



FMC Technologies

Flowline Products and Services

World Proven Chiksan® and Weco® Equipment

Flowline Products and Services

FMC Technologies is the world's leading supplier of flowline products and services to the oilfield industry and is the standard against which all others are measured. From the original Chiksan[®] and Weco[®] products to the revolutionary equipment designs and integrated services of today, FMC's fluid control family of products and services enables customers to achieve maximum life and value from their flowline systems throughout a complete range of applications.

The success of FMC's fluid control technology stems from a strong tradition of anticipating and responding to customer needs in every way possible. By focusing on the delivery of top products and services, FMC Technologies is helping its customers face tomorrow's technical and economic challenges today.

Flowline Products and Services



Experienced, Knowledgeable, Productive People

FMC's global fluid control team is structured around top flowline professionals – individuals who understand your business and are dedicated to meeting your needs. The management, engineering, and sales support staff are among the most experienced in the oil and gas industry. Their knowledge and industry expertise show up in the quality of products and services delivered to you.



Health, Safety & Environment

As a leading oilfield equipment and services provider, FMC Technologies stresses overall health, safety, and environment (HSE) in all of its operations and processes. With a proven record of outstanding HSE performance, FMC is a strong advocate of HSE training that goes beyond the basic legal requirements. The goal is to ensure that all field and office personnel are competent to carry out HSE critical duties, having received the appropriate training required by law, company policy, and clients. HSE policy covers all key elements of the business, including company safety policy statements, product safety, risk assessment, monitoring, auditing, and review.

Manufacturing Leader

FMC's fluid control manufacturing facility is located in Stephenville, Texas. The plant was constructed in 1980 and expanded in 1984, 1987, and 1996. The facility



occupies a 44-acre site and comprises 220,000 square feet of manufacturing capacity and 48,000 square feet of customer service, production support, and engineering offices. It utilizes the latest in computer numerical controlled (CNC) machining centers, production planning systems, computer aided design/computer aided manufacturing (CAD/CAM) systems, and the latest technology in order and distribution operating systems. The Stephenville facility produces a wide range of flowline equipment for distribution worldwide.

Flowline Products and Services

Unsurpassed Quality

FMC's fluid control quality system has been surveyed and approved by DNV and meets ISO 9001 and European Pressure Equipment Directive 97/23/CE. Most products are supplied with the CE marking. Chiksan and Weco products also can be supplied with both type and case approval from DNV, Lloyds, ABS, GGTN, and others. Products for sour gas service meet NACE MR-01-75 and API RP-14-E. Complete material certification and traceability are also available.

Research and Development

To meet the evolving needs of its customers, FMC continually invests in flowline research and development. This industry-leading effort has resulted in a host of new products and refinements to existing products. All new products are subjected to exhaustive laboratory and field tests to ensure their reliability and integrity before they are released to the marketplace. Research and development capabilities include exhaustive laboratory and field testing, destructive and nondestructive testing, three-dimensional finite element analysis, computational fluid dynamics, and the flowline industry's only high-velocity flow loop.

Worldwide Distribution

Chiksan and Weco products are distributed from more than 60 locations worldwide. FMC fluid control facilities stock many flowline products in the specific sizes, pressures, and materials common in the various regions. From a replacement seal for a Chiksan swivel joint to a platform full of well servicing equipment, FMC Technologies delivers.

Integrated Services

To satisfy the total flowline requirements of its customers, FMC Technologies has consolidated its industry-leading after-sales capabilities into a comprehensive Integrated Services program. Integrated Services is helping customers worldwide realize the maximum value from their flowline assets to guarantee that the right products are shipped to the job site in top working condition. This total solutions approach includes the InteServ tracking and management system, mobile inspection and repair, strategically located service centers, and genuine Chiksan and Weco spare parts.



Original Chiksan® Swivel Joints

Streamlined bore minimizes flow restrictions

Smooth, round bore design minimizes turbulence and pressure drop. Longsweep® and TripleStep swivel joints have extra-long radius elbows that optimize flow characteristics and extend life in the ball race areas when handling abrasives at extremely high pressures.

Proven packing design

Industry leading packing design integrates an anti-extrusion ring that serves as a retainer and bearing to reduce friction between the resilient packing material and the packing chamber as the joint is rotated.

Bearings key to rotation, strength

To assure long, dependable service, Chiksan dual and tri-race ball bearing swivels are designed to meet or exceed load capacities and service conditions. All ball races are either flame hardened, carburized and hardened, or have "snap-in" stainless steel ball races.

Field repairable

If packing, bearings, or ball plugs should need replacing, easy-to-use field repair kits are available.

Chiksan swivel joints deliver significantly longer life, superior performance, and reduced maintenance. Designed for standard and sour gas services, these world proven fittings come in 3/8 to 12-inch sizes and can handle pressures from vacuum to 20,000 psi. Many different Chiksan assembly configurations are available. These styles can be combined in an unlimited variety of ways to suit practically any installation. Available end connections are threaded, integral Weco® wing union, beveled for welding, or flanged. Like all pressure containing products, Chiksan swivels require special handling (see inside back cover for Warnings and Cautions).

Original Chiksan® Swivel Joints

Chiksan Models	Color Coding	Cold Working Pressure psi (bar)	Material	End Connections	Nominal Sizes, in.											Notes			
					3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6		8	10	12
Low-Pressure Swivel Joints	Dark Green	175 (12)	Ductile Iron	Flanged									✓	✓					1,2,3
	Blue	285 (20)	Carbon Steel	Flanged								✓		✓	✓	✓	✓	✓	1,3,4
	Dark Green	600 (41)	Ductile Iron	NPT			✓	✓	✓	✓	✓	✓	✓	✓					2,3
	Blue	1,000 (69)	Carbon Steel	NPT								✓		✓					3
High-Pressure Swivel Joints				Beveled for welding								✓		✓	✓	✓	✓	✓	3,4
	Olive Green (Sour Gas)	6,000 (414)	Carbon Steel	Weco figure 602 union								✓		✓	✓				5
Extra High-Pressure Swivel Joints	Silver	6,000 (414)	Carbon Steel	Female line pipe threads	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					3,6,8
	Black	10,000 (690)	Carbon Steel	Female line pipe threads								✓							3,6
	Brown	7,500 (517)	Alloy Steel	Female line pipe threads										✓					3,6
	Olive Green (Sour Gas)	7,500 (517)	Alloy Steel	Weco figure 1002 union										✓					5
	Olive Green (Sour Gas)	10,000 (690)	Alloy Steel	Weco figure 1502 union				✓			✓	✓		✓	✓				5
	Black	10,000 (690)	Alloy Steel	Female line pipe threads				✓											3,6,7
				Weco figure 1002 union										✓	✓				3
	Olive Green (Sour Gas)	15,000 (1034)	Alloy Steel	Weco figure 2202 union								✓		✓					6
	Red	15,000 (1034)	Alloy Steel	Weco figure 1502 union				✓		✓	✓	✓		✓	✓				3
	Light Blue	20,000 (1379)	Alloy Steel	Weco figure 2002 union								✓		✓					3
TripleStep Swivel Joints	Black	10,000 (690)	Alloy Steel	Weco figure 1002 union										✓	✓				3
	Red	15,000 (1034)	Alloy Steel	Weco figure 1502 union											✓				3

Notes
 All body materials meet ASTM or AISI standards.
 Consult factory for special sizes, styles, end connections, or packing units.

