Testing Dates & Location

Specimen	Make & Break	Bake-Out	Sealability
Location	TMK IPSCO	TMK IPSCO	TMK IPSCO
1	07/18/2018	08/01/2018	08/05/2018

Table 1-4: Test Schedule

## Identification of Test Personnel

**Engineer in Charge (EIC):** Alexey Prokofyev

**Project Manager:** Manish Nawal

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**Test Engineer:** Kevin Henry  
**Technicians:** Justin Cumberledge, Jason Park, Kenneth Brown, Guy Forester, Barry Fisher, Jose Zapata.

### 3<sup>rd</sup> Party Monitoring

Not Applicable

### Deviations and Anomalies

Mechanical property testing was conducted on one end of one pipe from the heat that the Specimen was cut from.

### Testing Summary

#### **Specimen Preparation**

Test specimens were machined from Vallourec (Heat# HM0113) casing stock and Tenaris (Heat# 71652) coupling stock. The pins were machined according to drawing no: TMK UP CENTUM 140.001 V3.1, Revision 1 and couplings were machined according to drawing no: TMK UP CENTUM 140.002 V3.1, Revision 1. All test specimens satisfied the thread and seal interference ranges outlined in EMCEP First Edition.

Specimen/Side	Box Finish	Pin Finish
Specimen 46	Mn Phosphate	Zn Phosphate

Table 1-5: End Surface Finish

#### **Make & Break Testing**

Test specimens were made up using horizontal tongs with 1.73 RPM. API modified thread compound (BestOLife 72733) per the quantities listed in Table 1-6 were used.

	Dope Quantity on Pin (g)	Dope Quantity on box (g)
Minimum	9-12	19-23

Table 1-6: Make & Break Dope Quantity

Recommended torque values ranged between 11,300 and 13,800 ft-lb (15,300 and 18,700 N.m). A detailed description of the recommended make-up torque ranges are indicated in Table 1-7.

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	Nm		ft-lb	
Minimum Yield torque	25900		19100	
Minimum recommended torque	15300		11300	
Optimum recommended torque	17000		12500	
Maximum recommended torque	18700		13800	
Minimum shoulder torque	900		700	
Maximum shoulder torque	13600		10100	
	Min	Max	Min	Max
Make-and-break cycles (M&Bs)	18360	19040	13600	14100
Final makeups (FMU)	14960	15640	11100	11600

Table 1-7: Make-Up Torque Ranges

## Bake out

Specimen 46 was baked out at 356°F (180°C) for 24 hours with mechanical 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	400	0	1 hour	180±15°C (356 ±27°F)
	-200		1 hour	
2	400		1 hour	
	-200		1 hour	
3	400		1 hour	
	-200		1 hour	
...	400		1 hour	
	-200		1 hour	
n	400		1 hour	
	-200		1 hour	

Table 1-8: Bake Out Exercise Load Table

## Sealability Testing

The load ratings specified in Table 1-1 were used on specimen 46. The applied loads (tension/compression) and internal pressure are provided in Figure 1-1. Specimen 46 met the displacement requirements per EMCEP First Edition.

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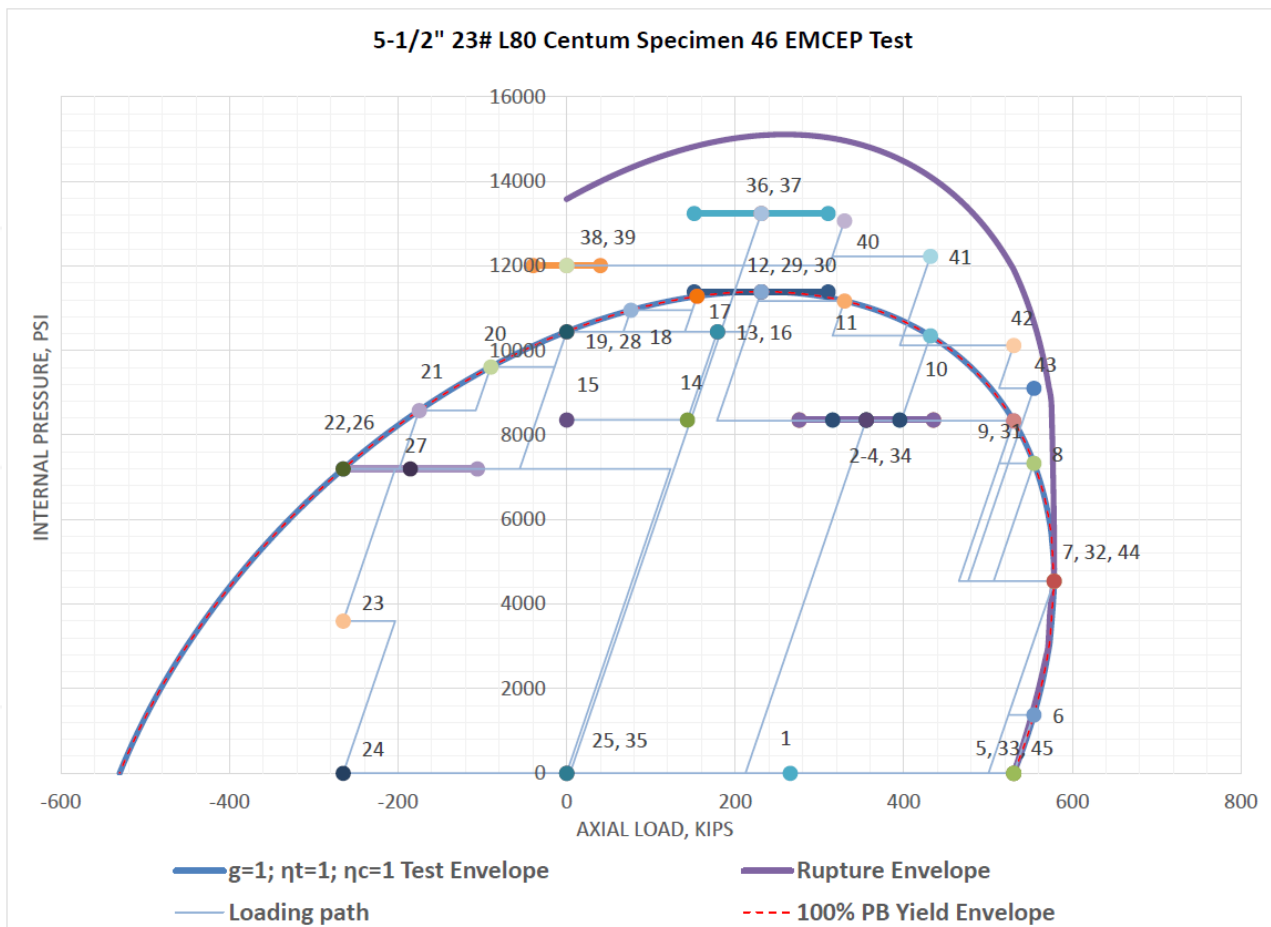


Figure 1-1: Test Envelope for TMK UP Centum Specimen 46 Sealability Testing

### Supplemental Testing

Not Applicable

### Conclusion

The 5.5" x 23# L80 TMK UP Centum connection Specimen 46 was successfully qualified in accordance with applicable EMCEP First Edition requirements per the Test Proposal TP PS-21-01-2018 Revision 2 with 100% tension and 100% compression efficiencies. The internal pressure correspond to 100% PBYS.

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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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