Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

Premium Connection

- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

Preface

Tianjin Pipe Corporation (TPCO) is one of the global leading seamless steel pipe manufacturers located in China. Its core business is to manufacture the seamless steel pipe that attains to the advanced international standards and to serve the global energy, machinery and other industries. TPCO has 10 overseas companies and offices spread all over the America, Europe, Asia, Africa and Oceania.TPCO is always ready to provide the high quality products and services to customers world-wide.

TPCO R&D center has national level CNAS approved labs, equipped with world leading test facilities and full-scale testing means, and evaluation equipment which can simulate all kinds of critical tubular application conditions, including connection evaluation test ISO 13679/API 5C5 CAL IV and ISO 12835, which to compliance with TPCO can conduct high level quantity control to production process and final products, make sure they satisfy API, ASME, ASTM and other standards or special requirements from customers.

Until now TP series premium connections already developed to dozen kinds of connection, size range covered from 1.9in to 26in, structure type including typical gas tight T&C, near flush T&C, upset semi flush integral, full flush integral and semi premium connections. Applicable material grade including all API grades, H2S,CO2 corrosion grades, high collapse grades and other material suitable for special and serve oilfield environments.

As of now, a dozen of premium connections in TP series already owned a whole process system including product design、FEA analysis、evaluation test、threading process control、inspection method and oilfield services, which can provide rapid respond to market demands.

For further information please visit our website at www.tpcointernational.com.

Connection Test Facilities

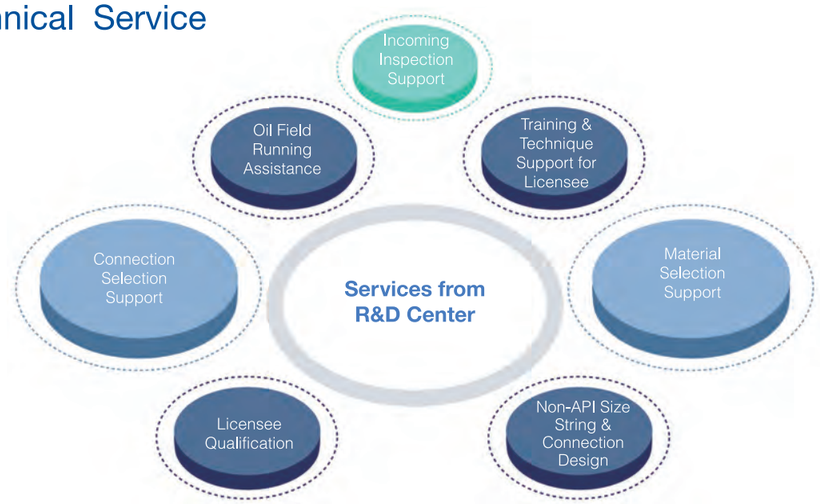
- In-house full scale pipe properties evolution system. Inside/outside pressure, gas-tight test, full stretch, burst testing etc.
- Large-scale comprehensive joint test equipment for four-quadrant composite loading testing according to ISO 13679,API 5C5 and ISO 12835.

Connection Category

No.	Type	Type of Connection	Connection	Remarks
1	Metal to Metal Gas-tight Premium Connection	T&C	TP-CQ^{Series}	The classics generation product,excellent gas seal-ability under combined load suitable for most well condition.
2			TP-G2^{Series}	Generation two connection especially suitable for deep well, high deviated well and long horizontal wells.
3			TP-G4^{Series}	The latest generation product, high performance premium connection suitable for high grade, high alloy material and most critical well condition.
4			TP-WG	Super anti high torque wedge thread connection suitable for CWD and other high torque operation.
5			TP-TW	Best heat stability suitable for thermal wells application such as SAGD.
6			TP-FE	High fatigue resistance suitable for offshore riser application
7			TP-NF3	Slim coupling premium connection for casing suitable for limited clearance well.
8		Integral flush	TP-FJ/II	Integral fully flush premium connection provides maximum clearance suitable for complicate wellbore design and limited clearance.
9		Integral upset	TP-SFJ	Integral upset semi-flush premium connection with double metal to metal seal suitable for complicate wellbore design and limited clearance.
10			TP-ISF	Integral upset semi-flush premium connection with two step threads and better performance, suitable for complicate wellbore design and limited clearance..
11	Semi Premium Connection	T&C	TP-BM(S)	Modified buttress connection and Interchangeable with API BC， high torque /compression capacity suitable for shale oil and horizontal part of shale gas.
12			TP-JC	New zigzag thread concept design suitable for replace API EU product
13			TP-QR	Quick run semi-premium connection suitable for large diameter surface casing

Note， Dope-free technology is optional for gas tight premium connection connection, without thread compound when make-up.

Technical Service



Steel Grade Availability

Grade \ Connection		TP-CQ Series	TP-G2 Series	TP-G4 Series	TP-WG	TP-NF3	TP-FJ/II	TP-SFJ	TP-ISF	TP-TW	TP-FE	TP-BM(S)	TP-JC	TP-QR
API Grade	H40	A	A	A	A	A	A	A	A	A	A	A	A	A
	J55	A	A	A	A	A	A	A	A	A	A	A	A	A
	K55	A	A	A	A	A	A	A	A	A	A	A	A	A
	N80-1 N80Q	A	A	A	A	A	A	A	A	A	A	A	A	A
	R95	A	A	A	A	A	A	A	A	A	A	A	A	A
	M65	A	A	A	A	A	A	A	A	A	A	A	A	A
	L80-1 L80-9Cr L80-13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	C90	A	A	A	A	A	A	A	A	A	A	A	A	A
	T95	A	A	A	A	A	A	A	A	A	A	A	A	A
	C110	A	A	A	A	A	A	A	A	A	A	A	A	A
	P110	A	A	A	A	A	A	A	A	A	A	A	A	A
	Q125	A	A	A	A	A	A	A	A	A	A	A	A	A
High collapse	TP80T	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP80TT	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95T	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95TT	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110T	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110TT	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125TT	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP130TT	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP140TT	A	A	A	A	A	A	A	A	A	A	A	A	A
Deep well service	TP110V	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125V	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP140V	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP150V	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP155V	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP165V	A	A	A	A	A	A	A	A	A	A	A	A	A
Stem injection	TP90H	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP100H	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110H	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125H	A	A	A	A	A	A	A	A	A	A	A	A	A
Shale gas	TP110SG	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125SG	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP140SG	A	A	A	A	A	A	A	A	A	A	A	A	A
low temperature	TP55LL	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP80LL	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110LL	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125LL	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP150LL	A	A	A	A	A	A	A	A	A	A	A	A	A
Sour service	TP80S	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP80SS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP90S	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP90SS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95S	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95SS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110S	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110SS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125S	A	A	A	A	A	A	A	A	A	A	A	A	A
High collapse & Sour service	TP80TS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP80TSS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP90TS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP90TSS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95TS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95TSS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110TS	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110TSS	A	A	A	A	A	A	A	A	A	A	A	A	A
Anti-CO2 corrosion	L80-1Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	L80-3Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110-3Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP80-13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP95-13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110-1Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110-13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110-HP13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP110-SUP13Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
	TP125-SUP15Cr	A	A	A	A	A	A	A	A	A	A	A	A	A
CRA	TP110-22Cr	A	A	A	A	A				A	A	A	A	A
	TP110-25Cr	A	A	A	A	A				A	A	A	A	A
	TP110-SUP25Cr	A	A	A	A	A				A	A	A	A	A
	TP125-22Cr	A	A	A	A	A				A	A	A	A	A
	TP125-25Cr	A	A	A	A	A				A	A	A	A	A
	TP125-SUP25Cr	A	A	A	A	A				A	A	A	A	A
	TP-TDJ028	A	A	A	A	A				A	A	A	A	A
	TP-TDJ2535	A	A	A	A	A				A	A	A	A	A
	TP-TDJG3	A	A	A	A	A				A	A	A	A	A
Ti alloy	TP-Ti-110	A	A	A	A	A				A	A	A	A	A

NOTE: A=Applicable, extra particular steel grades can be provided according to customer request, for details please check with TPCO R&D.

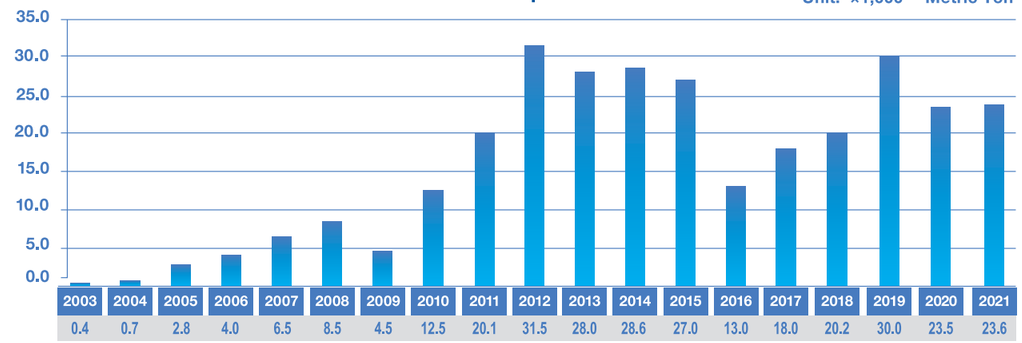
Size Availability

Inch \ Connection	TP-CQ Series	TP-G2 Series	TP-G4 Series	TP-WG	TP-NF3	TP-FJ/II	TP-SFJ	TP-ISF	TP-TW	TP-FE	TP-BM(S)	TP-JC	TP-QR
2-3/8	A	A		A			A					A	
2-7/8	A	A		A			A					A	
3-1/2	A	A		A			A					A	
4	A	A		A			A					A	
4-1/2	A	A		A			A		A		A	A	
5	A	A	A	A	A	A	A		A		A	A	
5-1/2	A	A	A	A	A	A	A	A	A		A	A	
5-5/8						A							
5-3/4						A							
6-1/8						A							
6-5/8	A	A	A	A	A	A	A	A	A	A	A		
7	A	A	A	A	A	A	A	A	A	A	A		
7-1/4					A								
7-1/2						A							
7-5/8	A	A	A	A	A	A	A	A	A	A	A		
7-3/4	A	A	A		A	A	A	A	A	A	A		
7-7/8	A		A										
8						A							
8-1/8	A					A							
8-1/2						A							
8-5/8	A	A	A	A	A	A	A	A	A	A	A		
8-3/4	A				A								
9-5/8	A	A	A	A	A	A	A	A	A	A	A		
9-3/4	A												
9-7/8	A	A	A	A									
10-1/4	A												
10-3/4	A	A	A	A	A	A		A	A	A	A		
11					A	A							
11-1/8	A				A	A							
11-1/4						A							
11-3/4	A	A	A	A	A	A		A	A	A	A		
13-3/8	A	A	A	A				A	A	A	A		A
13-5/8	A		A	A				A		A			A
14								A		A			
14-3/8	A		A		A					A			
14-3/4					A								
16		A								A	A		A
18-5/8		A									A		A
18-3/4		A											A
20		A									A		A
24													A

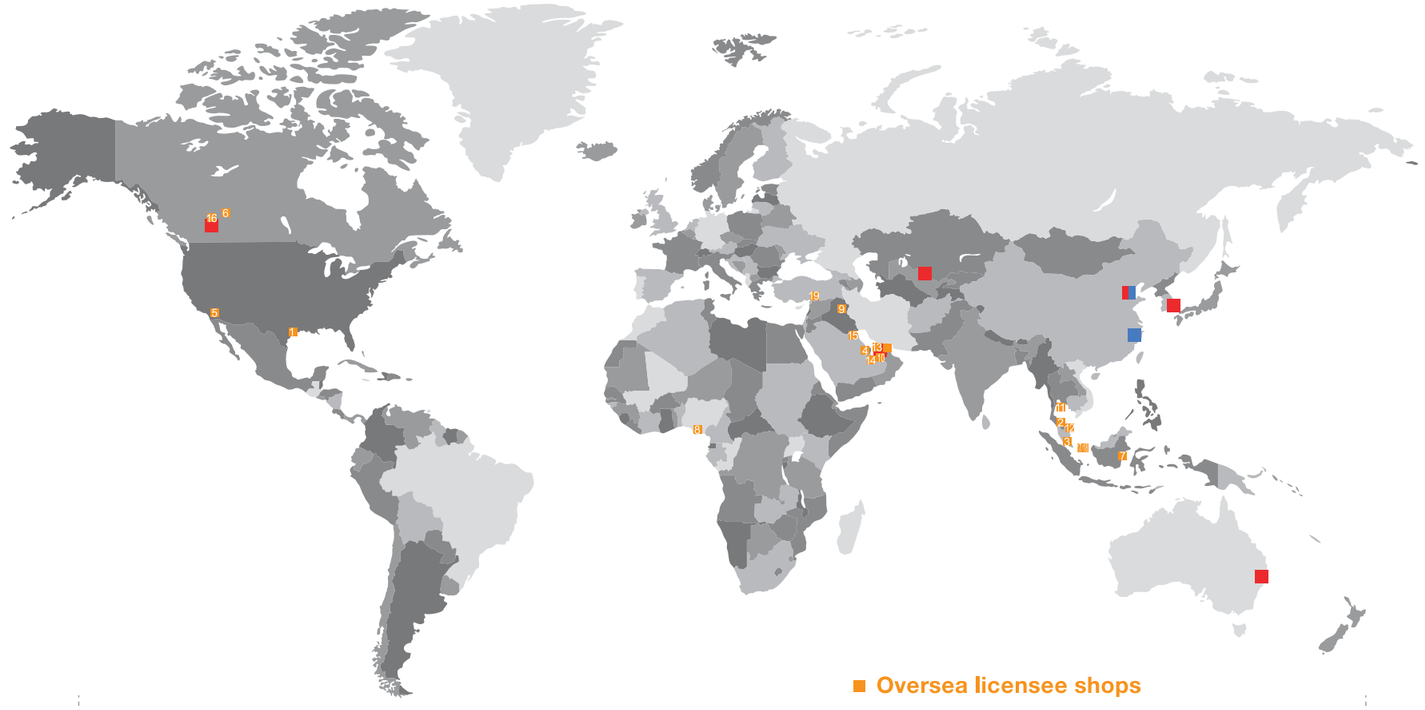
NOTE: A=Applicable, size expansion is avaliable according to customer request,for details please check with TPCO R&D.

TPCO Premium Connection Output

Unit: ×1,000 Metric Ton



Service Network



■ Sales & service centers

Tianjin Pipe International Economic & Trading Corporation
Address: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
P.C.: 300301
Tel.: 0086-22-6628-0988
Fax: 0086-22-6628-2951

Tianjin Pipe Corp. (Middle East) Ltd.
Address: 17537 Jebel Ali Free Zone, Dubai, U.A.E.
Tel.: 00971-4-8833-799
Fax: 00971-4-8833-899
Email: tpcome@eim.ae

TPCO Canada Branch Office
Adress: Sun Life Plaza West Tower, Suite 1624 144-4th Avenue, SW, Calgary, AB, T2P 3N4, Canada
Tel.: +1-403-370-9395
Email: tpcocanada@tpcointl.cn

TPCO Australia Pty Ltd.
Address: 2126 Central Plaza One, 345 Queen Street, Brisbane, QLD
Tel.: (07) 3012 6155
Fax: (07) 3012 6001
Email: tpcoaustralia@tpcointl.cn

Tianjin Pipe Korea Liaison Office
Address: 1306 West Wing Hanshin Cylux 716 Suser-Dong Kangnan-Gu Seoul Korea
Tel.: 0082-2-4512882
Fax: 0082-2-21499912
Email: tpcokorea@tpcointl.cn

TPCO Central Asia Office
Address: Block-A, 11th floor, Amir Temur Av. 107-B, International Business Centre,Tashkent, Uzbekistan
Tel: +998 973330979
Email: tpcoca@tpcointl.cn

■ Production sites

Tianjin Pipe Corporation
Address: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: 0086-22-6628-0988
Fax: 0086-22-6628-2951

Jiangsu Tianhuai Pipe Corporation
Address: No.69, Hanhou Road, Huaian City,Jiangsu Province, P.R. China
Tel.: 0086-517-83850681
Fax: 0086-517-83850678

■ Oversea licensee shops

1 Forum US, Inc. d/b/a Davis Lynch
USA Houston NO.2008-001

2 OMS Oilfield Services (Thailand) Ltd.(Songkhla)
Thailand Songkhla NO.2008-002

3 Drilmaco Pte Ltd
Singapore NO.2008-005

4 DOHA PETROLEUM CONSTRUCTION CO.LTD
Qatar Doha NO.2010-008

5 Timbalier Premium Sercices, LLC
USA LA NO.2012-006

6 Variperm Energy Services
Canada NO.2012-010

7 PT. Besmindo Borneo Semesta
Indonesia balikpapan NO.2013-001

8 Laila Mechanical Engineering Services & Contracting Co. Ltd.
Nigeria,Abuja NO.2014-001

9 Black Lake Energy Services
Iraq,Kurdistan ,Erbil NO.2014-002

10 Oryx Engineering Solution LLC.
Qatar NO.2014-004

11 OMS Oilfield Services (Thailand) Ltd. (Sattahip)
Thailand Sattahip NO.2014-005

12 Oilfield Services& Supplies (Thailand) CO. LTD
Thailand Songkhla NO.2015-003

13 WESCO LLC.
Abu Dahbi, UAE NO.2015-004

14 Rainbow Mechanical Solutions LLC.
Abu Dahbi, UAE NO.2015-008

15 Apex Energy Company For General Trading and Contracting W.L.L
Kuwait NO.2015-009

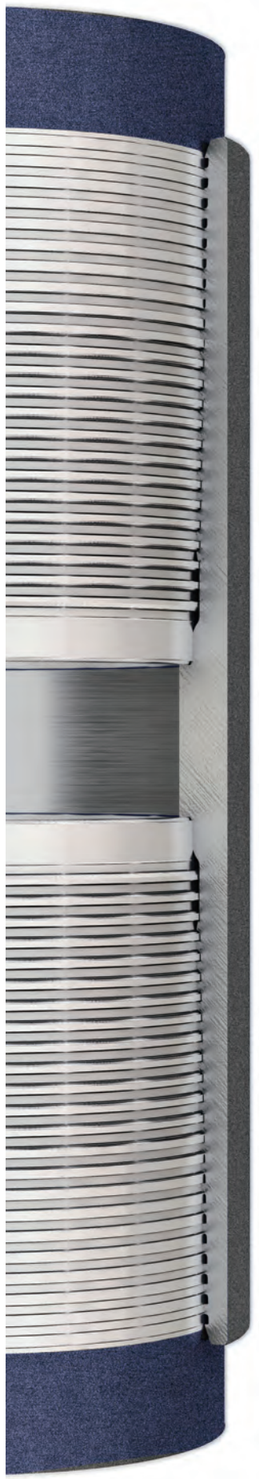
16 Force Inspection services LTD. (Nisku)
Nisku Canada NO.2018-004

17 PT PIPA MAS PUITH
batam,Indonesia NO.2018-006

18 PT.APPIPA INDONESIA
Batam,Indonesia NO.2019-001

19 Kaltek Machinery&Trading LTD.CO.
Hatay,Turkey NO.2021-001

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com



2022 Version 01

TPCO

Premium Connection

TP-CQ Series

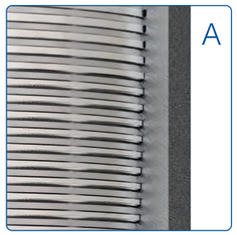
- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

TP-CQ Series 2-3/8in ~ 14-3/8in

High performance gas-tight premium connection for casing and tubing.

- Excellent gas seal-ability under combined load
- Easy stabbing, no cross threading
- Superior anti-galling performance
- Repairing easily
- Suitable for low alloy & carbon steel pipe
- ISO13679:2002 CAL IV qualified
- API 5C5:2017 CAL IV qualified



Modified buttress thread
Taper=1:16
TBG: 2-3/8in~2-7/8in: 8T.P.I.
3-1/2in~4-1/2in: 6T.P.I.
CSG: 5in~14-3-/8in 5T.P.I.

Metal-to-metal
Tapered pin and box seal
Reverse angel torque shoulder
Internal flush

Application:

- Horizon and deep wells
- Surface and intermediate casing
- Tubing
- Production casing, tie back and liners

1 . Description

1.1 Threaded connection

Improved buttress thread form with a taper of 1:16. The clearance at the top of the thread crests minimizes thread galling and avoids the trapping of compound inside the threads.

1.2 Metal-to-metal seal

Metal-to-metal seal surface provides enough contact length and contact pressure. The metal-to-metal seal system offers excellent gas-tight sealing, even under the most severe combined loads. The seal integrity remains constant after repeated make-ups and break-outs. Optimized thread geometry minimizes the risk of galling, even when thread lubricants are poorly applied.

1.3 Reverse angle torque shoulder

The reverse angle torque shoulder provides a positive torque stop, which allows accurate power tight make-up and minimizes hoop stresses of the connection. The “wedge” effect caused by the reverse angle gives the connection a superior structural strength. The shoulder design is optimized in order to resist adverse conditions such as combined compression and external pressure or combined bending, compression, and torque.

1.4 Streamlined internal profile

A pin ID chamfer, tight tolerances on the coupling center and a long shoulder combine to minimize turbulence and energy loss inside the connection for high-velocity gas flows.

1.5 Coupling design

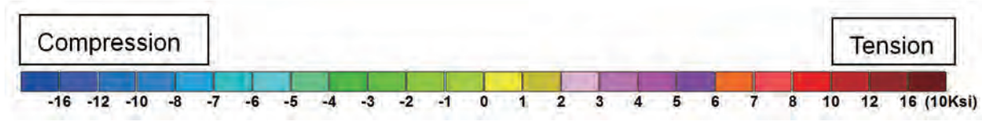
Joint efficiency is more than 100% and coupling critical section is greater than pipe body section. Because the coupling covers the vanishing threads, the connection tensile efficiency is maximized.

1.6 Connection low stress design

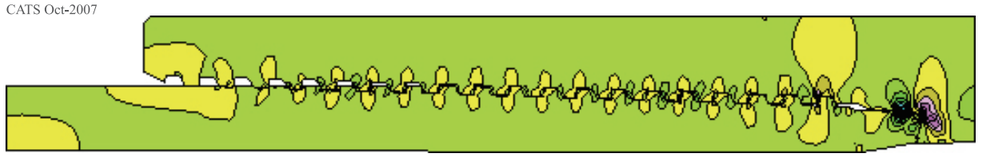
Connection low stress design can ensure that it can be safe under corrupt environment.

2 . Finite Element Analysis on TP-CQ

TP- CQ L80 9-5/8" × 53.5#

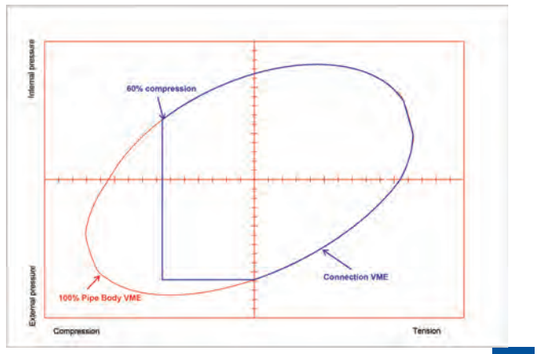


CATS Oct-2007



CATS Oct-2007

Finite Element Analysis (FEA) graphically illustrates the low-stress design which makes TP-CQ of the excellent choices for critical well applications.