1. Flanged ends faced and drilled to Class 150 flange specifications, unless otherwise specified.
2. Not available in Styles 80, 10, or other styles requiring more than two swivel connections.
3. 3/8- to 4-inch sizes furnished with nitrile packing and brass or stainless steel anti-extrusion ring.
4. 6- to 12-inch sizes furnished with nitrile packing and stainless steel anti-extrusion ring.
5. Furnished with Fluoroelastomer or HNBR packing and stainless steel anti-extrusion ring. FMC Technologies does not warrant the performance of any elastomer seal for sour gas service.
6. Power make-up must be used for line pipe threaded connections to achieve rated cold working pressure.
7. 3-inch size rated at 10,000 psi cold working pressure with integral Weco 1002 union ends only.
8. 5-inch size available with threaded or beveled ends; limited to 3,000 psi cold working pressure.

Sour Gas Service

FMC Technologies manufactures Chiksan sour gas swivel joints in accordance with the National Association of Corrosion Engineers (NACE) Standard MR-01-75 and the American Petroleum Institute's (API) Standard RP-14-E. These swivel joints are specially heat-treated and inspected for controlled hardness. Because the specially heat treated steel required for sour gas service does not provide a strong enough bearing surface, Chiksan sour gas swivel joints use patented snap-in ball races to assure extra strength and high load-bearing capacity. Fluoroelastomer or HNBR packing is used to isolate the races from the line fluid.

Original Chiksan® Swivel Joints

TripleStep Swivel Joints

Advanced material selection

The TripleStep swivel joint is manufactured from forged alloy steel with a closely controlled, proprietary chemical composition and heat treatment to ensure superior toughness, ductility, case depth, case hardness, and core strength.

Exclusive design delivers longer life, lower cost

TripleStep swivel joints deliver the highest bending and axial load capacities in the industry. They also eliminate rejections from excessive wear in the ball race area as well as swivel seizures due to corrosion and brinelling of the ball races.

Unmatched erosion allowance

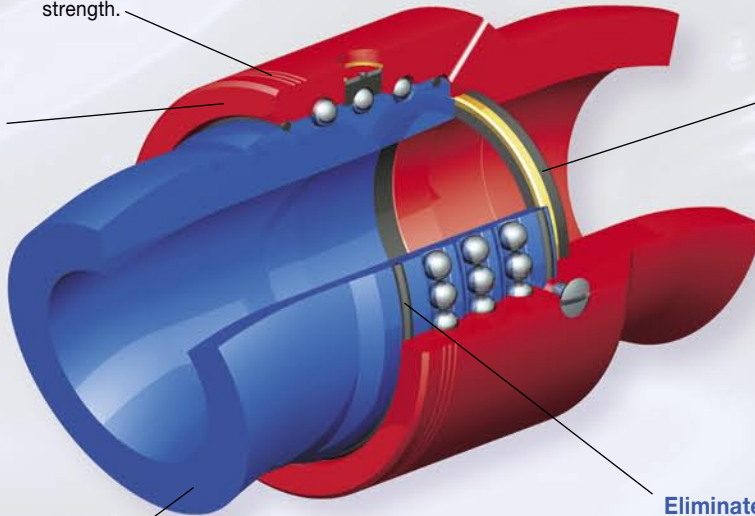
An exclusive three step design coupled with patented bearing race geometry adds significant wall thickness under the male races without increasing swivel joint size or weight.

Instream packing for long seal life

World proven instream packing technology provides unsurpassed sealability and reliability in the harshest oilfield conditions. An integral anti-extrusion ring serves as a retainer and bearing to reduce friction between the resilient packing material and the packing chamber as the joint is rotated.

Eliminates routine maintenance

An improved environmental seal reduces the potential for corrosion in the ball race area. The integrity of the seal and the use of a high-performance grease during initial assembly virtually eliminates the need for periodic greasing.



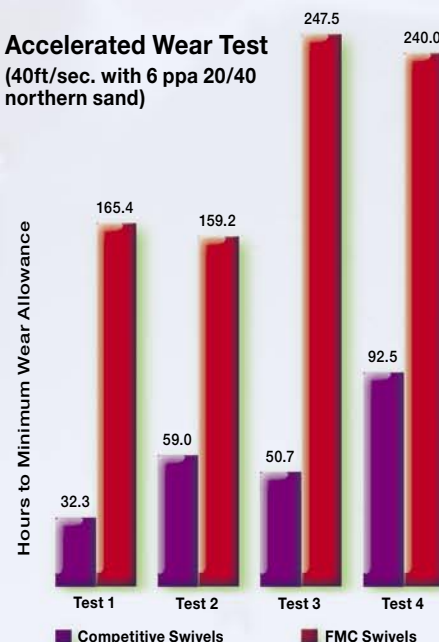
Competitive Hype VS. Proof Positive

Designed especially for abrasive, high-pressure well servicing applications, TripleStep swivel joints have been proven against competitive swivels in customer-witnessed flow loop tests and field applications. The unique three step ball race design provides significantly greater erosion allowance without increasing swivel joint size or weight. The result: TripleStep swivel joints deliver increased life, superior performance, and reduced maintenance...lasting 2-1/2 to 5 times longer than competitive swivels.

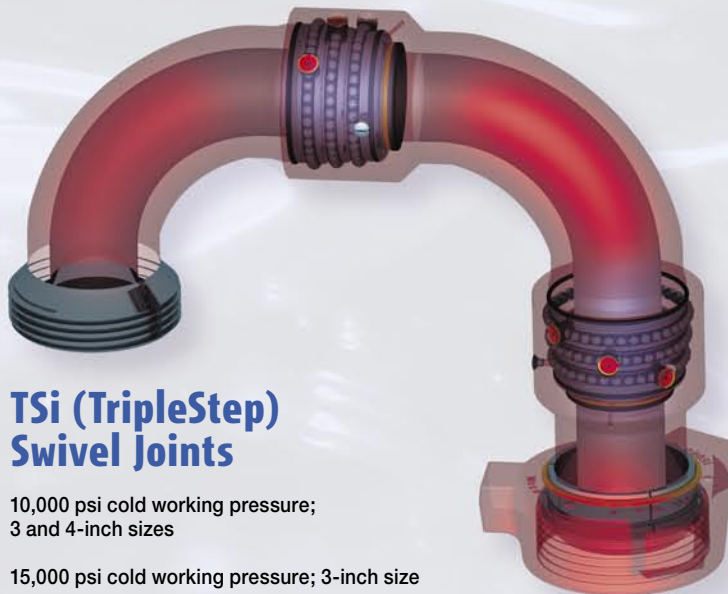
Thicker Where it Counts

Competitive swivels wear out first in the ball races, meaning they must be disassembled for inspection. TripleStep swivels wear in the elbows, meaning they can be inspected and returned to service without disassembly. The TripleStep design places more material under the male ball race – a location that computational flow dynamics analysis and field testing shows to be a high erosion area.

Accelerated Wear Test
(40ft/sec. with 6 ppa 20/40 northern sand)



Original Chiksan® Swivel Joints



TSi (TripleStep) Swivel Joints

10,000 psi cold working pressure;
3 and 4-inch sizes

15,000 psi cold working pressure; 3-inch size

For Longsweep swivels and sizes or
pressures not shown, consult factory.

