LOKRING® TECHNOLOGY LLC

4130 Alloy Steel (LTCS-333) Process Fittings

NACE MR0175 / ISO 15156 Compliant ✓

A333 (LTCS) Qualified ✓

1/8 in. / 3.2 mm Corrosion Allowance ✓

THE mechanical "weld equivalent" pipe connection

Suitable for use in: sour service
low-temperature service
high-temperature service

ASME B31 QUALIFICATION • Lloyds Type Approval

No hot work • Safe, permanent and tamper free • Quick and easy to install
Significantly reduces installation costs • Eliminates PWHT and HAZ issues

4130 Alloy Steel (LTCS-333) Process Fittings

- **A NACE-compliant fitting material (AISI/SAE 4130 (UNS G41300) 4130 alloy steel tested to NACE TMO-177 Method A**
- **Qualified for use on A333 (LTCS) Piping (Charpy impact tested to –50 °F (–46 °C). 85 % minimum shear)**
- **Designed for piping systems having a corrosion allowance of 1/8 in. or 3.2 mm**

ASME B31 Qualification Testing

- Qualified for use on A333 Gr 6, A106, API 5L and A53 Grades B
- Schedule 40, 80, and 160[A]

A. Up to 2 1/2 in.

Fitting Material Specification

- AISI/SAE 4130 (UNS G41300) 4130 alloy steel in accordance with Lokring material specifications LMS 97-22 and LMS 09-02
- Fittings have blue zinc chromate plating in accordance with ASTM B633

Applications may include but are not limited to...

Plant, instrument, utility, air
Fuel (diesel), fuel gas, natural gas
Lube, seal and hydraulic oil
Closed drains (hazardous and nonhazardous)
Open drains (hazardous and nonhazardous)
Butane and propane
Process vapor
LP flare
HP flare
Flare (sour)
Process fluids (sour)
Atmospheric vents
Steam
Gases (N_2, O_2, H_2, He, etc.)
Inert gas
Hydrocarbons and LPG
Hydrocarbon solvents
Distillates and aromatics
Condensate
Methanol
Sulfuric acid (95 to 98 % concentration)
Heat transfer fluids
Cooling, utility, and fire water
Crude and HP storage LPG connection lines

System Parameters

Typical class: 150, 300, 600, 900, and 1500
Temperature: –50 to 800 °F (–46 to 426 °C)

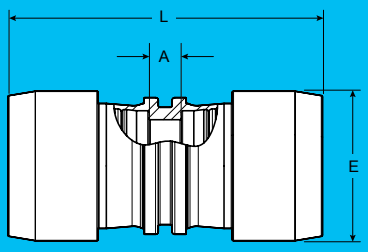
Elastic Strain Preload (ESP®) Technology

During installation, the axial movement of the Lokring™ driver over the fitting body swages the body onto the pipe surface, compressing the pipe wall first elastically and then plastically. The pipe wall resists this swaging action, generating high unit compressive loads at the contact points between narrow sealing lands inside the fitting body and the pipe surface.

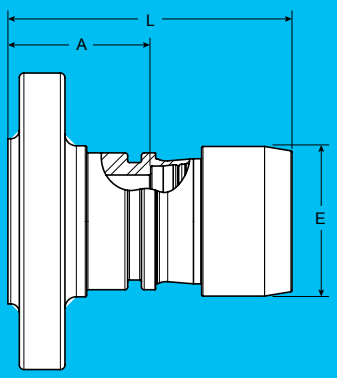
These contact stresses are sufficiently high to plastically yield the pipe surface under the multiple sealing lands, forming a 360° circumferential, permanent, metal-to-metal seal between the pipe and fitting body. The driver, which experiences a small increase in diameter (elastic strain) during installation, exerts an elastic, radial preload on the metallic seals for the life of the connection

4130 Alloy Steel (LTCS-333) Process Fittings Technical Specifications

Coupling (-CPL-)