Options:

- TP-CQ D: Optimized Design
- TP-CQ HC: High Compression
- TP-CQ HT: High Torque
- TP-CQ(SB): Special Bevel
- TP-CQ(SC): Special Clearance
- TP-CQ(MS): Match Strength
- Dope Free Solution

Imperial Units

Size (OD)		Nominal weight	Wall thickness		Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Yield strength(1000lb.)						Exernal pressure(psi)						Minimum internal yield pressure(psi)					
inch	mm	lb./ft	inch	mm	inch	inch	inch	inch	%	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80psi	95psi	110psi	125psi	140 psi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
2-3/8	60.32	4.60	0.190	4.83	1.901	2.795	2.520	6.024	100.0	72	104	124	143	163	183	8100	11780	13990	16150	17930	19620	8100	11200	13300	15400	17500	19600
2-7/8	73.02	6.40	0.217	5.51	2.347	3.307	2.835	6.654	100.0	100	145	172	199	227	254	7670	11160	12930	14540	16060	17490	7670	10570	12550	14530	16510	18490
3-1/2	88.90	9.20	0.254	6.45	2.867	3.937	3.346	7.874	100.0	142	207	246	285	324	363	7240	10530	12070	13520	14880	16150	7400	10160	12070	13970	15880	17780
		12.70	0.375	9.52	2.625	4.134	3.346	7.874	100.0	203	295	350	405	460	515	10520	15300	18170	21040	23900	26770	10520	15000	17810	20630	23440	26250
4	101.60	9.50	0.226	5.74	3.423	4.409	3.543	8.268	100.0	147	214	255	295	335	375	4530	6590	7310	7910	8380	8740	5110	7910	9390	10880	12360	13840
		10.70	0.262	6.65	3.351	4.409	3.543	8.268	100.0	169	246	292	338	385	431	6040	8790	9960	11040	12010	12870	6590	9170	10890	12610	14330	16050
4-1/2	114.30	12.60	0.271	6.88	3.833	5.000	3.937	9.055	100.0	198	288	342	396	450	504	5150	7490	8400	9200	9880	10440	5720	8430	10010	11590	13170	14750
		15.20	0.337	8.56	3.701	5.118	3.937	9.055	100.0	243	353	419	485	551	617	7620	11090	12770	14340	15830	17230	7620	10480	12450	14420	16380	18350
		18.90	0.430	10.92	3.515	5.197	3.937	9.055	100.0	303	440	522	605	687	770	9510	13830	16420	19010	21600	24190	9510	13380	15890	18390	20900	23410
5	127.00	15.00	0.296	7.52	4.283	5.563	4.764	10.512	100.0	241	350	416	481	547	612	4980	7250	8110	8850	9480	9980	5560	8290	9840	11400	12950	14500
		18.00	0.362	9.19	4.151	5.563	4.764	10.512	98.2	285	414	492	570	647	725	7220	10500	12020	13470	14820	16070	7380	10140	12040	13940	15840	17740
		20.30	0.408	10.36	4.059	5.563	4.764	10.512	88.0	285	414	492	570	647	725	8240	11990	14240	16490	18550	20320	8240	11420	13570	15710	17850	19990
		20.80	0.422	10.72	4.031	5.563	4.764	10.512	85.3	285	414	492	570	647	725	8500	12360	14680	17000	19320	21610	8500	11820	14030	16250	18460	20680
		21.40	0.437	11.10	4.001	5.563	4.764	10.512	82.7	285	414	492	570	647	725	8770	12760	15150	17550	19940	22330	8770	12240	14530	16820	19120	21410
		23.20	0.478	12.14	3.919	5.563	4.764	10.512	76.2	285	414	492	570	647	725	9510	13830	16430	19020	21620	24210	9510	13380	15890	18400	20910	23420
		24.10	0.500	12.70	3.875	5.563	4.764	10.512	73.2	285	414	492	570	647	725	9900	14400	17100	19800	22500	25200	9900	14000	16630	19250	21880	24500
5-1/2	139.70	17.00	0.304	7.72	4.767	6.181	4.843	10.709	100.0	273	397	471	546	620	695	4320	6290	6940	7480	7890	8170	4910	7740	9190	10640	12090	13540
		20.00	0.361	9.17	4.653	6.181	4.843	10.709	100.0	320	466	554	641	729	816	6070	8830	10020	11110	12090	12950	6620	9190	10910	12640	14360	16080
		23.00	0.415	10.54	4.545	6.181	4.843	10.709	100.0	364	530	630	729	829	928	7670	11160	12930	14540	16060	17480	7670	10560	12540	14530	16510	18490
		26.00	0.476	12.09	4.423	6.181	4.843	10.709	90.6	374	544	647	749	851	953	8700	12650	15020	17390	19760	22140	8700	12120	14390	16660	18930	21200
		26.80	0.500	12.70	4.375	6.181	4.843	10.709	86.7	374	544	647	749	851	953	9090	13220	15700	18180	20660	23140	9090	12730	15110	17500	19890	22270
6-5/8	168.28	20.00	0.288	7.32	5.924	7.402	5.039	11.260	100.0	316	459	545	631	717	803	2390	3480	3800	4030	4170	4220	2970	6090	7230	8370	9510	10650
		24.00	0.352	8.94	5.796	7.402	5.039	11.260	100.0	382	555	659	763	867	971	3960	5760	6310	6730	7020	7180	4560	7440	8830	10230	11620	13020
		28.00	0.417	10.59	5.666	7.402	5.039	11.260	100.0	448	651	773	895	1017	1139	5620	8170	9220	10160	11000	11710	6170	8810	10460	12120	13770	15420
		32.00	0.475	12.07	5.550	7.402	5.039	11.260	100.0	505	734	872	1009	1147	1285	7100	10320	11820	13230	14540	15750	7320	10040	11920	13800	15680	17570
7	177.80	23.00	0.317	8.05	6.241	7.717	5.236	11.969	100.0	366	532	632	732	832	932	2630	3830	4150	4440	4650	4760	3270	6340	7530	8720	9910	11100
		26.00	0.362	9.19	6.151	7.717	5.236	11.969	100.0	415	604	717	830	944	1057	3720	5410	5890	6230	6450	6690	4320	7240	8600	9960	11310	12670
		29.00	0.408	10.36	6.059	7.717	5.236	11.969	100.0	465	676	803	929	1056	1183	4830	7030	7840	8530	9110	9560	5400	8160	9690	11220	12750	14280
		32.00	0.453	11.51	5.969	7.717	5.236	11.969	99.4	509	741	880	1019	1158	1296	5920	8610	9740	10780	11710	12530	6470	9060	10760	12460	14160	15860
		35.00	0.498	12.65	5.879	7.717	5.236	11.969	91.0	509	741	880	1019	1158	1296	7010	10190	11650	13030	14320	15490	7270	9960	11830	13700	15560	17430
		38.00	0.540	13.72	5.795	7.717	5.236	11.969	84.5	509	741	880	1019	1158	1296	7830	11390	13430	15130	16740	18260	7830	10800	12830	14850	16880	18900
7-5/8	193.68	26.20	0.328	8.33	6.844	8.500	5.433	12.047	100.0	414	602	714	827	940	1053	2340	3400	3710	3920	4050	4080	2890	6020	7150	8280	9410	10540
		29.70	0.375	9.52	6.750	8.500	5.433	12.047	100.0	470	683	811	940	1068	1196	3290	4790	5130	5350	5670	5930	3900	6890	8180	9470	10760	12050
		33.70	0.430	10.92	6.640	8.500	5.433	12.047	100.0	535	778	923	1069	1215	1361	4510	6560	7270	7870	8340	8690	5090	7900	9380	10860	12340	13820
		35.80	0.465	11.81	6.570	8.500	5.433	12.047	100.0	575	837	994	1151	1308	1464	5290	7690	8640	9480	10200	10800	5850	8540	10140	11740	13340	14940
		39.00	0.500	12.70	6.500	8.500	5.433	12.047	100.0	615	895	1063	1231	1399	1567	6060	8820	10000	11080	12060	12920	6610	9180	10900	12620	14340	16070
		42.80	0.562	14.27	6.376	8.500	5.433	12.047	98.1	673	979	1162	1346	1530	1713	7440	10820	12410	13930	15350	16680	7510	10320	12250	14190	16120	18060
		45.30	0.595	15.11	6.310	8.500	5.433	12.047	93.1	673	979	1162	1346	1530	1713	7910	11510	13670	15440	17110	18670	7910	10920	12970	15020	17070	19120
		47.10	0.625	15.88	6.250	8.500	5.433	12.047	89.0	673	979	1162	1346	1530	1713	8280	12040	14300	16550	18700	20490	8280	11480	13630	15780	17930	20080
7-3/4	196.85	39.50	0.500	12.70	6.625	8.656	5.433	12.047	100.0	626	911	1082	1253	1424	1594	5890	8560	9680	10710	11630	12430	6430	9030	10730	12420	14110	15810
8-5/8	219.08	28.00	0.304	7.72	7.892	9.625	5.591	12.677	100.0	437	636	755	874	993	1113	1490	2160	2210	2210	2210	2210	1880	4930	5860	6780	7710	8640
		32.00	0.352	8.94	7.796	9.625	5.591	12.677	100.0	503	732	869	1006	1144	1281	2100	3050	3290	3420	3470	3470	2530	5710	6780	7860	8930	10000
		36.00	0.400	10.16	7.700	9.625	5.591	12.677	100.0	569	827	982	1137	1292	1447	2820	4100	4360	4690	4930	5090	3450	6490	7710	8930	10140	11360
		40.00	0.450	11.43	7.600	9.625	5.591	12.677	100.0	636	925	1098	1271	1445	1618	3800	5530	6020	6400	6640	6830	4400	7300	8670	10040	11410	12780
		44.00	0.500	12.70	7.500	9.625	5.591	12.677	100.0	702	1021	1212	1404	1595	1787	4780	6950	7740	8420	8980	9410	5360	8120	9640	11160	12680	14200
		49.00	0.557	14.15	7.386	9.625	5.591	12.677	100.0	776	1129	1341	1553	1765	1977	5890	8570	9700	10740	11660	12460	6440	9040	10740	12430	14130	15820
8-3/4	222.25	53.00	0.599	15.21	7.427	9.433	5.591	12.677	83.6	705	1026	1218	1410	1603	1795	6550	9530	10850	12090	13230	14250	7010	9580	11380	13180	14980	16770
9-5/8	244.48	36.00	0.352	8.94	8.765	10.625	5.591	12.677	100.0	564	820	974	1128	1282	1436	1630	2370	2470	2470	2470	2470	2020	5120	6080	7040	8000	8960
		40.00	0.395	10.03	8.679	10.625	5.591	12.677	100.0	630	916	1088	1260	1432	1604	2120	3090	3330	3470	3530	3530	2570	5750	6820	7900	8980	10050
		43.50	0.435	11.05	8.599	10.625	5.591	12.677	100.0	691	1005	1193	1381	1570	1758	2620	3810	4130	4420	4620	4730	3250	6330	7510	8700	9890	11070
		47.00	0.472	11.99	8.525	10.625	5.591	12.677	100.0	747	1086	1289	1493	1697	1900	3270	4760	5090	5300	5630	5890	3890	6870	8150	9440	10730	12010
		53.50	0.545	13.84	8.379	10.625	5.591	12.677	100.0	855	1244	1477	1710	1943	2177	4550	6620	7340	7950	8440	8790	5130	7930	9410	10900	12390	13870
		58.40	0.595	15.11	8.279	10.625	5.591	12.677	100.0	928	1350	1604	1857	2110	2363	5430	7900	8880	9770	10540	11190	5990	8650	10280	11900	13520	15150
9-3/4	247.65	54.30	0.545	13.84	8.504	10.625	5.591	12.677	100.0	867	1261	1497	1734	1970	2207	4430	6440	7130	7700	8140	8460	5010	7830	9290	10760	12230	13690
9-7/8	250.82	62.80	0.625	15.88	8.469	10.625	5.591	12.677	95.9	958	1394	1655	1917	2178	2439	5680	8260	9320	10290	11140	11870	6230	8860	10520	12180	13840	15510
		62.80	0.625	15.88	8.469	10.906	5.591	12.677	100.0	999	1453	1725	1998	2270	2543	5680	8260	9320	10290	11140	11870	6230	8860	10520	12180	13840	15510
10-1/4	260.35	75.40	0.734	18.64	8.626	11.125	5.591	12.677	92.2	1112	1618	1922	2225	2529	2832	7080	10300	11790	13200	14500	15710	7310	10030	11910	13780	15660	17540
10-3/4	273.05	40.50	0.350	8.89	9.894	11.750	5.591	12.677	100.0	629	915	1086	1258	1429	1601	1190	1730	1730	1730	1730	1730	1580	4560	5410	6270	7120	7980
		45.50	0.400	10.16	9.794	11.750	5.591	12.677	100.0	715	1040	1236	1431	1626	1821	1710	2480	2590	2610	2610	2610	2090	5210	6190	7160	8140	9120
		51.00	0.450	11.43	9.694	11.750	5.591	12.677	100.0	801	1165	1383	1602	1820	2039	2210	3220	3490	3660	3740	3750	2710	5860	6960	8060	9160	10260
		55.50	0.495	12.57	9.604	11.750	5.591	12.677	100.0	877	1276	1515	1754	1993	2233	2760	4020	4300	4610	4850	4990	3390	6450	7660	8860	10070	11280
		60.70	0.545	13.84	9.504	11.750	5.591	12.677	100.0	961	1398	1660	1922	2184	2446	3550	5160	5580	5880	6070	6380	4160	7100	8430	9760	11090	12420
		65.70	0.595	15.11	9.404	11.750	5.591	12.677	100.0	1044	1519	1803	2088	2373	2657	4340	6310	6960	7510	7920	8200	4920	7750	9200	10650	12110	13560
11-1/8	282.58	82.40	0.734	18.64	9.501	11.880	5.591	12.677	64.3	847	1232	1463	1694	1925	2156	6130	8920	10120	11230	12220	13110	6670	9240	10970	12700	14430	16160
11-3/4	298.45	47.00	0.375	9.52	10.844	12.750	5.591	12.677	100.0	737	1072	1273	1474	1675	1876	1120	1630	1630	1630	1630	1630	1510	4470	5310	6140	6980	7820
		54.00	0.435	11.05	10.724	12.750	5.591	12.677	100.0	850	1237	1469	1701	1933	2165	1680	2450	2560	2570	2570	2570	2070	5180	6150	7130	8100	9070
		60.00	0.489	12.42	10.616	12.750	5.591	12.677	100.0	952	1384	1644	1903	2163	2422	2190	3180	3440	3610	3680	3680	2660	5830	6920	8010	9100	10200
		65.00	0.534	13.56	10.526	12.750	5.591	12.677	100.0	1035	1505	1788	2070	2352	2634	2660	3870	4180	4480	4690	4810	3290	6360	7560	8750	9940	11130
13-3/8	339.72	54.50	0.380	9.65	12.459	14.375	5.591	12.677	100.0	853	1241	1474	1707	1939	2172	780	1140	1140	1140	1140	1140	1130	3980	4720	5470	6210	6960
		61.00	0.430	10.92	12.359	14.375	5.591	12.677	100.0	962	1399	1661	1924	2186	2448	1150	1670	1670	1670	1670	1670	1540	4500	5340	6190	7030	7880
		68.00	0.480	12.19	12.259	14.375	5.591	12.677	100.0	1070	1556	1847	2139	2431	2722	1550	2260	2340	2330	2330	2330	1950	5020	5970	6910	7850	8790
		72.00	0.514	13.06	12.191	14.375	5.591	12.677	100.0	1142	1661	1973	2284	2596	2908	1840	2670	2830	2880	2880	2880	2230	5380	6390	7400	8410	9420
13-5/8	346.08	77.50	0.545	13.84	12.348	14.625	5.591	12.677	100.0	1232	1792	2128	2463	2799	3135	2010	2920	3130	3240	3260	3260	2400	5600	6650	7700	8750	9800
14-3/8	365.12	82.00	0.546	13.88	13.127	15.507	5.591	12.677	100.0	1305	1898	2254	2609	2965	3321	2180	2600	2740	2780	2780	2780	3650	5310	6310	7310	8300	9300

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

Metric Units

Size (OD)		Nominal weight	Wall thickness		Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Yield strength(KN)						Exernal pressure(MPa)						Minimum internal yield pressure(MPa)					
inch	mm	lb./ft	inch	mm	mm	mm	mm	mm	%	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80psi	95psi	110psi	125psi	140 psi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
2-3/8	60.32	4.60	0.190	4.83	48.29	71.00	64.00	153.00	100.0	318	463	552	636	725	814	55.8	81.2	96.5	111.4	123.6	135.3	55.9	77.2	91.7	106.2	120.7	135.1
2-7/8	73.02	6.40	0.217	5.51	59.61	84.00	72.00	169.00	100.0	443	645	765	885	1010	1130	52.9	76.9	89.1	100.2	110.7	120.6	52.9	72.9	86.5	100.2	113.8	127.5
3-1/2	88.90	9.20	0.254	6.45	72.82	100.00	85.00	200.00	100.0	633	921	1094	1268	1441	1615	49.9	72.6	83.2	93.2	102.6	111.4	51.0	70.1	83.2	96.3	109.5	122.6
		12.70	0.375	9.52	66.68	105.00	85.00	200.00	100.0	902	1312	1557	1802	2046	2291	72.5	105.5	125.3	145.1	164.8	184.6	72.6	103.4	122.8	142.2	161.6	181.0
4	101.60	9.50	0.226	5.74	86.94	112.00	90.00	210.00	100.0	654	952	1134	1312	1490	1668	31.2	45.4	50.4	54.5	57.8	60.3	35.2	54.5	64.7	75.0	85.2	95.4
		10.70	0.262	6.65	85.12	112.00	90.00	210.00	100.0	752	1094	1299	1503	1713	1917	41.7	60.6	68.7	76.1	82.8	88.7	45.4	63.2	75.1	86.9	98.8	110.7
4-1/2	114.30	12.60	0.271	6.88	97.36	127.00	100.00	230.00	100.0	881	1281	1521	1761	2002	2242	35.5	51.6	57.9	63.4	68.1	72.0	39.4	58.1	69.0	79.9	90.8	101.7
		15.20	0.337	8.56	94.01	130.00	100.00	230.00	100.0	1080	1570	1864	2157	2451	2745	52.6	76.5	88.0	98.9	109.1	118.8	52.6	72.3	85.8	99.4	112.9	126.5
		18.90	0.430	10.92	89.28	132.00	100.00	230.00	100.0	1346	1957	2322	2691	3056	3425	65.6	95.4	113.2	131.1	148.9	166.8	65.6	92.3	109.6	126.8	144.1	161.4
5	127.00	15.00	0.296	7.52	108.79	141.30	121.00	267.00	100.0	1070	1557	1850	2140	2433	2722	34.4	50.0	55.9	61.0	65.4	68.8	38.3	57.2	67.8	78.6	89.3	100.0
		18.00	0.362	9.19	105.44	141.30	121.00	267.00	98.2	1266	1842	2189	2535	2878	3225	49.8	72.4	82.9	92.9	102.2	110.8	50.9	69.9	83.0	96.1	109.2	122.3
		20.30	0.408	10.36	103.10	141.30	121.00	267.00	88.0	1266	1842	2189	2535	2878	3225	56.8	82.7	98.2	113.7	127.9	140.1	56.8	78.7	93.6	108.3	123.1	137.8
		20.80	0.422	10.72	102.39	141.30	121.00	267.00	85.3	1266	1842	2189	2535	2878	3225	58.6	85.2	101.2	117.2	133.2	149.0	58.6	81.5	96.7	112.0	127.3	142.6
		21.40	0.437	11.1	101.63	141.30	121.00	267.00	82.7	1266	1842	2189	2535	2878	3225	60.5	88.0	104.5	121.0	137.5	154.0	60.5	84.4	100.2	116.0	131.8	147.6
		23.20	0.478	12.14	99.54	141.30	121.00	267.00	76.2	1266	1842	2189	2535	2878	3225	65.6	95.4	113.3	131.1	149.1	166.9	65.6	92.3	109.6	126.9	144.2	161.5
		24.10	0.500	12.7	98.43	141.30	121.00	267.00	73.2	1266	1842	2189	2535	2878	3225	68.3	99.3	117.9	136.5	155.1	173.7	68.3	96.5	114.7	132.7	150.9	168.9
5-1/2	139.70	17.00	0.304	7.72	121.08	157.00	123.00	272.00	100.0	1214	1766	2095	2429	2758	3092	29.8	43.4	47.8	51.6	54.4	56.3	33.9	53.4	63.4	73.4	83.4	93.4
		20.00	0.361	9.17	118.19	157.00	123.00	272.00	100.0	1425	2073	2464	2851	3243	3630	41.9	60.9	69.1	76.6	83.4	89.3	45.7	63.4	75.2	87.1	99.0	110.9
		23.00	0.415	10.54	115.44	157.00	123.00	272.00	100.0	1621	2358	2802	3243	3688	4128	52.9	76.9	89.1	100.2	110.7	120.5	52.9	72.8	86.5	100.2	113.8	127.5
		26.00	0.476	12.09	112.34	157.00	123.00	272.00	90.6	1664	2420	2878	3332	3785	4239	60.0	87.2	103.6	119.9	136.2	152.6	60.0	83.6	99.2	114.9	130.5	146.2
		26.80	0.500	12.7	111.13	157.00	123.00	272.00	86.7	1664	2420	2878	3332	3785	4239	62.7	91.1	108.2	125.3	142.4	159.5	62.7	87.8	104.2	120.7	137.1	153.5
6-5/8	168.28	20.00	0.288	7.32	150.47	188.00	128.00	286.00	100.0	1404	2042	2424	2807	3189	3572	16.5	24.0	26.2	27.8	28.8	29.1	20.5	42.0	49.8	57.7	65.6	73.4
		24.00	0.352	8.94	147.22	188.00	128.00	286.00	100.0	1697	2469	2931	3394	3857	4319	27.3	39.7	43.5	46.4	48.4	49.5	31.4	51.3	60.9	70.5	80.1	89.8
		28.00	0.417	10.59	143.92	188.00	128.00	286.00	100.0	1991	2896	3438	3981	4524	5067	38.7	56.3	63.6	70.1	75.8	80.7	42.6	60.7	72.1	83.6	94.9	106.3
		32.00	0.475	12.07	140.97	188.00	128.00	286.00	100.0	2245	3265	3879	4488	5102	5716	48.9	71.2	81.5	91.2	100.2	108.6	50.5	69.2	82.2	95.1	108.1	121.1
7	177.80	23.00	0.317	8.05	158.52	196.00	133.00	304.00	100.0	1627	2366	2811	3256	3701	4146	18.2	26.4	28.6	30.6	32.1	32.8	22.6	43.7	51.9	60.1	68.3	76.5
		26.00	0.362	9.19	156.24	196.00	133.00	304.00	100.0	1847	2687	3189	3692	4199	4702	25.6	37.3	40.6	43.0	44.5	46.1	29.8	49.9	59.3	68.7	78.0	87.4
		29.00	0.408	10.36	153.90	196.00	133.00	304.00	100.0	2067	3007	3572	4132	4697	5262	33.3	48.5	54.1	58.8	62.8	65.9	37.2	56.3	66.8	77.4	87.9	98.5
		32.00	0.453	11.51	151.61	196.00	133.00	304.00	99.4	2266	3296	3914	4533	5151	5765	40.8	59.4	67.2	74.3	80.7	86.4	44.6	62.5	74.2	85.9	97.6	109.4
		35.00	0.498	12.65	149.33	196.00	133.00	304.00	91.0	2266	3296	3914	4533	5151	5765	48.3	70.3	80.3	89.8	98.7	106.8	50.1	68.7	81.6	94.5	107.3	120.2
		38.00	0.540	13.72	147.19	196.00	133.00	304.00	84.5	2266	3296	3914	4533	5151	5765	54.0	78.5	92.6	104.3	115.4	125.9	54.0	74.5	88.5	102.4	116.4	130.3
7-5/8	193.68	26.20	0.328	8.33	173.84	215.90	138.00	306.00	100.0	1841	2678	3176	3679	4181	4684	16.1	23.4	25.6	27.0	27.9	28.1	19.9	41.5	49.3	57.1	64.9	72.7
		29.70	0.375	9.52	171.45	215.90	138.00	306.00	100.0	2089	3038	3608	4181	4751	5320	22.7	33.0	35.4	36.9	39.1	40.9	26.9	47.5	56.4	65.3	74.2	83.1
		33.70	0.430	10.92	168.66	215.90	138.00	306.00	100.0	2379	3461	4106	4755	5405	6054	31.1	45.2	50.1	54.3	57.5	59.9	35.1	54.5	64.7	74.9	85.1	95.3
		35.80	0.465	11.81	166.88	215.90	138.00	306.00	100.0	2560	3723	4422	5120	5818	6512	36.5	53.0	59.6	65.4	70.3	74.5	40.3	58.9	69.9	80.9	92.0	103.0
		39.00	0.500	12.7	165.10	215.90	138.00	306.00	100.0	2737	3981	4728	5476	6223	6970	41.8	60.8	68.9	76.4	83.2	89.1	45.6	63.3	75.2	87.0	98.9	110.8
		42.80	0.562	14.27	161.95	215.90	138.00	306.00	98.1	2994	4355	5169	5987	6806	7620	51.3	74.6	85.6	96.0	105.8	115.0	51.8	71.2	84.5	97.8	111.1	124.5
		45.30	0.595	15.11	160.27	215.90	138.00	306.00	93.1	2994	4355	5169	5987	6806	7620	54.6	79.4	94.3	106.5	118.0	128.7	54.6	75.3	89.4	103.6	117.7	131.8
		47.10	0.625	15.88	158.75	215.90	138.00	306.00	89.0	2994	4355	5169	5987	6806	7620	57.1	83.0	98.6	114.1	128.9	141.3	57.1	79.2	94.0	108.8	123.6	138.4
7-3/4	196.85	39.50	0.500	12.7	168.28	219.85	138.00	306.00	100.0	2786	4052	4813	5574	6334	7090	40.6	59.0	66.7	73.8	80.2	85.7	44.3	62.3	74.0	85.6	97.3	109.0
8-5/8	219.08	28.00	0.304	7.72	200.46	244.48	142.00	322.00	100.0	1945	2829	3358	3888	4417	4951	10.2	14.9	15.2	15.2	15.2	15.2	13.0	34.0	40.4	46.7	53.2	59.6
		32.00	0.352	8.94	198.02	244.48	142.00	322.00	100.0	2239	3256	3866	4475	5089	5698	14.5	21.0	22.7	23.6	23.9	23.9	17.4	39.4	46.7	54.2	61.6	68.9
		36.00	0.400	10.16	195.58	244.48	142.00	322.00	100.0	2529	3679	4368	5058	5747	6437	19.4	28.3	30.1	32.3	34.0	35.1	23.8	44.7	53.2	61.6	69.9	78.3
		40.00	0.450	11.43	193.04	244.48	142.00	322.00	100.0	2829	4115	4884	5654	6428	7197	26.2	38.1	41.5	44.1	45.8	47.1	30.3	50.3	59.8	69.2	78.7	88.1
		44.00	0.500	12.7	190.50	244.48	142.00	322.00	100.0	3122	4542	5391	6245	7095	7949	32.9	47.9	53.4	58.1	61.9	64.9	37.0	56.0	66.5	76.9	87.4	97.9
		49.00	0.557	14.15	187.60	244.48	142.00	322.00	100.0	3453	5022	5965	6908	7851	8794	40.6	59.1	66.9	74.0	80.4	85.9	44.4	62.3	74.0	85.7	97.4	109.1
8-3/4	222.25	53.00	0.599	15.21	188.65	239.60	142.00	322.00	83.6	3138	4564	5418	6272	7130	7985	45.2	65.7	74.8	83.4	91.2	98.3	48.3	66.1	78.5	90.9	103.3	115.6
9-5/8	244.48	36.00	0.352	8.94	222.63	269.88	142.00	322.00	100.0	2508	3648	4333	5018	5703	6388	11.2	16.3	17.0	17.0	17.0	17.0	13.9	35.3	41.9	48.5	55.2	61.8
		40.00	0.395	10.03	220.45	269.88	142.00	322.00	100.0	2801	4075	4840	5605	6370	7135	14.6	21.3	23.0	23.9	24.3	24.3	17.7	39.6	47.0	54.5	61.9	69.3
		43.50	0.435	11.05	218.41	269.88	142.00	322.00	100.0	3073	4470	5307	6143	6984	7820	18.1	26.3	28.5	30.5	31.9	32.6	22.4	43.6	51.8	60.0	68.2	76.3
		47.00	0.472	11.99	216.54	269.88	142.00	322.00	100.0	3321	4831	5734	6641	7549	8452	22.6	32.8	35.1	36.5	38.8	40.6	26.8	47.4	56.2	65.1	74.0	82.8
		53.50	0.545	13.84	212.83	269.88	142.00	322.00	100.0	3804	5534	6570	7606	8643	9684	31.4	45.6	50.6	54.8	58.2	60.6	35.4	54.7	64.9	75.2	85.4	95.6
		58.40	0.595	15.11	210.29	269.88	142.00	322.00	100.0	4129	6005	7135	8260	9386	10511	37.4	54.5	61.2	67.4	72.7	77.2	41.3	59.6	70.9	82.0	93.2	104.5
9-3/4	247.65	54.30	0.545	13.84	216.00	269.88	142.00	322.00	100.0	3856	5609	6659	7713	8763	9817	30.5	44.4	49.2	53.1	56.1	58.3	34.6	54.0	64.1	74.2	84.3	94.4
9-7/8	250.82	62.80	0.625	15.88	215.11	269.88	142.00	322.00	95.9	4263	6201	7362	8527	9688	10849	39.2	57.0	64.3	70.9	76.8	81.8	43.0	61.1	72.5	84.0	95.4	106.9
		62.80	0.625	15.88	215.11	277.00	142.00	322.00	100.0	4443	6463	7673	8888	10097	11312	39.2	57.0	64.3	70.9	76.8	81.8	43.0	61.1	72.5	84.0	95.4	106.9
10-1/4	260.35	75.40	0.734	18.64	219.10	282.58	142.00	322.00	92.2	4948	7197	8549	9897	11250	12597	48.8	71.0	81.3	91.0	100.0	108.3	50.4	69.2	82.1	95.0	108.0	120.9
10-3/4	273.05	40.50	0.350	8.89	251.31	298.45	142.00	322.00	100.0	2798	4070	4831	5596	6357	7122	8.2	11.9	11.9	11.9	11.9	11.9	10.9	31.4	37.3	43.2	49.1	55.0
		45.50	0.400	10.16	248.77	298.45	142.00	322.00	100.0	3180	4626	5498	6365	7233	8100	11.8	17.1	17.9	18.0	18.0	18.0	14.4	35.9	42.7	49.4	56.1	62.9
		51.00	0.450	11.43	246.23	298.45	142.00	322.00	100.0	3563	5182	6152	7126	8096	9070	15.3	22.2	24.1	25.2	25.8	25.9	18.7	40.4	48.0	55.6	63.2	70.7
		55.50	0.495	12.57	243.94	298.45	142.00	322.00	100.0	3902	5676	6739	7802	8865	9933	19.1	27.7	29.6	31.8	33.4	34.4	23.4	44.5	52.8	61.1	69.4	77.8
		60.70	0.545	13.84	241.40	298.45	142.00	322.00	100.0	4275	6219	7384	8549	9715	10880	24.5	35.6	38.5	40.5	41.9	44.0	28.7	49.0	58.1	67.3	76.5	85.6
		65.70	0.595	15.11	238.86	298.45	142.00	322.00	100.0	4645	6757	8020	9288	10556	11819	29.9	43.5	48.0	51.8	54.6	56.5	33.9	53.4	63.4	73.4	83.5	93.5
11-1/8	282.58	82.40	0.734	18.64	241.33	301.70	142.00	322.00	64.3	3768	5480	6508	7535	8563	9590	42.3	61.5	69.8	77.4	84.3	90.4	46.0	63.7	75.6	87.6	99.5	111.4
11-3/4	298.45	47.00	0.375	9.52	275.44	323.85	142.00	322.00	100.0	3278	4768	5663	6557	7451	8345	7.7	11.2	11.2	11.2	11.2	11.2	10.4	30.8	36.6	42.3	48.1	53.9
		54.00	0.435	11.05	272.39	323.85	142.00	322.00	100.0	3783	5502	6534	7566	8598	9630	11.6	16.9	17.7	17.7	17.7	17.7	14.3	35.7	42.4	49.2	55.8	62.5
		60.00	0.489	12.42	269.65	323.85	142.00	322.00	100.0	4232	6156	7313	8465	9621	10774	15.1	21.9	23.7	24.9	25.4	25.4	18.3	40.2	47.7	55.2	62.7	70.3
		65.00	0.534	13.56	267.36	323.85	142.00	322.00	100.0	4603	6695	7953	9208	10462	11717	18.3	26.7	28.8	30.9	32.3	33.2	22.7	43.9	52.1	60.3	68.5	76.7
13-3/8	339.72	54.50	0.380	9.65	316.46	365.12	142.00	322.00	100.0	3795	5520	6557	7593	8625	9662	5.4	7.9	7.9	7.9	7.9	7.9	7.8	27.4	32.5	37.7	42.8	48.0
		61.00	0.430	10.92	313.92	365.12	142.00	322.00	100.0	4278	6223	7388	8558	9724	10889	7.9	11.5	11.5	11.5	11.5	11.5	10.6	31.0	36.8	42.7	48.5	54.3
		68.00	0.480	12.19	311.38	365.12	142.00	322.00	100.0	4758	6921	8216	9515	10814	12108	10.7	15.6	16.1	16.1	16.1	16.1	13.4	34.6	41.2	47.6	54.1	60.6
		72.00	0.514	13.06	309.65	365.12	142.00	322.00	100.0	5080	7388	8776	10160	11548	12935	12.7	18.4	19.5	19.9	19.9	19.9	15.4	37.1	44.1	51.0	58.0	64.9
13-5/8	346.08	77.50	0.545	13.84	313.64	371.48	142.00	322.00	100.0	5480	7971	9466	10956	12451	13945	13.8	20.1	21.6	22.3	22.5	22.5	16.6	38.6	45.9	53.1	60.3	67.6
14-3/8	365.12	82.00	0.546	13.88	333.42	393.89	142.00	322.00	100.0	5805	8444	10027	11610	13193	14776	15.0	17.9	18.9	19.2	19.2	19.2	25.2	36.7	43.5	50.4	57.3	64.1

