



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Lokring Technology Corporation
Address	38376 Apollo Parkway, Willoughby, OH, 44094, United States
Type	Weldless Mechanical Pipe Coupling
Description	Elastic Strain Preload (ESP) Mechanically attached tube, pipe fittings and Lokring tooling
Trade Name	Pipe sizes: ¼ NPS to 3 NPS (SS, MAS and CuNi), Tube sizes: ¼ OD to 2 OD (SS)
Application	Marine, Industrial and Offshore
Specified Standard	Rules and Regulations for the Classification of Ships- 2022 Rules and Regulations for the Classification of Offshore Units- 2022 Rules and Regulations for the Classification of Naval Ships- 2022 IACS UR P2.11- R5-2021 ASME B31.1- 2020 ASME B31.3 -2020
Ratings	See Appendix to this certificate.
Other Conditions	

Gopal Nair

Piping & Pressure System Principal Specialist
to Lloyd's Register North America, Inc.
A member of the Lloyd's Register group

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1. Chemical composition, mechanical properties and certification of the fittings materials used in class I and II piping systems on ships or installations classed or intended for classification with Lloyds Register are to comply with relevant sections of the '*Rules for the Manufacture and Testing and Certification of the Materials*'
2. Lokring fittings do not employ elastomeric seals and are metal to metal seated. Lokring fittings passed fire testing of API 607 and ASTM F 1387. However for marine applications in accordance with *Rules and Regulations for Classification of ships Part 5, chapter 1 2 table 12.2.7 – compression couplings are considered metal to metal seated* and these fittings can be used on systems which require thirty minutes wet fire tests.
3. MAS-3000, MAS-3000 RCPL, SS and CN-3300 fittings have completed combined pressure pulsation and vibration tests in accordance with IACS UR P.2.11. CN 200 & 700 Couplings have not completed combined pressure pulsation and vibration cycle testing in accordance with IACS UR P 2.11. Couplings made out of CN 200 & 700 are not to be used where major pressure pulsation is expected in accordance with table 9 of IACS UR P2.11.5.1 such as diesel injection lines, diesel pump spill lines, or where major pressure pulsation other than water hammer is expected for a particular system.
4. Any tubes and/or pipes connected are to have a minimum burst pressure ratio of 4:1 and suitability of the pipe scantlings is to be advised by the firm. The pipe segments connected are to maintain the minimum recommended cross-sectional area, taking also into account the assumed corrosion allowance on case-by-case basis. Intermediate diameter and/or thickness or metric dimensions consult manufacture's catalogue for published pressure temperature rating.
5. During installation the Firm's standard procedures and tooling are to be employed by qualified personnel. The fittings are not to be reinstalled after dismantling.
6. Pipe/tubes and the corresponding fittings are to have similar coefficient of linear expansion; i.e, where thermal expansion effects govern intermixing of different materials are to be avoided for pipes/tubes and fittings.
7. Where the fittings are employed in installation where compliance with

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Lloyds Register Rules and Regulations for classification of Ships/Mobile Offshore units/fixed or floating installations, ASME B 31.1 and/or ASME B 31.3 is required the relevant ambient maximum design pressure and de-rating factors are to be applied as described in Firm's specifications. Consult manufacturer for the stress intensification factors to be used for pipe stress analysis.

7.1 The fittings are not considered acceptable in applications for lethal, toxic or LNG service where only full butt welded piping systems are required by relevant Lloyds Register Rules, Codes and /or Standards.

7.2 The use of taper male pipe thread adapter is to be limited as per ASME 31.1 and 31.3 codes (Paragraphs 114 and 314 respectively). For code stamped installations use of fittings are to be in agreement with the administration having jurisdiction over the place of installation.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register North America, Inc. of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: 98/600074(E4)

The Design Appraisal Document Q/ADSO/22-0938/001/GN and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR23405429TA****Appendix to LR23405429TA****Pressure Ratings****Lokring Fittings Ratings for Marine Applications**

<u>LOKRING Fitting</u>	<u>NPS</u>	<u>Pipe Sch.</u>	<u>Pressure Rating IACS</u>
SS40-XXX-P04	1/4 "	10	3781
		40	5300
		80	6000
SS40-XXX-P06	3/8 "	10	3400
		40	4900
		80	5750
SS40-XXX-P08	1/2 "	10	4030
		40	4760
		80	4760
SS40-XXX-P12	3/4 "	10	3170
		40	4210
		80	4930

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SS40-XXX-P16	1"	10	3340
		40	3680
		80	3990
SS40-XXX-P20	1 1/4"	10	2500
		40	2700
		80	2980
SS40-XXX-P24	1 1/2"	10	2260
		40	2440
		80	2440
SS40-XXX-P32	2"	10	1500
		40	2200
		80	2500
SS40-XXX-P48	3"	10	920
		40	1700
		80	1350

