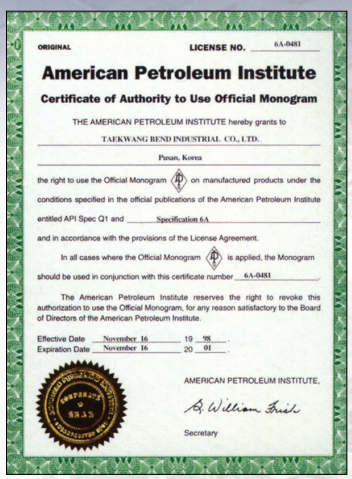
TK corporation

HIGH PRESSURE FITTINGS

SINCE 1965

1965. Establishment in Busan, Korea
1977. Approved as a shipbuilding fitting maker by DET NORSK VERITAS(DNV).
1983. Approved as a material manufacturer by K.HI.C. for nuclear power division.
Approved by ARAMCO for ZULUF and MARJAN project.
Approved by SAUDI DAVY for YANBU interconnecting pipelines phase Ⅱ project and by BROWN & ROOT for MARJAN project.
1984. Approved by BUREAU VERITAS(BV) for shipbuilding.
Approved by ESSO.EMPI for Guntong, Tabu and Palas project.
1985. Approved by JBE & C for SAN MIGUEL, NC-41B project.
Approved by SHELL BERHAD(SSD)ENG, F6-A project.
Approved by SARAWAK for SSB ENG, F6-A project.
Approved by EXXON for SYU project.
1986. Approved by TEXACO for LOMBO project and by EIL for IP/IG/IH project
1988. Approved by NKK for ONGC project.
Approved as a fitting manufacturer by KEPCO(CLASS:Q, ASME SEC. Ⅲ)
1989. Approved as a fitting manufacturer by K.H.I.C(CLASS:Q, ASME SEC. Ⅲ)
1992. Approved as a fitting manufacturer by HHI.
Authorized as a "NPT" Stamp & "Material Manufacture" & "Material Supplier" by the American Society Mechanical Engineers (ASME Certificate Number : N-2870).
1993. Approved by ONGC & EIL for SHG, SHW, C-Ⅱ, NPC, NQP.
1995. Re-authorized as a ASME Certificate Number N-2870 by the ASME.
1997. Authorized as a ISO 9002 by BUREAU VERITAS(B.V).
1998. Re-authorized as a ASME Certificate Number N-2870 by the ASME.
Authorized as a ISO 9001 by HSB-RS(certificate Registration Number 210)
Authorized as a "API MONOGRAM" by American Petroleum Institute (API Certificate Number 6A-0481)
Supplied High Pressure Fittings(Studded block etc.) for CONOCO Drillship project of R&B FALCON
1999. Supplied High Pressure Fittings(Long sweep elbow & Tee, Studded block etc.) for SAIPEM S10000 Drillship project and NAVIS EXPLORER 1 Drillship project.
2000. APPROVED AS A FITTING MANUFACTURER BY SHELL EASTERN PETROLEUM(PTE) LTD.
2001. APPROVED AS A FITTING MANUFACTURER BY ARAMCO OVERSEAS COMPANY B.V
2001. COMPANY NAME WAS CHANGE INTO TK CORPORATION
2001. AUTHORIZED AS A "PP" & "S" STAMP BY THE AMERICAN SOCIETY MECHANICAL ENGINEERS
AUTHORIZED AS A PED BY HSB-RS(IDENT-NO 0871)
2002. AUTHORIZED AS A "JIS" MARK BY KOREAN STANDARDS ASSOCIATION
AUTHORIZED AS A PED BY HSB-RS(IDENT-NO 1871)
2003. APPROVED BY DET NORSKE VERITAS(DNV):CERTIFICATE NO. AMM-1756
2003. NOMINATED AS ENVIRONMENT CONTROL CO-OPERATIVE COMPANY BY BUSAN CITY
2004. TK SCT R&D CENTER WAS APPROVED BY KOREA INDUSTRIAL TECHNOLOGY PROMOTION ASSOCIATION
2004. APPROVED BY EXXON MOBIL ASIA PACIFIC PTE LTD
2005. 4. 06 APPROVED AS FITTING MANUFACTURER BY GS CALTEX
2005. 5. 24 REGISTER A PATENT FOR FITTING MANUFACTURING(PATENT NO. 0492747
2005. 8. 25 JOIN INTERNATIONAL CONSTRUCTION ASSOCIATION OF KOREA AS A ASSOCIATE MEMBER
2005. 8. 25 REGISTER TRADE MARK(T-LOK AND TK-LOK, RCG, NO.:0629214-5)
2005. BUILT NEW WAREHOUSE LOCATED AT JINHAE MACHUN COMPLEX CORP.
2006. EXPANDED NEAR DOUBLE THE PRODUCTION CAPACITY SINCE 2005, IVESTING USD 30MIL. (FROM 3,000TON TO 5,000TON PER A MANTH)
2007. APPROVED BY EXXONMOBIL IN MOVING TO ALL AREAS FROM ASIA PACIFICE AREA ADDENDUM



ORIGINAL LICENSE NO. 6A-0481

American Petroleum Institute

Certificate of Authority to Use Official Monogram

THE AMERICAN PETROLEUM INSTITUTE hereby grants to

TAEKWANG BEND INDUSTRIAL CO., LTD.

Pusan, Korea

the right to use the Official Monogram on manufactured products under the conditions specified in the official publications of the American Petroleum Institute entitled API Spec Q1 and Specification 6A and in accordance with the provisions of the License Agreement.

In all cases where the Official Monogram is applied, the Monogram should be used in conjunction with this certificate number 6A-0481

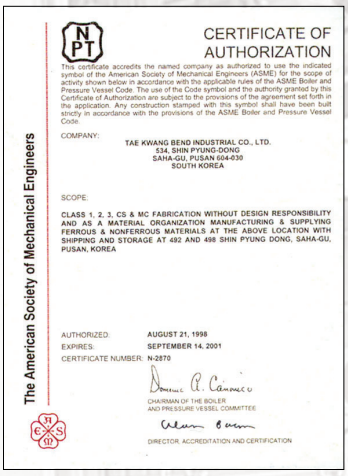
The American Petroleum Institute reserves the right to revoke this authorization to use the Official Monogram, for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

Effective Date November 16 19 98
Expiration Date November 16 20 01

AMERICAN PETROLEUM INSTITUTE.