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

Premium Connection

TP-G2 Series

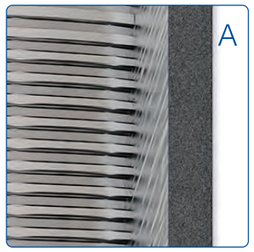
- Metal-to-Metal gas tight Premium Connection
  - T&C
    - TP-CQ series
    - TP-G2 series
    - NEW TP-G4 series
    - NEW TP-WG
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - Integral Upset
    - TP-SFJ
    - TP-ISF
  - Particular Condition
    - TP-TW
    - TP-FE
- Semi Premium Connection
  - T&C
    - TP-BM(S)
    - TP-JC
    - TP-QR

Tianjin Pipe Corporation

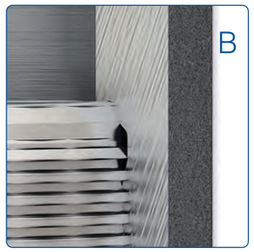
TP-G2 2-3/8in~20in

High performance gas-tight premium connection for casing and tubing. ISO 13679 CAL IV approved

- Excellent resistance to bending, compression and torque
- Superior anti-galling performance
- Reliable gas-tight sealing under any kind of combined loads
- Especially suited for highly deviated and long horizontal wells
- ISO13679:2002 CAL IV qualified



Hooked Thread
Taper=1:16
TBG: 2-3/8in~2-7/8in: (8T.P.I.)
3-1/2in~4-1/2in: (6T.P.I.)
CSG: 5in~8-5/8in: (5T.P.I.)
9-5/8in~20in (4T.P.I.)



Large angle metal-to-metal seal
Tapered pin and box seal
Reverse angel torque shoulder
internal flush

Application:

- Long horizontal well
- Deep well
- High deviated well
- Surface and intermediate casing
- Tubing
- Production casing, tie back and liners

Description

1.1 Threaded connection

A modified hook thread profile with 4 degree of reverse angle on the load flank, not only provide the connection with superior tension strength but also increase its resistance to compression. The excellent structural strength including increased bending and compression resistance, makes this connection especially suited for highly deviated and long horizontal well. Optimized thread geometry minimizes the risk of galling, even when thread lubricants are poorly applied.

1.2 Metal-to-Metal seal

The large angle metal-to-metal seal system offers excellent gas-tight sealing, even under the most severe combined loads. The seal integrity remains constant after repeated make-ups and break-outs.

1.3 Reverse angle torque shoulder

A reverse angle torque shoulder provides a positive torque stop which allows accurate power-tight make-up and minimizes hoop stresses of the connection. The "wedge" effect caused by the reverse angle gives the connection superior structural strength. The shoulder design is optimized in order to resist adverse conditions such as combined compression and external pressure or combined bending, compression and torque.

1.4 Streamlined internal profile

A pin ID chamfer, tight tolerances on the coupling center and a long shoulder combine to minimize turbulence and energy loss inside the connection for high-velocity gas flows.

1.5 Coupling design

The 100% efficient connection performance has been engineered through factors such as: the coverage of the vanishing threads, long internal shoulder, and coupling critical cross sections greater than those of the pipe body.

1.6 Connection low stress design

Connection low stress design can ensure that it can be safe under the corrosive environment.

Options

- TP-G2 HC: High Compression
- TP-G2 HT: High Torque
- TP-G2(SB): Special Bevel
- TP-G2(SC): Special Clearance
- TP-G2(MS): Match Strength
- Dope Free solution

TP-G2 | T&C | 2-3/8in~20in

Imperial Unit

Size (OD)		Nominal weight	Wall thickness	Internal diameter	Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Joint Yield strength(1000lb.)						Exernal pressure(psi)						Minimum internal yield pressure(psi)					
inch	mm	lb./ft	inch	inch	inch	inch	inch	inch		55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
2-3/8	60.32	4.60	0.190	1.995	1.901	2.875	2.327	5.638	100%	71.7	104.3	123.9	143.4	163.0	182.5	8100	11780	13980	16130	17900	19590	7700	11200	13300	15400	17500	19600
2-7/8	73.02	6.40	0.217	2.441	2.347	3.307	2.937	6.661	100%	100	145	172	199	227	254	7680	11170	12940	14550	16070	17500	7260	10570	12550	14530	16510	18490
3-1/2	88.90	9.20	0.254	2.992	2.867	3.937	3.110	7.244	100%	142	207	246	285	324	363	7400	10540	12080	13530	14890	16160	6990	10160	12070	13970	15880	17780
		10.20	0.289	2.922	2.797	3.976	3.110	7.244	100%	160	233	277	321	364	408	8330	12120	14390	16670	18940	20770	7950	11560	13730	15900	18060	20230
		12.70	0.375	2.750	2.625	4.055	3.740	8.504	100%	202	295	350	405	460	515	10520	15310	18180	21050	23920	26790	10310	15000	17810	20630	23440	26250
4-1/2	114.30	10.50	0.224	4.052	3.927	4.827	3.268	7.481	100%	166	241	286	331	376	421	4010	4940	5310	5550	5830	6110	4790	6970	8280	9580	10890	12200
		11.60	0.250	4.000	3.875	4.871	3.268	7.481	100%	184	267	317	367	417	467	4960	6350	7030	7580	8000	8300	5350	7780	9240	10690	12150	13610
		12.60	0.271	3.958	3.833	4.906	3.268	7.481	100%	198	288	342	396	450	504	5730	7500	8410	9210	9890	10460	5800	8430	10010	11590	13170	14750
		13.50	0.290	3.920	3.795	4.937	3.268	7.481	100%	211	307	364	422	479	537	6420	8540	9660	10690	11600	12410	6200	9020	10710	12410	14100	15790
		15.10	0.337	3.826	3.701	4.969	4.056	9.056	100%	242	353	419	485	551	617	7620	11080	12760	14340	15830	17230	7210	10480	12450	14420	16380	18350
		17.00	0.380	3.740	3.615	5.035	4.056	9.056	100%	271	393	467	541	615	689	8500	12370	14690	17010	19330	21640	8130	11820	14040	16260	18470	20690
		17.70	0.402	3.696	3.571	5.068	4.056	9.056	100%	285	414	492	569	647	725	8950	13020	15460	17900	20340	22780	8600	12510	14850	17200	19540	21890
		18.90	0.430	3.640	3.515	5.109	4.056	9.056	100%	302	440	522	605	687	770	9510	13830	16420	19010	21610	24200	9200	13380	15890	18390	20900	23410
5	127.00	13.00	0.253	4.494	4.369	5.393	4.524	10.228	100%	208	302	358	415	472	528	4140	5140	5560	5840	6050	6360	4870	7080	8410	9740	11070	12400
		15.00	0.296	4.408	4.283	5.465	4.524	10.228	100%	241	350	416	481	547	612	5560	7250	8110	8850	9480	9990	5700	8290	9840	11400	12950	14500
		18.00	0.362	4.276	4.151	5.571	4.524	10.228	100%	290	422	501	580	659	738	7390	10490	12030	13470	14820	16080	6970	10140	12040	13940	15840	17740
		20.30	0.408	4.184	4.059	5.642	4.524	10.228	100%	324	471	559	647	736	824	8240	11990	14240	16490	18550	20330	7850	11420	13570	15710	17850	19990
		20.80	0.422	4.156	4.031	5.663	4.524	10.228	100%	334	486	577	668	759	850	8500	12360	14680	17000	19320	21620	8120	11820	14030	16250	18460	20680
		21.40	0.437	4.126	4.001	5.686	4.524	10.228	100%	345	501	595	689	783	877	8770	12760	15150	17550	19940	22330	8410	12240	14530	16820	19120	21410
		23.20	0.478	4.044	3.919	5.746	4.524	10.228	100%	373	543	645	747	849	951	9510	13830	16430	19020	21620	24210	9200	13380	15890	18400	20910	23420
		24.10	0.500	4.000	3.875	5.777	4.524	10.228	100%	389	565	672	778	884	990	9900	14400	17100	19800	22500	25200	9630	14000	16630	19250	21880	24500
5-1/2	139.70	15.50	0.275	4.950	4.825	5.930	4.628	10.438	100%	248	361	429	497	564	632	4040	4990	5380	5630	5890	6180	4810	7000	8310	9630	10940	12250
		17.00	0.304	4.892	4.767	5.979	4.628	10.438	100%	273	397	471	546	620	695	4910	6290	6940	7480	7890	8170	5320	7740	9190	10640	12090	13540
		20.00	0.361	4.778	4.653	6.073	4.628	10.438	100%	321	466	554	641	729	816	6620	8830	10020	11110	12080	12960	6320	9190	10910	12640	14360	16080
		23.00	0.415	4.670	4.545	6.158	4.628	10.438	100%	365	530	630	729	829	928	7670	11160	12930	14540	16060	17490	7260	10560	12540	14530	16510	18490
		26.00	0.476	4.548	4.423	6.252	4.628	10.438	100%	413	601	714	826	939	1052	8700	12650	15020	17390	19760	22140	8330	12120	14390	16660	18930	21200
		26.80	0.500	4.500	4.375	6.287	4.628	10.438	100%	432	628	746	864	982	1100	9090	13220	15700	18180	20660	23140	8750	12730	15110	17500	19890	22270
		28.40	0.530	4.440	4.315	6.331	4.628	10.438	100%	455	662	786	910	1034	1159	9580	13930	16540	19160	21770	24380	9280	13490	16020	18550	21080	23610
		29.70	0.562	4.376	4.251	6.376	4.628	10.438	100%	480	697	828	959	1090	1221	10090	14680	17430	20180	22940	25690	9840	14310	16990	19670	22350	25030
7	177.80	23.00	0.317	6.366	6.241	7.497	5.161	11.502	100%	366	532	632	732	832	932	3270	3830	4140	4440	4650	4760	4360	6340	7530	8720	9910	11100
		26.00	0.362	6.276	6.151	7.574	5.161	11.502	100%	415	604	717	830	944	1057	4330	5410	5890	6230	6450	6690	4980	7240	8600	9960	11310	12670
		29.00	0.408	6.184	6.059	7.651	5.161	11.502	100%	465	676	803	929	1056	1183	5410	7030	7840	8530	9110	9560	5610	8160	9690	11220	12750	14280
		32.00	0.453	6.094	5.969	7.725	5.161	11.502	100%	512	745	885	1025	1165	1304	6460	8600	9740	10780	11710	12530	6230	9060	10760	12460	14160	15860
		35.00	0.498	6.004	5.879	7.796	5.161	11.502	100%	559	814	966	1119	1272	1424	7270	10180	11650	13030	14310	15500	6850	9960	11830	13700	15560	17430
		38.00	0.540	5.920	5.795	7.862	5.161	11.502	100%	603	877	1041	1206	1370	1534	7830	11390	13430	15130	16740	18270	7430	10800	12830	14850	16880	18900
7-5/8	193.68	26.40	0.328	6.969	6.844	8.126	5.388	11.957	100%	414	602	714	827	940	1053	2900	3400	3710	3920	4050	4080	4140	6020	7150	8280	9410	10540
		29.70	0.375	6.875	6.750	8.207	5.388	11.957	100%	470	683	811	940	1068	1196	3910	4790	5130	5350	5670	5930	4730	6890	8180	9470	10760	12050
		33.70	0.430	6.765	6.640	8.300	5.388	11.957	100%	535	778	923	1069	1215	1361	5100	6560	7280	7870	8340	8690	5430	7900	9380	10860	12340	13820
		35.80	0.465	6.695	6.570	8.358	5.388	11.957	100%	575	837	994	1151	1307	1464	5850	7690	8640	9480	10200	10810	5870	8540	10140	11740	13340	14940
		39.00	0.500	6.625	6.500	8.415	5.388	11.957	100%	616	895	1063	1231	1399	1567	6610	8820	10000	11080	12060	12930	6310	9180	10900	12620	14340	16070
		42.80	0.562	6.501	6.376	8.513	5.388	11.957	100%	686	997 998	1185	1372	1559	1746	7510	10810	12410	13930	15350	16680	7090	10320	12250	14190	16120	18060
		45.30	0.595	6.435	6.310	8.564	5.388	11.957	100%	723	1051	1248	1445	1643	1840	7910	11510	13670	15440	17100	18680	7510	10920	12970	15020	17070	19120
		47.10	0.625	6.375	6.250	8.611	5.388	11.957	100%	756	1100	1306	1512	1718	1924	8280	12040	14300	16550	18700	20500	7890	11480	13630	15780	17930	20080
9-5/8	244.48	40.00	0.395	8.835	8.679	10.285	5.679	12.539	100%	630	916	1088	1260	1432	1604	2570	3090	3330	3470	3530	3530	3950	5750	6820	7900	8980	10050
		43.50	0.435	8.755	8.599	10.355	5.679	12.539	100%	691	1005	1193	1381	1570	1758	3250	3810	4130	4420	4620	4730	4350	6330	7510	8700	9890	11070
		47.00	0.472	8.681	8.525	10.418	5.679	12.539	100%	746	1086	1289	1493	1697	1900	3890	4750	5090	5300	5630	5890	4720	6870	8150	9440	10730	12010
		53.50	0.545	8.535	8.379	10.541	5.679	12.539	100%	855	1244	1477	1710	1943	2177	5130	6620	7340	7950	8440	8800	5450	7930	9410	10900	12390	13870
		58.40	0.595	8.435	8.279	10.622	5.679	12.539	100%	928	1350	1604	1857	2110	2363	5990	7890	8890	9770	10540	11190	5950	8650	10280	11900	13520	15150
18-3/4	476.25	100.47	0.500	17.750	17.563	20.000	6.142	13.464	100%	1577	2293	2723	3153	3583	4013	940	940	940	940	940	940	2570	3730	4430	5130	5830	6530
20	508	94.00	0.438	19.124	18.936	21.000	6.142	13.464	100%	1480	2153	2557	2961	3365	3768	520	520	520	520	520	520	2110	3070	3640	4220	4790	5370
		106.50	0.500	19.000	18.812	21.000	6.142	13.464	100%	1685	2450	2910	3369	3829	4288	770	770	770	770	770	770	2410	3500	4160	4810	5470	6130