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<u>LOKRING Fitting</u>	<u>OD</u>	<u>Tube Wall</u>	<u>Pressure Rating</u> <u>IACS</u>
SS40-XXX-T04	1/4 "	0.035	4794
		0.049	7050
		0.065	8507
SS40-XXX-T06	3/8 "	0.035	3102
		0.049	4512
		0.065	5311
SS40-XXX-T08	1/2 "	0.035	2444
		0.049	3478
		0.065	4014
SS40-XXX-T10	5/8 "	0.035	1974
		0.049	2726
		0.065	3525
SS40-XXX-T12	3/4 "	0.035	1598
		0.049	2256
		0.065	3102
SS-3000-XXX-T14	7/8 "	0.065	2632

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SS-3000-XXX-T16	1"	0.065	2256
SS-3000-XXX-T20	1 1/4"	0.065	1786
		0.083	2256
		0.095	2632
		0.109	3102
SS-3000-XXX-T24	1 1/2"	0.065	1504
		0.083	1880
		0.095	2162
		0.109	2538
		0.120	2820
SS40-XXX-T32	2"	0.065	1034
		0.083	1410
SS40-XXX-T40	2 1/2"	0.065	846
		0.083	1128



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<u>LOKRING Fitting</u>	<u>NPS</u>	<u>Pipe Sch.</u>	<u>Pressure Rating</u> <u>IACS</u>
MAS-3000-XXX-P04	NPS ¼	40	4890
		80	6610
MAS-3000-XXX-P06	NPS ⅜	40	4040
		80	5600
MAS-3000-XXX-P08	NPS ½	40	3890
		80	5250
		160	4810
MAS-3000-XXX-P12	NPS ¾	40	3230
		80	4400
		160	4240
MAS-3000-XXX-P16	NPS 1	40	3030
		80	3975
		160	3650
MAS-3000-XXX-P20	NPS 1¼	40	2480
		80	3350
MAS-3000-XXX-P24	NPS 1½	40	2200
		80	2930

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MAS-3000-XXX-P32	NPS 2	40	1790
		80	2420
MAS-3000-XXX-P40	NPS 2 1/2	40	2300
		80	2550
MAS-3000-XXX-M76.1	M76.1	40	2300
		80	2550
MAS-3000-XXX-P48	NPS 3	10	990
		40	1700
		80	2260

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR23405429TA****CN 200**

<u>LOKRING Fitting</u>	<u>NPS</u>	<u>Wall</u>	<u>Pressure Rating</u> <u>IACS</u>
CN-200-XXX-P04	1/4 "	0.065	290
CN-200-XXX-P06	3/8 "	0.065	290
CN-200-XXX-P08	1/2 "	0.065	290
CN-200-XXX-P12	3/4 "	0.065	290
CN-200-XXX-P16	1 "	0.065	290
CN-200-XXX-P20	1 1/4 "	0.072	290
CN-200-XXX-P24	1 1/2 "	0.072	290
CN-200-XXX-P32	2 "	0.083	290

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR23405429TA****CN 700**

<u>LOKRING Fitting</u>	<u>NPS</u>	<u>Wall</u>	<u>Pressure Rating IACS</u>
CN-700-XXX-P04	1/4 "	0.065	700
CN-700-XXX-P06	3/8 "	0.072	700
CN-700-XXX-P08	1/2 "	0.072	700
CN-700-XXX-P12	3/4 "	0.083	700
CN-700-XXX-P16	1 "	0.095	700
CN-700-XXX-P20	1 1/4 "	0.095	700
CN-700-XXX-P24	1 1/2 "	0.109	700
CN-700-XXX-P32	2 "	0.12	700

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR23405429TA****MASS 3000 RCPL**

<u>LOKRING Fitting</u>	<u>NPS</u>	<u>Pipe Sch.</u>	<u>Pressure Rating IACS</u>
MAS-3000-RCPL-P04	NPS ¼	40	4890
		80	6000
MAS-3000-RCPL-P06	NPS ⅜	40	4040
		80	5600
MAS-3000-RCPL-P08	NPS ½	40	3890
		80	4760
MAS-3000-RCPL-P12	NPS ¾	40	3230
		80	3840
MAS-3000-RCPL-P16	NPS 1	40	3030
		80	3975
MAS-3000-RCPL-P20	NPS 1¼	40	2480
		80	2980

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR23405429TA**

MAS-3000-RCPL-P24	NPS 1½	40	2200
		80	2440
MAS-3000-RCPL-P32	NPS 2	40	1790
		80	2420
MAS-3000-RCPL-P48	NPS 3	40	1700
		80	1350

CN-3300

<u>LOKRING Fitting</u>	<u>OD</u>	<u>Tube wall</u>	<u>Pressure Rating IACS</u>
CN-3300-XXX-T04	¼	0.035	3300