Recommended service

Long-radius elbows designed especially for high-pressure abrasive
applications such as fracturing, choke-and-kill lines, cementing and
circulating hoses, acidizing, and test lines

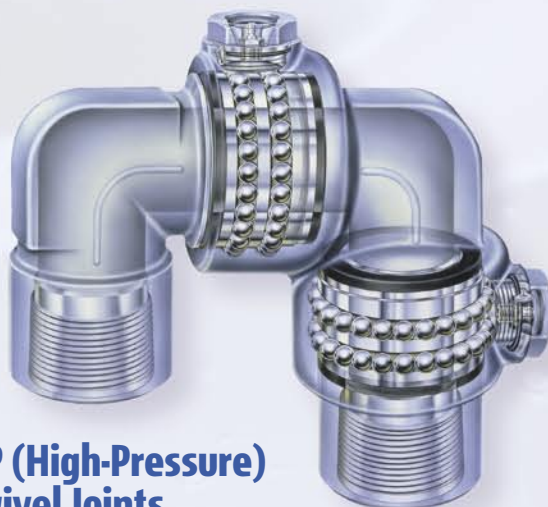


XHP (Extra High-Pressure) Swivel Joints

10,000 psi cold working pressure; 2-inch size

Recommended service

Hydraulic control lines, mud lines, rotary line connections,
BOP lines, test lines, water lines, offshore wellhead connections,
cementing and circulating hoses, and choke-and-kill lines



HP (High-Pressure) Swivel Joints

6,000 psi cold working pressure; 3/8 to 4-inch sizes

Recommended service

Hydraulic control lines, mud lines, rotary line connections, BOP lines,
test lines, water lines, offshore wellhead connections, cementing and
circulating hoses, and choke-and-kill lines



Low-Pressure Swivel Joints

175 psi to 1,000 psi cold working pressure;
3/4 to 12-inch sizes

Recommended service

Transfer lines, temporary flow lines, discharge lines, auxiliary
flow lines, water lines, and other general-service oilfield
applications

See specifications tables (pages SJ1A to SJ8A) for sizes, dimensions, weights, materials, and part numbers.

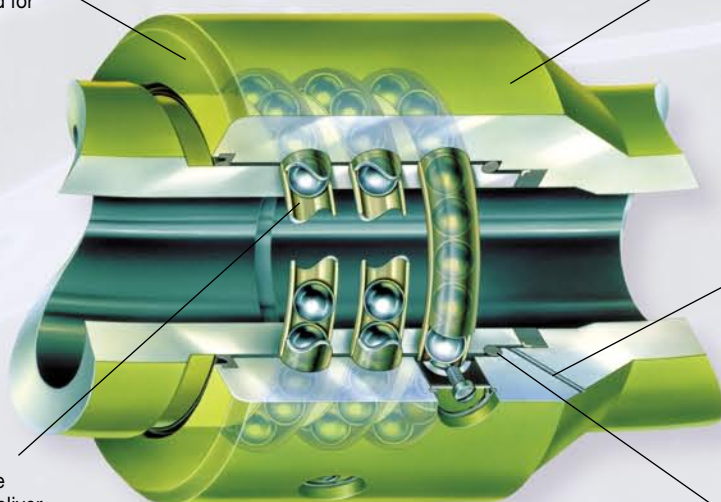
Original Chiksan® Swivel Joints

Controlled hardness

Swivel components are specially heat-treated and 100% tested for controlled hardness.

Positive identification

Chiksan swivels for sour gas service are stamped "Sour Gas" and painted with an olive green, zinc-chromate primer to ensure quick, positive identification.



Snap-in ball races

Snap-in ball races provide hard bearing surface to deliver extra strength and high load-bearing capacity when handling sour gas.

Leak detection

A leak detection port between the packing and O-ring seal signals the need for packing replacement.

Chiksan Sour Gas Swivel Joint

Proven packing design

Elastomeric packing with stainless steel anti-extrusion ring and secondary O-ring seal are used to isolate the races and bearings from line fluid.

Sour Gas Service

FMC Technologies manufactures Chiksan sour gas swivel joints in accordance with the National Association of Corrosion Engineers (NACE) Standard MR-01-75 and the American Petroleum Institute's (API) Standard RP-14-E. These swivel joints are specially heat-treated and inspected for controlled hardness. Because the specially heat-treated steel required for sour gas does not provide a hard enough bearing surface, Chiksan sour gas swivel joints use snap-in ball races for extra strength and high load-bearing capacity. Sour gas swivel joints come standard with integral Weco wing union end connections. They also have a leak-detection port between the packing and the O-ring seal. If leakage past the packing should occur, it is forced through the port, signaling the need for packing replacement. For positive identification, all Chiksan sour gas swivel joints are stamped "Sour Gas" or "NACE MR-01-75" using low-stress dot stamping and painted with an olive green, zinc-chromate primer that is unique to sour gas equipment.

Chiksan Swivel Joints for Sour Gas Service

High-Pressure Swivel Joints

6,000 psi cold working pressure, 2 and 3-inch sizes;
Weco wing union end connections

Longsweep Swivel Joints

7,500 psi cold working pressure, 3-inch size;
Weco wing union end connections

10,000 psi cold working pressure, 1, 2, 3, and 4-inch sizes;
Weco wing union end connections

15,000 psi cold working pressure, 2 and 3-inch sizes;
Weco wing union end connections

Original Chiksan® Swivel Joints

Chiksan Swivel Joint Styles

Chiksan swivel joints are available from stock in nine basic styles or configurations. These styles permit 360-degree rotation and movement in one, two, or three planes. They can be combined in an unlimited variety of ways to suit practically any installation. All Chiksan swivel joints are assembled using two or more standard pieces.

WARNING

Although Chiksan swivel joints can be rotated while under fluid pressure, they are not recommended for services requiring continuous rotary motion. See inside back cover for additional Warnings and Cautions.



Style 20



Style 30



Style 40



Style 50



Style 60



Style 70



Style 80



Style 10



Style 100

See specifications tables (pages SJ1A to SJ8A) for sizes, dimensions, weights, materials, and part numbers

Chiksan® Swivel Joints

Chiksan Cementing and Circulating Hoses

Chiksan cementing and circulating hoses can handle a complete range of standard and sour gas fluids at cold working pressures up to 15,000 psi. These rugged, all-steel hoses are available in 1 to 3-inch sizes and configurations to meet virtually any need. All materials meet ASTM or AISI standards.

Recommended service

High-pressure discharge lines, water lines, temporary flow lines, well testing lines, cementing and circulating lines, and other high-pressure applications

Features

- All designs feature Chiksan swivel joints which provide flexibility, absorb shock and vibration, and maximize flow characteristics
- Weco wing union connections ensure fast, pressure-tight make-up and break-out without threading, welding, or special connections
- Chiksan hoses fold up easily and quickly for transportation and storage
- Designs are available for sour gas services at cold working pressures up to 15,000 psi



See specifications tables (page SJ5A) for sizes, dimensions, weights, materials, and part numbers.

Chiksan Coiled Tubing Reel Swivel

15,000 psi cold working pressure; 2 and 3-inch sizes

Recommended service

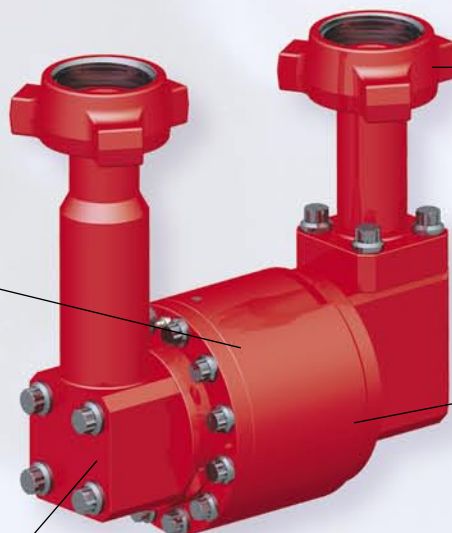
High-pressure coiled tubing applications

Reliable UV packing

With zero failures in thousands of high-pressure gate valve stem seal applications worldwide, proprietary UV packing provides greater sealability with lower torque than comparable seals.