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

TP-G2 | T&C | 2-3/8in~20in

Metric Units

Size (OD)		Nominal weight	Wall thickness	Internal diameter	Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Joint Yield strength(KN.)						Exernal pressure(MPa)						Minimum internal yield pressure(MPa)					
inch	mm	Kg/m	mm	mm	mm	mm	mm	mm		55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
2-3/8	60.32	6.85	4.83	50.66	48.28	73.02	59.10	143.20	100%	319	464	551	638	725	812	55.9	81.2	96.4	111.2	123.4	135.1	53.1	77.2	91.7	106.2	120.7	135.1
2-7/8	73.02	9.52	5.51	62.00	59.62	84.00	74.60	169.20	100%	445	645	766	887	1010	1128	53.0	76.9	89.1	100.2	110.7	120.6	50.1	72.9	86.5	100.2	113.8	127.5
3-1/2	88.90	13.69	6.45	76.00	72.82	100.00	79.00	184.00	100%	632	922	1095	1267	1441	1613	51.0	72.7	83.3	93.3	102.7	111.4	48.2	70.1	83.2	96.3	109.5	122.6
		15.18	7.34	74.22	71.04	101.00	79.00	184.00	100%	712	1037	1232	1426	1619	1815	57.4	83.6	99.2	114.9	130.6	143.2	54.8	79.7	94.7	109.6	124.5	139.5
		18.90	9.52	69.86	66.68	103.00	95.00	216.00	100%	899	1311	1556	1802	2046	2291	72.5	105.6	125.3	145.1	164.9	184.7	71.1	103.4	122.8	142.2	161.6	181.0
4-1/2	114.30	15.73	5.69	102.92	99.74	122.61	83.01	190.02	100%	738	1072	1272	1472	1673	1873	27.6	34.1	36.6	38.3	40.2	42.1	33.0	48.1	57.1	66.1	75.1	84.1
		17.38	6.35	101.60	98.42	123.73	83.01	190.02	100%	818	1188	1410	1632	1855	2077	34.2	43.8	48.5	52.3	55.2	57.2	36.9	53.6	63.7	73.7	83.8	93.8
		18.75	6.88	100.54	97.36	124.62	83.01	190.02	100%	881	1281	1521	1761	2002	2242	39.5	51.7	58.0	63.5	68.2	72.1	40.0	58.1	69.0	79.9	90.8	101.7
		19.87	7.37	99.57	96.39	125.41	83.01	190.02	100%	939	1366	1619	1877	2131	2389	44.3	58.9	66.6	73.7	80.0	85.6	42.7	62.2	73.8	85.6	97.2	108.9
		22.69	8.56	97.18	94.00	126.21	103.01	230.02	100%	1076	1570	1864	2157	2451	2745	52.5	76.4	88.0	98.9	109.1	118.8	49.7	72.3	85.8	99.4	112.9	126.5
		25.30	9.65	95.00	91.82	127.89	103.01	230.02	100%	1205	1748	2077	2406	2736	3065	58.6	85.3	101.3	117.3	133.3	149.2	56.1	81.5	96.8	112.1	127.3	142.7
		26.34	10.21	93.88	90.70	128.73	103.01	230.02	100%	1268	1840	2189	2531	2878	3225	61.7	89.8	106.6	123.4	140.2	157.1	59.3	86.3	102.4	118.6	134.7	150.9
		28.13	10.92	92.46	89.28	129.78	103.01	230.02	100%	1343	1956	2323	2690	3056	3424	65.6	95.4	113.2	131.1	149.0	166.9	63.4	92.3	109.6	126.8	144.1	161.4
5	127.00	19.69	6.43	114.14	110.96	136.98	114.90	259.80	100%	925	1343	1592	1847	2100	2349	28.5	35.4	38.3	40.3	41.7	43.9	33.6	48.8	58.0	67.2	76.3	85.5
		22.69	7.52	111.96	108.78	138.81	114.90	259.80	100%	1072	1557	1849	2141	2433	2722	38.3	50.0	55.9	61.0	65.4	68.9	39.3	57.2	67.8	78.6	89.3	100.0
		27.19	9.19	108.62	105.44	141.50	114.90	259.80	100%	1290	1876	2228	2580	2931	3283	51.0	723.3	82.9	92.9	102.2	110.9	48.1	69.9	83.0	96.1	109.2	122.3
		30.21	10.36	106.28	103.10	143.31	114.90	259.80	100%	1441	2094	2486	2879	3274	3664	56.8	82.7	98.2	113.7	127.9	140.2	54.1	78.7	93.6	108.3	123.1	137.8
		30.95	10.72	105.56	102.38	143.85	114.90	259.80	100%	1486	2160	2565	2970	3376	3780	58.6	85.2	101.2	117.2	133.2	149.1	56.0	81.5	96.7	112.0	127.3	142.6
		32.13	11.10	104.80	101.62	144.42	114.90	259.80	100%	1535	2229	2647	3065	3483	3901	60.5	88.0	104.5	121.0	137.5	154.0	58.0	84.4	100.2	116.0	131.8	147.6
		34.76	12.14	102.72	99.54	145.94	114.90	259.80	100%	1659	2416	2869	3322	3777	4228	65.6	95.4	113.3	131.1	149.1	166.9	63.4	92.3	109.6	126.9	144.2	161.5
		36.15	12.70	101.60	98.42	146.74	114.90	259.80	100%	1730	2515	2989	3459	3932	4402	68.3	99.3	117.9	136.5	155.1	173.7	66.4	96.5	114.7	132.7	150.9	168.9
5-1/2	139.70	23.07	6.98	125.74	122.56	150.61	117.56	265.12	100%	1103	1605	1906	2211	2509	2809	27.9	34.4	37.1	38.8	40.6	42.6	33.2	48.3	57.3	66.4	75.4	84.5
		25.30	7.72	124.26	121.08	151.86	117.56	265.12	100%	1214	1766	2097	2428	2758	3090	33.9	43.4	47.8	51.6	54.4	56.3	36.7	53.4	63.4	73.4	83.4	93.4
		29.76	9.17	121.36	118.18	154.25	117.56	265.12	100%	1428	2074	2463	2852	3243	3630	45.6	60.9	69.1	76.6	83.3	89.4	43.6	63.4	75.2	87.1	99.0	110.9
		34.23	10.54	118.62	115.44	156.41	117.56	265.12	100%	1624	2359	2801	3244	3688	4128	52.9	76.9	89.1	100.2	110.7	120.6	50.1	72.8	86.5	100.2	113.8	127.5
		38.69	12.09	115.52	112.34	158.80	117.56	265.12	100%	1837	2673	3175	3676	4177	4678	60.0	87.2	103.6	119.9	136.2	152.6	57.4	83.6	99.2	114.9	130.5	146.2
		39.88	12.70	114.30	111.12	159.70	117.56	265.12	100%	1922	2795	3319	3843	4368	4891	62.7	91.1	108.2	125.3	142.4	159.5	60.3	87.8	104.2	120.7	137.1	153.5
		42.26	13.46	112.78	109.60	160.80	117.56	265.12	100%	2024	2944	3496	4048	4599	5155	66.1	96.0	114.0	132.1	150.1	168.1	64.0	93.0	110.5	127.9	145.3	162.8
		44.20	14.27	111.16	107.98	161.95	117.56	265.12	100%	2135	3101	3683	4265	4849	5431	69.6	101.2	120.2	139.1	158.2	177.1	67.8	98.7	117.1	135.6	154.1	172.6
7	177.80	34.23	8.05	161.70	158.52	190.42	131.08	292.16	100%	1628	2368	2812	3256	3701	4144	22.5	26.4	28.5	30.6	32.1	32.8	30.1	43.7	51.9	60.1	68.3	76.5
		38.69	9.19	159.42	156.24	192.37	131.08	292.16	100%	1846	2685	3188	3692	4199	4702	29.9	37.3	40.6	43.0	44.5	46.1	34.3	49.9	59.3	68.7	78.0	87.4
		43.16	10.36	157.08	153.90	194.33	131.08	292.16	100%	2068	3006	3572	4133	4697	5260	37.3	48.5	54.1	58.8	62.8	65.9	38.7	56.3	66.8	77.4	87.9	98.5
		47.62	11.51	154.78	151.60	196.21	131.08	292.16	100%	2277	3314	3938	4560	5182	5800	44.5	59.3	67.2	74.3	80.7	86.4	43.0	62.5	74.2	85.9	97.6	109.4
		52.09	12.65	152.50	149.32	198.03	131.08	292.16	100%	2487	3620	4299	4978	5658	6335	50.1	70.2	80.3	89.8	98.7	106.9	47.2	68.7	81.6	94.5	107.3	120.2
		56.55	13.72	150.36	147.18	199.70	131.08	292.16	100%	2682	3901	4632	5364	6094	6824	54.0	78.5	92.6	104.3	115.4	126.0	51.2	74.5	88.5	102.4	116.4	130.3
7-5/8	193.68	39.29	8.33	177.02	173.84	206.40	136.85	303.70	100%	1842	2678	3177	3679	4181	4682	20.0	23.4	25.6	27.0	27.9	28.1	28.5	41.5	49.3	57.1	64.9	72.7
		44.20	9.53	174.62	171.44	208.46	136.85	303.70	100%	2091	3038	3608	4181	4751	5322	27.0	33.0	35.4	36.9	39.1	40.9	32.6	47.5	56.4	65.3	74.2	83.1
		50.15	10.92	171.84	168.66	210.83	136.85	303.70	100%	2380	3461	4106	4755	5405	6054	35.2	45.2	50.2	54.3	57.5	59.9	37.4	54.5	64.7	74.9	85.1	95.3
		53.28	11.81	170.06	166.88	212.30	136.85	303.70	100%	2558	3722	4420	5120	5814	6513	40.3	53.0	59.6	65.4	70.3	74.5	40.5	58.9	69.9	80.9	92.0	103.0
		58.04	12.70	168.28	165.10	213.74	136.85	303.70	100%	2740	3983	4729	5476	6223	6970	45.6	60.8	68.9	76.4	83.2	89.1	43.5	63.3	75.2	87.0	98.9	110.8
		63.69	14.27	165.14	161.96	216.23	136.85	303.70	100%	3051	4439	5271	6103	6935	7767	51.8	74.5	85.6	96.0	105.8	115.0	48.9	71.2	84.5	97.8	111.1	124.5
		67.41	15.11	163.46	160.28	217.53	136.85	303.70	100%	3216	4675	5552	6428	7308	8185	54.5	79.4	94.3	106.5	117.9	128.8	51.8	75.3	89.4	103.6	117.7	131.8
		70.09	15.88	161.92	158.74	218.71	136.85	303.70	100%	3363	4892	5810	6727	7642	8558	57.1	83.0	98.6	114.1	128.9	141.3	54.4	79.2	94.0	108.8	123.6	138.4
9-5/8	244.48	59.53	10.03	224.42	220.45	261.23	144.24	318.48	100%	2802	4075	4839	5603	6370	7135	17.7	21.3	23.0	23.9	24.3	24.3	27.2	39.6	47.0	54.5	61.9	69.3
		64.74	11.05	222.38	218.41	263.01	144.24	318.48	100%	3074	4469	5307	6143	6984	7822	22.4	26.3	28.5	30.5	31.9	32.6	30.0	43.6	51.8	60.0	68.2	76.3
		69.94	11.99	220.50	216.53	264.62	144.24	318.48	100%	3318	4830	5736	6641	7549	8453	26.8	32.8	35.1	36.5	38.8	40.6	32.5	47.4	56.2	65.1	74.0	82.8
		79.62	13.84	216.80	212.83	267.73	144.24	318.48	100%	3803	5534	6568	7605	8643	9684	35.4	45.6	50.6	54.8	58.2	60.7	37.6	54.7	64.9	75.2	85.4	95.6
		86.91	15.11	214.26	210.29	269.81	144.24	318.48	100%	4128	6005	7135	8260	9386	10509	41.3	54.4	61.3	67.4	72.7	77.2	41.0	59.6	70.9	82.0	93.2	104.5
18-3/4	476.25	149.51	12.70	450.85	446.09	508.00	156.00	342.00	100%	7015	10200	12113	14025	15938	17851	6.5	6.5	6.5	6.5	6.5	6.5	17.7	25.7	30.5	35.4	40.2	45.0
20	508	139.89	11.13	485.74	480.98	533.40	156.00	342.00	100%	6583	9577	11374	13171	14968	16761	3.6	3.6	3.6	3.6	3.6	3.6	14.5	21.2	25.1	29.1	33.0	37.0
		158.49	12.70	482.60	477.84	533.40	156.00	342.00	100%	7495	10898	12944	14986	17032	19074	5.3	5.3	5.3	5.3	5.3	5.3	16.6	24.1	28.7	33.2	37.7	42.3

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

Premium Connection

TP-G4 Series

- Metal-to-Metal gas tight Premium Connection
  - T&C
    - TP-CQ series
    - TP-G2 series
    - NEW TP-G4 series
    - NEW TP-WG
  - T&C Semi-flush
    - NEW TP-NF3
  - Integral Flush
    - TP-FJ/II
  - Integral Upset
    - TP-SFJ
    - TP-ISF
  - Particular Condition
    - TP-TW
    - TP-FE
- Semi Premium Connection
  - T&C
    - TP-BM(S)
    - TP-JC
    - TP-QR

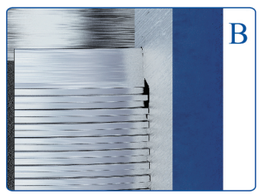
Tianjin Pipe Corporation

TP-G4 The Lstest Fourth Generation Premium Connection 5in～14-3/8in

High Performance Gas-Tight Connection

- Performance meet four-100% (tension, compression, internal and external pressure)
- Thread crest parallel to axis design, easy to make up.
- New concept sealing structure ensures excellent gas sealing ability under combined load, and improves the over-torque ability.
- Suitable for complex well conditions such as horizontal well and extended reach well.
- Suitable for high grade steel and high alloy materials.

Hook Buttress Thread
Taper=1:16
CSG: 5in~9-5/8in: 5T.P.I.
9-7/8in~14-3/8in:



Three Stage Sealing Structure. Metal to Metal Seal.
Reverse Angel Torque Shoulder.
Internal flush.

Options:
- TP-G4 HT: High Torque
- TP-G4(SC): Special Clearance

1 . Description

1.1 Threaded Connection

Unique golden section proportional tooth shape design, uniform and harmonious thread structure size, stable mechanical structure and excellent bearing performance.
The negative angle bearing design is adopted, with excellent connection performance and 100% bending and compression resistance.
Optimized hook thread design reduces thread collision.
Stepped thread design, easy to make up and not easy to cross thread. thread.

1.2 Sealing Structure

The design of new concept sealing structure improves the leakage resistance of the joint.
The main seal and auxiliary seal adopt non equivalent interference design, highlighting the advantages of the main seal.

1.3 Reverse Angle Torque Shoulder

Negative angle shoulders provide accurate screw positioning.

1.4 Streamlined Internal Profile

The streamlined internal profile minimizes turbulence and energy loss when high-velocity gas flows.

1.5 Coupling Design

The coupling performance meets 100% design requirements, and the outer diameter design is consistent with API standard.

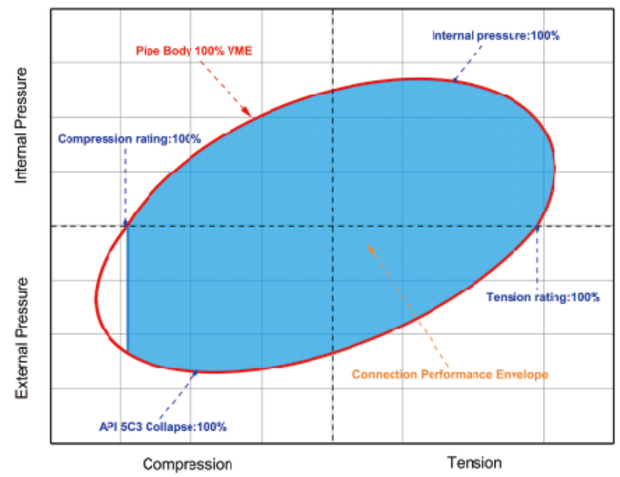
1.6 Connection Low Stress Design

The lower stress design makes the connections reliable in Corrosive condition.

2. Finite Element Analysis on TP-G4

The low stress design of the joint makes TP-G4 the best choice for corrosive environment applications.

VME

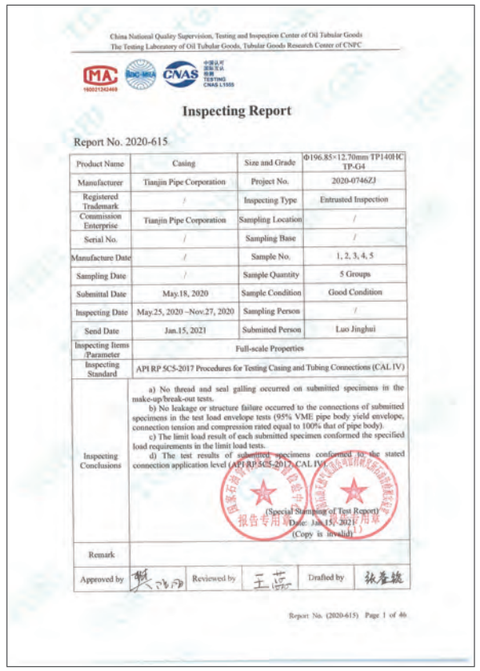


3. Proven Test or Apply

3.1 Qualification Test

TGRC=CNPC Tubular Good Research Center
TPCO = The R&D Center of Tianjin Pipe Corporation

OD		t (mm)	GRADE	Test Standard	CAL	Lab.
mm	in					
177.80	7	10.36	TP110-HP13Cr	API 5C5 (2017) CAL IV	IV	TGRC
196.85	7.75	12.7	TP140HC	API 5C5 (2017) CAL IV	IV	TGRC
200.03	7.875	10.92	C110	API 5C5 (2017) CAL IV	IV	TPCO
244.48	9.625	11.99	P110	API 5C5 (2017) CAL IV	IV	TPCO
273.05	10.75	13.84	TP140V	API 5C5 (2017) CAL IV	IV	TPCO
339.72	13.375	13.06	TP140V	API 5C5 (2017) CAL IV	IV	TPCO



China National Quality Supervision, Testing and Inspection Center of Oil Tubular Goods
The Testing Laboratory of Oil Tubular Goods, Tubular Goods Research Center of CNPC

Inspecting Report

Report No. 2020-615

Product Name	Casing	Size and Grade	Φ196.85×12.70mm TP140HC TP-G4
Manufacturer	Tianjin Pipe Corporation	Project No.	2020-0746ZJ
Registered Trademark	/	Inspecting Type	Entrusted Inspection
Commission Enterprise	Tianjin Pipe Corporation	Sampling Location	/
Serial No.	/	Sampling Base	/
Manufacture Date	/	Sample No.	1, 2, 3, 4, 5
Sampling Date	/	Sample Quantity	5 Groups
Submittal Date	May.18, 2020	Sample Condition	Good Condition
Inspecting Date	May.25, 2020 –Nov.27, 2020	Sampling Person	/
Send Date	Jan.15, 2021	Submitted Person	Luo Jinghui
Inspecting Items /Parameter	Full-scale Properties		
Inspecting Standard	API RP 5C5-2017 Procedures for Testing Casing and Tubing Connections (CAL IV)		
Inspecting Conclusions	a) No thread and seal galling occurred on submitted specimens in the make-up/break-out tests. b) No leakage or structure failure occurred to the connections of submitted specimens in the test load envelope tests (95% VME pipe body yield envelope, connection tension and compression rated equal to 100% that of pipe body). c) The limit load result of each submitted specimen conformed the specified load requirements in the limit load tests. d) The test results of submitted specimens conformed to the stated connection application level (API RP 5C5-2017 CAL IV). (Special Stamping of Test Report) (Date: Jan.15/-2021) (Copy is invalid)		
Remark			
Approved by	Reviewed by	Drafted by	

Report No. (2020-615) Page 1 of 46

天津天管检测技术有限公司
Tianjin TPCO Testing Technology Co., Ltd.
检验报告
Test Report

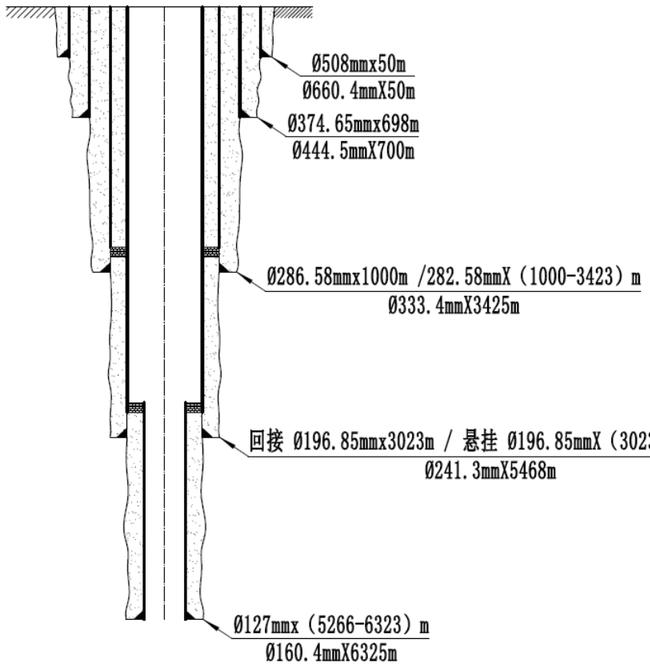
No: J2009077

产品/项目名称 Product	套管		规格 Size（mm）	Φ200.03*10.92	
钢级/牌号 Grade/Trademark	C110		扣型 Connection	TP-G4	
样品炉号 Heat No.	548229		样品数量 Quantity	5 件	
生产日期/批号 Production date/batch	——		样品编号 Specimen No.	10, 20, 30, 40, 50	
生产单位名称 Manufacturer	天津钢管制造有限公司		委托单位名称 Trust Company	天津钢管制造有限公司	
样品进达日期 Arrived date	2020.9.10	送样人员 Deliverer	--	检验类别 kind of inspection	委托检验 Consignment inspection
样品状态 Specimen state	符合试验要求 Meet the test requirements	抽样基数 Sampling base	--	抽样人员 Checker	--
检测项目/参数 Item/ Parameter	API RP 5C5: 2017 --- CAL IV				
检测依据标准 Test standard	API RP 5C5: 2017				
检验结论 Test conclusion	7.875in 34.98t/ft C110 TP-G4 特殊扣通过了 API 5C5: 2017 CAL IV 标准的所有试验程序。试验载荷包络线(TLE)超大达到了管体屈服的 95%。接头拉伸效率等于管体的 100%。接头压缩效率等于管体的 100%。接头内压效率等于管体 100%。接头外压效率等于管体 100%。有效期至 2071/10/09 。 7.875in 34.98t/ft C110 TP-G4 premium connection successfully passed qualification testing in accordance with the test procedure for casing connection. API 5C5: 2017 CAL IV. Maximum Test load envelope up to [illegible] body yield strength with connection tension efficiency at 100%, compression efficiency at 100%, connection internal pressure efficiency at 100%, connection external pressure efficiency at 100% and 20?/10/09 bending capacity [illegible]. 具体检验结果见报告内容。 After samples had tested, please refer to the report. 签发日期（Date）: 2021.06.10				
备注 Note	委托单位负责加工送检试样。 Trust Company is responsible for the processing of samples.				

批准: Approved by: 审核: Verified by: 主检: Prepared by:

3.2 Typical Performance

User	Petro China Southwest Oil & Gasfield Company
Date	2022.4
Well NO.	Pengshen-5#
Location	Sui Ning,SI Chuan
Connection	TP-G4
Grade/Size	TP110S 196.85*16.83mm
MD	3980m



4. Supply Recorder

User	Grade	Size (mm)	Quantity (ton)	Year
CNPC Southwest Oil & Gas field Company	TP110S	196.85×16.83	1100	2022
CNPC Tuha Oilfield Company	TP140V	139.7×12.7	1130	2022
Sinoepc Jianghan Oilfield Company	TP125V	139.7×12.34	1450	2022
	TP140V	139.7×12.34	1450	2022

