



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: October 19, 2018

Test Dates: September 19, 2018 – September 25, 2018

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

Project Number: RDP–105–18–1013

Pipe Specifications: 9.875 In. OD–62.8 lb.–P110

Connection Identification: 9-7/8" 62.8# Centum V1

Specimen Preparation & Test Locations

Specimen Machining:	Custom Threading (CTI), 5835 Cheswood, Houston, TX 77087
Specimen 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

Table 1-1: Specimen Preparation and Test Locations

Test Procedure

Test Type: API RP 5C5: 2017 CAL IV M&B Only

Planned deviations from API RP 5C5: Make and Break testing only
Additional Make and Break Cycle (see section 4.2 of the test protocol)

Number of Specimens: 2 (Specimen 3,5)

Test Temperatures: 96°F (35.5°C) for Ambient Temperature Testing

TMK IPSCO Confidential and Proprietary Information	TEST: TMK UP Centum 9.875X62.8 P110			PG: 1.1 of 1.7
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Testing Dates & Location

Specimen	Make & Break
Location	TMK IPSCO
3	09/25/2018
5	09/20/2018

Table 1-2: Test Schedule

Identification of Test Personnel

Engineer in Charge (EIC): Alexey Prokofyev
Project Manager: Manish Nawal
Test Engineer: Kevin Henry
Technicians: Guy Forester, Barry Fisher

3rd Party Monitoring

Not Applicable

Deviations and Anomalies

On Make Up 5 of Specimen 5A, the load cell did not function properly causing the connection to be over torqued to an unknown value

Testing Summary

Specimen Preparation

Test specimens were machined from Tenaris (Heat# 26302) casing stock and Timken (Heat# L9970) coupling stock. The pins were machined according to drawing no: TMK UP CENTUM 250.001V1, Revision 1 and couplings were machined according to drawing no: TMK UP CENTUM 250.002V1, Revision 1. All test specimens satisfied the thread and seal interference ranges outlined in API RP 5C5:2017.

Specimen/Side	Box Finish	Pin Finish
3A	Zn Phosphate	As Machined
3B	Zn Phosphate	Bead Blast & Moly
5A	Zn Phosphate	As Machined
5B	Zn Phosphate	Bead Blast & Moly

Table 1-3: End Surface Finish

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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 1-4 were used.

	Dope Quantity on Pin (g)	Dope Quantity on box (g)
Minimum	21±1	42±1
Maximum	25±1	50±1

Table 1-4: Make & Break Dope Quantity

Recommended torque values ranged between 43,100 and 52,700 ft-lb (58,500 and 71,500 N.m). A detailed description of the recommended make-up torque ranges are indicated in Table 1-5. The shoulder torques on all specimens were within acceptable limits. Details of all Make and Breaks are shown in Table 1-7 through Table 1-10 below.

	Nm		ft-lb	
Minimum recommended torque	58500		43100	
Optimum recommended torque	65000		47900	
Maximum recommended torque	71500		52700	
Minimum shoulder torque	3300		2500	
Maximum shoulder torque	52000		38400	
	Min	Max	Min	Max
High Make-Up Torque range	68900	71500	50900	52800
Low Make-Up Torque range	58500	61100	43200	45100
Speed of Make-up/Break- out	Not more than 1.8 RPM (at the last turn before shouldering)			

Table 1-5: V1 Make-Up Torque Ranges

Specimens 3A, 5A and 5B exhibited galling that was acceptable and reparable during make and break trials. Repairs were conducted by TMK Premium authorized personnel. A short summary on the observed galling and the repair action is included in Table 1-6 and Figure 1-1.

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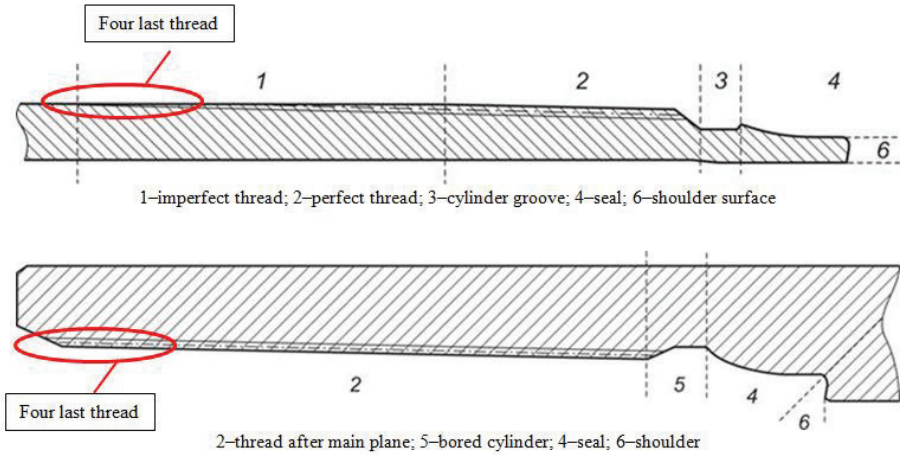


Figure 1-1: Thread Galling Locations

Specimen	Cycle #	Galling Severity	Location (Refer Figure 1-1)		Repair Area	Repair Equipment	Repair Time (min.)
			Pin	Box			
3A	6-11	Light	NA	Area 2	No repairs were made		
3A	12	moderate	Area 4	Area 4	Not Repairable		
5A	2-12	Light	Area 1	Area 2	Pin/Box	Sand paper	*10
5B	8-12	Light	Area 1	Area 2	Pin/Box	Sand paper	**10