William Finch

Secretary



The American Society of Mechanical Engineers

CERTIFICATE OF AUTHORIZATION

This certificate accredits the named company as authorized to use the indicated symbol of the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the Code symbol and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this symbol shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

TAE KWANG BEND INDUSTRIAL CO., LTD.
534, SHIN PYUNG-DONG
SAHA-GU, PUSAN 604-030
SOUTH KOREA

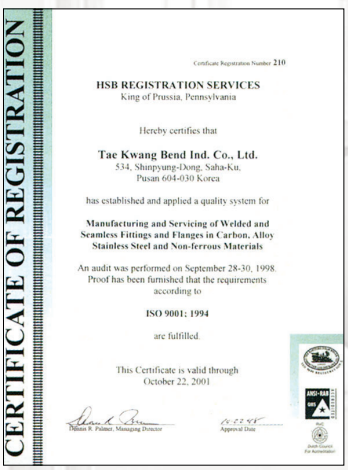
SCOPE:

CLASS 1, 2, 3, CS & MC FABRICATION WITHOUT DESIGN RESPONSIBILITY AND AS A MATERIAL ORGANIZATION MANUFACTURING & SUPPLYING FERROUS & NONFERROUS MATERIALS AT THE ABOVE LOCATION WITH SHIPPING AND STORAGE AT 492 AND 498 SHIN PYUNG DONG, SAHA-GU, PUSAN, KOREA

AUTHORIZED: AUGUST 21, 1998
EXPIRES: SEPTEMBER 14, 2001
CERTIFICATE NUMBER: N-2870

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

DIRECTOR ACCREDITATION AND CERTIFICATION



CERTIFICATE OF REGISTRATION

Certificate Registration Number 210

HSB REGISTRATION SERVICES
King of Prussia, Pennsylvania

Hereby certifies that

Tae Kwang Bend Ind. Co., Ltd.
534, Shinpyung-Dong, Saha-Ku,
Pusan 604-030 Korea

has established and applied a quality system for

Manufacturing and Servicing of Welded and Seamless Fittings and Flanges in Carbon, Alloy Stainless Steel and Non-ferrous Materials

An audit was performed on September 28-30, 1998
Proof has been furnished that the requirements according to

ISO 9001: 1994

are fulfilled.

This Certificate is valid through
October 22, 2001

Dennis R. Palmer, Managing Director

Approval Date

PRODUCTS

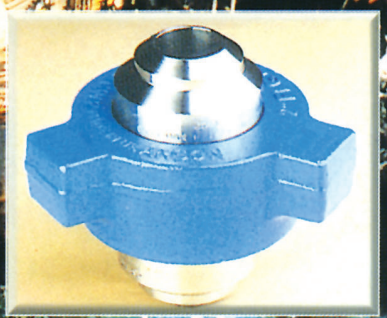
MANIFOLD FITTINGS

STUDDED TARGET BLOCKS

API FLANGES

CLAMP CONNECTIONS

HAMMER UNIONS



MATERIAL SPECIFICATION

DESIGNED **to meet international standards**

TK corporation High Pressure Fittings have been designed in accordance with the following standards:

MSS-SP-75 Specification for High Test Wrough Butt Weld Fittigs.

ANSI B31.3 Chemical Plant and Petroleum Refinery Piping.

AISI B16.9 Factory Made Wrought Steel Butt Weld Fittings.

NACE MR-01-75 Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment.

ASME Ⅷ Division 1 Section 13.10 Boiler and Pressure Vessel Code.

API 6A Specification for Wellhead and Christmas Tree Equipment.

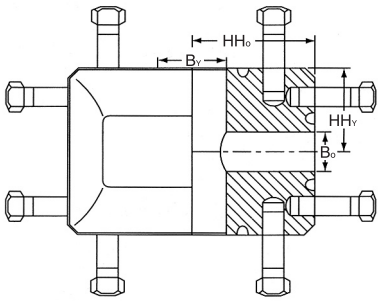
Material Specification Table

Element	%	A350 LF2 Mod	AISI 4130	A182 F316(L)	A182 F304	A182 F51
Carbon	Max.	0.22	0.33	0.035	0.08	0.03
	Min.	– –	0.28	– –	– –	– –
Sillicon	Max.	0.30	0.35	1.00	1.00	1.00
	Min.	0.15	0.15	– –	– –	– –
Manganese	Max.	0.35	0.60	2.00	2.00	2.00
	Min.	– –	0.40	0.04	– –	– –
Phosphorous	Max.	0.025	0.04	– –	0.04	0.03
	Min.	– –	– –	0.03	– –	– –
Sulphur	Max.	– –	0.04	– –	0.03	0.02
	Min.	– –	– –	14.00	– –	– –
Nickel	Max.	– –	– –	10.00	11.00	6.50
	Min.	– –	– –	18.00	8.00	4.50
Chromium	Max.	– –	1.10	16.00	– –	23.00
	Min.	– –	0.80	3.00	– –	21.00
Molybdenum	Max.	– –	0.25	2.00	– –	3.50
	Min.	– –	0.15	– –	– –	2.50
Copper	Max.	– –	– –	– –	– –	– –
	Min.	– –	– –	– –	– –	– –
Titanium	Max.	– –	– –	– –	– –	– –
	Min.	– –	– –	– –	– –	– –
Nitrogen	Max.	– –	– –	– –	– –	0.20
	Min.	– –	– –	– –	– –	0.15
Carbon Equivalent	Max.	0.42	– –	– –	– –	– –
Tensile Strength	Psi	70000	90000	75000	75000	90000
	N/mm^2	483	621	517	517	621
Yield Strength	Psi	52000	60000	30000	30000	65000
	N/mm^2	359	414	207	207	450
Hardness (Max.)		197 BHN	235 BHN	– –	– –	28 HRC
Impact Values	Joules	54/40	– –	– –	– –	70/65
at ℃		-46				-50
Heat Trestment	℃	Q+T	Q+T	S.A	S.A	S.A
Temper Temp.		650	650	– –	– –	– –
Corrosion Test		– –	– –	– –	– –	G48

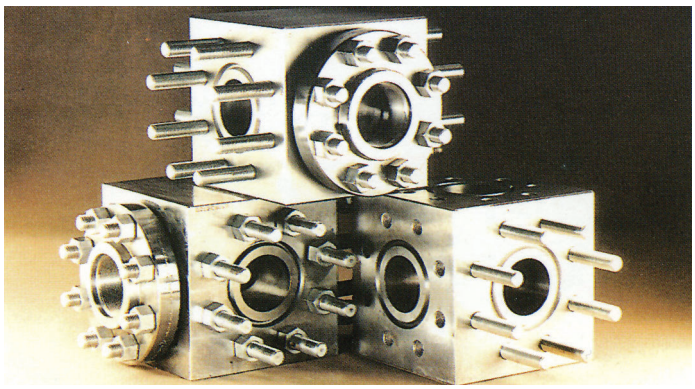
This data represents **TKcorporation** standard material specifications applicable to the **TKcorporation** product range.
Other material specification are available upon request.