5. Performance of TP-G4 Connection

Size OD mm/in		t	Dirft	Coupling OD			Make up loss	Yield strength (KN)				External Pressure (Mpa)				Minimum internal yield pressure (Mpa)			
				OD	Length			80	110	125	140	80	110	125	140	80	110	125	140
in	mm	mm	mm	mm	mm		mm	KIPS	KIPS	KIPS	KIPS	PSI	PSI	PSI	PSI	PSI	PSI	PSI	PSI
5.5	139.7	9.17	118.19	6.300	10.906	TP-G4	4.961	466	641	729	816	8830	11100	12080	12960	9190	12640	14360	16080
5.5	139.7	10.54	115.45	6.300	10.906	TP-G4	4.961	530	729	829	928	11160	14540	16060	17490	10560	14530	16510	18490
5.5	139.7	12.34	111.85	6.300	10.906	TP-G4	4.961	612	842	957	1072	12890	17720	20140	22560	12370	17010	19330	21650
5.5	139.7	12.70	111.13	6.300	10.906	TP-G4	4.961	628	864	982	1100	13220	18180	20660	23140	12730	17500	19890	22270
5.5	139.7	14.27	107.99	6.394	10.906	TP-G4	4.961	697	959	1090	1221	14680	20180	22940	25690	14310	19670	22350	25030
7	177.80	8.05	158.53	7.875	12.205	TP-G4	5.118	532	732	832	932	3830	4440	4650	4760	6340	8720	9910	11100
7	177.80	9.19	156.25	7.875	12.205	TP-G4	5.118	604	830	944	1057	5410	6230	6450	6690	7240	9960	11310	12670
7	177.80	10.36	153.91	7.875	12.205	TP-G4	5.118	676	929	1056	1183	7030	8530	9110	9560	8160	11220	12750	14280
7	177.80	11.51	151.61	7.875	12.205	TP-G4	5.118	745	1025	1165	1304	8600	10780	11710	12530	9060	12460	14160	15860
7	177.80	12.65	149.33	7.875	12.205	TP-G4	5.118	814	1119	1272	1424	10180	13030	14310	15500	9960	13700	15560	17430
7	177.80	13.72	147.19	7.875	12.205	TP-G4	5.118	877	1206	1370	1534	11390	15130	16740	18270	10800	14850	16880	18900
7	177.80	14.99	144.65	7.976	13.150	TP-G4	5.591	950	1307	1485	1663	12350	16980	19300	21570	11800	16230	18440	20650
7	177.80	15.88	142.87	7.976	13.150	TP-G4	5.591	1001	1377	1565	1752	13010	17890	20330	22770	12500	17190	19530	21880
7.25	184.15	15.83	149.32	8.213	13.780	TP-G4	5.906	1038	1427	1621	1816	12570	17280	19640	21990	12030	16540	18800	21050
7.625	193.68	10.92	168.67	8.500	12.992	TP-G4	5.512	778	1069	1215	1361	6560	7870	8340	8690	7900	10860	12340	13820
7.625	193.68	12.70	165.11	8.500	12.992	TP-G4	5.512	895	1231	1399	1567	8820	11080	12060	12930	9180	12620	14340	16070
7.625	193.68	14.27	161.97	8.661	12.992	TP-G4	5.512	998	1372	1559	1746	10810	13930	15350	16680	10320	14190	16120	18060
7.625	193.68	15.11	160.29	8.661	12.992	TP-G4	5.512	1051	1445	1643	1840	11510	15440	17100	18680	10920	15020	17070	19120
7.625	193.68	15.88	158.75	8.661	12.992	TP-G4	5.512	1100	1512	1718	1924	12040	16550	18700	20500	11480	15780	17930	20080
7.75	196.85	12.70	168.28	8.500	13.189	TP-G4	5.610	894	1229	1396	1564	8560	10710	11630	12440	9030	12420	14110	15810
7.75	196.85	16.83	160.02	8.779	13.189	TP-G4	5.610	1181	1624	1845	2067	12520	17210	19560	21900	11980	16470	18710	20960
7.875	200.03	10.92	175.02	8.750	11.811	TP-G4	4.921	805	1106	1257	1408	6120	7240	7620	7860	7640	10510	11940	13380
7.875	200.03	12.70	171.46	8.750	11.811	TP-G4	4.921	927	1274	1448	1622	8300	10350	11220	11970	8890	12220	13890	15560
7.875	200.03	14.20	168.46	8.898	13.268	TP-G4	5.650	1028	1413	1606	1799	10150	12970	14250	15430	9940	13660	15530	17390
7.875	200.03	15.88	165.10	8.898	13.268	TP-G4	5.650	1139	1566	1779	1993	11690	15910	17640	19290	11110	15280	17360	19440
9.625	244.48	10.03	220.45	10.625	12.598	TP-G4	5.315	916	1260	1432	1604	3090	3470	3530	3530	5750	7900	8980	10050
9.625	244.48	11.05	218.41	10.625	12.598	TP-G4	5.315	1005	1381	1570	1758	3810	4420	4620	4730	6330	8700	9890	11070
9.625	244.48	11.99	216.53	10.625	12.598	TP-G4	5.315	1086	1493	1697	1900	4750	5300	5630	5890	6870	9440	10730	12010
9.625	244.48	13.84	212.83	10.625	12.598	TP-G4	5.315	1244	1710	1943	2177	6620	7950	8440	8800	7930	10900	12390	13870
10.75	273.05	10.16	248.76	11.750	12.992	TP-G4	5.512	1040	1431	1626	1821	2470	2610	2610	2610	5210	7160	8140	9120
10.75	273.05	11.43	246.22	11.750	12.992	TP-G4	5.512	1165	1602	1820	2039	3220	3660	3740	3750	5860	8060	9160	10260
10.75	273.05	12.57	243.94	11.750	12.992	TP-G4	5.512	1276	1754	1993	2233	4020	4610	4850	4990	6450	8860	10070	11280
10.75	273.05	13.84	241.40	11.750	12.992	TP-G4	5.512	1398	1922	2184	2446	5160	5880	6070	6390	7100	9760	11090	12420
10.75	273.05	15.11	238.86	11.750	12.992	TP-G4	5.512	1519	2088	2373	2658	6300	7500	7920	8210	7750	10650	12110	13560
11.125	282.58	17.32	243.97	12.362	13.780	TP-G4	5.906	1790	2461	2797	3132	7770	9590	10330	10960	8580	11800	13410	15020
11.125	282.58	18.64	241.33	12.362	13.780	TP-G4	5.906	1917	2636	2995	3355	8920	11220	12220	13110	9240	12700	14430	16160
13.375	339.72	10.92	313.91	14.375	13.071	TP-G4	5.551	1399	1924	2186	2448	1670	1670	1670	1670	4500	6190	7030	7880
13.375	339.72	12.19	311.37	14.375	13.071	TP-G4	5.551	1556	2139	2431	2722	2260	2330	2330	2330	5020	6910	7850	8790
13.375	339.72	13.06	309.63	14.375	13.071	TP-G4	5.551	1661	2284	2596	2907	2670	2880	2880	2880	5380	7400	8410	9420
13.375	339.72	13.97	307.81	14.375	13.071	TP-G4	5.551	1773	2438	2770	3102	3100	3490	3550	3550	5760	7920	9000	10070
14.375	365.12	13.88	332.61	15.507	13.386	TP-G4	5.709	1898	2609	2965	3321	2600	2780	2780	2780	5320	7310	8310	9310

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

premium connections

TP-WG

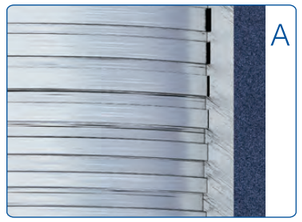
- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

TP-WG 2-3/8in～14-3/8in

T&C type ultra-high torque Gas tight premium connection

- Wedge form threads provide extreme high torque operation ability compares to all other shoulder type premium connection.
- Tapered Metal to Metal seal provide stable gas tight ability under complex loads.
- Very easy stabbing and hand tight with thread flanks space design, less make up turns required compares to traditional type premium connection.
- Torque vs turns record system is not mandatory required for running, make up position and torque value will be enough to judge.
- API 5C5:2017 CAL IV qualified with 100% compression.



Wedge type thread, Gradual thread width changed

Metal to Metal tapered seal

Application:

- Casing while drilling
- High torque operation wells
- Horizontal wells
- Intermediate and production casing and liners
- Tubing

Anti Galling test:

7in 23PPF L80 TP-WG

After 3 Make up and 3 break out no galling was found.

Over torque test :

Note: Due to Clamp slide issue, the real TP-WG yield torque value is even higher than the yield torques shown on below graphs

7in 23PPF L80 TP-WG

Yield torque is over 33000ft-lbs, while the other non-wedge type premium connection for this size can only reach about 20000ft-lbs.

5.5in 26PPF Q125 TP-WG

Yield torque is over 35000ft-lbs, while the other non-wedge type premium connection for this size can only reach about 25000ft-lbs.

Combine load Gas-tight test :

API 5C5:2017 CAI IV
7IN 23PPF L80 TP-WG has passed API 5C5 2017 CAI IV 100% Compression Series A+ B+ C test, no leak or structure damage was found.

天津天管检测技术有限公司
Tianjin TPCO Testing Technology Co., Ltd.

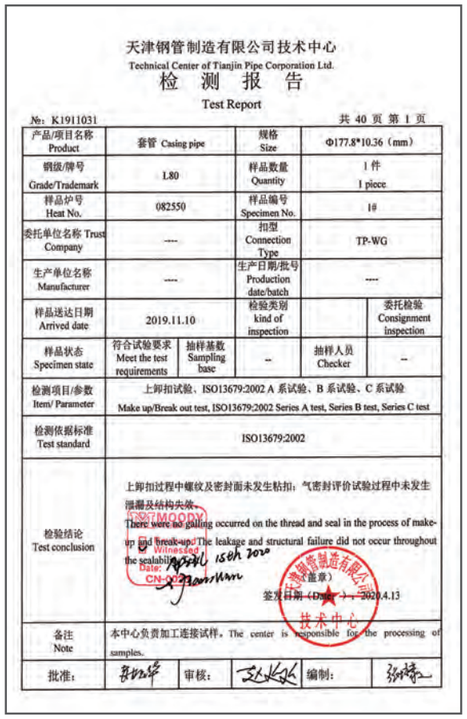
检验报告
Test Report

№: J2204005 共 13 页 第 1 页

产品/项目名称 Product	套管		规格 Size（mm）	Φ177.8*8.05	
钢级/牌号 Grade/Trademark	L80-1		扣型 Connetion	TP-WG	
样品炉号 Heat No.	064397		样品数量 Quantity	1 件	
生产日期/批号 Production date/batch	----		样品编号 Specimen No.	1#	
生产单位名称 Manufacturer	天津钢管制造有限公司		委托单位名称 Trust Company	天津钢管制造有限公司	
样品送达日期 Arrived date	2022.04.05	送样人员 Deliverer	--	检验类别 kind of inspection	委托检验 Consignment inspection
样品状态 Specimen state	符合试验要求 Meet the test requirements	抽样基数 Sampling base	--	抽样人员 Checker	--
检测项目/参数 Item/ Parameter	试样的 B 系、C 系和 A 系载荷包络线试验				
检测依据标准 Test standard	API RP 5C5: 2017				
检验结论 Test conclusion	7.0in 23.3lb/ft L80-1 TP-WG 的 1 号试样特殊扣通过了 API 5C5: 2017 CAL IV 标准的试验程序。试验载荷包络线(TLE)最大达到了管体屈服的 95%。接头拉伸效率等于管体的 100%，接头压缩效率等于管体的 100%，接头内压效率等于管体 100%，接头外压效率等于管体 100%，有缺度 19°/100ft 。 Specimen NO.1 of 7.0in 23.3lb/ft L80-1 TP-WG premium connection successfully passed qualification testing in accordance with the test procedure for casing connection, API 5C5: 2017 CAL IV. Maximum Test load envelope up to 95% pipe body yield strength with connection tension efficiency at 100%, connection compression efficiency at 100%, connection internal pressure efficiency at 100% and 19°/100ft bending severity. 具体检验结果见报告内容。 After samples had tested, please refer to the report. 签发日期（Date:）：2022.05.25				
备注 Note	委托单位负责加工连接试样。 Trust Company is responsible for the processing of samples.				

批准: Approved by: 审核: Verified by: 主检: Prepared by:

ISO 13679:2002 CAI IV
7in 29PPF L80 TP-WG has passed ISO 13679:2002 CAI IV 100% Compression Series A+ B+ C test, no leak or structure damage was found.



天津钢管制造有限公司技术中心
Technical Center of Tianjin Pipe Corporation Ltd.

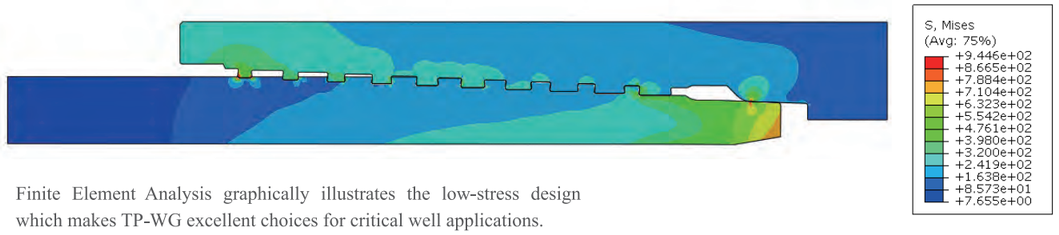
检 测 报 告
Test Report

№: K1911031 共 40 页 第 1 页

产品/项目名称 Product	套管 Casing pipe		规格 Size	Φ177.8*10.36（mm）	
钢级/牌号 Grade/Trademark	L80		样品数量 Quantity	1 件 1 piece	
样品炉号 Heat No.	082550		样品编号 Specimen No.	1#	
委托单位名称 Trust Company	----		扣型 Connection Type	TP-WG	
生产单位名称 Manufacturer	----		生产日期/批号 Production date/batch	----	
样品送达日期 Arrived date	2019.11.10		检验类别 kind of inspection		委托检验 Consignment inspection
样品状态 Specimen state	符合试验要求 Meet the test requirements	抽样基数 Sampling base	--	抽样人员 Checker	--
检测项目/参数 Item/ Parameter	上卸扣试验、ISO13679:2002 A 系试验、B 系试验、C 系试验 Make up/Break out test, ISO13679:2002 Series A test, Series B test, Series C test				
检测依据标准 Test standard	ISO13679:2002				
检验结论 Test conclusion	上卸扣过程中螺纹及密封面未发生粘扣；气密封评价试验过程中未发生泄漏及结构失效。 There were no galling occurred on the thread and seal in the process of make-up and break-up. The leakage and structural failure did not occur throughout the sealability test. 签发日期（Date:）：2020.4.13				
备注 Note	本中心负责加工连接试样。The center is responsible for the processing of samples.				
批准:		审核:		编制:	

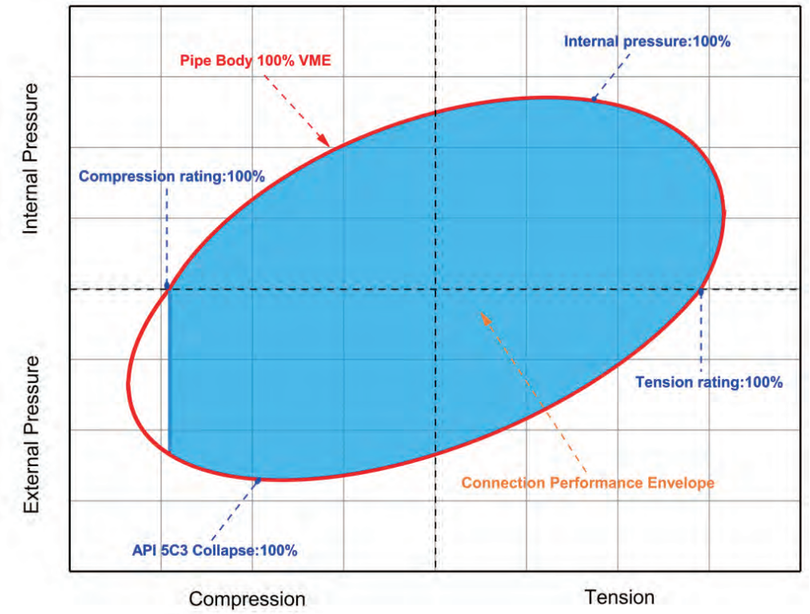
Finite Element Analysis on TP-WG:

5.5in 26.8PPF Q125 TP-WG



Finite Element Analysis graphically illustrates the low-stress design which makes TP-WG excellent choices for critical well applications.

VME application



Supply record of TP-WG:

User	Grade	OD	PPF	Time	Quantity
COSL Canada	L80-D10	7in	23	2022.4	560 ton

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

Special Premium Connection

TP-NF3

Metal-to-Metal gas tight Premium Connection

- TP-CQ series
- TP-G2 series
- NEW TP-G4 series
- NEW TP-WG

  → T&C

- NEW TP-NF3 → T&C Semi-flush
- TP-FJ/II → Integral Flush
- TP-SFJ
- TP-ISF

  → Integral Upset

- TP-TW
- TP-FE

  → Particular Condition

Semi Premium Connection

- TP-BM(S)
- TP-JC
- TP-QR

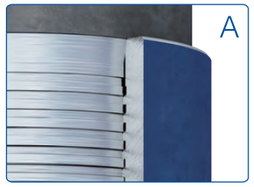
  → T&C

Tianjin Pipe Corporation

TP-NF3 Special Premium Connection

5in～16in

- The OD of the coupling is not more than 10% of the pipe body, and the gas seal joint is specially designed for special clearance.
- The internal and external sealing structure design ensures the gas sealing performance of the joint.
- Inverted hook thread design ensures excellent connection performance
- Stepped thread design, easy to make up.
- The compression property is equal to the tensile property.
- Pass 13679 (2002) CAL IV evaluation test.



Outer Sealing Structure

Inverted hook thread

1 . Description

1.1 Threaded Connection

The golden section proportion inverted hook bearing thread design is adopted, which has excellent connection performance in bending state.
The top and bottom of the thread adopt a stepped design parallel to the axis, with strong anti-galling ability.
Stepped thread design, easy to make up and not easy to cross thread.

1.2 Sealing Structure

Conical metal seal ensures that the sealing surface has sufficient contact width and reasonable contact pressure.
The sealing system of internal and external sealing ensures the excellent gas sealing ability of the joint under composite load.
The geometric parameters of the sealing surface ensure its good anti-galling performance, and it still has good gas sealing performance after many times of makeup and breakout.

1.3 Reverse Angle Torque Shoulder

Negative angle shoulders provide accurate makeup positioning.
The "wedge effect" formed by negative angle torque shoulder and sealing surface strengthens the sealing ability of metal sealing surface.

1.4 Streamlined Internal Profile

The streamlined internal profile minimizes turbulence and energy loss when high-velocity gas flows.

1.5 Coupling Design

The outer diameter of the coupling shall not exceed 10% of the outer diameter of the pipe body, which provides the maximum annular clearance while ensuring sufficient connection performance.

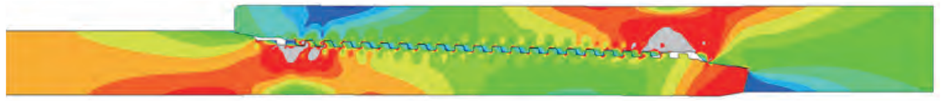
1.6 Connection Lower Stress Design

Ensure that the joint is safe and reliable in corrosive environment.

1.7 Technical Support

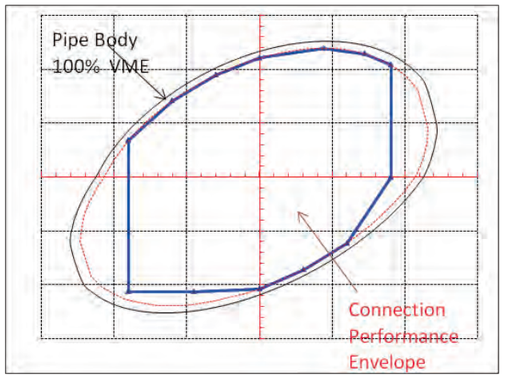
Provide rapid and all-round technical support for commodity inspection, acceptance and well drilling.

2. Finite Element Analysis on TP-NF3



The joint meets the low stress design.

VME



3. Proven Test

3.1 Typical Qualification Test

OD		t (mm)	Grade	Test Standard	CAL	Lab.
mm	in					
206.38	8-1/8	17.25	TP140HC	ISO 13679(2002)	IV	TPCO

3.2. Performance of TP-NF3 Connection

Size	Wall thickness	Dirft	Coupling OD	Coupling Length	Make up loss	Yield strength (KN)				External Pressure (Mpa)				Minimum internal yield pressure (Mpa)			
mm	mm	mm	mm	mm	mm	80Ksi	110Ksi	125Ksi	140Ksi	80Ksi	110Ksi	125Ksi	140Ksi	80Ksi	110Ksi	125Ksi	140Ksi
139.7	10.54	115.45	146.81	280.0	127.0	1770	2438	2765	3097	77	100.3	110.8	120.6	72.8	100.1	113.8	127.4
	14.27	107.99	155.00	286.0	130.0	2172	2986	3393	3800	101.2	139.5	158.1	177.1	98.6	135.6	154.1	172.6
	15.80	104.93	155.00	286.0	130.0	2375	3266	3711	4156	110.7	152.2	173	193.7	109.3	150.1	170.6	191.1
187.33	17.42	149.32	200.90	350.0	150.0	3848	5290	6012	6733	93	128	145.4	162.9	89.8	123.4	140.3	157.1
203.2	25.40	149.23	225.00	330.0	140.0	5871	8072	9173	10274	120.7	165.9	188.6	211.2	120.8	165.9	188.6	211.3
206.38	17.25	168.71	220.00	330.0	140.0	4241	5831	6627	7422	84.6	116.2	132.1	146.5	80.8	111.0	126.1	141.3
	19.05	165.11	215.90	355.0	158.2	4330	5953	6765	7477	92.5	127.1	144.5	161.8	89.1	122.6	139.3	155.9
273.05	13.84	241.40	283.00	354.0	152.0	4663	6412	7287	8161	35.6	40.5	41.9	44	49.0	67.3	76.5	85.8
	13.93	241.22	283.00	354.0	152.0	4692	6452	7331	8211	36.1	41.3	42.6	44.7	49.3	67.8	77.0	86.3
279.00	17.10	240.83	293.45	338.0	150.0	5822	8005	9096	10188	53.5	66.1	71.2	75.5	59.3	81.4	92.5	103.6
282.58	17.32	243.97	293.45	350.0	151.0	5574	7664	8709	9755	53.5	66.1	71.2	75.5	59.3	81.4	92.5	103.6
	18.64	241.33	298.45	350.0	150.0	6395	8794	9993	11192	61.4	77.4	84.3	90.4	63.8	87.6	99.5	111.4
298.45	13.56	267.36	304.80	340.0	145.0	4687	6445	7323	8202	26.7	30.8	32.3	33.2	43.9	60.3	68.6	76.8
339.72	13.06	309.63	346.70	350.0	150.0	5176	7117	8087	9058	18.4	19.9	19.9	19.9	37.1	51.0	58.0	65.0
406.40	12.57	376.50	415.00	352.0	151.0	6006	8258	9285	10511	10.2	10.2	10.2	10.2	29.9	41.0	46.8	52.3

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

premium connections

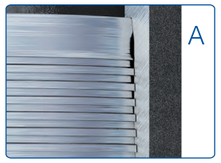
TP-FJ/II

- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series
  - TP-G2 series
  - NEW TP-G4 series
  - NEW TP-WG
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ
  - TP-ISF
  - TP-TW
  - TP-FE
  - T&C: TP-CQ series, TP-G2 series, NEW TP-G4 series, NEW TP-WG
  - Integral Upset: TP-SFJ, TP-ISF
  - Particular Condition: TP-TW, TP-FE
- Semi Premium Connection
  - TP-BM(S)
  - TP-JC
  - TP-QR
  - T&C: TP-BM(S), TP-JC, TP-QR

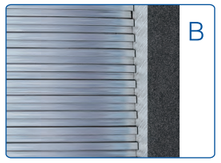
Tianjin Pipe Corporation

TP-FJ/II 2-7/8in～15-1/2in

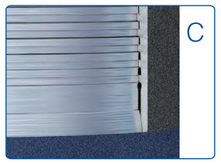
- The OD and ID are 100% Flush, Stream lined design connection provide Maximum Clearance.
- Hooked thread form design provide excellent joint strength & bending capacity.
- Joint efficiency is about 60% of pipe body.
- Double seal can provide excellent gas-tight ability.
- Optimized MTM seal geometry design ensure the anti-galling property.
- ISO 13679:2002 approved.
- Product design according to customer specifications.



External seal



Optimized hook thread



Internal seal

Application:

- Horizon and deep wells
- intermediate casing
- Production casing, tie back and liners

1 . Description

1.1 Thread Connection

A modified hooked thread form design provides excellent joint strength & bending capacity. Threading on medium or heavy wall pipes. Pipe to pipe connection without couplings.

1.2 Metal-to-Metal Seal

Internal and external Metal-to-metal seal surface can provide enough contact length and contact pressure. The metal-to-metal seal system offers excellent gas-tight sealing, even under the most severe combined loads. The seal integrity remains constant after repeated make-ups and break-outs. Optimized thread geometry minimizes the risk of galling, even when thread lubricants are poorly applied.

1.3 Reverse Angle Torque Shoulder

A reverse angle torque shoulder provides accurate power-tight make-up, which also enhances metal-to-metal sealing.

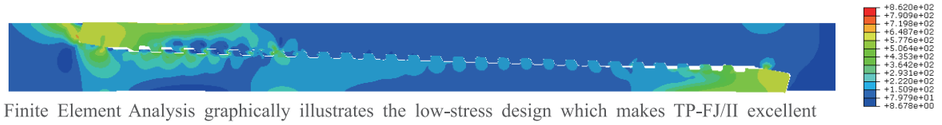
1.4 Streamlined Internal Profile

The OD and ID are 100% flush, which gives the maximum clearance.

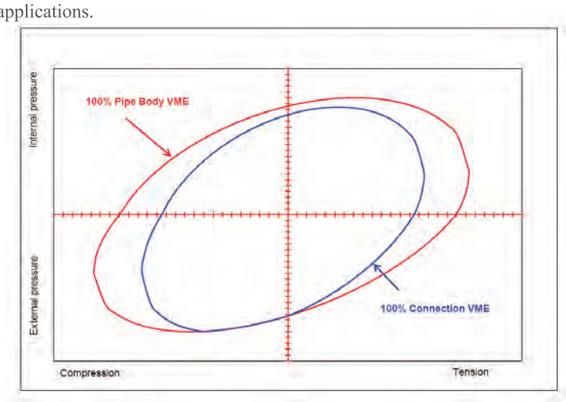
1.5 Lower Stress Design

The lower stress design makes the connections reliable in Corrosive conditions.

2 . Finite Element Analysis on TP-FJ/II



Finite Element Analysis graphically illustrates the low-stress design which makes TP-FJ/II excellent choices for critical well applications.



3. Test Report

Grade	OD	Wt	Lab	Test Spec.	Result
TP80S	5-1/2 in	5-1/2in×20# (139.70×9.17mm)	TPCO	ISO 13679:2002 CAL II[1]	Pass
P110	5-1/2 in	5-1/2in×23# (139.70×10.54mm)	TPCO	ISO 13679:2002 CAL II[2]	Pass
TP125SS	9-5/8in	9-5/8inx53.5# (244.48x13.84mm)	TPCO	ISO 13679:2002 CAL II[2]	Pass
TP140HC	8-1/8in	8-1/8inx53.3# (206.38x17.25mm)	TPCO	ISO 13679:2002 CAL II[2]	Pass
TP155V	6-5/8in	6-5/8x28# (168.28x10.59mm)	TPCO	ISO 13679:2002 CAL II[2]	Pass

Note:
Abbreviate test.
As Per Customer's Request .