*Repairs were only made after Break Out #7 **Repairs were only made after Break Out #9

Table 1-6: Make and Break Galling Summary

Specimen 3 Make & Break Side A							
BOX: 1001A/ PIN:101							
Make Up	MU Torque ft-lbs	BO Torque ft-lbs	Galling (Y/N)	Dope Pin grams	Dope Box grams	Delta Turns	Shoulder Torque
1	52,336	51,301	N	21.9	42.2	0.027	26,298
2	52,432	49,007	N	20.9	42.7	0.026	25,193
3	52,326	47,121	N	21.3	42.7	0.028	25,021
4	52,240	48,562	N	20.2	42.7	0.032	22,836
5	52,751	48,764	N	21.1	41.7	0.030	22,624
6	52,348	51,582	Y	21.7	42.0	0.031	22,549
7	52,242	53,327	Y	21.7	41.7	0.029	23,749
8	52,181	53,604	Y	20.9	41.9	0.030	24,304
9	52,410	53,474	Y	20.5	42.8	0.031	22,724
10	52,552	50,887	Y	21.7	42.7	0.030	23,878
11	52,555	52,455	Y	21.7	41.2	0.028	24,952
12	51,910	50,160	Y	20.6	41.7	0.029	25,059

Table 1-7: Specimen 3 Make & Break Side A

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Specimen 3 Make & Break Side B							
BOX: 1001B/ PIN:102							
Make Up	MU Torque ft-lbs	BO Torque ft-lbs	Galling (Y/N)	Dope Pin grams	Dope Box grams	Delta Turns	Shoulder Torque
1	52,624	58,810	N	21.5	42.3	0.032	20,191
2	52,115	43,855	N	21.3	41.5	0.027	25,808
3	52,985	46,502	N	21.9	41.3	0.030	25,143
4	52,126	45,067	N	20.6	41.6	0.027	25,616
5	52,151	46,671	N	20.1	42.5	0.030	23,847
6	52,454	47,646	N	21.3	42.7	0.030	21,908
7	52,259	51,493	N	20.3	42.7	0.031	22,654
8	52,376	49,979	N	21.7	42.0	0.029	24,878
9	52,380	47,297	N	21.9	42.4	0.031	24,931
10	52,240	48,954	N	21.7	42.5	0.024	26,001
11	52,480	49,276	N	21.8	42.2	0.031	23,095
12	52,496	50,070	N	21.3	41.7	0.033	22,191

Table 1-8: Specimen 3 Make & Break Side B

Specimen 5 Make & Break Side A							
BOX: 1002A/ PIN:103							
Make Up	MU Torque ft-lbs	BO Torque ft-lbs	Galling (Y/N)	Dope Pin grams	Dope Box grams	Delta Turns	Shoulder Torque
1	52,293	52,903	N	21.6	42.6	0.027	25,982
2	52,363	47,813	Y	20.6	42.3	0.025	27,838
3	52,182	55,674	Y	21.2	42.0	0.029	25,737
4	52,580	49,040	Y	21.1	42.0	0.028	26,035
5	NA	91,826	Y	21.0	41.9	NA	NA
6	52,181	55,110	Y	21.9	42.5	0.035	25,895
7	52,301	53,897	Y	21.9	42.4	0.034	27,757
8	52,417	50,174	Y	20.6	41.2	0.032	27,536
9	52,654	48,694	Y	21.7	42.4	0.035	24,742
10	52,748	49,356	Y	20.6	42.0	0.031	25,480
11	51,960	49,570	Y	20.1	42.0	0.033	25,780
12	52,531	51,535	Y	21.5	41.5	0.032	25,793

Table 1-9: Specimen 5 Make & Break Side A

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Specimen 5 Make & Break Side B							
BOX: 1002B/ PIN:104							
Make Up	MU Torque ft-lbs	BO Torque ft-lbs	Galling (Y/N)	Dope Pin grams	Dope Box grams	Delta Turns	Shoulder Torque
1	52,166	72,413	N	20.3	42.8	0.029	24,022
2	52,537	50,487	N	21.6	42.8	0.026	29,550
3	52,444	50,211	N	21.0	41.6	0.024	30,223
4	52,580	50,064	N	20.6	41.3	0.024	28,897
5	52,187	51,523	N	21.6	41.7	0.024	29,645
6	52,302	47,582	N	21.5	42.7	0.026	28,415
7	52,252	52,332	N	21.1	42.4	0.028	30,075
8	52,487	50,708	Y	20.2	42.8	0.024	29,780
9	52,299	51,816	Y	21.2	41.4	0.025	28,733
10	52,363	50,484	Y	20.6	41.1	0.024	31,215
11	51,981	48,860	Y	21.1	42.9	0.021	30,597
12	52,388	48,142	Y	20.8	42.9	0.024	29,584

Table 1-10: Specimen 5 Make & Break Side B

Supplemental Testing

Not Applicable

Conclusion

The 9.875 x 62.8 P110 TMK UP CENTUM V1 connection met the make and break requirements listed in the test protocol (TP PS-29-05-2018, Revision 1).

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Approval Signatures

Prepared By:
Connection Test Engineer

Kevin Henry

Kevin Henry

2018.10.30 08:42:40 -05'00'

Date

Reviewed By:
Design Engineer (EIC)

Prokofyev Alexey

Alexey Prokofyev

2018.10.30 09:24:00 -05'00'

Date

Approved By:
General Manager of R&D

Dhiren Panda

Date

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