TK corporation

API FLANGE STUDDED CROSSES & TEES



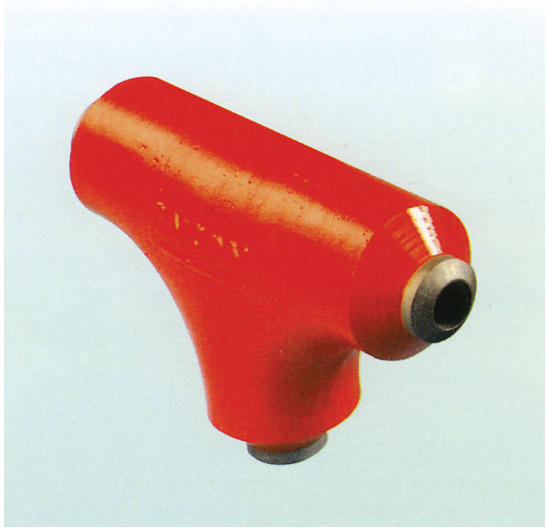
API Flange studded Cross & Tee

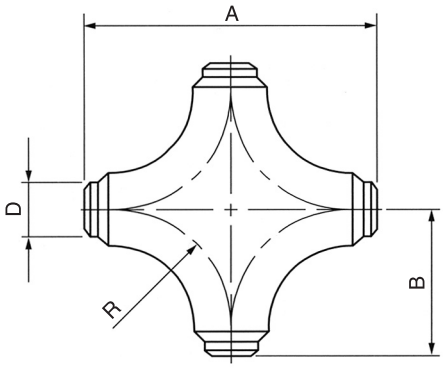


Rated Working Pressure (psi)	Vertical Bv +1,-0mm	Outlet Bo +1,-0mm	Center to Face Vertical Run, HHv ±0.8mm	Center to Face Horizontal Run, HHo ±0.8mm
2000	52	52	89.0	89.0
2000	65	52	89.0	101.5
2000	65	65	114.5	114.5
2000	78	52	114.5	114.5
2000	78	65	114.5	114.5
2000	78	78	114.5	114.5
2000	103	52	114.5	139.5
2000	103	65	114.5	139.5
2000	103	78	114.5	139.5
2000	103	103	139.5	139.5
3000	78	52	114.5	127.0
3000	78	65	127.0	127.0
3000	78	78	127.0	127.0
3000	103	52	114.5	156.0
3000	103	65	127.0	156.0
3000	103	78	127.0	156.0
3000	103	103	156.0	156.0
5000	52	52	114.5	114.5
5000	65	52	114.5	127.0
5000	65	65	127.0	127.0
5000	78	52	114.5	139.5
5000	78	65	139.5	139.5
5000	78	78	139.5	139.5
5000	103	52	114.5	165.0
5000	103	65	127.0	165.0
5000	103	78	139.5	165.0
5000	103	103	165.0	165.0
10000	46	46	111.0	111.0
10000	52	46	111.0	111.0
10000	52	52	111.0	111.0
10000	65	46	114.5	130.0
10000	65	52	114.5	130.0
10000	65	65	130.0	130.0
10000	78	46	114.5	149.0
10000	78	52	114.5	149.0

Rated Working Pressure (psi)	Vertical Bv +1,-0mm	Outlet Bo +1,-0mm	Center to Face Vertical Run, HHv ±0.8mm	Center to Face Horizontal Run, HHo ±0.8mm
10000	78	65	130.0	149.0
10000	78	78	149.0	149.0
10000	103	46	114.5	174.5
10000	103	52	114.5	174.5
10000	103	65	130.0	174.5
10000	103	78	149.0	174.5
10000	103	103	174.5	174.5
15000	46	46	127.0	127.0
15000	52	46	127.0	127.0
15000	52	52	127.0	127.0
15000	65	46	139.5	139.5
15000	65	52	139.5	139.5
15000	65	65	139.5	139.5
15000	78	46	160.5	160.5
15000	78	52	160.5	160.5
15000	78	65	160.5	160.5
15000	78	78	160.5	160.5
15000	103	46	194.0	194.0
15000	103	52	194.0	194.0
15000	103	65	194.0	194.0
15000	103	78	194.0	194.0
15000	103	103	194.0	194.0
20000	46	46	164.5	164.5
20000	52	46	164.5	164.5
20000	52	52	164.5	164.5
20000	65	46	185.0	185.0
20000	65	52	185.0	185.0
20000	65	65	185.0	185.0
20000	78	46	202.5	202.5
20000	78	52	202.5	202.5
20000	78	65	202.5	202.5
20000	78	78	202.5	202.5
20000	103	46	251.5	251.5
20000	103	52	251.5	251.5
20000	103	65	251.5	251.5
20000	103	78	251.5	251.5
20000	103	103	251.5	251.5

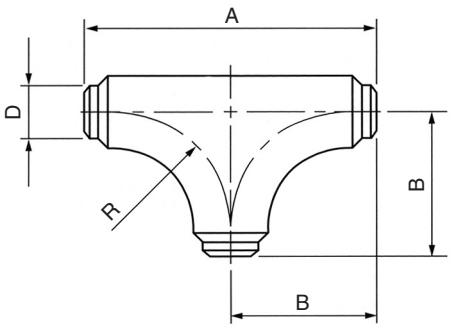
HIGH PRESSURE MANIFOLD FITTINGS





FULL FLOW CROSS

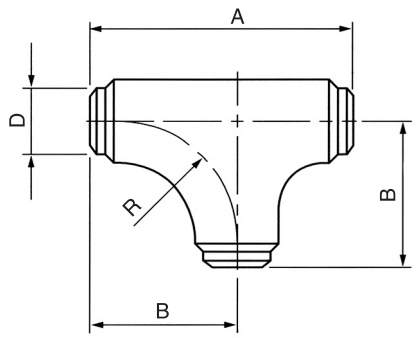
Size	ALL DIMENSIONS IN mm			
	D	A	B	R
2″	60.3	406	203	150
3″	88.9	406	203	150
4″	114.3	560	280	210
5″	141.3	610	305	240
6″	168.3	762	381	305