Fast, easy field maintenance

The swivel internal components can be serviced from the front without removing the housing from the coiled tubing unit.



Converts for sour gas service

By changing out the Weco wing union subs, the assembly is converted to a sour gas swivel. This exclusive feature reduces inventory and lowers costs.

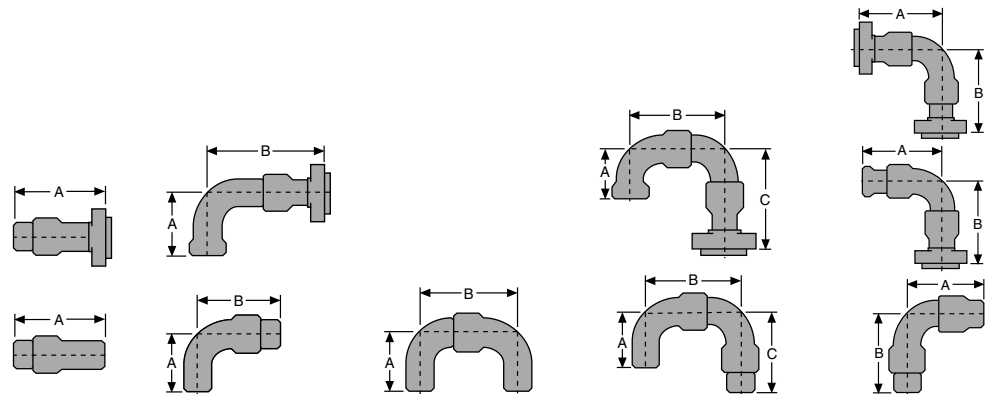
Stepped bearing races

Exclusive stepped bearing race geometry enables easy centering of the mandrel relative to the packing. Stepped design also provides low bearing stresses and torque for longer bearing life.

Consult factory for special coiled tubing applications.

Chiksan® Swivel Joint Specifications

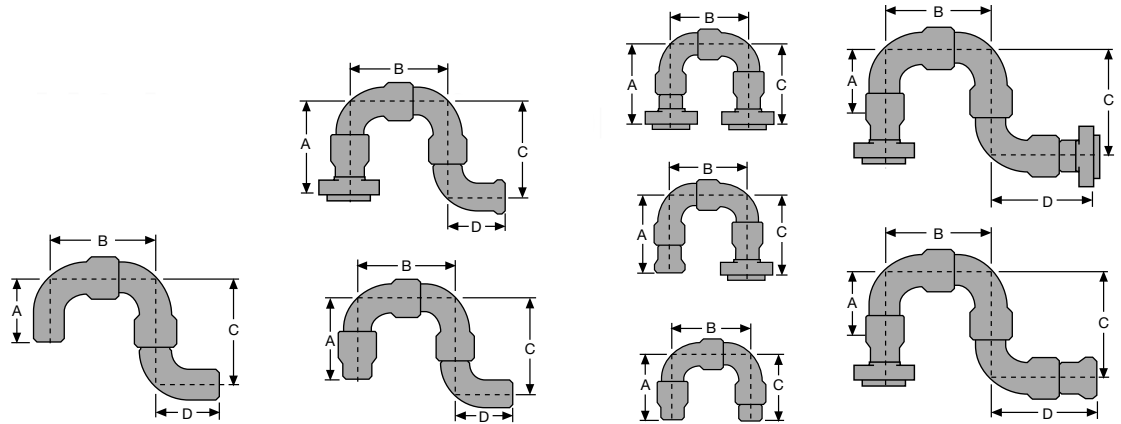
TripleStep and Longsweep® Swivel Joints



Size/Model Bore in. (mm)	CWP psi (bar)	End Connections	Style 20			Style 30				Style 40				Style 50					Style 60			
			Part No.	A	Wt lb kg	Part No.	A	B	Wt lb kg	Part No.	A	B	Wt lb kg	Part No.	A	B	C	Wt lb kg	Part No.	A	B	Wt lb kg
1" LS10 .86 (22)	10,000 (690)	Threaded	CF			6101537	4.38 111	7.14 181	8 3.6	N/A				3139546	4.38 111	7.28 185	7.02 178	16 7.2	CF			
1" LS15 .88 (22)	15,000 (1034)	1502 (MxF)	CF			3259291	4.06 103	8.4 213	12 5.5	N/A				3139547	4.06 103	7.35 187	8.4 213	22 10.2	CF			
		1502 (MxM)	CF			N/A				N/A				N/A					CF			
1.5" LS10 1.3 (33)	10,000 (690)	Threaded	P506047	6.53 166	8 3.6	CF				N/A				3139779	7.96 202	9.37 238	7.96 202	26 11.8	CF			
1.5" LS15 1.3 (33)	15,000 (1034)	1502 (MxF)	P510860	10.87 276	26 12	CF				N/A				3139778	5 127	9.4 239	10.1 257	34 15.5	CF			
		1502 (MxM)	CF			N/A				N/A				N/A					CF			
2" LS10 1.88 (48)	10,000 (690)	Threaded	P523525	7.2 183	14 6.2	3139888	6.38 162	9.01 229	21 9.5	3139890	6.36 162	10.73 273	30 13.6	3139904	6.4 163	10.74 273	9 229	37 16.8	3144545	9 229	9 229	29 13.2
2" LS15 1.88 (48)	15,000 (1034)	1502 (MxF)	P514100	11.15 283	37 16.8	3144126	5.5 140	10.91 277	36 16.3	N/A				3139475	5.5 140	10.74 273	10.92 277	56 25.5	3144630	11 279	11 279	48 22
		1502 (MxM)	CF			N/A				N/A				3267203	7.28 185	10.74 273	10.92 277	60 27.2	6101559	11 279	11 279	62 28.1
		1502 (FxF)	CF	9.03 229	20 9.1	N/A				N/A				3144000	5.5 140	10.74 273	8.79 223	42 18.9	P504952	8.79 223	8.79 223	37 16.9
2" LS20 1.88 (48)	20,000 (1379)	2002 (MxF)	CF			CF				N/A				3144569	5.12 130	10.9 277	12.42 315	62 28.3	CF			
		2002 (MxM)	CF			N/A				N/A				N/A					P512325	12.51 318	12.51 318	66 30.2
3" TS17 2.75 (70)	7,500 (517)	Threaded	CF			N/A				N/A				N/A					CF			
3" TS15 2.75 (70)	15,000 (1034)	1502 (MxF)	P505417	12.6 320	52 23.8	P505416	7.9 201	14.4 366	68 31	N/A				P505327	7.9 201	16.4 417	14.4 366	107 48.4	P505420	14.5 368	14.5 368	91 41.3
		1502 (MxM)	CF			N/A				N/A				N/A					CF			
3" TS120 3 (76)	20,000 (1379)	2002 (MxF)	CF			CF				N/A				3145133	9.69 246	21.2 538	20.4 518	299 136	CF			
4" TS10 3.88 (98)	10,000 (690)	1002 (MxF)	P516092	14.15 359	74 33.6	P517487	8.3 211	16.2 411	99 45	N/A				P516091	8.3 211	18.1 460	16.2 411	161 73.3	CF			
		1002 (MxM)	CF			N/A				N/A				N/A					CF			
4" XHTL 3.5 (89)	10,000 (690)	1502 (MxF)	P517048			N/A				N/A				3130502	9.69 246	21.2 538	20.4 518	275 125	P500656	20.38 518	20.38 518	234 106