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

premium connections

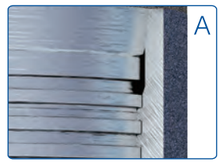
TP-SFJ

- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

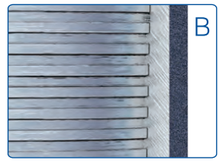
Tianjin Pipe Corporation

TP-SFJ 2-3/8in～12-3/4in

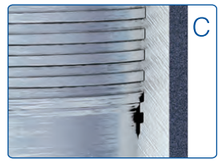
- No coupling, pin and box upsetting controlled below 4%, which can provide optimized clearance
- Double seal can provide excellent gas-tight ability
- Connection tension strength can achieve 60-70% of the pipe body
- Internal torque shoulder can provide accurate make-up stop
- Suitable for low alloy & carbon steel pipe
- Easy Stabbing, No Cross Threading
- ISO13679:2002 CAL IV approved
- Design according to customer requirements



External seal



Hooked thread



Internal seal

1 . Description

1.1 Connection thread

A modified hook thread profile with 4° reverse angle on the load flank not only provides superior tension strength to connection, but also increases its resistance to compression. Optimized thread geometry minimizes the risk of galling, even when thread lubricants are poorly applied.

1.2 Metal-to-Metal Seal

Internal and external metal-to-metal seal can provide enough contact length and contact pressure. The metal-to-metal seal system offers excellent gas-tight sealing, even under the most severe combined loads. The seal integrity remains constant after repeated make-ups and break-outs.

1.3 Torque Shoulder

The reverse angle torque shoulder provides a positive torque stop, which allows for accurate power tight make-up and minimizes hoop stresses in the connection. The wedge effect caused by the reverse angle gives the connection a superior structural strength.

1.4 Optimized clearance

Pin and box are upsetting controlled below 4% over the OD diameter of the pipe. The connection can provide 60-70% tension efficiency and optimized clearance at same time.

1.5 Lower Stress Design

The lower stress design makes the connections reliable in corrosive conditions.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

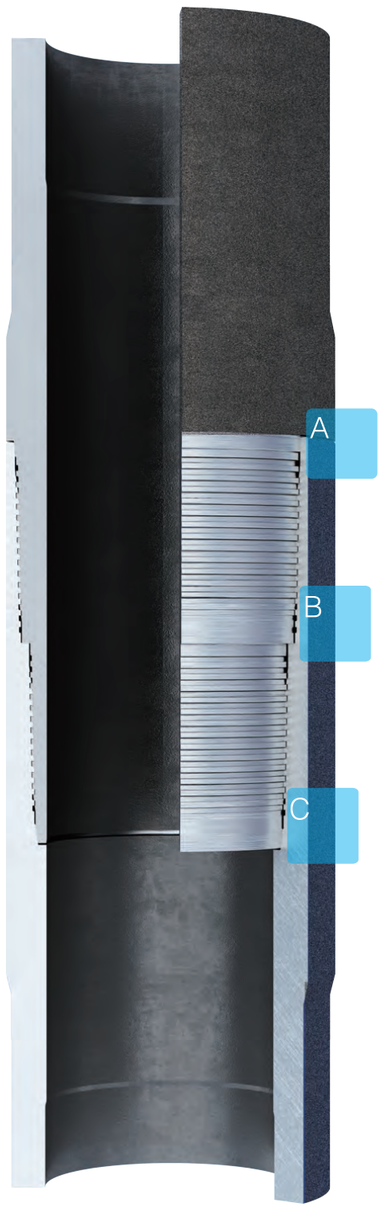
premium connections

TP-ISF

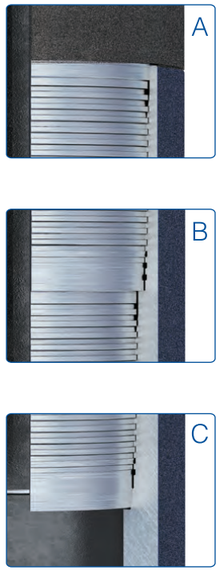
- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

TP-ISF 4-1/2in～14in



- No coupling with pin and box upseting controlled below 4%, can provide optimized clearance
- Double sealing surface, can provide excellent gas seal ability
- Torque shoulder in the middle of the connection, can provide accurate make-up stop
- Two step thread design can achieve the 70-80% strength of the pipe body.
- Suitable for low alloy & carbon steel pipe
- Easy Stabbing, No Cross Threading
- ISO13679:2002 CAL IV approved
- Design according to customer requirements



external sealing surface

Straight torque shoulder

internal sealing surface

1 . Description

1.1 Thread Connection

Thread design incorporates broad critical sections that develop tension efficiencies of 70% to 80% of the pipe body yield strength. the form of the bipolar thread design threads are hooked thread, with a taper of 1:16.

1.2 Metal-to-Metal Seal

Internal and external metal-to-metal seal surface can provide enough contact length and contact pressure. The metal-to-metal seal system offers excellent gas-tight sealing, even under the most severe combined loads. The seal integrity remains constant after repeated make-ups and break-outs. Optimized thread geometry minimizes the risk of galling, even when thread lubricants are poorly applied.

1.3 Torque Shoulder

A straight torque shoulder provides accurate power-tight make-up, and contribute to high compression strength.

1.4 Internal Profile

Box is upseted and turned down to OD's that are typically 3% to 4% over the diameter of the pipe.

1.5 Lower Stress Design

The lower stress design makes the connections reliable in Corrosive conditions.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

premium connections

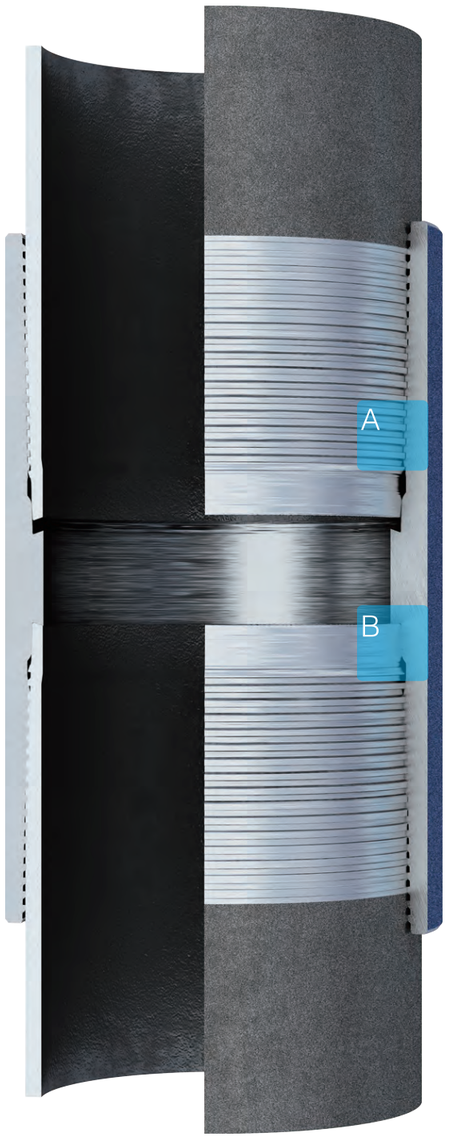
TP-TW

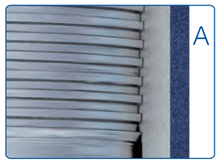
- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

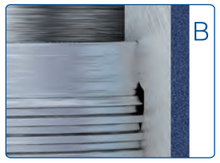
TP-TW 4-1/2in～13-3/8in

- Sphere-cone seal provide reliable gas-seal ability
- Excellent thread structure, superior structural integrity under high compression
- For Thermal well, complex well and horizontal well
- Easy to repair
- ISO 12835 2013 ASL 350 approved





Flank-to-flank contact thread
Taper=1：16
4-1/2in ~8-5/8in：5TPI
9-5/8in~13-3/8in：4TPI



Sphere-cone seal
Reverse angle torque shoulder

1 . Description

1.1 Threaded connection

Flank-to-flank contact thread design offers optimum performance under tension and compression. The excellent strucutral interity including bending and tension resistance makes it suited for SAGD and other complex wells, such as horizontal and deep wells. The thread geometry enhances galling resistance, avoids the trapping of compound inside the threads after make-up.

1.2 Metal to Metal Seal

Sphere-to-cone metal seal system, allows enough contact length and contact stress on contact surface. The metal-to-metal seal offers excellent gas-tight sealing, even under the most severe combined loads, or after repeated make-ups and break-outs. Optimized seal geometry minimizes the risk of galling.

1.3 Reverse Angle Torque Shoulder

The reverse angle torque shoulde provides accurate power tight make-up. The wedge effect caused by the reverse angle and seal system gives the connection a superior structural strength, and also improves sealability. The shoulder design is optimized to resist adverse conditions such as combined compression and external pressure or combined bending and compression.

1.4 Internal profile

The streamlined internal profile minimizes turbulence and energy loss when high-velocity gas flows.

1.5 Coupling Design

Joint efficiency is more than 100% and coupling critical section is greater than pipe body section. Because the coupling covers the vanishing threads, the connection tensile efficiency is maximized.

1.6 Lower stress design

The lower stress design makes the connections reliable in corrosive conditions.

2. Finite Element Analysis for TP-TW

The make-up equivalent stress for K55 9-5/8" 36# TP-TW is shown on fig.1. Finite Element Analysis graphically illustrates the low-stress design which makes TP-TW excellent choices for critical well applications.

Fig.1 make-up equivalent stress

Loading is according to ISO12835(2013) ASL290. The Contact stress for seal is shown on fig.2. The conclusion is that the sealing ability of the sealing surface is reliable.

Table 1 Load steps

Step		Temperature（C）	Pressure（MPa）
Make-up Complete	2	5	0
Pressure Applied	3	5	7.4
Temperature Applied	5	290	7.4
Pressure Removed	6	290	0
Temperature Removed	8	5	0

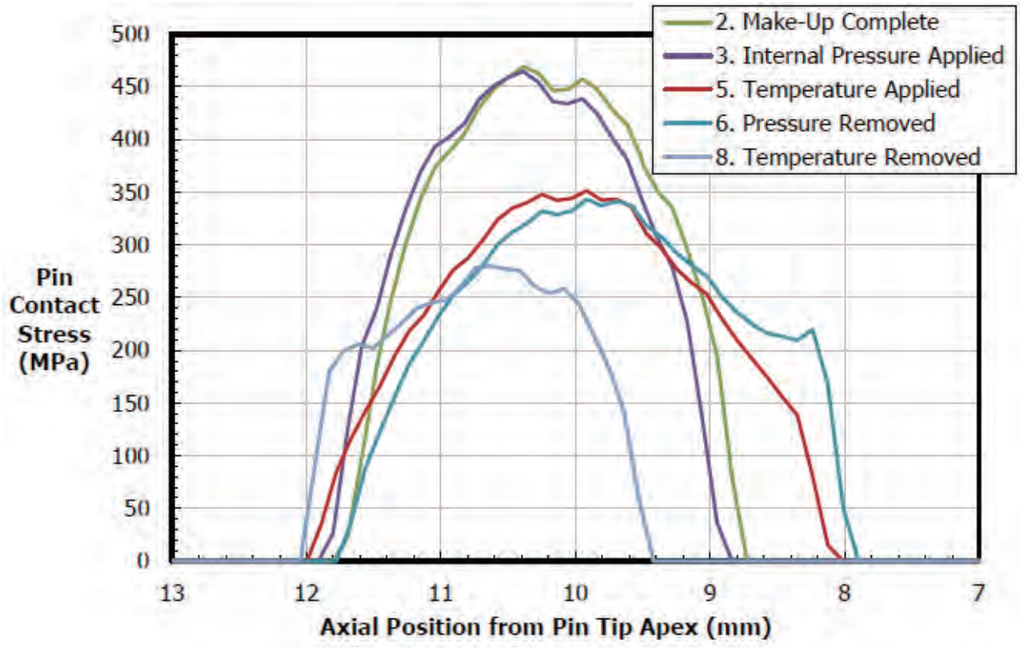


Fig.2 Contact stress for seal

3. TP-TW Qualification Test

The completed test is shown in the table 2.

Table 2 Brief introduction of test

Steel grade	OD	Size	Lab.	Specification	TPI	Result
K55	9-5/8 in	36# (244.48×8.94 mm)	TPCO	ISO 12835(2013) ASL290	Moddy& Noetic	Pass
L80	9-5/8 in	40# (244.48×8.94 mm)	TPCO	ISO 12835(2013) ASL290		Pass
K55	11 3/4	54# (298.45×11.05 mm)	TPCO	ISO 12835(2013) ASL290	Moddy& Noetic	Pass

The test load envelope tests results are summarized in table 3.

Table 3 Test load envelope tests result summary

Specimen No.	M&B Test A	M&B Test B	Thermal cycle test	Bend test	Limit-strain test
			ASL290℃ Pi : 7.4MPa(Gas) LCEI = 1407mm LtestHS = 101mm SRI = 126με LTTS = 268με	ρmax:20°/30m Pi : 7.4MPa(Gas) △ρ= 4°/30m	Local strain value:1.5% Tensile strain threshold:3% Pi : 7.4MPa(Gas) Pi : 0.1MPa(Gas) LCEI = 1407mm LtestHS = 101mm
1#	MBG(A) 3M/3B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	MBG(B) 3M/3B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(B) No Galling	N/A	N/A	No Leak, No seepage, No structural failure was observed up to average displacement of 44.363 mm (3.4%) Passed
2#	MBG(A) 3M/3B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	MBG(B) 3M/3B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(B) No Galling	N/A	No Leak, No seepage 36 deg/30m is OK Upon further loading, the dogleg severity in the bottom pup increased to 44 deg/30m Passed	N/A
3#	MBG(A) 2M/2B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	MBG(B) 2M/2B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(B) No Galling	No Leak Passed	N/A	N/A
4#	FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	No Leak Seepage in high temp.: A:0.076ml/min; B:0.016 ml/min Seepage in low temp.: A:1.69ml/min; B:0.017ml/min Passed	Average seepage: A:No seepage B:0.009ml/min No structural failure Terminate the test after up to dogleg of 40 deg/30m Passed	N/A
5#	MBG(A) 2M/2B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	MBG(A) 2M/2B Min dope/Max Tq. FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	No Leak Passed	N/A	N/A
6#	FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	FMU 1M Min dope/Max Tq. GTS bef.FMU(A) No Galling	No Leak No seepage in high temp. Seepage in low temp.: A:1.909ml/min; B:1.164ml/min Passed	N/A	Average seepage: A:No seepage B:12.1ml/min No structural failure was observed up to average displacement of 42.72 mm (3.27%) Passed

Test result:

- No galling was observes on any specimen throughout the make-up/break-out test program;
- The connection remained the seal integrity and structural integrity throughout the thermal cycle test.;
- The connection met threshold performance requirements in the bend test and limit-strain test.

TPCO

Riser connections

TP-FE

- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Riser Connection
  - TP-FE — Riser Connection
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

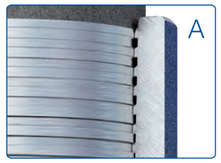
2022 Version 01

TP-FE 4-1/2in ~ 14in

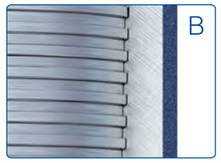
TP-FE Riser connection has been specially designed for use in deepwater drilling riser and inner production riser applications where an exceptional level of fatigue resistance and sealability performance is required (SAF ≤ 2.0 vs. DNVB1 curve).

- High fatigue resistance SAF≤2.0
- Excellent gas seal-ability under combined load
- High-grade and Corrosion material are available
- Easy Stabbing, No Cross Threading
- Superior Anti-Galling Performance
- API 5C5 and ISO 13679 CAL IV approved
- Full-scale fatigue test

Modified Thread
CSG: 4-1/2in~8-5/8in: 5T.P.I.
9-5/8in~14in: 4T.P.I.



Double elliptical groove
Improve connection fatigue resistance (optional)



Modified Thread
Low stress and super anti fatigue ability

Special Metal to Metal Seal
Tapered pin and box seal
Super sealing capacity

Application:
- Drilling Risers
- Inner Production Riser
- Extended reach horizontal well
- Casing drilling

1 . Description

1.1 Threaded connection
The special modified thread can effectively reduce the stress concentration of the thread and make it have a high anti fatigue ability. At the same time, the excellent strucutral interity including bending and tension resistance makes it suited for complex wells, such as drilling riser, horizontal and deep wells.

1.2 Metal to Metal Seal
Special Metal to Metal Seal system, allows enough contact length and contact stress on contact surface. The metal-to-metal seal offers excellent gas-tight sealing, even under the most severe combined loads, or after repeated make-ups and break-outs. Optimized seal geometry minimizes the risk of galling.

1.3 Reverse Angle Torque Shoulder
The reverse angle torque should provides accurate power tight make-up. The wedge effect caused by the reverse angle and seal system gives the connection a superior structural strength, and also improves sealability. The shoulder design is optimized to resist adverse conditions such as combined compression and external pressure or combined bending and compression.

1.4 Internal profile
The streamlined internal profile minimizes turbulence and energy loss when high-velocity gas flows.

1.5 Coupling Design
Double elliptical groove (optional) to improve connection fatigue resistance. Joint efficiency is more than 100% and coupling critical section is greater than pipe body section.

1.6 Lower stress design
The lower stress design makes the connections fatigue resistance SAF ≤ 2.0 vs. DNVB1 curve.

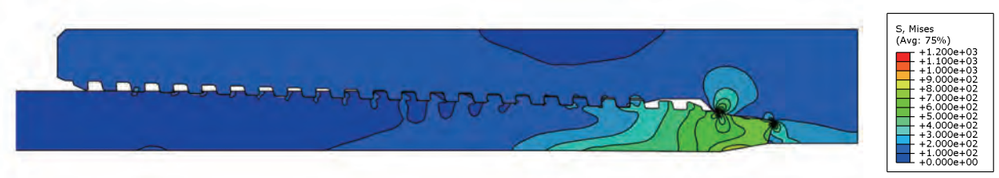


Figure 1 make-up equivalent stress

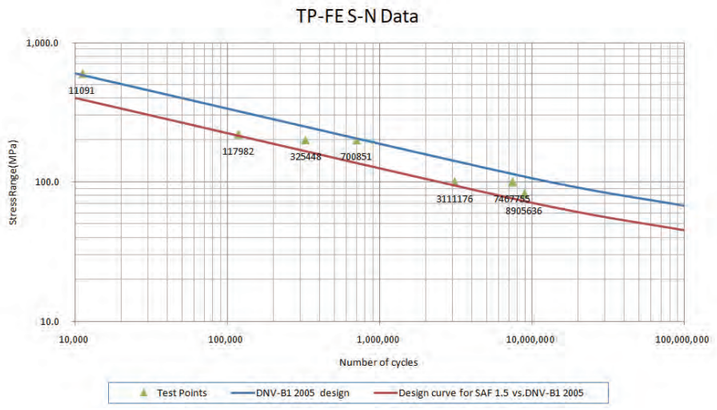


Figure 2 S-N data obtained by FEA

2. TP-FE Qualification Test

Table 1 Brief introduction of test

Steel grade	OD	Size	Lab.	Specification	Series	Result
L80	9-5/8 in	47# (244.48×11.99 mm)	TPCO	ISO 13679(2002) IV	CAL IV	Pass
L80	6 5/8 in	36.70# (168.28×14.27 mm)	TPCO	Full scale fatigue test	cyclical loading (168MPa)	ultimate life (2,300,000)
L110	9-5/8 in	75.6# (244.48x20.24 mm)	TPCO	Full scale fatigue test	6 cyclical loading point	SAF≤2.0

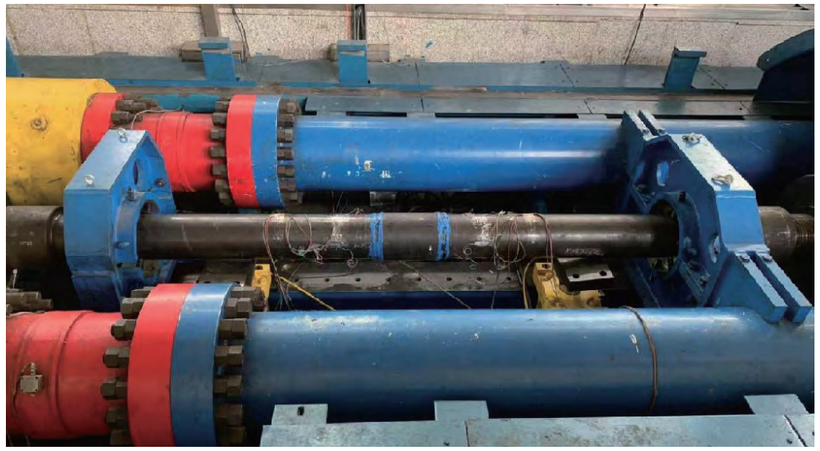


Figure 3 Full scale test

Figure 4 Full scale fatigue test

3. Use performance

Table 2 Performance profile

Steel grade	OD	Size	Water depth	user name	Length of use
P110	9-5/8 in	47# (244.48×11.99 mm)	1300（m）	PetroChina Ocean	2500(m)
P110	13-3/8 in	68# (339.72×12.19 mm)	1300（m）	PetroChina Ocean	400(m)
P110	9-5/8 in	75.6# (244.48x20.24 mm)	2000（m）	CRIMM	2000(m)

Figure 5 Construction Drilling Platform Blue Whale II

TPCO

Semi-Premium

TP-BM(S)

Metal-to-Metal gas tight Premium Connection

- TP-CQ series — T&C
- TP-G2 series — T&C
- NEW TP-G4 series — T&C
- NEW TP-WG — T&C
- NEW TP-NF3 — T&C Semi-flush
- TP-FJ/II — Integral Flush
- TP-SFJ — Integral Upset
- TP-ISF — Integral Upset
- TP-TW — Particular Condition
- TP-FE — Particular Condition

Semi Premium Connection

- TP-BM(S) — T&C
- TP-JC — T&C
- TP-QR — T&C

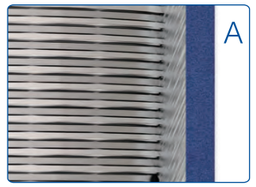
Tianjin Pipe Corporation

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

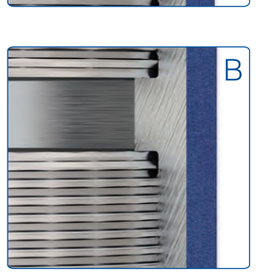
2022 Version 01

TP-BM(S) 4-1/2in～20in

- API BC thread, interchangeable with API BC connection
- Joint strength is the same as that of API BC
- Provide high torque capacity and compression capacity
- Superior structural integrity under tension, high compression and high bending
- ISO 13679:2002 CAL II tested and field proven



API Buttress Thread



Vertical Torque Shoulder
Internal flush

Application:

- Shales Casing
- Casing while drilling
- Surface and intermediate casing
- Production casing, tie back and liners

Options:

- TP-BM(S)(SB): Special Bevel
- TP-BM(S)(SC): Special Clearance

Description

1.1 Threaded Connection

API BC thread form connection with a taper of 1:16, 5TPI, enables high connection strength.

1.2 Torque Shoulder

The vertical torque shoulder provides accurate power tight make-up, which also enables connection to withstand higher compression load.

1.3 Streamlined Internal Profile

Internally flush design. The streamlined internal profile minimizes turbulence and energy loss when high-velocity liquid flows.

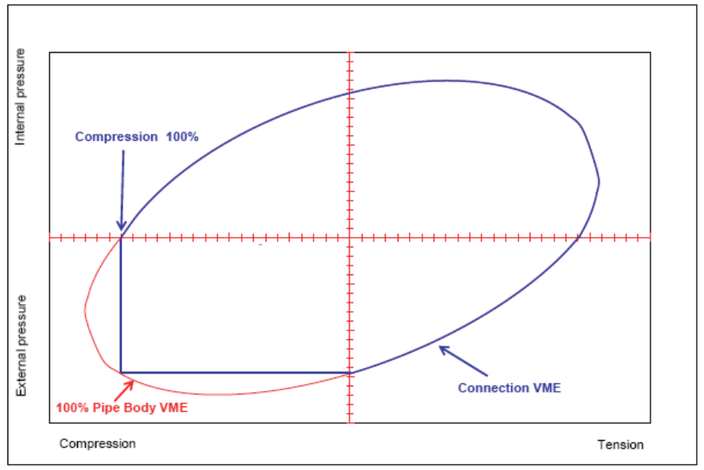
1.4 Coupling Design

Because the coupling covers the vanishing threads, the connection tensile efficiency is maximized.

1.5 Lower Stress Design

The lower stress design makes the connections reliable in Corrosive conditions.