FULL FLOW TEE

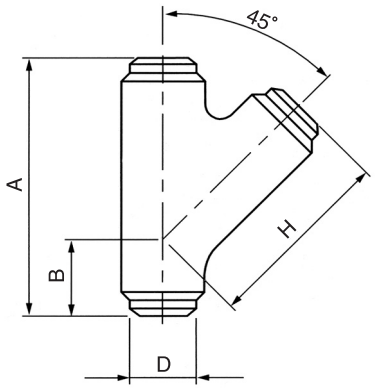
Size	ALL DIMENSIONS IN mm			
	D	A	B	R
2″	60.3	406	203	150
3″	88.9	406	203	150
4″	114.3	560	280	210
5″	141.3	610	305	240
6″	168.3	762	381	305

HIGH PRESSURE MANIFOLD FITTINGS



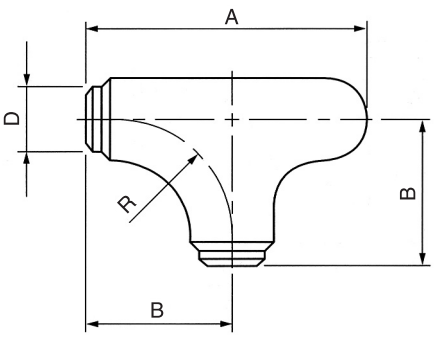
LONG SWEEP TEE

Size	ALL DIMENSIONS IN mm			
	D	A	B	R
2″	60.3	330	203	150
3″	88.9	330	203	150
4″	114.3	406	280	210
5″	141.3	483	305	240
6″	168.3	686	381	305



45° LATERAL TEE

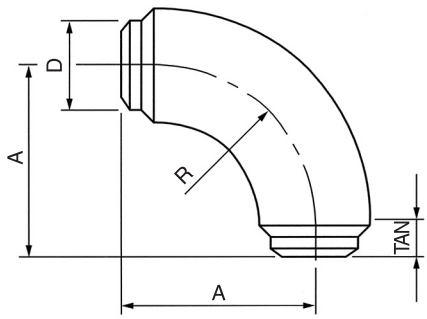
Size	ALL DIMENSIONS IN mm			
	D	A	B	H
2″	60.3	365	115	265
3″	88.9	365	115	265
4″	114.3	510	155	365
5″	141.3	550	165	405
6″	168.3	670	195	505



LONG SWEEP TEE WITH INTEGRAL BULL PLUG

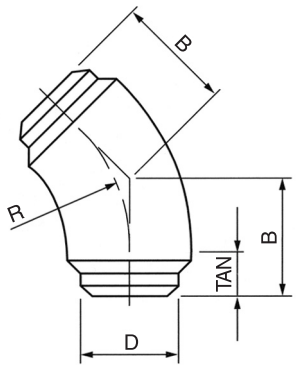
Size	ALL DIMENSIONS IN mm				
	D	T	A	B	R
2″	60.3	11.1	385	203	150
3″	88.9	15.2	385	203	150
4″	114.3	17.1	496	280	210
5″	141.3	19.0	582	305	240
6″	168.3	21.9	805	381	304

HIGH PRESSURE MANIFOLD FITTINGS



90° LONG SWEEP ELBOW

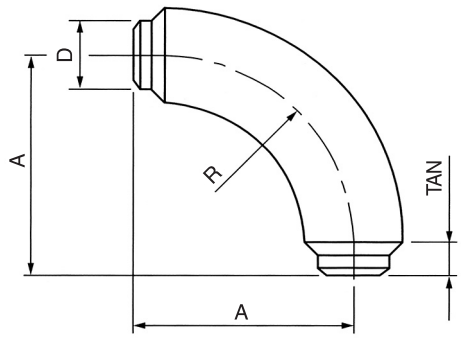
Size	ALL DIMENSIONS IN mm			
	D	A	R	TAN
2″	60.3	203	150	53
3″	88.9	203	150	53
4″	114.3	280	210	70
5″	141.3	305	240	65
6″	168.3	381	305	76



45° LONG SWEEP ELBOW

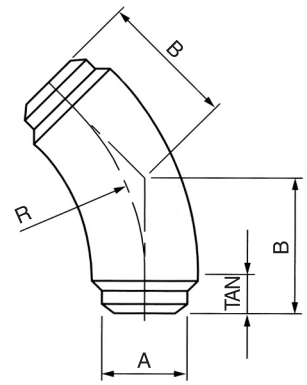
Size	ALL DIMENSIONS IN mm			
	D	B	R	TAN
2″	60.3	119	150	56
3″	88.9	119	150	56
4″	114.3	162	210	75
5″	141.3	172	240	72
6″	168.3	203	305	76

HIGH PRESSURE MANIFOLD FITTINGS



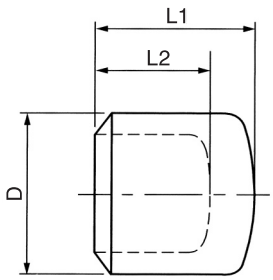
90° 3D DOUBLE BACKED BEND

Size	ALL DIMENSIONS IN mm			
	D	A	R	TAN
2″	60.3	178	152	26
3″	88.9	305	229	76
4″	114.3	356	305	51
5″	141.3	432	381	51
6″	168.3	533	457	76



