



CERTIFICATE NUMBER	21-2200436-PDA
EFFECTIVE DATE	13-Jan-2022
EXPIRY DATE	12-Jan-2027
ABS TECHNICAL OFFICE	Houston ESD - Piping

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

LOKRING TECHNOLOGY, LLC

located at

**38376 APOLLO PARKWAY, WILLOUGHBY, OH, United States,
44094**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Elastic Strain Preload (ESP) Fittings
Model: MAS-3000, MAS-3000-RCPL
Endorsements:
Tier: 3 - Type Approved, unit certification not required

This Product Design Assessment (PDA) Certificate remains valid until 12/Jan/2027 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Yongjin Lee

Yongjin Lee, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

LOKRING TECHNOLOGY

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WILLOUGHBY OH

United States 44094

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Email: dmaron@lokring.com

Web: www.lokring.com

Tier: 3 - Type Approved, unit certification not required

Product: Elastic Strain Preload (ESP) Fittings

Model: MAS-3000, MAS-3000-RCPL

Endorsements:

Intended Service:

Marine & Offshore Application - For joining Pipe and Tube . May be used in flammable fluids since none of the fittings components will deteriorate in a fire.

Description:

1) MAS-3000 for Carbon Steel Pipe, ASTM A53 and A106, SCH 40 and 80, 1/4" through 3" NPS.
Body and swage rings of this fitting are made from micro alloyed Carbon steel

2) MAS-3000-RCPL for Carbon Steel Pipe, ASTM A53 and A106, SCH 40 and 80 , 1/4" NPS through 3" NPS.
Body made from stainless steel and swage rings made from carbon steel

3) MAS-3000 for Carbon Steel Pipe, ASTM A53 and A106, Sch 160, 1/2" through 1" NPS.

Rating:

For Fittings, Sizes, Pressure Rating, etc. see attached "pdf" for details.

Service Restriction:

Unit Certification is not required for this product.

If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Drawing no. 16-005, Proposed Test Plan Procedure for extension of American Bureau of Shipping PDA, 2016

Drawing no. 6090128R6, Guideline for Designing ASME B31 Pressure Piping Using Lokring™ Fittings with Elastic Strain Preload® (ESP®) Technology, 2015

Drawing no. 6090127 Lokring Fitting Applications Guide, 2014

Drawing no. 08-017 TSSA Subm 020311, Test Report 08-017 TSSA of MAS-3000 P64 Fitting, 2011, Lokring Technology

Drawing no. 11-014 052511, Test Report 11-014 of MAS-CPL-P64, 2011, Lokring Technology

Drawing no. 11-022 Lokring API 6FB Fire test 020212, Test Report 11-022 of LTCS-333 and MAS-3000 product lines, 2011, Lokring Technology

Terms of Validity:

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STANDARDS**ABS Rules:**

The Rules for Conditions of Classification, 2022 Marine Vessel Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:

2022 Rules for Building and Classing Marine Vessel Rules: 4-6-4/13.7.1(b), 4-6-4/Table 2, 4-6-2/5.9.

The Rules for Conditions of Classification, Offshore Units and Structures, 2022 Mobile Offshore Units 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

2022 Rules for Building and Classing Mobile Offshore Units: 4-2-1/11.13.

National:

ASTM F 1387:2019

International:

IACS P2.11.5 - IACS Req. 2001/Rev.5 2021

Government:

NA

EUMED:

NA

OTHERS:

NA

For the MAS-3000 pipe product line:

LOKRING Fitting	NPS	Pipe/Tube OD(inches)	Pipe Schedule			Pressure rating ABS (psi)
MAS-3000-XXX-P04	¼”	0.540	40	80		3300
MAS-3000-XXX-P06	3/8”	0.675	40	80		3300
MAS-3000-XXX-P08	½”	0.840	40	80	160	3300
MAS-3000-XXX-P12	¾”	1.050	40	80	160	3300
MAS-3000-XXX-P16	1”	1.315	40	80	160	3300
MAS-3000-XXX-P20	1-1/4”	1.660	40			2480
			80			
MAS-3000-XXX-P24	1-1/2”	1.900	40			2200
			80			
MAS-3000-XXX-P32	2”	2.375	40			1790
			80			
MAS-3000-XXX-P40	2-1/2”	2.875	40			2300
			80			
MAS-3000-XXX-M76.1	M76.1	76.1 mm	40			2300
			80			
MAS-3000-XXX-P48	3”	3.500	40			1700
			80			

For the MAS-3000-RCPL Pipe Product Line:

LOKRING Fitting	NPS	Pipe/Tube OD (inches)	Pipe Schedule		Pressure Rating ABS (psi)
MAS-3000-RCPL-P04	¼"	0.540	40		3300
			80		
MAS-3000-RCPL-P06	3/8"	0.675	40		3300
			80		
MAS-3000-RCPL-P08	½"	0.840	40		3300
			80		
MAS-3000-RCPL-P12	¾"	1.050	40		3300
			80		
MAS-3000-RCPL-P16	1"	1.315	40		2475
			80		
MAS-3000-RCPL-P20	1-1/4"	1.660	40		1875
			80		
MAS-3000-RCPL-P24	1-1/2"	1.900	40		1695
			80		
MAS-3000-RCPL-P32	2"	2.375	40		1125
			80		
MAS-3000-RCPL-P48	3"	3.500	40		920
			80		

Temperature De-rating factors for Carbon Steel Lokring Fittings (MAS-3000, MAS-3000-RCPL):

Temperature °F (°C)	De-Rating Factor ASME B31.1	De-Rating Factor ASME B31.3
400°F (204°C)	1.00	1.00
500°F (260°C)	0.95	0.95
600°F (315°C)	0.87	0.87
650°F (343°C)	0.75	0.75