Certificate No: LR21228904TA
Issue Date: 02/06/2021
Expiry Date: 01/06/2026

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
Type	Pipe Couplings
Description	Elastic Strain Preload (ESP) Mechanically attached pipe fittings and Lokring tooling PRODUCT TYPE Low Temperature Carbon Steel- 333 Process Fittings (LTCS)& Carbon steel Fittings (MAS)
Trade Name	Lokring LTCS and MAS Fittings
Application	Process Pipe Fittings for Sour Service - Offshore and Industrial Applications
Specified Standard	LR Rules and Regulations for the Classification of OffshoreUnits 2020 ASME B 31.1- 2018 ASMEB 31.3- 2018 NACEMR0175/ ISO15156-1 First Edition & NACE TM0177-2005
Ratings	As defined and documented in manufacturer's documentation and calculations. Consult manufacturer for pressure- temperature ratings
Additional Tests	Test report 24-2007-161706 for H_2S exposure

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Gopal Nair

Americas Design Appraisal Manager to
Lloyd's Register Quality Assurance Inc
A member of the Lloyd's Register group

1330 Enclave Parkway, Houston, Texas, 77077,
United States

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Other Conditions

1.For Low Temperature Carbon Steel 333 fittings anytemperature is allowed with a more restrictive partial pressure of $H_2S$of 15 psia, derived from the test conditions of the test report24-2007-161706. End user to consult withLokring Technology for partial pressure of H_2S and the testedenvelope not to be exceeded.
2.Report 24-2007-161706 is based on a modified test toevaluate the configuration of the fittings, considers only sulphide stresscracking and effect of any corrosion is not addressed in this report. Accordingly end user to consult manufacturerfor effect of erosion or corrosion.
3.Where flanged fittings are employed, the materials currently proposed are not listed in ASMEB 16.5. Accordingly, for the flanges materialprocurements and manufacturing to meet an acceptable standard such as MSSSP-44. The pressure temperature limitationswill be as per the acceptable flange standard.
4.Couplings do not employ elastomeric sealing materials and the couplings/ fittings are not firetested type.
5.Couplings covered under this certificate are primarilyintended for process side and not to be employed where requirements of IACS URP.2.11 requirements as specified for marine applications.
6.Any tubes and/or pipes connected are to have a minimumburst pressure ratio of 4:1 and suitability of the pipe scantlings is to beadvised by the firm. The pipe segmentsconnected are to maintain the minimum recommended cross-sectional area, takingalso into account the assumed corrosion allowance on case by case basis. Testreport 24-2007-161706 is based on seamless pipes and this need to be accountedfor during selection of the pipes.
7.Low temperature applications the driver are to be impact tested as per applicable Rules / Codes .
8.MAS products are intended for non-sour service.

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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 Quality Assurance Inc of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: 10/60002(E2)

The Design Appraisal Document and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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