45° 3D DOUBLE BACKED BEND

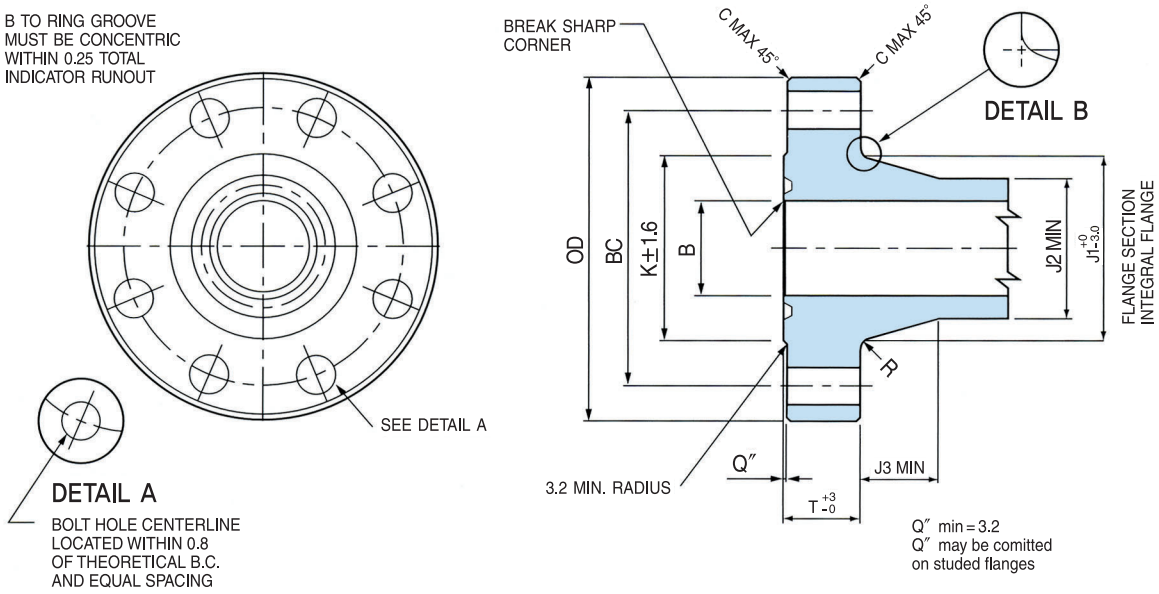
Size	ALL DIMENSIONS IN mm			
	D	B	R	TAN
2″	60.3	121	152	58
3″	88.9	171	229	76
4″	114.3	178	305	51
5″	141.3	209	381	51
6″	168.3	266	457	76



BULL PLUG

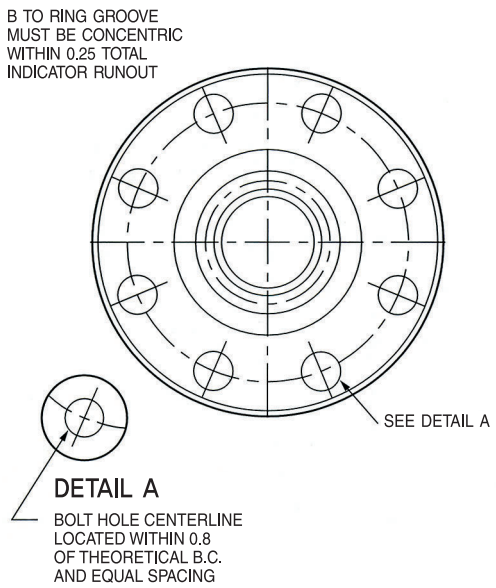
Size	ALL DIMENSIONS IN mm		
	D	L1	L2
2″	60.3	70	48
3″	88.9	90	60
4″	114.3	115	81
5″	141.3	140	102
6″	168.3	170	126