2. VME envelope application



3. Qualification Test:

Grade	OD(in)	Size	Test Spec.	Lab	Result
P110	5-1/2	5.5in×20# (139.70×9.17 mm)	ISO13679:2002 CAL II	TPCO	Passed
P110	5-1/2	5.5in×23# (139.70×10.54 mm)	ISO13679:2002 CAL II	TPCO	Passed
P110	5-1/2	5.5in×26.4# (139.70×12.34 mm)	ISO13679:2002 CAL II	TPCO	Passed
Q125	5-1/2	5.5in×26.8# (139.70×12.7 mm)	ISO13679:2002 CAL II	TPCO	Passed
P110	7-5/8	7-5/8in×29.7# (193.68×9.52 mm)	ISO13679:2002 CAL II	TPCO	Passed

TP-BM(S) | T&C | 4-1/2in～20in

Imperial Units

Size (OD)		Nominal weight	Wall thickness		Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Yield strength(1000lb.)						Exernal pressure(psi)						Minimum internal yield pressure(psi)					
inch	mm	lb./ft	inch	mm	inch	inch	inch	inch	%	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
4-1/2	114.30	10.50	0.224	5.69	3.927	5.250	3.937	9.375	100.0	166	241	286	331	376	421	4010	4930	5310	5560	5830	6110	4790	6970	8280	9580	10890	12200
		11.60	0.250	6.35	3.875	5.250	3.937	9.375	100.0	184	267	317	367	417	467	4960	6350	7030	7580	8000	8300	5350	7780	9240	10690	12150	13610
		12.60	0.271	6.88	3.833	5.250	3.937	9.375	100.0	198	288	342	396	450	504	5720	7490	8400	9200	9880	10440	5790	8430	10010	11590	13170	14750
		13.50	0.290	7.37	3.794	5.250	3.937	9.375	100.0	211	307	365	422	480	537	6430	8550	9680	10700	11620	12420	6210	9030	10720	12410	14100	15800
		15.20	0.337	8.56	3.701	5.250	3.937	9.375	100.0	242	353	419	485	551	617	7620	11090	12770	14340	15830	17230	7210	10480	12450	14420	16380	18350
5	127.00	13.00	0.253	6.43	4.369	5.800	3.963	9.425	100.0	208	302	359	415	472	529	4150	5140	5560	5850	6050	6370	4870	7090	8420	9750	11080	12400
		15.00	0.296	7.52	4.283	5.800	3.963	9.425	100.0	241	350	416	481	547	612	5560	7250	8110	8850	9480	9980	5700	8290	9840	11400	12950	14500
		18.00	0.362	9.19	4.151	5.800	3.963	9.425	100.0	290	422	501	580	659	738	7380	10480	12010	13460	14810	16060	6960	10130	12030	13930	15830	17730
		21.40	0.437	11.10	4.001	5.800	3.963	9.425	100.0	345	501	595	689	783	877	8770	12760	15150	17550	19940	22330	8410	12240	14530	16820	19120	21410
		23.20	0.478	12.14	3.919	5.800	3.963	9.425	100.0	373	543	645	747	849	951	9510	13830	16430	19020	21610	24210	9200	13380	15890	18400	20910	23420
		24.10	0.500	12.70	3.875	5.800	3.963	9.425	100.0	389	565	672	778	884	990	9900	14400	17100	19800	22500	25200	9630	14000	16630	19250	21880	24500
5-1/2	139.70	17.00	0.304	7.72	4.767	6.300	4.125	9.750	100.0	273	397	471	546	620	695	4910	6280	6940	7470	7880	8170	5320	7740	9190	10640	12090	13540
		20.00	0.361	9.17	4.653	6.300	4.125	9.750	100.0	321	466	554	641	729	816	6620	8830	10020	11100	12090	12960	6320	9190	10910	12640	14360	16080
		23.00	0.415	10.54	4.545	6.300	4.125	9.750	100.0	365	530	630	729	829	928	7670	11160	12930	14540	16060	17490	7260	10560	12540	14520	16500	18480
		26.80	0.500	12.70	4.375	6.300	4.125	9.750	100.0	432	628	746	864	982	1100	9090	13220	15700	18180	20660	23140	8750	12730	15110	17500	19890	22270
6-5/8	168.28	20.00	0.288	7.32	5.924	7.390	4.213	9.624	100.0	316	459	545	631	717	803	2970	3480	3800	4030	4170	4220	4190	6090	7230	8370	9510	10650
		24.00	0.352	8.94	5.796	7.390	4.213	9.624	100.0	382	555	659	763	867	971	4560	5760	6310	6730	7020	7180	5110	7440	8830	10230	11620	13020
		28.00	0.417	10.59	5.666	7.390	4.213	9.624	100.0	447	651	773	895	1017	1139	6170	8170	9220	10160	11000	11710	6060	8810	10460	12120	13770	15420
		32.00	0.475	12.06	5.550	7.390	4.213	9.624	100.0	505	734	872	1009	1147	1285	7320	10310	11820	13230	14540	15750	6900	10030	11920	13800	15680	17570
7	177.80	23.00	0.317	8.05	6.241	7.875	4.400	10.000	100.0	366	532	632	732	832	932	3270	3830	4150	4440	4650	4760	4360	6340	7530	8720	9910	11100
		26.00	0.362	9.19	6.151	7.875	4.400	10.000	100.0	415	604	717	830	944	1057	4320	5400	5890	6230	6450	6690	4970	7240	8600	9960	11310	12670
		29.00	0.408	10.36	6.059	7.875	4.400	10.000	100.0	465	676	803	929	1056	1183	5400	7020	7840	8530	9110	9560	5610	8160	9690	11220	12750	14280
		32.00	0.453	11.51	5.969	7.875	4.400	10.000	100.0	513	746	885	1025	1165	1305	6470	8610	9750	10790	11720	12540	6230	9060	10760	12460	14160	15860
		35.00	0.498	12.65	5.879	7.875	4.400	10.000	100.0	560	814	966	1119	1272	1424	7270	10190	11650	13030	14320	15500	6850	9960	11830	13700	15560	17430
		38.00	0.540	13.72	5.794	7.875	4.400	10.000	100.0	603	877	1041	1206	1370	1535	7830	11390	13440	15140	16750	18280	7430	10800	12830	14850	16880	18910
7-5/8	193.68	26.20	0.328	8.33	6.844	8.500	4.587	10.375	100.0	414	601	714	827	940	1053	2890	3400	3710	3920	4050	4080	4140	6020	7150	8280	9410	10540
		29.70	0.375	9.52	6.750	8.500	4.587	10.375	100.0	470	683	811	940	1068	1196	3900	4780	5130	5350	5670	5930	4730	6880	8180	9470	10760	12050
		33.70	0.430	10.92	6.640	8.500	4.587	10.375	100.0	535	777	923	1069	1215	1361	5090	6560	7270	7870	8340	8690	5430	7890	9380	10860	12340	13820
		39.00	0.500	12.70	6.500	8.500	4.587	10.375	100.0	616	895	1063	1231	1399	1567	6610	8820	10000	11080	12060	12920	6310	9180	10900	12620	14340	16070
		42.80	0.562	14.27	6.376	8.500	4.587	10.375	97.7	670	974	1157	1340	1523	1705	7510	10810	12410	13920	15340	16670	7090	10310	12250	14180	16120	18050
		45.30	0.595	15.11	6.310	8.500	4.587	10.375	92.7	670	974	1157	1340	1523	1705	7910	11510	13670	15430	17100	18670	7510	10920	12970	15020	17070	19110
		47.10	0.625	15.88	6.250	8.500	4.587	10.375	88.6	670	974	1157	1340	1523	1705	8280	12040	14300	16560	18710	20510	7890	11480	13630	15780	17940	20090
8-5/8	219.08	32.00	0.352	8.94	7.796	9.625	4.713	10.625	100.0	503	732	869	1006	1144	1281	2530	3050	3290	3420	3470	3470	3930	5710	6780	7860	8930	10000
		36.00	0.400	10.16	7.700	9.625	4.713	10.625	100.0	568	827	982	1137	1292	1447	3450	4100	4360	4690	4930	5090	4460	6490	7710	8930	10140	11360
		40.00	0.450	11.43	7.600	9.625	4.713	10.625	100.0	636	925	1098	1271	1445	1618	4400	5520	6020	6400	6640	6830	5020	7300	8670	10040	11410	12780
		44.00	0.500	12.70	7.500	9.625	4.713	10.625	100.0	702	1021	1212	1404	1595	1787	5350	6950	7740	8420	8980	9410	5580	8120	9640	11160	12680	14200
		49.00	0.557	14.15	7.386	9.625	4.713	10.625	100.0	777	1130	1341	1553	1765	1977	6440	8570	9700	10740	11660	12460	6220	9040	10740	12430	14130	15820
9-5/8	244.48	36.00	0.352	8.94	8.765	10.625	4.713	10.625	100.0	564	820	974	1128	1282	1436	2020	2370	2470	2470	2470	2470	3520	5120	6080	7040	8000	8960
		40.00	0.395	10.03	8.679	10.625	4.713	10.625	100.0	630	916	1088	1260	1432	1604	2570	3080	3330	3470	3530	3530	3950	5740	6820	7900	8980	10050
		43.50	0.435	11.05	8.599	10.625	4.713	10.625	100.0	691	1005	1193	1381	1570	1758	3250	3810	4130	4420	4620	4730	4350	6330	7510	8700	9890	11070
		47.00	0.472	11.99	8.525	10.625	4.713	10.625	100.0	747	1086	1289	1493	1697	1900	3890	4750	5090	5300	5630	5890	4720	6870	8150	9440	10730	12010
		53.50	0.545	13.84	8.379	10.625	4.713	10.625	100.0	855	1243	1477	1710	1943	2177	5130	6610	7340	7950	8440	8790	5450	7930	9410	10900	12390	13870
		58.40	0.595	15.11	8.279	10.625	4.713	10.625	100.0	928	1350	1604	1857	2110	2363	5990	7890	8880	9770	10540	11190	5950	8650	10280	11900	13520	15150
10-3/4	273.05	40.50	0.350	8.89	9.894	11.750	4.713	10.625	100.0	629	915	1086	1258	1429	1601	1580	1730	1730	1730	1730	1730	3130	4560	5410	6270	7120	7980
		45.50	0.400	10.16	9.794	11.750	4.713	10.625	100.0	715	1040	1236	1431	1626	1821	2090	2470	2590	2610	2610	2610	3580	5210	6190	7160	8140	9120
		51.00	0.450	11.43	9.694	11.750	4.713	10.625	100.0	801	1165	1383	1602	1820	2039	2710	3220	3490	3660	3740	3750	4030	5860	6960	8060	9160	10260
		55.50	0.495	12.57	9.604	11.750	4.713	10.625	100.0	877	1276	1515	1754	1993	2233	3390	4020	4300	4610	4850	4990	4430	6440	7660	8860	10070	11280
		60.70	0.545	13.84	9.504	11.750	4.713	10.625	100.0	961	1398	1660	1922	2184	2446	4160	5160	5580	5880	6070	6380	4880	7100	8430	9760	11090	12420
		65.70	0.595	15.11	9.404	11.750	4.713	10.625	100.0	1044	1518	1803	2088	2373	2657	4920	6300	6960	7510	7920	8200	5330	7750	9200	10650	12110	13560
11-3/4	298.45	47.00	0.375	9.53	10.844	12.750	4.713	10.625	100.0	737	1073	1273	1474	1675	1876	1520	1630	1630	1630	1630	1630	3070	4470	5310	6140	6980	7820
		54.00	0.435	11.05	10.724	12.750	4.713	10.625	100.0	851	1237	1469	1701	1933	2165	2070	2440	2560	2570	2570	2570	3560	5180	6150	7130	8100	9070
		60.00	0.489	12.42	10.616	12.750	4.713	10.625	100.0	951	1384	1644	1903	2163	2422	2660	3180	3440	3610	3680	3680	4010	5830	6920	8010	9100	10200
13-3/8	339.72	54.50	0.380	9.65	12.459	14.375	4.713	10.625	100.0	853	1241	1474	1707	1939	2172	1130	1140	1140	1140	1140	1140	2730	3980	4720	5470	6210	6960
		61.00	0.430	10.92	12.359	14.375	4.713	10.625	100.0	962	1399	1661	1924	2186	2448	1540	1660	1670	1670	1670	1670	3090	4500	5340	6190	7030	7880
		68.00	0.480	12.19	12.259	14.375	4.713	10.625	100.0	1069	1555	1847	2139	2431	2722	1950	2260	2340	2330	2330	2330	3450	5020	5970	6910	7850	8790
		72.00	0.514	13.06	12.191	14.375	4.713	10.625	100.0	1143	1662	1973	2284	2596	2908	2230	2670	2830	2880	2880	2880	3700	5380	6390	7400	8410	9420

NOTE:
The data are for reference only.
For size expansion and more infromation please contact TPCO Internatioal Trading Dept. or R&D Center.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com

2022 Version 01

TPCO

Semi-Premium

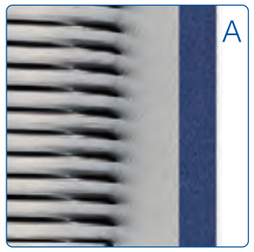
TP-JC

- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

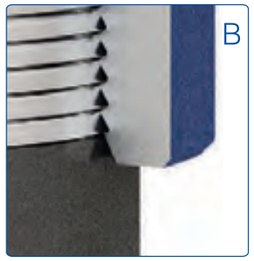
Tianjin Pipe Corporation

TP-JC 1.9in~5-1/2in

- Original design, first zigzag thread structure
- Joint efficiency is 100% rated to pipe body strength
- EU connection replarceable, good performance
- High productivity, field repair friendly
- ISO 13679:2002 CAL II qualified



Zigzag thread
Lead=8T.P.I Taper=1:16



Thread cutting retract naturally

Description

1.1 Tensile strength not less than pipe body yield strength

The thread profile with 3 degree on the load flank, which meets mechanical locking condition. The thread critical section nearly equals to that of pipe body,which enhanced the joint strength.
Under the tension failure test, the pipe body fractured but TP-JC thread connection no demaged, in contrast, API round thread slipped out with the same load.

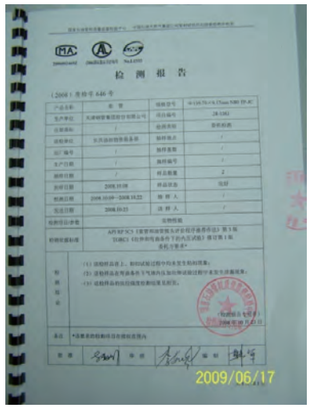
1.2 Excellent seal ability

The thread designed with ultrathin clearance (the clearance between thread crest and root is 0.03mm), which minimizes the leakage path. The clearance of API round thread is 0.076mm.
Designed with optimized thread parameters and appropriate torque, the distribution of contact stress between pin and box surface is at relatively reasonable level, even though the high pressure between pin and box, but the stress spreads to contacts averagely without concentration, which improves the leakage resistance ability.

3.1 Qualification Test @ TGRC

TGRC=CNPC Tubular Good Research Center

Grade	OD	Wt	Lab	Test Spec.	Result
N80	5.5 in	5.5in×20# (139.70×9.17 mm)	TGRC	API 5C5 + TGRC Spec	Pass



3.2 Qualification Test @TPCO

Grade	OD	Wt	Lab	Test Spec.	Result
TP80S	2 7/8in	73.02*5.51mm	TPCO	API 5C5	Pass
TP110S	3 1/2n	88.90*6.45mm	TPCO	API 5C5	Pass
P110	4.5 in	114.30*7.37mm	TPCO	ISO 13679:2002	Pass
J55	5.5in	139.70*7.72mm	TPCO	API 5C5	Pass
N80	5.5 in	139.70*9.17mm	TPCO	API 5C5	Pass
P110	5.5 in	139.70*10.54mm	TPCO	API 5C5	Pass

4. TP-JC Typical Application Cases

User	Northwest Oildfield Sinopec					
Location	Tahe Oildfield					
Size	TP110S/3-1/2"×9.20# (88.9×6.45 mm)					
Connection	TP-JC					
Well NO.	TH12410	TH12226	TOP19X	TK767	TH12219	TK262
MD	5539m	5510	5798m	5499.8m	6000m	5500m

TP-JC | T&C | 1.9in~5-1/2in

Imperial Units

Size (OD)		Nominal weight	Wall thickness		Standard Drift	Coupling OD	Make up loss	Coupling length	Tension Efficiency	Yield strength(1000lb.)						Exernal pressure(psi)						Minimum internal yield pressure(psi)					
inch	mm	lb./ft	inch	mm	inch	inch	inch	inch	%	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
1.9	48.26	3.65	0.2	5.08	1.406	2.283	2.165	5.118	100	59	85	101	117	134	150	10360	15070	17890	20720	23550	26370	10130	14740	17500	20260	23030	25790
2-3/8	60.32	4.00	0.167	4.24	1.947	2.875	2.559	5.906	100	64	93	110	127	145	162	7190	9980	11410	12740	13980	15110	6770	9840	11690	13540	15380	17230
		4.60	0.190	4.83	1.901	2.875	2.559	5.906	100	72	104	124	143	163	183	8100	11780	13980	16130	17900	19580	7710	11200	13300	15400	17500	19600
		5.80	0.254	6.45	1.773	2.875	2.559	5.906	100	93	135	161	186	212	237	10510	15280	18150	21010	23880	26740	10290	14970	17780	20590	23390	26200
		6.60	0.295	7.49	1.691	2.875	2.559	5.906	100	106	154	183	212	241	270	11960	17410	20670	23930	27200	30460	11950	17390	20650	23910	27170	30430
		7.35	0.336	8.53	1.609	2.875	2.559	5.906	100	118	172	204	237	269	301	13360	19430	23080	26720	30360	34010	13610	19810	23520	27230	30950	34660
2-7/8	73.02	6.40	0.217	5.51	2.347	3.500	2.953	6.693	100	100	145	172	199	227	254	7670	11170	12940	14550	16070	17490	7260	10570	12550	14530	16510	18490
		7.80	0.276	7.01	2.229	3.500	2.953	6.693	100	124	180	214	248	282	316	9550	13890	16490	19090	21700	24300	9240	13440	15960	18480	21000	23520
		8.60	0.308	7.82	2.165	3.500	2.953	6.693	100	137	199	236	273	311	348	10520	15300	18170	21040	23910	26780	10310	15000	17810	20620	23430	26250
		9.35	0.340	8.64	2.101	3.500	2.953	6.693	100	149	217	257	298	339	379	11480	16680	19810	22940	26070	29200	11390	16560	19660	22770	25870	28970
		10.50	0.392	9.96	1.997	3.500	2.953	6.693	100	168	245	291	336	382	428	12960	18840	22370	25910	29440	32970	13130	19090	22670	26250	29830	33410
		11.50	0.440	11.18	1.901	3.500	2.953	6.693	100	185	269	320	370	421	471	14260	20740	24630	28520	32410	36290	14740	21430	25440	29460	33480	37500
3-1/2	88.90	7.70	0.216	5.49	2.943	4.250	3.150	7.087	100	123	178	212	245	279	312	5980	7870	8850	9730	10500	11140	5940	8640	10260	11880	13500	15120
		9.20	0.254	6.45	2.867	4.250	3.150	7.087	100	142	207	246	285	324	363	7400	10540	12080	13530	14890	16150	6980	10160	12070	13970	15880	17780
		10.20	0.289	7.34	2.797	4.250	3.150	7.087	100	160	233	277	321	364	408	8330	12120	14390	16670	18940	20770	7950	11560	13730	15900	18060	20230
		12.70	0.375	9.52	2.625	4.250	3.150	7.087	100	202	295	350	405	460	515	10520	15310	18180	21050	23920	26790	10310	15000	17810	20630	23440	26250
		14.30	0.430	10.92	2.515	4.250	3.150	7.087	100	228	332	394	456	518	581	11850	17240	20480	23710	26940	30170	11820	17200	20430	23650	26880	30100
		15.50	0.476	12.09	2.423	4.250	3.150	7.087	100	249	362	430	497	565	633	12930	18800	22330	25850	29380	32900	13090	19040	22610	26180	29750	33320
		17.00	0.530	13.46	2.315	4.250	3.150	7.087	100	272	396	470	544	618	692	14130	20560	24410	28270	32120	35980	14570	21200	25180	29150	33130	37100
4	101.60	9.50	0.226	5.74	3.423	4.750	3.346	7.480	100	147	214	255	295	335	375	5110	6590	7310	7910	8390	8730	5440	7910	9390	10880	12360	13840
		10.70	0.262	6.65	3.351	4.750	3.346	7.480	100	169	246	292	338	385	431	6590	8800	9980	11060	12030	12890	6300	9170	10890	12610	14330	16050
		13.20	0.330	8.38	3.215	4.750	3.346	7.480	100	209	304	361	419	476	533	8320	12110	14380	16650	18910	20740	7940	11550	13720	15880	18050	20210
		16.10	0.415	10.54	3.045	4.750	3.346	7.480	100	257	374	444	514	584	654	10230	14880	17670	20460	23250	26040	9980	14530	17250	19970	22700	25420
		18.90	0.500	12.70	2.875	4.750	3.346	7.480	100	302	440	522	605	687	770	12030	17500	20780	24060	27340	30630	12030	17500	20780	24060	27340	30630
		22.20	0.610	15.49	2.655	4.750	3.346	7.480	89.3	319	464	551	639	726	813	14210	20670	24560	28430	32310	36190	14670	21340	25350	29360	33360	37360
4-1/2	114.30	12.60	0.271	6.88	3.833	5.200	3.543	7.874	100	198	288	342	396	450	504	5720	7500	8410	9210	9890	10450	5790	8430	10010	11590	13170	14750
		15.20	0.337	8.56	3.701	5.200	3.543	7.874	100	242	353	419	485	551	617	7620	11080	12760	14340	15830	17220	7210	10480	12450	14420	16380	18350
		17.00	0.380	9.65	3.615	5.200	3.543	7.874	100	270	393	467	541	615	689	8500	12370	14690	17010	19330	21630	8130	11820	14040	16260	18470	20690
		18.90	0.430	10.92	3.515	5.200	3.543	7.874	100	302	440	522	605	687	770	9510	13830	16420	19010	21610	24200	9200	13380	15890	18390	20900	23410
		21.50	0.500	12.70	3.375	5.200	3.543	7.874	97.7	338	491	583	675	767	859	10860	15800	18770	21730	24690	27650	10690	15560	18470	21390	24310	27220
		23.70	0.560	14.22	3.255	5.200	3.543	7.874	88.6	338	491	583	675	767	859	11980	17430	20700	23970	27240	30510	11970	17420	20690	23960	27220	30490
5	127.00	11.50	0.220	5.59	4.435	5.800	3.740	8.465	100	182	264	314	364	413	463	3060	3560	3900	4150	4310	4380	4240	6160	7320	8470	9630	10780
		13.00	0.253	6.43	4.369	5.800	3.740	8.465	100	208	302	359	415	472	529	4150	5140	5560	5850	6050	6370	4870	7090	8420	9750	11080	12400
		15.00	0.296	7.52	4.283	5.800	3.740	8.465	100	241	350	416	481	547	613	5560	7250	8110	8860	9480	9990	5700	8290	9840	11400	12950	14510
		18.00	0.362	9.19	4.151	5.800	3.740	8.465	100	290	422	501	580	659	738	7380	10480	12010	13460	102.1	16060	6960	10130	12030	13930	109.1	17730
		21.40	0.437	11.10	4.001	5.800	3.740	8.465	100	345	501	595	689	783	877	8770	12760	15150	17550	19940	22330	8410	12240	14530	16820	19120	21410
		23.20	0.478	12.14	3.919	5.800	3.740	8.465	100	373	543	645	747	849	951	9510	13830	16430	19020	21610	24210	9200	13380	15890	18400	20910	23420
		24.10	0.500	12.70	3.875	5.800	3.740	8.465	100	389	565	672	778	884	990	9900	14400	17100	19800	22500	25200	9630	14000	16630	19250	21880	24500
5-1/2	139.7	15.50	0.275	6.98	4.825	6.30	3.94	8.86	100.0	248	361	429	496	564	632	4040	4980	5370	5620	5880	5170	4810	6990	8310	9620	10930	12240
		17.00	0.304	7.72	4.767	6.30	3.94	8.86	100.0	273	397	471	546	620	695	4910	6280	6940	7470	7880	8170	5320	7740	9190	10640	12090	13540
		20.00	0.361	9.17	4.653	6.30	3.94	8.86	100.0	321	466	554	641	729	816	6620	8830	10020	11100	12090	12960	6320	9190	10910	12640	14360	16080
		23.00	0.415	10.54	4.545	6.30	3.94	8.86	100.0	365	530	630	729	829	928	7670	11160	12930	14540	16060	17490	7260	10560	12540	14520	16500	18480
		26.80	0.500	12.70	4.375	6.30	3.94	8.86	100.0	432	628	746	864	982	1100	9090	13220	15700	18180	20660	23140	8750	12730	15110	17500	19890	22270
		29.70	0.562	14.27	4.251	6.30	3.94	8.86	99.2	476	692	821	951	1081	1210	10090	14670	17430	20180	22930	25680	9830	14300	16980	19660	22340	25030