Chiksan® Swivel Joint Specifications

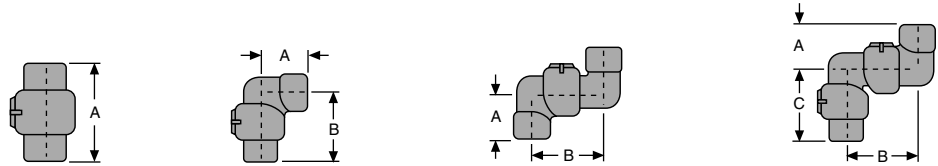
TripleStep and Longsweep Swivel Joints



Size/Model Bore in. (mm)	PSI (bar)	End Connections	Style 70						Style 80						Style 10					Style 100					
			Part No.	A	B	C	D	Wt lb kg	Part No.	A	B	C	D	Wt lb kg	Part No.	A	B	C	Wt lb kg	Part No.	A	B	C	D	Wt lb kg
1" LS10 .88 (22)	10,000 (690)	Threaded	N/A						CF						3141454	7.14 181	7.46 189	7.14 181	24 10.9	N/A					
1" LS15 .88 (22)	15,000 (1034)	1502 (MxF)	N/A						P516135	8.4 181	7.47 190	7.47 190	4.06 103	28 12.9	3139550	8.4 213	7.4 188	8.4 213	27 12.1	CF					
		1502 (MxM)	N/A						N/A						3145886	8.4 213	7.4 188	8.4 213	27 12.1	CF					
1.5" LS10 1.3 (33)	10,000 (690)	Threaded	N/A						CF						P501542	7.96 202	9.37 238	7.96 202	26 11.8	N/A					
1.5" LS15 1.3 (33)	15,000 (1034)	1502 (MxF)	N/A						P502504	10.12 257	9.37 238	9.37 238	5 127	47 21.1	3139781	10.12 257	9.37 238	10.12 257	44 20	CF					
		1502 (MxM)	N/A						N/A						3139780	10.12 257	9.37 238	10.12 257	52 23.5	CF					
2" LS10 1.88 (48)	10,000 (690)	Threaded	3139891	6.38 162	10.73 273	10.73 273	6.38 162	47 21.2	3139892	8.91 226	10.73 273	10.73 273	6.38 162	56 25.6	3139476	9 229	10.7 272	9 229	45 20.5	N/A					
2" LS15 1.88 (48)	15,000 (1034)	1502 (MxF)	P505482	5.5 140	10.73 273	10.73 273	5.5 140	60 27.2	3139901	10.9 277	10.73 256	10.73 256	5.5 140	80 36.5	3139905	10.9 277	10.7 272	10.9 277	61 27.7	3144094	10.97 279	10.73 273	10.73 273	10.91 277	82 37.5
		1502 (MxM)	N/A						N/A						3139477	10.9 277	10.7 272	10.9 277	70 31.8	3139903	10.97 279	10.73 273	10.73 273	10.91 277	90 40.7
		1502 (FxF)	N/A						N/A						P518960	8.8 224	10.7 272	10.9 277	50 22.7	CF					
2" LS20 1.88 (48)	20,000 (1379)	2002 (MxF)	N/A						CF						3144570	10.9 277	10.81 275	12.42 315	78 35.2	CF					
		2002 (MxM)	N/A						N/A						3144571	12.51 318	10.91 277	12.52 318	87 39.5	3144572	12.5 318	10.9 277	10.9 277	12.5 318	108 49.1
3" TSi7 2.75 (70)	7,500 (517)	Threaded	N/A						N/A						P524218	12.88 327	16.42 417	12.88 327	102 46.4	CF					
3" TSi15 2.75 (70)	15,000 (1034)	1502 (MxF)	N/A						P505409	14.4 366	16.4 417	16.4 417	7.9 201	145 65.9	P505325	14.5 368	16.4 417	14.4 366	129 58.7	P505410	14.4 366	16.4 417	16.4 417	14.6 371	168 76.1
		1502 (MxM)	N/A						N/A						P505326	14.4 366	16.4 417	14.4 366	143 64.8	P505411	14.4 366	16.4 417	16.4 417	14.6 371	181 82.2
3" TSi20 3 (76)	20,000 (1379)	2002 (MxF)	N/A						CF						3145134	20.4 518	21.2 538	20.4 518	360 164	CF					
4" TSi10 3.88 (98)	10,000 (690)	1002 (MxF)	N/A						CF						P516094	16.1 409	18.1 460	16.2 411	198 89.8	CF					
		1002 (MxM)	N/A						N/A						P516093	15.9 404	18.1 460	16.2 411	209 95	CF					
4" XHTL 3.5 (89)	10,000 (690)	1502 (MxF)	N/A						CF						3130501	20.4 518	21.2 538	20.4 518	338 154	CF					

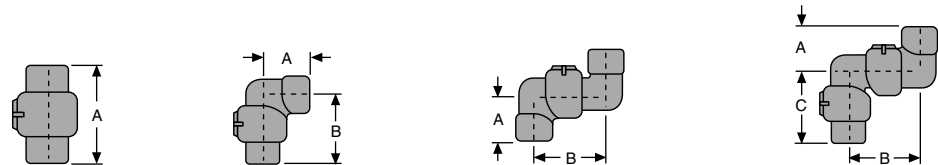
Chiksan® Swivel Joint Specifications

Extra High-Pressure Swivel Joints



Nom. Size in.	CWP psi (bar)	End Connections	Style 20			Style 30				Style 40				Style 50				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg
2	10,000 (690)	Threaded	3213066	6.97 177	14 6.4	3213067	4.12 105	6.48 165	21 9.5	3213068	4.12 105	6.38 162	28 12.7	3222842	4.12 105	6.45 164	7.52 191	36 16.4

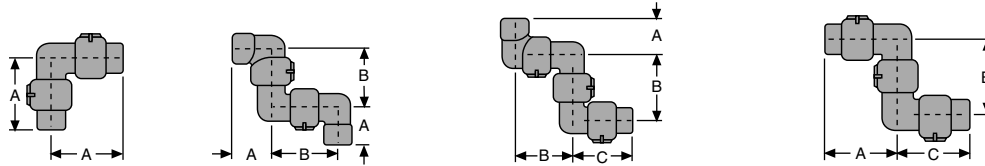
High-Pressure Swivel Joints



Nom. Size in.	CWP psi (bar)	End Connections	Style 20			Style 30				Style 40				Style 50				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg
.38	6,000 (414)	Threaded	3111290	3.31 84	1.5 0.7	3111291	1.94 49	2.81 71	1.8 0.8	3111292	1.94 49	2.13 54	2.5 1.1	3111293	1.94 49	2.88 73	2.81 71	3.3 1.5
.5	6,000 (414)	Threaded	3111314	3.31 84	1.5 0.7	3111315	1.94 49	2.81 71	1.8 0.8	3111316	1.94 49	2.13 54	2.5 1.1	3111317	1.94 49	2.88 73	2.81 71	3.3 1.5
.75	6,000 (414)	Threaded	3220946	5.31 135	2.8 1.3	3220947	2.72 69	4.62 117	3.8 1.7	3220948	2.62 67	4.22 107	4.5 2	3220883	2.72 69	4.22 107	4.62 117	6.8 3.1
1	6,000 (414)	Threaded	3207727	5.31 135	2.8 1.3	3207728	2.72 69	4.62 117	3.6 1.6	3207729	2.62 67	4.22 107	4.5 2	3205399	2.72 69	4.22 107	4.62 117	6.8 3.1
1.25	6,000 (414)	Threaded	3207734	5.47 139	4 1.8	3207735	3.19 81	4.72 120	5 2.3	3207736	3.19 81	4.28 109	6.3 2.8	3207737	3.19 81	4.28 109	4.72 120	8 3.6
1.5	6,000 (414)	Threaded	3207741	5.47 139	4 1.8	3207743	3.19 81	4.72 120	5 2.3	3207744	3.19 81	4.28 109	6.3 2.8	3205400	3.19 81	4.28 109	4.72 120	10 4.5
2	6,000 (414)	Threaded	3207749	6.66 169	12 5.5	3207750	4.03 102	5.84 148	15 6.8	3207751	4.03 102	5.88 149	19.5 8.9	3205637	5.84 148	5.88 149	4.03 102	27 12.3
2.5	6,000 (414)	Threaded	CF	8.25 210	18 8.2	3220167	4.88 124	7.12 181	22 10	3221068	4.88 124	7.68 195	29 13.2	3219959	7.12 181	7.68 195	4.88 124	37 16.8
3	6,000 (414)	Threaded	3207756	9.12 232	25 11.4	3207757	4.62 117	9.44 240	37 16.8	3207758	4.62 117	8.75 222	38 17.3	3207759	4.62 117	7.94 202	8.62 219	53 24.1
4	6,000 (414)	Threaded	3207764	9.62 244	38 17.3	3207765	5.56 141	10.81 275	51 23.2	3207766	5.56 141	10.56 268	64 29.1	3207767	5.56 141	9.83 250	9.88 251	86 39.1