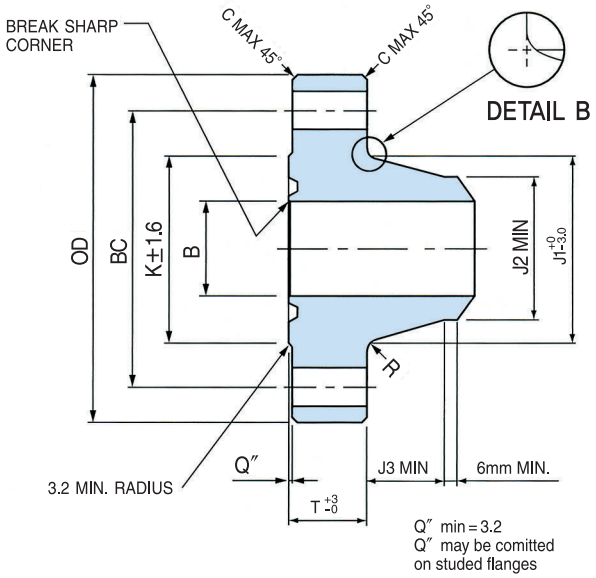
API FLANGE - TYPE 6BX INTEGRAL FLANGES



Basic Flange Dimensions														Bolting Dimensions				
Norminal Size of Flange		Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raiserd Face	Tatal Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance	Minimum Length of Stud Bolts	Ring Number
in.	mm	B	OD	OD	C	K	T	J1	J2	J3	R	BC		in.	mm		Lssb	BX
10000 psi																		
1 −13/16	46	46.8	190	2	3	105	42.1	88.9	65.1	48.4	10	146.0	8	3/4	23	+2/−0.5	130	151
2 −1/16	52	53.2	200	2	3	111	44.1	100.0	74.6	51.6	10	158.8	8	3/4	23	+2/−0.5	130	152
2 −9/16	65	65.9	230	2	3	132	51.2	120.7	92.1	57.2	10	184.2	8	7/8	25	+2/−0.5	150	153
3 −1/16	78	78.6	270	2	3	152	58.4	142.1	110.4	63.5	10	215.9	8	1	29	+2/−0.5	170	154
4 −1/16	103	104.0	315	2	3	185	70.3	182.6	146.1	73.1	10	258.8	8	1−1/8	32	+2/−0.5	200	155
5 −1/8	130	131.0	360	2	3	221	79.4	223.8	182.6	81.0	10	300.0	12	1−1/8	32	+2/−0.5	220	169
7 −1/16	179	180.2	479	3	6	302	103.2	301.6	254.0	95.3	16	403.2	12	1−1/2	42	+2/−0.5	285	156
9	228	229.4	555	3	6	359	123.8	374.7	327.1	93.7	16	476.2	16	1−1/2	42	+2/−0.5	330	157
11	279	280.2	655	3	6	429	141.3	450.9	400.1	103.2	16	565.2	16	1−3/4	48	+3/−0.5	380	158
13 −5/8	346	346.9	770	3	6	518	168.3	552.5	495.3	114.3	16	673.1	20	1−7/8	51	+3/−0.5	440	159
16 −3/4	425	426.2	870	3	6	576	168.3	655.6	601.7	76.2	19	776.3	24	1−7/8	51	+3/−0.5	440	162
15000 psi																		
1 −13/16	46	46.8	210	2	3	106	45.2	97.6	71.4	47.6	10	160.3	8	7/8	26	+2/−0.5	140	151
2 −1/16	52	53.2	220	2	3	114	50.8	111.1	82.6	54.0	10	174.6	8	7/8	26	+2/−0.5	150	152
2 −9/16	65	65.9	250	2	3	133	57.1	128.6	100.0	57.1	10	200.0	8	1	30	+2/−0.5	170	153
3 −1/16	78	78.6	290	2	3	154	64.3	154.0	122.2	63.5	10	230.2	8	1−1/8	32	+2/−0.5	190	154
4 −1/16	103	104.0	360	2	3	194	78.6	195.3	158.8	73.0	10	290.5	8	1−3/8	40	+2/−0.5	235	155
7 −1/16	179	180.2	505	3	6	305	119.1	325.4	276.2	66.7	16	428.6	16	1−1/2	42	+2/−0.5	325	156
20000 psi																		
1 −13/16	46	46.8	255	2	3	117	63.5	133.3	109.5	49.2	10	203.2	8	1	30	+2/−0.5	190	151
2 −1/16	52	53.2	285	2	3	132	71.5	154.0	127.0	52.4	10	230.2	8	1−1/8	32	+2/−0.5	210	152
2 −9/16	65	65.9	325	2	3	151	79.4	173.0	144.4	58.7	10	261.9	8	1−1/4	36	+2/−0.5	235	153
3 −1/16	78	78.6	355	2	3	171	85.7	192.1	160.3	63.5	10	287.3	8	1−3/8	40	+2/−0.5	255	154
4 −1/16	103	104.0	445	2	3	219	106.4	242.9	206.4	73.0	10	357.2	8	1−3/4	48	+3/−0.5	310	155
7 −1/16	179	180.2	655	3	6	352	165.1	385.7	338.1	96.8	16	554.0	16	2	54	+3/−0.5	445	156