Flange (-FLNG600-) Class 600 Shown



Fitting Ordering Information

	Ordering Information			Dimensions, in.			Dimensions, mm		
Pipe Size NPS	Fitting Material	Shape	Fitting Size PXX	Length (Uninstalled) L	E dia	Take-Out A	Length (Uninstalled) L	E dia	Take-Out A
1/2	LTCS	-CPL-	P08	3.33	1.46	0.47	84.6	37.1	11.9
3/4	LTCS	-CPL-	P12	3.78	1.75	0.55	96.0	44.5	14.0
1	LTCS	-CPL-	P16	4.61	1.98	0.6	117.1	50.3	15.2
1 1/2	LTCS	-CPL-	P24	5.39	2.70	0.67	136.9	68.6	17.0
2	LTCS	-CPL-	P32	6.9	3.28	0.7	175.3	83.3	17.8
3	LTCS	-CPL-	P48	9.43	4.34	0.85	239.5	110.2	21.6
4	LTCS	-CPL-	P64	10.88	5.52	N/A	276.4	140.2	N/A
1/2	LTCS	-FLNG600-	P08	3.74	1.46	2.31	95.0	37.1	58.7
3/4	LTCS	-FLNG600-	P12	4.12	1.75	2.50	104.6	44.5	63.5
1	LTCS	-FLNG600-	P16	4.70	1.98	2.69	119.4	50.3	68.3
1 1/2	LTCS	-FLNG600-	P24	5.37	2.70	3.00	136.4	68.6	76.2
2	LTCS	-FLNG600-	P32	6.23	3.28	3.13	158.2	83.3	79.5
3	LTCS	-FLNG600-	P48	7.79	4.34	3.50	197.9	110.2	88.9
4	LTCS	-FLNG600-	P64	9.69	5.52	4.25	246.1	140.2	108.0

Weld-free ASME B16.5 equivalent flanges also available in classes 150, 300, and 1500.
Weld-free elbows and tees under development. Caps available up to 1 inch NPS.

Tooling Ordering Information

	Loktool®				
Pipe Size NPS	Fitting Size PXX	Standard Installation Tool	MPG	Body Insert	Jaw Insert
1/2	P08	MTK45	8090155	7080279	7080280
3/4	P12	MTK45	8090156	7080277	7080278
1	P16	MTK60	8090157	7080275	7080276
1 1/2	P24	MTK60	8090111	7080283	7080284
2	P32	MTK60	8090110	7080282	—
3	P48	MTK100	8090102	7080281	—
3	P48	MKT145	8090102	6080428 (upper) and 080429 (lower)	6080430 (upper) and 6080431 (lower)
4	P64	MKT145	8090159	6080426	6080426

Actual Test Description

- 4130 alloy steel material 1 1/2- and 2-inch Lokring couplings on A333/A106 pipe
- Internal exposure testing of the assemblies using NACE TM0177 solution A for a duration of 30 days
- Solution A is 5 % NaCl acidified with 0.5 % glacial acetic acid
- Tests conducted at 1 atm of H_2S at room temperature (76 °F / 24 °C) to assess sulfide stress cracking (SSC)
- The solution and test specimens were initially deaerated with N_2 followed by continuous purging of H_2S for the duration
- pH was initially 2.7 and was replenished when pH reached 3.8

Key Observations and Conclusions

- ✓ No evidence of sulfide stress cracking (SSC) or stress corrosion was observed in any sample
- ✓ Deemed suitable for sour service applications within the H_2S partial pressure temperature limitations listed in NACE MR0175 / ISO 15156 and NACE MR0103
- ✓ Any temperature is allowed with a restrictive partial pressure of H_2S of 15 psia (1 bar)

The above was extracted from a customer test report. Available for viewing on request.

Crevice Corrosion Testing

This was conducted to see the impact of corrosion within the small cavity, or crevice, in the Lokring fitting design with the intent to evaluate the corrosion specific to a Lokring fitting and compared to a socket weld.

It was based on the principles of ASTM G78 *Standard Guide for Crevice Corrosion Testing of Iron-Base and Nickel-Base Stainless Alloys in Seawater and Other Chloride-Containing Aqueous Environments* for an accelerated 30-day test.

The test solution and exposure conditions as outlined in ASTM G78 utilized test solution A: 5.0 wt % sodium chloride and 0.5 wt % glacial acetic acid dissolved in distilled or deionized water (e.g., 50.0 g of NaCl and 5.0 g of CH_3COOH dissolved in 945 g of distilled or deionized water).

As a result of this testing, Lokring is now pleased to endorse Lokring 4130 alloy steel fittings for applications that customers feel may result in crevice corrosion. We would however suggest that you work closely with your Lokring representative to ensure all parties are comfortable with the overall system conditions and parameters. This report is available on request.

Warranty Information
Lokring components are backed by the Lokring Limited Lifetime Warranty. For a copy, visit lokring.com or contact your authorized Lokring representative.

System design and system safety are the ultimate responsibilities of the end-user. Consideration to system function, compatibility, product ratings, as well as other factors, must be given to ensure proper product selection and function. All information in this catalog has been compiled with regard to accuracy; however the most up-to-date information should be verified before use of the product. Lokring reserves the right to change product dimensions, ratings or other information.

38376 Apollo Parkway • Willoughby • Ohio • 44094 • U.S.A. • T: +1.440.942.0880

www.lokring.com

November 2014, Rev 6
9070072