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

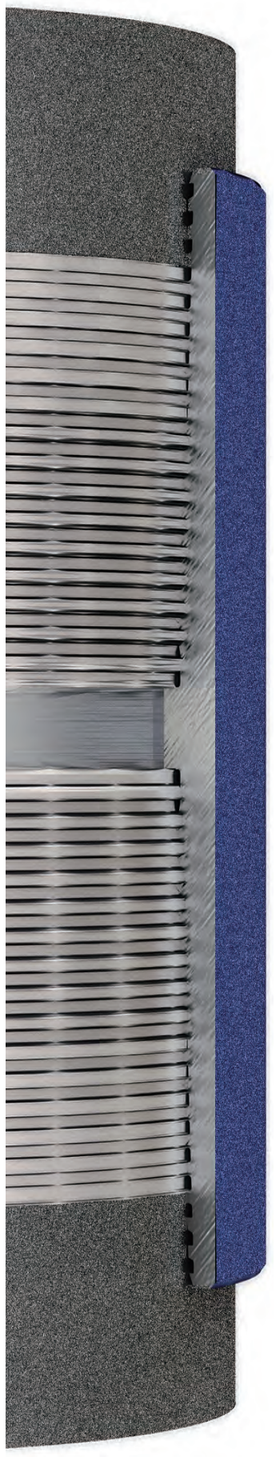
TP-JC | T&C | 1.9in~5-1/2in

Metric Units

Size (OD)		Nominal weight	Wall thickness		Standard Drift	Standard Coupling OD	Make up loss	Coupling length	Tension Efficiency	Yield strength(KN)						Exernal pressure(MPa)						Minimum internal yield pressure(MPa)					
inch	mm	lb./ft	inch	mm	mm	mm	mm	mm	%	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
1.9	48.26	3.65	0.2	5.08	35.72	58	55	130	100	261	380	451	523	594	665	71.4	103.9	123.3	142.9	162.4	181.8	69.8	101.6	120.7	139.7	158.8	177.8
2-3/8	60.32	4.00	0.167	4.24	49.46	73.02	65.00	150.00	100	283	414	489	565	644	721	49.6	68.8	78.7	87.8	96.4	104.2	46.6	67.8	80.6	93.4	106.0	118.8
		4.60	0.190	4.83	48.28	73.02	65.00	150.00	100	319	463	552	636	726	814	55.9	81.2	96.4	111.2	123.4	135.0	53.1	77.2	91.7	106.2	120.7	135.1
		5.80	0.254	6.45	45.04	73.02	65.00	150.00	100	414	601	716	827	941	1054	72.4	105.4	125.1	144.9	164.6	184.4	71.0	103.2	122.6	142.0	161.3	180.6
		6.60	0.295	7.49	42.95	73.02	65.00	150.00	100	471	685	814	943	1071	1201	82.5	120.0	142.5	165.0	187.5	210.0	82.4	119.9	142.4	164.9	187.3	209.8
		7.35	0.336	8.53	40.87	73.02	65.00	150.00	100	526	765	907	1054	1196	1339	92.1	134.0	159.1	184.2	209.3	234.5	93.8	136.6	162.2	187.7	213.4	239.0
2-7/8	73.02	6.40	0.217	5.51	59.62	88.90	75.00	170.00	100	443	645	765	885	1007	1130	52.9	77.0	89.2	100.3	110.8	120.6	50.1	72.9	86.5	100.2	113.8	127.5
		7.80	0.276	7.01	56.62	88.90	75.00	170.00	100	551	801	952	1103	1253	1406	65.8	95.8	113.7	131.6	149.6	167.5	63.7	92.7	110.0	127.4	144.8	162.2
		8.60	0.308	7.82	54.99	88.90	75.00	170.00	100	607	885	1050	1214	1380	1548	72.5	105.5	125.3	145.1	164.9	184.6	71.1	103.4	122.8	142.2	161.5	181.0
		9.35	0.340	8.64	53.37	88.90	75.00	170.00	100	663	965	1143	1326	1506	1686	79.1	115.0	136.6	158.2	179.7	201.3	78.5	114.2	135.6	157.0	178.4	199.7
		10.50	0.392	9.96	50.72	88.90	75.00	170.00	100	748	1090	1294	1495	1701	1904	89.3	129.9	154.2	178.6	203.0	227.3	90.5	131.6	156.3	181.0	205.7	230.4
		11.50	0.440	11.18	48.29	88.90	75.00	170.00	100	824	1197	1423	1646	1872	2095	98.3	143.0	169.8	196.6	223.5	250.2	101.6	147.8	175.4	203.1	230.8	258.6
3-1/2	88.90	7.70	0.216	5.49	74.74	107.95	80.00	180.00	100	546	794	942	1090	1240	1388	41.2	54.3	61.1	67.1	72.4	76.8	41.0	59.6	70.8	81.9	93.1	104.2
		9.20	0.254	6.45	72.82	107.95	80.00	180.00	100	634	921	1094	1268	1440	1615	51.0	72.7	83.3	93.3	102.7	111.4	48.1	70.1	83.2	96.3	109.5	122.6
		10.20	0.289	7.34	71.04	107.95	80.00	180.00	100	713	1036	1232	1428	1621	1815	57.4	83.6	99.2	114.9	130.6	143.2	54.8	79.7	94.7	109.6	124.5	139.5
		12.70	0.375	9.52	66.68	107.95	80.00	180.00	100	900	1312	1557	1802	2046	2291	72.5	105.6	125.3	145.1	164.9	184.7	71.1	103.4	122.8	142.2	161.6	181.0
		14.30	0.430	10.92	63.88	107.95	80.00	180.00	100	1014	1477	1753	2028	2306	2584	81.7	118.9	141.2	163.5	185.7	208.0	81.5	118.6	140.9	163.1	185.3	207.5
		15.50	0.476	12.09	61.54	107.95	80.00	180.00	100	1106	1610	1913	2211	2514	2816	89.1	129.6	154.0	178.2	202.6	226.8	90.2	131.3	155.9	180.5	205.1	229.7
		17.00	0.530	13.46	58.80	107.95	80.00	180.00	100	1210	1760	2091	2420	2749	3078	97.4	141.8	168.3	194.9	221.5	248.1	100.5	146.2	173.6	201.0	228.4	255.8
4	101.60	9.50	0.226	5.74	86.94	120.65	85.00	190.00	100	656	952	1134	1312	1490	1668	35.2	45.4	50.4	54.5	57.8	60.2	37.5	54.5	64.7	75.0	85.2	95.4
		10.70	0.262	6.65	85.12	120.65	85.00	190.00	100	752	1094	1299	1503	1710	1917	45.4	60.7	68.8	76.3	82.9	88.9	43.4	63.2	75.1	86.9	98.8	110.7
		13.20	0.330	8.38	81.66	120.65	85.00	190.00	100	931	1352	1606	1864	2115	2371	57.4	83.5	99.1	114.8	130.4	143.0	54.7	79.6	94.6	109.5	124.5	139.3
		16.10	0.415	10.54	77.34	120.65	85.00	190.00	100	1143	1664	1975	2286	2599	2909	70.5	102.6	121.8	141.1	160.3	179.5	68.8	100.2	118.9	137.7	156.5	175.3
		18.90	0.500	12.70	73.03	120.65	85.00	190.00	100	1345	1957	2322	2691	3057	3425	82.9	120.7	143.3	165.9	188.5	211.2	82.9	120.7	143.3	165.9	188.5	211.2
		22.20	0.610	15.49	67.44	120.65	85.00	190.00	89.4	1419	2064	2451	2842	3229	3616	98.0	142.5	169.3	196.0	222.8	249.5	101.1	147.1	174.8	202.4	230.0	257.6
4-1/2	114.30	12.60	0.271	6.88	97.36	132.08	90.00	200.00	100	880	1281	1521	1761	2001	2242	39.4	51.7	58.0	63.5	68.2	72.1	39.9	58.1	69.0	79.9	90.8	101.7
		15.20	0.337	8.56	94.01	132.08	90.00	200.00	100	1078	1570	1864	2157	2451	2745	52.5	76.4	88.0	98.9	109.1	118.7	49.7	72.3	85.8	99.4	112.9	126.5
		17.00	0.380	9.65	91.82	132.08	90.00	200.00	100	1203	1748	2077	2406	2734	3065	58.6	85.3	101.3	117.3	133.3	149.1	56.1	81.5	96.8	112.1	127.3	142.7
		18.90	0.430	10.92	89.28	132.08	90.00	200.00	100	1345	1957	2322	2691	3057	3425	65.6	95.4	113.2	131.1	149.0	166.9	63.4	92.3	109.6	126.8	144.1	161.4
		21.50	0.500	12.70	85.73	132.08	90.00	200.00	97.7	1502	2184	2594	3004	3413	3823	74.9	108.9	129.4	149.8	170.2	190.6	73.7	107.3	127.3	147.5	167.6	187.7
		23.70	0.560	14.22	82.68	132.08	90.00	200.00	88.6	1502	2184	2594	3004	3413	3823	82.6	120.2	142.7	165.3	187.8	210.4	82.5	120.1	142.7	165.2	187.7	210.2
5	127.00	11.50	0.220	5.59	112.64	147.32	95.00	215.00	100	809	1176	1397	1617	1838	2058	21.1	24.5	26.9	28.6	29.7	30.2	29.2	42.5	50.5	58.4	66.4	74.3
		13.00	0.253	6.43	110.96	147.32	95.00	215.00	100	924	1343	1595	1847	2099	2351	28.6	35.4	38.3	40.3	41.7	43.9	33.6	48.9	58.1	67.2	76.4	85.5
		15.00	0.296	7.52	108.78	147.32	95.00	215.00	100	1070	1557	1849	2141	2433	2725	38.3	50.0	55.9	61.1	65.4	68.9	39.3	57.2	67.8	78.6	89.3	100.0
		18.00	0.363	9.19	105.44	147.32	95.00	215.00	100	1290	1876	2228	2580	2931	3283	50.9	72.3	82.8	92.8	102.1	110.7	48.0	69.8	82.9	96.0	109.1	122.2
		21.40	0.437	11.10	101.62	147.32	95.00	215.00	100	1533	2229	2647	3065	3483	3901	60.5	88.0	104.5	121.0	137.5	154.0	58.0	84.4	100.2	116.0	131.8	147.6
		23.20	0.478	12.14	99.54	147.32	95.00	215.00	100	1661	2416	2869	3322	3775	4228	65.6	95.4	113.3	131.1	149.0	166.9	63.4	92.3	109.6	126.9	144.2	161.5
		24.10	0.500	12.70	98.42	147.32	95.00	215.00	100	1729	2515	2987	3459	3930	4402	68.3	99.3	117.9	136.5	155.1	173.7	66.4	96.5	114.7	132.7	150.9	168.9
5-1/2	139.7	15.50	0.275	6.98	122.56	160.02	100.00	225.00	100.0	1104	1605	1906	2207	2508	2809	27.9	34.3	37.0	38.7	40.5	42.5	33.2	48.2	57.3	66.3	75.4	84.4
		17.00	0.304	7.72	121.08	160.02	100.00	225.00	100.0	1214	1766	2097	2428	2759	3090	33.9	43.3	47.8	51.5	54.3	56.3	36.7	53.4	63.4	73.4	83.4	93.4
		20.00	0.361	9.17	118.18	160.02	100.00	225.00	100.0	1426	2074	2463	2852	3241	3630	45.6	60.9	69.1	76.5	83.4	89.4	43.6	63.4	75.2	87.1	99.0	110.9
		23.00	0.415	10.54	115.44	160.02	100.00	225.00	100.0	1622	2359	2801	3244	3686	4128	52.9	76.9	89.1	100.2	110.7	120.6	50.1	72.8	86.5	100.1	113.8	127.4
		26.80	0.500	12.70	111.12	160.02	100.00	225.00	100.0	1921	2795	3319	3843	4367	4891	62.7	91.1	108.2	125.3	142.4	159.5	60.3	87.8	104.2	120.7	137.1	153.5
		29.70	0.562	14.27	107.98	160.02	100.00	225.00	99.2	2115	3077	3654	4231	4807	5384	69.6	101.1	120.2	139.1	158.1	177.1	67.8	98.6	117.1	135.6	154.0	172.6

NOTE:
The data are for reference only, subject to change without prior notice.
If the table outside the specifications that you need, please contact TPCO R&D Center.

Tianjin Pipe Corporation
Tianjin Pipe International Economic & Trading Corporation
Add.: No.396, Jintang Road, Dongli District, Tianjin, P.R. China
Tel.: +86 22 6628 0988
Fax: +86 22 6628 0681
P.C.: 300301
www.tpcointernational.com



2022 Version 01

TPCO

Semi-Premium

TP-QR

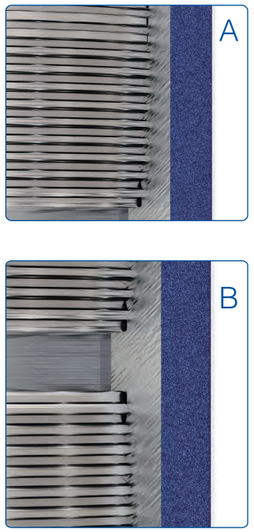
- Metal-to-Metal gas tight Premium Connection
  - TP-CQ series — T&C
  - TP-G2 series — T&C
  - NEW TP-G4 series — T&C
  - NEW TP-WG — T&C
  - NEW TP-NF3 — T&C Semi-flush
  - TP-FJ/II — Integral Flush
  - TP-SFJ — Integral Upset
  - TP-ISF — Integral Upset
  - TP-TW — Particular Condition
  - TP-FE — Particular Condition
- Semi Premium Connection
  - TP-BM(S) — T&C
  - TP-JC — T&C
  - TP-QR — T&C

Tianjin Pipe Corporation

TP-QR 13-3/8in～24in

Large diameter with fast make-up speed premium connection for casing.

- 3T.P.I Coarse Thread Enable Fast Make-up and no Cross-thread
- Torque Shoulder Provides Accurate Power Tight Make-up
- Seal-ability is better than API Buttress Thread
- Internal Flush
- Applied to Surface Casing
- ISO 13679 :2002 Approved



Hooked Thread
Taper=1:12
Lead=3T.P.I

Vertical Torque Shoulder

Description

1.1 Threaded Connection

Coarse thread form with a taper of 1:12, 3T.P.I, fast and easy running and avoids cross-threading. A modified hook thread profile with 4° reverse angle on the load flank, not only provides the connection with superior tension strength but also increases its resistance to compression. Optimized thread geometry minimizes the risk of galling.

1.2 Torque Shoulder

The torque shoulder provides accurate power tight make-up, which also enables connection to withstand higher compression load.

1.3 Internal Profile

The streamlined internal profile minimizes turbulence and energy loss when high-velocity gas flows.

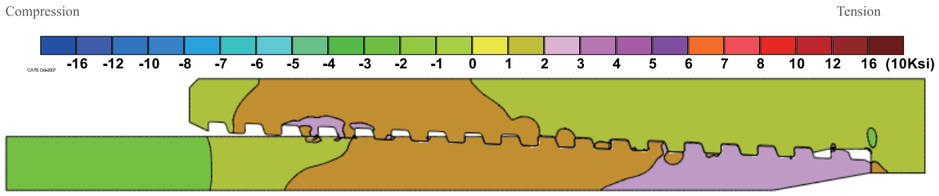
1.4 Coupling Design

Because the coupling covers the vanishing threads, the connection tensile efficiency is maximized.

1.6 Lower Stress Design

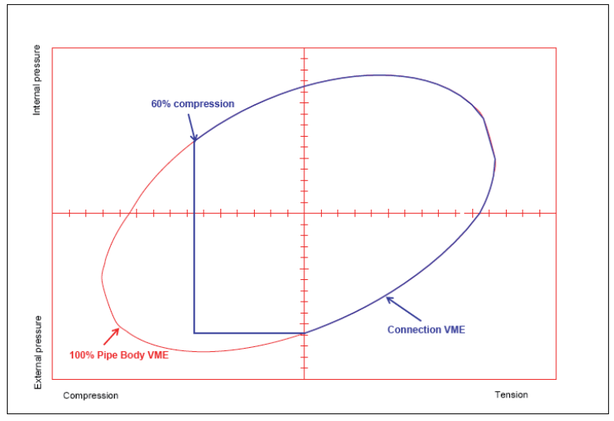
The lower stress design makes the connections reliable in Corrosive conditions.

2. Finite Element Analysis on TP-QR



Finite Element Analysis graphically illustrates the low-stress design which makes TP-QR excellent choices for critical well applications.

VME envelope application

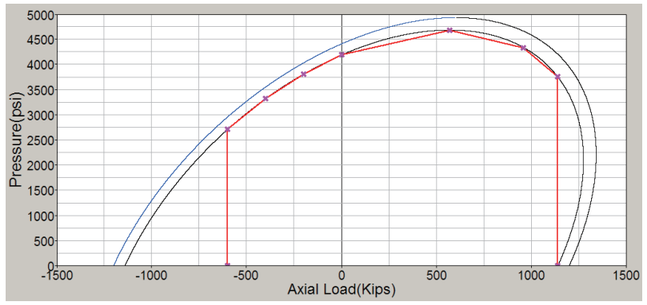


3. Test Reports: TP-QR @ TPCO

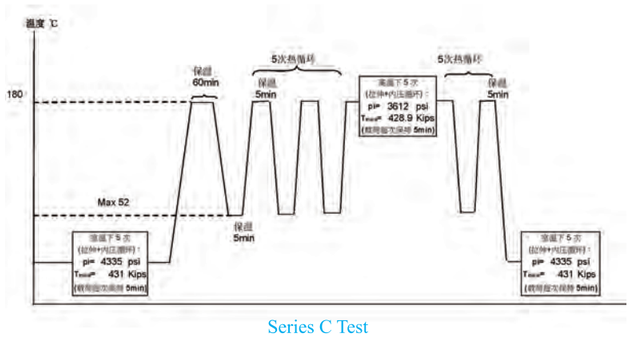
3.1 J55 ksi 13-3/8in 68.0PPF (339.72×12.19mm)

ISO 13679:2002 CAL II:

- Bending=5°/100' (30.48 m)
- VME=95%
- Compression=50%P.B.Y.S
- Thermal Cycling@90%VME: 100times



Series B Test

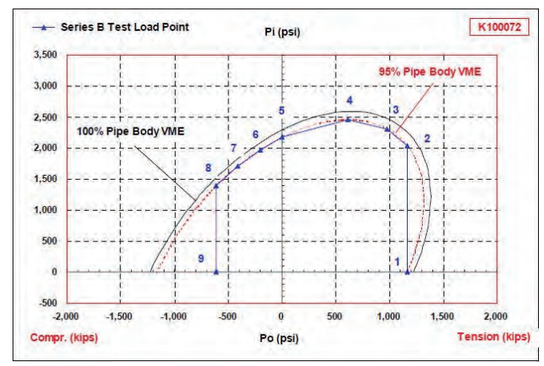


Series C Test

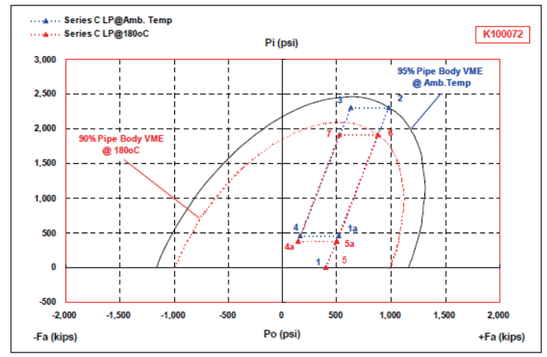
3.2 K55 ksi 18-5/8in 87.5PPF (473.08×11.05mm)

ISO 13679:2002 CAL II:

- VME=95%
- Compression=50%P.B.Y.S
- Thermal Cycling@90%VME: 100times



Series B Test



Series C Test

3.3 Qualification Test Summary for TP-QR

Connection	Size	Grade	Weight lbs/ft	Anti-galling Treatment	Test Spec.	CAL Level	Load Condition	Test Lab	Date
TP-QR	13 3/8 in	J55	68.0	Box: Phosphating	ISO 13679:2002	CAL II (Abbreviated)	1*H(A)/L(B) were tested with ISO B(50%Compr.)+C(Temperature 180℃) Bending=5o/100', VME=95%	TPCO	2009.05
TP-QR	18 5/8 in	K55	87.5	Box: Phosphating	ISO 13679:2002	CAL II (Abbreviated)	1*H(A)/L(B) were tested with ISO B(50%Compr.)+C(Temperature 180℃) VME=95%	TPCO	2010.03

Imperial Units

Size (OD)	Nominal weight	Wall thickness		Drift	Coupling OD	Make up loss	Coupling length	Yield strength(1000lb.)						Exernal pressure(psi)						Minimum internal yield pressure(psi)					
inch mm	lb./ft	inch	mm	inch	inch	inch	inch	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi	55ksi	80ksi	95ksi	110ksi	125ksi	140ksi
13-3/8 339.72	54.00	0.380	9.65	12.459	14.375	6.201	13.386	853	1241	1473	1706	1939	2171	1130	1140	1140	1140	1140	1140	2730	3980	4720	5470	6210	6960
	61.00	0.430	10.92	12.359	14.375	6.201	13.386	962	1399	1661	1923	2185	2448	1540	1670	1670	1670	1670	1670	3090	4500	5340	6190	7030	7880
	68.00	0.480	12.19	12.259	14.375	6.201	13.386	1069	1555	1847	2139	2430	2722	1950	2260	2330	2330	2330	2330	3450	5020	5970	6910	7850	8790
	72.00	0.514	13.06	12.191	14.375	6.201	13.386	1142	1661	1973	2284	2595	2907	2230	2670	2820	2880	2880	2880	3700	5380	6390	7400	8410	9420
16 406.40	84.00	0.495	12.57	14.822	17.000	6.240	13.465	1326	1929	2291	2652	3014	3376	1410	1480	1480	1480	1480	1480	2980	4330	5140	5960	6770	7580
18-5/8 473.08	87.50	0.435	11.05	17.567	20.000	6.240	13.465	1367	1989	2362	2734	3107	3480	630	630	630	630	630	630	2250	3270	3880	4500	5110	5720
	96.50	0.485	12.32	17.467	20.000	6.240	13.465	1520	2211	2626	3040	3455	3870	870	870	870	870	870	870	2510	3650	4330	5010	5700	6380
	127.50	0.649	16.48	17.140	20.000	6.240	13.465	2016	2932	3482	4032	4581	5131	1830	2100	2130	2130	2130	2130	3350	4880	5790	6710	7620	8540
18-3/4 476.32	152.41	0.783	19.88	17.000	20.000	6.240	13.465	2431	3536	4199	4862	5525	6188	2690	3200	3460	3640	3720	3720	4020	5850	6940	8040	9130	10230
478.56	160.53	0.827	21.00	17.000	20.000	6.240	13.465	2450	3564	4232	4900	5568	6236	3040	3540	3880	4120	4280	4340	4220	6150	7300	8450	9600	10750
20 508.00	94.00	0.438	11.13	18.936	21.000	6.240	13.465	1480	2153	2557	2961	3365	3768	520	520	520	520	520	520	2110	3070	3640	4220	4790	5370
	106.50	0.500	12.70	18.813	21.000	6.240	13.465	1685	2450	2910	3369	3829	4288	770	770	770	770	770	770	2410	3500	4160	4810	5470	6130
	14.30	0.563	14.30	18.687	21.000	6.240	13.465	1891	2750	3266	3782	4297	4813	1100	1100	1100	1100	1100	1100	2710	3940	4680	5420	6160	6900
	133.00	0.635	16.13	18.543	21.000	6.240	13.465	2089	3039	3609	4179	4748	5318	1500	1600	1600	1600	1600	1600	3060	4450	5280	6110	6950	7780
	147.60	0.709	18.00	18.395	21.000	6.240	13.465	2089	3039	3609	4179	4748	5318	1900	2190	2250	2250	22550	2250	3410	4960	5890	6820	7750	8690
	167.65	0.812	20.62	18.189	21.000	6.240	13.465	2089	3039	3609	4179	4748	5318	2500	3020	3240	3370	3410	3410	3520	5120	6070	7030	7990	8950
	203.70	1.000	25.40	17.813	21.000	6.240	13.465	2089	3039	3609	4179	4748	5318	4040	4990	5380	5630	5890	6180	4330	6300	7480	8660	9840	11030
24 609.60	152.30	0.600	15.24	22.613	25.000	6.240	13.465	2426	3529	4190	4852	5513	6175	770	770	770	770	770	770	2410	3500	4160	4810	5470	6130

NOTE:
The data are for reference only.
For size expansion and more infromation please contact TPCO Internatioal Trading Dept. or R&D Center.