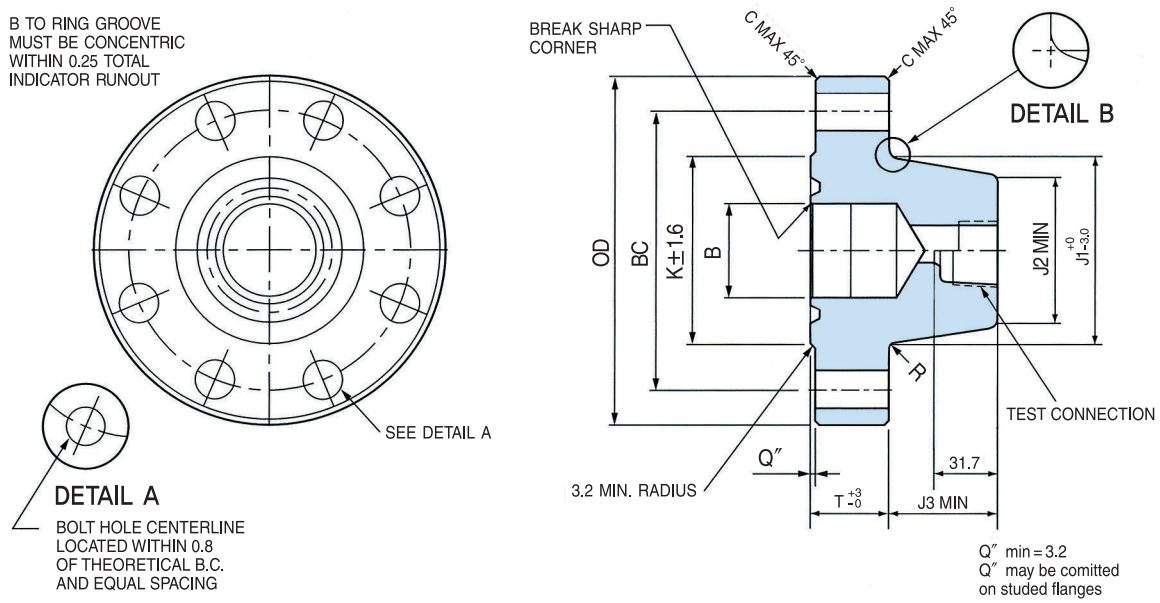
API FLANGE - TYPE 6BX WELD NECK FLANGES





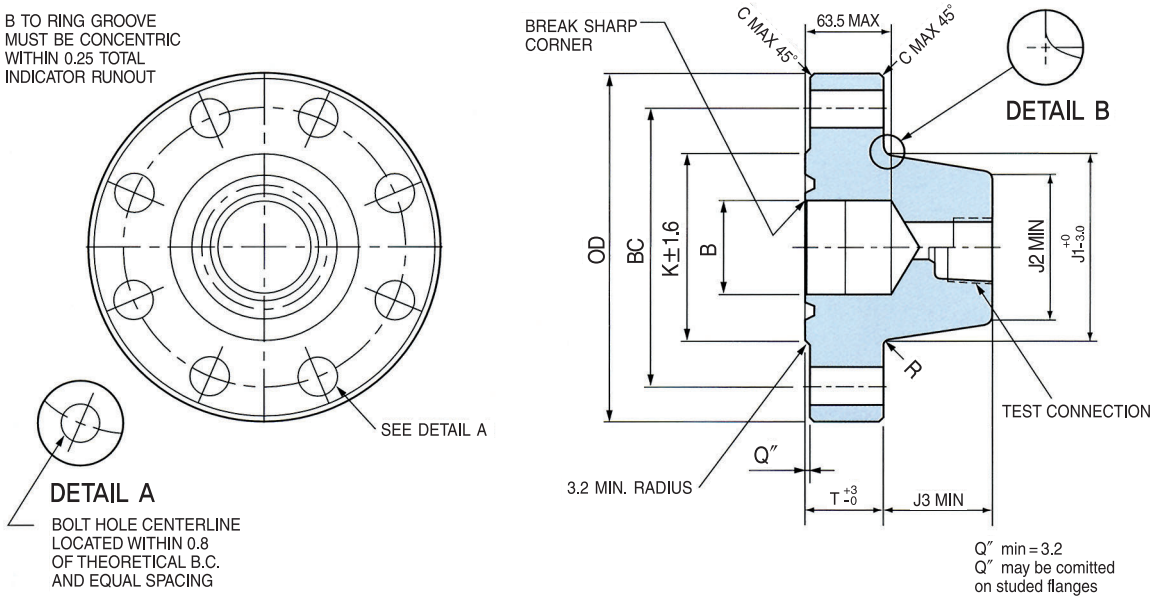
Basic Flange Dimensions														Bolting Dimensions				
Norminal Size of Flange		Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raiserd Face	Total Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance	Minimum Length of Stud Bolts	Ring Number
in.	mm	B	OD	OD	C	K	T	J1	J2	J3	R	BC		in.	mm		Lssb	BX
10000 psi																		
1-13/16	46	46.8	190	2	3	105	42.1	88.9	65.1	48.4	10	146.0	8	3/4	23	+2/-0.5	130	151
2-1/16	52	53.2	200	2	3	111	44.1	100.0	74.6	51.6	10	158.8	8	3/4	23	+2/-0.5	130	152
2-9/16	65	65.9	230	2	3	132	51.2	120.7	92.1	57.2	10	184.2	8	7/8	25	+2/-0.5	150	153
3-1/16	78	78.6	270	2	3	152	58.4	142.1	110.4	63.5	10	215.9	8	1	29	+2/-0.5	170	154
4-1/16	103	104.0	315	2	3	185	70.3	182.6	146.1	73.1	10	258.8	8	1-1/8	32	+2/-0.5	200	155
5-1/8	130	131.0	360	2	3	221	79.4	223.8	182.6	81.0	10	300.0	12	1-1/8	32	+2/-0.5	220	169
7-1/16	179	180.2	479	3	6	302	103.2	301.6	254.0	95.3	16	403.2	12	1-1/2	42	+2/-0.5	285	156
9	228	229.4	555	3	6	359	123.8	374.7	327.1	93.7	16	476.2	16	1-1/2	42	+2/-0.5	330	157
11	279	280.2	655	3	6	429	141.3	450.9	400.1	103.2	16	565.2	16	1-3/4	48	+3/-0.5	380	158
13-5/8	346	346.9	770	3	6	518	168.3	552.5	495.3	114.3	16	673.1	20	1-7/8	51	+3/-0.5	440	159
16-3/4	425	426.2	870	3	6	576	168.3	655.6	601.7	76.2	19	776.3	24	1-7/8	51	+3/-0.5	440	162
15000 psi																		
1-13/16	46	46.8	210	2	3	106	45.2	97.6	71.4	47.6	10	160.3	8	7/8	26	+2/-0.5	140	151
2-1/16	52	53.2	220	2	3	114	50.8	111.1	82.6	54.0	10	174.6	8	7/8	26	+2/-0.5	150	152
2-9/16	65	65.9	250	2	3	133	57.1	128.6	100.0	57.1	10	200.0	8	1	30	+2/-0.5	170	153
3-1/16	78	78.6	290	2	3	154	64.3	154.0	122.2	63.5	10	230.2	8	1-1/8	32	+2/-0.5	190	154
4-1/16	103	104.0	360	2	3	194	78.6	195.3	158.8	73.0	10	290.5	8	1-3/8	40	+2/-0.5	235	155
7-1/16	179	180.2	505	3	6	305	119.1	325.4	276.2	66.7	16	428.6	16	1-1/2	42	+2/-0.5	325	156
20000 psi																		
1-13/16	46	46.8	255	2	3	117	63.5	133.3	109.5	49.2	10	203.2	8	1	30	+2/-0.5	190	151
2-1/16	52	53.2	285	2	3	132	71.5	154.0	127.0	52.4	10	230.2	8	1-1/8	32	+2/-0.5	210	152
2-9/16	65	65.9	325	2	3	151	79.4	173.0	144.4	58.7	10	261.9	8	1-1/4	36	+2/-0.5	235	153
3-1/16	78	78.6	355	2	3	171	85.7	192.1	160.3	63.5	10	287.3	8	1-3/8	40	+2/-0.5	255	154
4-1/16	103	104.0	445	2	3	219	106.4	242.9	206.4	73.0	10	357.2	8	1-3/4	48	+3/-0.5	310	155
7-1/16	179	180.2	655	3	6	352	165.1	385.7	338.1	96.8	16	554.0	16	2	54	+3/-0.5	445	156

API FLANGE - TYPE 6BX BLIND AND TEST FLANGES



Basic Flange Dimensions														Bolting Dimensions				
Nominal Size of Flange		Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raiserd Face	Talal Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Boll Holes	Boll Hole Tolerance	Minimum Length of Stud Bolts	Ring Number
in.	mm	B	OD	OD	C	K	T	J1	J2	J3	R	BC		in.	mm		Lssb	BX
10000 psi																		
1 −13/16	46	46.8	190	2	3	105	42.1	88.9	65.1	48.4	10	146.0	8	3/4	23	+2/−0.5	130	151
2 −1/16	52	53.2	200	2	3	111	44.1	100.0	74.6	51.6	10	158.8	8	3/4	23	+2/−0.5	135	152
2 −9/16	65	65.9	230	2	3	132	51.2	120.7	92.1	57.1	10	184.2	8	7/8	25	+2/−0.5	155	153
3 −1/16	78	78.6	270	2	3	152	58.4	142.1	110.3	63.5	10	215.9	8	1	29	+2/−0.5	175	154
4 −1/16	103	104.0	315	2	3	185	70.3	182.6	146.0	73.0	10	258.8	8	1−1/8	32	+2/−0.5	205	155
15000 psi																		
1 −13/16	46	46.8	210	2	3	106	45.2	97.6	71.4	47.6	10	160.3	8	7/8	26	+2/−0.5	140	151
2 −1/16	52	53.2	220	2	3	114	50.8	111.1	82.6	54.0	10	174.6	8	7/8	26	+2/−0.5	150	152
2 −9/16	65	65.9	250	2	3	133	57.1	128.6	100.0	57.1	10	200.0	8	1	29	+2/−0.5	170	153
3 −1/16	78	78.6	290	2	3	154	64.3	154.0	122.2	63.5	10	230.2	8	1−1/8	32	+2/−0.5	190	154
4 −1/16	103	104.0	360	2	3	194	78.6	195.3	158.8	73.0	10	290.5	8	1−3/8	39	+2/−0.5	230	155