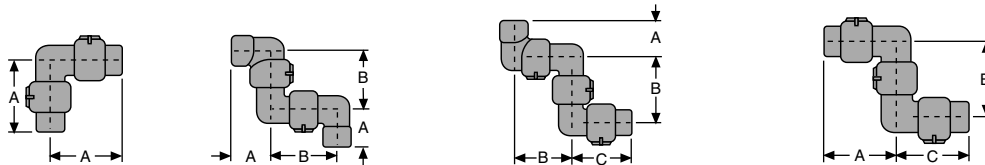
Chiksan® Swivel Joint Specifications

Extra High-Pressure Swivel Joints



Nom. Sizes in.	CWP psi (bar)	End Connections	Style 60			Style 70				Style 80					Style 10				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg	Part Number	A	B	C	Wt lb kg
2	10,000 (690)	Threaded	3222843	7.52 191	29 13.2	3256404	4.12 105	7 187	44 20	3256405	4.12 105	7 178	7.52 191	54 24.5	3222841	7 178	7.52 191	7.52 191	45 20.5

High-Pressure Swivel Joints



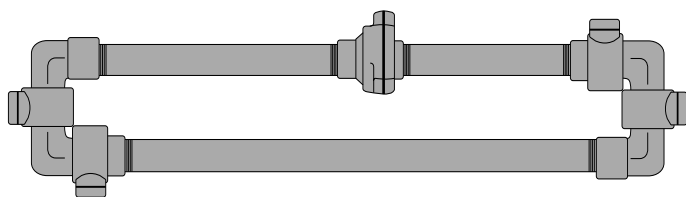
Nom. Size in.	CWP psi (bar)	End Connections	Style 60			Style 70				Style 80					Style 10				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg	Part Number	A	B	C	Wt lb kg
.38	6,000 (414)	Threaded	3111294	2.81 71	2.8 1.3	CF				N/A					N/A				
.5	6,000 (414)	Threaded	3111318	2.81 71	2.8 1.3	CF				3111320	1.94 49	2.88 73	2.81 71	4.8 2.2	3111313	3.12 79	2.88 73	3.12 79	4 1.8
.75	6,000 (414)	Threaded	3220949	4.62 117	5.8 2.6	CF				3220952	2.72 69	4.22 107	4.62 117	10 4.5	3220951	4.62 117	4.22 107	4.62 117	9 4.1
1	6,000 (414)	Threaded	3207730	4.62 117	8.8 4	3207731	2.72 69	4.22 107	8 3.6	3207732	2.72 69	4.22 107	4.62 117	10 4.5	3207726	4.62 117	4.22 107	4.62 117	9 4.1
1.25	6,000 (414)	Threaded	3207738	4.72 120	7 3.2	3207739	3.19 81	4.28 109	9.4 4.3	3207740	3.19 81	4.28 109	4.72 120	12 5.2	3207733	4.72 120	4.28 109	4.72 120	10 4.5
1.5	6,000 (414)	Threaded	3207745	4.72 120	7 3.2	3207746	3.19 81	4.28 109	9.4 4.3	3207747	3.19 81	4.28 109	4.72 120	14 6.4	3207741	4.72 120	4.28 109	4.72 120	10 4.5
2	6,000 (414)	Threaded	3207752	5.84 148	20 9.1	3207753	4.03 102	5.88 149	31 14.1	3207754	4.03 102	5.88 149	5.84 148	38 17.3	3207748	5.84 148	5.88 149	5.84 148	33 15
2.5	6,000 (414)	Threaded	N/A			N/A				N/A					N/A				
3	6,000 (414)	Threaded	3207760	8.62 219	48 21.8	3207761	4.62 117	7.94 202	57 25.9	3207755	4.62 117	7.94 202	9.44 240	77 35	3207755	8.62 219	7.94 202	9.44 240	71 32.3
4	6,000 (414)	Threaded	3207768	9.88 251	73 33.2	3207769	5.56 141	9.62 244	101 45.9	3207763	5.56 141	9.62 244	10.81 275	123 55.9	3207763	9.88 251	10.31 262	10.81 275	111 50.2

Chiksan® Swivel Joint Specifications

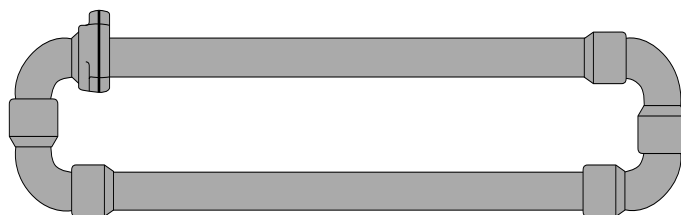
Chiksan Cementing and Circulating Hoses

Nominal Size/Model	Color Code	Cold Working Pressure psi (bar)	Weco Fig. No.	Swivel Joint Styles #1 / #2	Method of Construction Length in Extended Condition, Weight					
					Threaded 10 ft Part No.	lb (kg)	Threaded 12 ft Part No.	lb (kg)	Integral 9.5 ft* Part No.	lb (kg)
1" HP	Silver	6,000 (414)	602	50 / 50	3211995	37 (17)	3207644	41 (19)	N/A	–
1-1/2" HP	Silver	6,000 (414)	602	50 / 50	3206211	86 (39)	3205870	100 (45)	N/A	–
1-1/2" LS	Black	10,000 (690)	1502	50 / 50	3264538	106 (48)	3254780	–	N/A	–
	Red	15,000 (1034)	1502	50 / 10	N/A	–	N/A	–	3267266	132 (60)
2" HP	Silver	6,000 (414)	602	50 / 50	3206495	114 (52)	3205876	180 (820)	N/A	–
2" XHP	Black	10,000 (690)	1502	50 / 50	CF	CF	3205872	144 (66)	N/A	–
2" LS	Black	10,000 (690)	1502	50 / 50	3144394	136 (62)	3144001	148 (67)	N/A	–
	Red	15,000 (1034)	1502	50 / 10	N/A	–	N/A	–	6102805	159 (72)
2" LSG	Olive Green (Sour Gas)	10,000 (690)	1502	50 / 10	N/A	–	N/A	–	6102809	159 (72)
3" HP	Silver	6,000 (414)	602	50 / 50	3247975	213 (97)	3231262	234 (106)	N/A	–

* Actual length



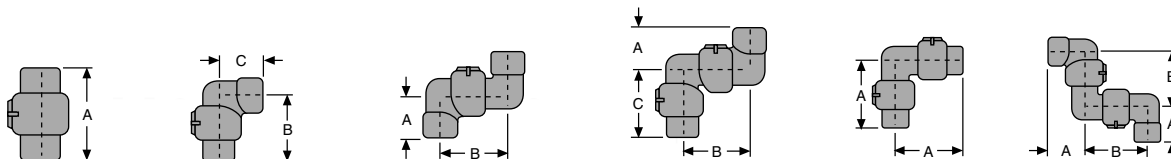
Typical Threaded Construction



Typical Integral Construction

Chiksan® Swivel Joint Specifications

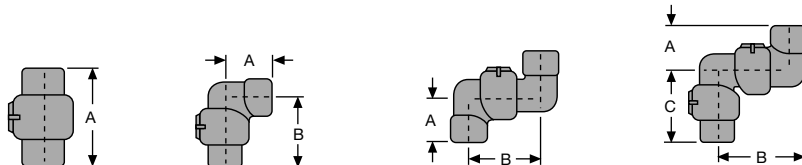
Low-Pressure Swivel Joints - Ductile Iron



Nom. Size in.	CWP psi (bar)	End Connections	Style 20			Style 30				Style 40				Style 50					Style 60			Style 70			
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg	Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg
.75	600 (41)	Threaded	3131926	4.5 114	2 1	3131927	2.5 64	3.88 99	3 1.2	3131886	2.5 64	3.6 91	3 1.4	3132053	2.5 64	3.6 91	3.9 99	4 2	3131928	3.88 99	4 1.7	3131929	3.64 92	2.4 61	6 2.5
1	600 (41)	Threaded	3131930	4.5 114	2 1	3131931	2.5 64	3.88 99	3 1.3	3131932	2.5 64	3.6 91	3 1.4	3132054	2.5 64	3.6 91	3.9 99	4 2	3131933	3.88 99	4 1.7	3131934	3.63 92	2.5 64	5 2.3
1.25	600 (41)	Threaded	3131935	5 127	3 1.5	3131936	3 76	4.5 114	6 2.5	3131937	3 76	4.2 107	5 2.3	3131937	3 76	4.2 107	4.5 114	7 3.1	3131938	4.5 114	6 2.5	CF			
1.5	600 (41)	Threaded	3131940	5 127	3 1.5	3131941	3 76	4.5 114	5 2.2	3131942	3 76	4.2 107	5 2.3	3132056	3 76	4.2 107	4.5 114	7 3.1	3131943	4.5 114	6 2.5	3131944	4.25 108	3 76	8 3.6
2	600 (41)	Threaded	3131945	5.75 146	8 3.5	3131946	3.5 89	5.75 146	10 4.5	3131947	3.5 89	6.1 155	13 5.9	3132011	3.5 89	6.1 155	5.8 147	17 7.9	3131951	5.75 146	15 6.8	3131952	6.13 156	3.5 89	22 9.8
2.5	600 (41)	Threaded	3131954	6.63 168	17 7.5	3131955	4.63 118	6.88 175	19 8.6	3131957	4.6 117	7.63 194	23 10.5	3131959	4.6 117	7.6 193	6.9 175	28 12.7	3131962	6.88 175	23 10.2	3131963	7.63 194	4.63 118	35 15.9
3	600 (41)	Threaded	3131965	6.63 168	13 5.7	3131966	4.63 118	6.88 175	16 5.7	3131968	4.6 117	7.63 194	16 7.3	3131970	4.6 117	7.6 193	6.9 175	21 9.5	3131973	6.88 175	23 10.2	3131974	7.63 194	4.63 118	8 3.5
	175 (12)	Flanged	3132204	6.63 168	27 12.3	3131976	5.5 140	6.88 175	33 14.8	3131979	5.5 140	7.63 194	39 17.7	CF					CF			CF			
4	600 (41)	Threaded	3131987	7.25 184	18 8	3131988	5 127	7.75 197	24 8	3131990	5 127	9.2 234	31 14.1	3131992	5 127	9.1 231	7.6 193	42 19.1	3131995	7.63 194	35 15.9	3131996	9.13 231.9	5 127	50 22.7
	175 (12)	Flanged	3131356	7.5 191	39 17.7	3131998	6.13 156	8.13 207	47 21.4	3132001	6.13 156	9.5 241	56 25.5	CF					3132006	8 203	58 26.4	CF			

Chiksan® Swivel Joint Specifications

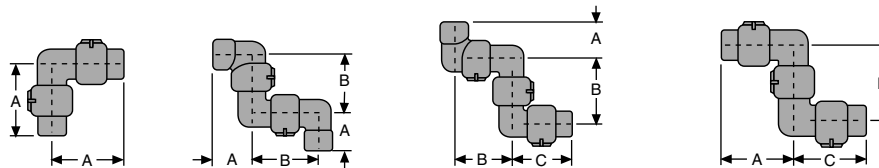
Low-Pressure Swivel Joints - Carbon Steel



Nom. Size in.	CWP psi (bar)	End Connections	Style 20			Style 30				Style 40				Style 50				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg
2	1,000 (69)	Threaded	3131048	5.75 146	8 3.4	3131049	3.5 89	5.75 146	10 4.5	3131050	3.5 89	6.1 155	13 5.8	3131052	3.5 89	6.13 156	5.8 147	18 8
	275 (19)	Flanged	CF			3131218	4.25 108	6.29 160	20 8.9	3131220	5.94 151	6.1 155	22 10	CF				
	1,000 (69)	Beveled	3131225	5.75 146	8 3.6	3131226	3.5 89	5.75 146	13 5.8	3131229	3.5 89	6.1 155	13 5.8	3131231	3.5 89	6.13 156	5.75 146	18 8
3	1,000 (69)	Threaded	3131272	6.63 168	12 5.2	3131273	4.62 117	6.88 175	16 7	3131276	4.76 121	7.6 193	21 9.3	3131278	4.6 117	7.6 193	6.9 175	33 15
	275 (19)	Flanged	3131635	6.63 168	29 13.2	3131286	5.5 140	6.88 175	34 15.5	3131289	5.5 140	7.63 194	40 18.2	3131291	5.5 140	7.63 194	6.88 175	46 20.9
	1,000 (69)	Beveled	3131299	6.63 168	12 5.2	3131300	4.63 118	6.88 175	16 7	3131303	4.6 117	7.6 193	21 9.3	3131305	4.63 118	7.63 194	6.88 175	28 12.7
4	1,000 (69)	Threaded	3131316	7.25 184	18 8	3131317	5.00 127	7.75 197	24 10.7	3131320	5 127	9.2 234	31 14.1	3131322	5 127	9.1 231	7.6 193	40 18.2
	275 (19)	Flanged	3134977	7.5 191	43 19.5	3131330	6.13 156	8.13 207	50 22.7	3131333	6.13 156	9.5 241	57 25.9	3131335	6.13 156	9.13 232	8 203	66 30
	1,000 (69)	Beveled	3131343	7.25 184	18 8	3131344	5 127	7.75 197	24 10.7	3131347	5 127	9.2 234	31 14.1	3131349	5 127	9.13 232	7.63 194	40 18.2
6	1,000 (69)	Threaded	3131069	13.94 354	66 30	3131070	9.75 248	16.19 411	76 34.5	3131071	9.75 248	18.48 469	73 33.3	CF				
	275 (19)	Flanged	3131077	13.44 341.4	96 43.6	3131078	9.5 241	15.94 405	112 50.9	3131079	9.5 241	18.5 470	127 57.7	CF				
	1,000 (69)	Beveled	3131088	6.44 164	42 19.2	3131089	2.44 62	6 152	59 27	3131090	6 152	18.5 470	97 44.2	3131091	6 152	18.48 469	12.48 317	123 55.9
8	1,000 (69)	Threaded	3131096	16.25 413	106 48.4	3131097	12.5 318	19.75 502	137 62.4	P523643	12.5 318	23.2 589	167 75.9	CF				
	275 (19)	Flanged	3131104	15.25 387	138 62.9	3131105	12 305	19.25 489	169 77	3131106	12 305	23.2 589	200 91	3131107	12.03 306	23.28 591	19.35 491	261 119
	1,000 (69)	Beveled	3131114	7.25 184	62 28	3131115	8 203	15.25 387	91 41.5	3131116	8 203	23.2 589	121 54.8	CF				