API FLANGE - TYPE 6BX BLIND AND TEST FLANGES



Basic Flange Dimensions														Bolting Dimensions				
Norminal Size of Flange		Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Lenght of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance	Minimum Length of Stud Bolts	Ring Number
in.	mm	B	OD	OD	C	K	T	J1	J2	J3	R	BC		in.	mm		Lssb	BX
20000 psi																		
1–13/16	46	46.8	255	2	3	117	63.5	133.4	109.5	49.2	10	203.2	8	1	29	+2/–0.5	190	151
2–1/16	52	53.2	290	2	3	132	71.4	154.0	127.0	52.4	10	230.2	8	1–1/8	32	+2/–0.5	210	152
2–9/16	65	65.9	325	2	3	151	79.4	173.0	144.5	58.7	10	261.9	8	1–1/4	34	+2/–0.5	235	153
3–1/16	78	78.6	355	2	3	171	85.7	192.0	160.3	63.5	10	287.3	8	1–3/8	38	+2/–0.5	255	154
4–1/16	103	104.0	445	2	3	219	106.4	242.9	206.4	73.0	10	357.2	8	1–3/4	48	+3/–0.5	310	155

The **TK corporation** clamp connector is a compact mechanical joint consisting of four basic elements : hubs, sealing, clamps and bolting. During assembly the hubs are drawn together under the twin wedge action of the clamp segments to provide the initial self-energising seal.

Clamp connector are available as standard from 1″-12″ and supplied in a wide range of meterials from Carbon Steel to Duplex Steel and Nickel Alloys

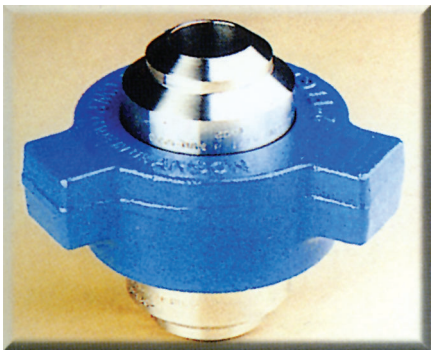
The **TK corporation** is the industry's leading manufacturer and supplier of high performance, low weight proven sealing technologies for onshore, offshore & subsea pipeline applications.

LARGE SELECTION

TK corporation Hammer Unions are available in a wide range of sizes and in working pressures to 20,000 psi. Pressure seal, non-pressure seal and butt weld styles are offered in various sizes and pressures.

BUILT-IN QUALITY

TK corporation starts with quality steel forgings and ductile iron castings made to exacting specifications for the appropriate pressure ratings.
All materials meet ASTM and AISI standards, Raw materials are machined to precise dimensions and heat treated using the most modern equipment and procedures.
Each union is inspected for flawless threads, sure seating and other qualities that mean long, dependable service.



FAST, SURE MAKE-UP

All **TK corporation** Hammer Unions have three-lug nuts and coarse Acme threads for faster make-up and break-out using only a hammer. Wrenches or other tools are not needed.

POSITIVE SEALING

All **TK corporation** Hammer Unions provide pressure-tight, positive sealing, Types of seals vary according to pressure and application.

For 1,000 to 2,000 psi(low pressure) service, the spherical surface of the male sub and the cone shaped surface of the female provide a metal-to-metal seal.
Even when one of these surfaces is not perfectly aligned or slightly pitted, the seal is still leak proof.

For some applications in the 2,000 to 4,000 psi (medium pressure) service range, the metal-to-metal seal is supplemented with a resilient seal ring.

For 6,000 to 20,000 psi (high pressure) service, a replaceable, lip-type seal ring is part of the female sub. This seal ring reduces flow turbulence and protects the metal-to-metal seal from corrosion.

TK corporation non-pressure seal hammer unions are designed for abrasive, high-pressure applications where welded connections are not desired.

INTERCHANGEABLE PARTS

All **TK corporation** Hammer Union assemblies of the same figure number, size and pressure rating are intercangeable with similar assemblies made by other leading manufacturers.

SOUR GAS SERVICE

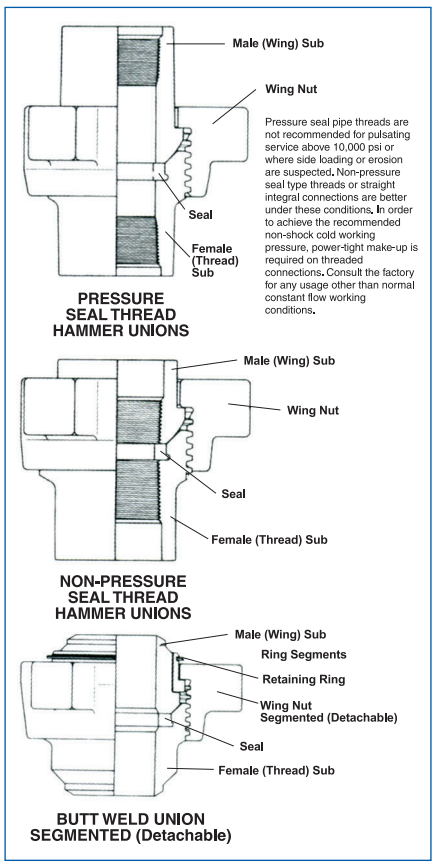
TK corporation Hammer Union for sour gas service are specially heat treated for controlled hardness.
Fluorocarbon elastomer seals and seal rings are used in all sour gas unions.

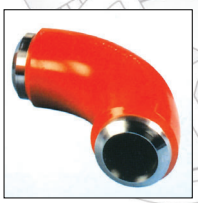
All **TK corporation** unions for sour gas service are manufactured in accordance to Standard M R-01-75 of the National Association of Corrosion Engineers and Srandard RP-14E of the American Petroleum Institute.

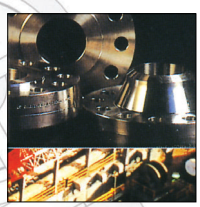
CAUTION : It is possible that standard service parts could be interchanged with our gas parts. Therefore, users must adopt safety practices for identification, maintenance and use of sour gas equipment.

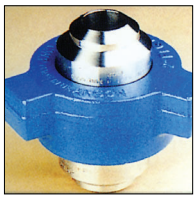
HAMMER UNIONS PLUS LOTS MORE

Unions manufactured by **TK corporation** supply the everyday needs of most users.
Other union sizes, end configurations and unions for special service requirements are provided on request









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