Chiksan® Swivel Joint Specifications

Low-Pressure Swivel Joints - Carbon Steel



Nom. Size in.	CWP psi (bar)	End Connections	Style 60			Style 70				Style 80					Style 10				
			Part Number	A	Wt lb kg	Part Number	A	B	Wt lb kg	Part Number	A	B	C	Wt lb kg	Part Number	A	B	C	Wt lb kg
2	1000 (69)	Threaded	3131053	5.75 146	15 6.7	3131054	2.4 61	3.64 92	21 9.3	3131055	3.5 89	6.13 156	5.75 146	25 11.5	3131047	5.73 146	6.13 156	6.13 156	22 10.2
	275 (19)	Flanged	3134978	6.2 157	30 13.6	CF				CF					CF				
	1000 (69)	Beveled	CF			CF				CF					P511523	5.73 146	6.07 154	5.73 146	24 10.8
3	1000 (9)	Threaded	3131281	6.88 175	23 10.5	3131282	4.63 118	7.63 194	33 15	3131284	4.63 118	7.63 194	6.88 175	46 20.9	3131271	6.88 175	7.63 194	6.88 175	35 15.9
	275 (19)	Flanged	3131294	6.88 175	40 18.2	CF				CF					CF				
	1000 (69)	Beveled	3131308	6.88 175	24 10.9	P505098	4.63 118	7.63 194	32 14.7	CF					CF				
4	1000 (69)	Threaded	3131325	7.63 194	24 10.7	3131327	5 127	9.13 232	47 21.4	3131328	5 127	9.13 232	7.63 194	58 26.4	3131315	7.63 194	9.13 232	7.63 194	53 24.1
	275 (19)	Flanged	3131338	8 203	59 26.8	CF				CF					CF				
	1000 (69)	Beveled	3131352	7.63 194	24 10.7	3134423	5 127	9.13 232	47 21.4	CF					3265987	7.62 194	9.12 232	7.62 194	53 24.1
6	1000 (69)	Threaded	CF			CF				CF					CF				
	275 (19)	Flanged	3131081	15.94 405	154 70	3131082	6 152	18.6 472	185 84	CF					CF				
	1000 (69)	Beveled	CF			3131093	9.5 241	18.44 468	130 59	3267081	6 152	18.6 472	12.54 319	171 77.7	CF				
8	1000 (69)	Threaded	CF			CF				CF					CF				
	275 (19)	Flanged	3131108	19.41 493	230 104	CF				CF					CF				
	1000 (69)	Beveled	CF			CF				CF					CF				

Typical Weco® and Chiksan® Equipment Recommended Temperature Ranges

(Consult factory for specific values)

Elastomer Selection	Product Line and Materials of Construction					Temperature Ranges
	Wing Unions, Swivel Joints		Wing Unions, Swivel Joints, Plug Valves, Check Valves, Fittings, Pup Joints, Adapters		Butterfly Valves	
	Ductile Iron	Carbon Steel	Alloy Steel Standard Service	Alloy Steel Sour Gas Service		
No Seal (Wing Union)	X					20°F (-7°C) to 300°F (149°C)
No Seal (Wing Union)		X				0°F (-18°C) to 300°F (149°C)
Nitrile	X					20°F (-7°C) to 240°F (116°C)
Nitrile		X				0°F (-18°C) to 240°F (116°C)
Nitrile			X			-20°F (-29°C) to 240°F (116°C)
Winterized Nitrile				X		-50°F (-46°C) to 240°F (116°C)
HNBR	X					20°F (-7°C) to 300°F (149°C)
HNBR		X	X	X		10°F (-12°C) to 300°F (149°C)
Viton®	X	X	X	X		20°F (-7°C) to 300°F (149°C)
Natural Rubber Seat					X	-20°F (-29°C) to 150°F(66°C)
Nitrile Seat					X	-20°F (-29°C) to 200°F (93°C)
EPDM, Hypalon, or PTFE Seat					X	-20°F (-29°C) to 250°F (121°C)
Silicone Rubber Seat					X	-20°F (-29°C) to 300°F (149°C)
Fluoroelastomer Seat					X	-10°F (-23°C) to 300°F (149°C)
Neoprene Seat					X	0°F (-18°C) to 200°F (93°C)

Warnings and Cautions

FMC Technologies cannot anticipate all of the situations a user may encounter while installing and using FMC products. Therefore, the user of FMC products MUST know and follow all applicable industry specifications and practices on the safe installation and use of these products. For additional safety information, refer to FMC Technologies product catalogs, product brochures, and installation, operating, and maintenance manuals, which can be accessed at www.fmctechnologies/fluidcontrol.com, or contact FMC Technologies at 800-772-8582.

WARNING

Failure to follow these safety warnings could result in death, serious personal injury, and/or severe property damage.

- Never mix or assemble components, parts, or end connections with different pressure ratings. Mismatched conditions, including but not limited to that of a 2" Figure 1502 male sub end connected to a 2" Figure 602 female sub, may fail under pressure resulting in death, serious personal injury, or severe property damage.
- Never use or substitute non FMC components or parts in FMC products or assemblies.
- Never modify or repair FMC products in a manner not specifically directed in instructions published by FMC Technologies.
- Never strike, tighten, loosen, or attempt repairs on pressurized components or connections.
- Never exceed the rated working pressure of the product.
- Complete and proper make-up of components and connections is required to attain rated working pressure. Always apply essential care, attention, handling, and inspection to threaded components before, during and after make-up.
- Never use severely worn, eroded, or corroded products. Contact FMC Technologies for more information on how to identify the limits of erosion and corrosion.
- Never strike wing union nuts having severely flattened and extruded ears. This condition can result in flying debris leading to serious personal injury and must immediately be addressed by either grinding off extruded material or removing the nut from service.
- Always follow safe practices when using products in overhead applications. Products not properly secured could fall.
 - Never exceed the load rating of lifting devices on products or lifting equipment.
 - Use of FMC products in suspension applications can result in over-stress conditions leading to catastrophic failure.
 - If externally applied loads are anticipated, consult factory.
- Always follow safe practices when manually lifting and carrying products.
- Always select only appropriate product and materials for the intended service:
 - Never expose standard service products to sour gas fluids (Refer to NACE MR-01-75). Do not interchange sour gas with standard service components.
 - Always use appropriate safety precautions when working with ferrous products in below freezing temperatures. Freezing temperatures lower the impact strength of ferrous materials.
- Always follow manufacturer's instructions and Material Safety Data Sheet directions when using solvents.
- Always make certain that personnel and facilities are protected from residual hazardous fluids before disassembly of any product.
- Whenever leakage is detected from FMC Technologies products, remove them from service immediately to prevent death, serious personal injury, and/or property damage.

SAFETY INSTRUCTIONS: The applications of FMC products are in working environments and systems which must be properly designed and controlled. Safety procedures and policies MUST be clearly established by the user and followed. Always use appropriate protective equipment.

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