Certificate No: LR2004619TA
Issue Date: 31/03/2020
Expiry Date: 30/03/2025

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	**Graco High Pressure Equipment Inc.**
Address	2955 West 17th StreetSuite 6, Erie, PA, 16505-3928, United States
Place of Production	Graco High Pressure Equipment Inc. 2955 West 17th StreetSuite 6, Erie, PA, 16505-3928, United States
Type	Air Operated Needle, Ball and Check Valves
Description	Air Operated Needle, Ball and Check Valves Part Numbers 20-41LF6-T-LC 603897-LC 20-11LF6-LT-HPO-NO-LS-ATEX-LC 20-11LF6-LT-HPO-NC-LS-ATEX-SP1-LC
Trade Name	Graco HIP Valves
Application	Low Temperature LNG systems
Specified Standard	ASME B 31.3 - 2016 Lloyd's Register Rules and Regulation for Classification of Ships Part 5 Chapter 12-2019 Lloyd's Register Regulations for the Construction and Classification of Ships for the Carriage of Liquefied Gases in Bulk, July 2019

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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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Ratings

Design Conditions 698 bar
Design Temperature Minus 55 Degree to + 148 Degree C
for 603897-LC Minus 28 Degree to + 148 Degree C

Additional Tests

Body and Seat Leak Test dated Feb 21, 2020

Other Conditions

1. Materials used in the construction are to be manufactured and tested in accordance with the requirements of the Rules for the Manufacture, Testing and Certification of Materials to Class I requirements to attending surveyor's satisfaction.
2. In calculations tensile strength is considered as 95000 psi and yield strength as 75,000 psi, these values are much higher than commercially available ASTM A 479/276 – TP316. For each heat of material sourced from Lloyd's Register approval works, the certificate should show values equal to or higher than these values.
3. Impact tests are required for materials at minus 60 oC and acceptance energy should be 41KV.
4. If the valves are used for the application of emergency shutdown and if the valve have materials having melting temperatures lower than 925°C, the type testing shall include a fire test to a standard acceptable
5. With respect screwed couplings and end connections, which comply with recognized standards shall only be used for accessory lines and instrumentation lines of LNG classed installation applications with external diameters of 25 mm or less, the sealing arrangements for other than this application should be agreed with local Lloyd's Register plan approval office for each application for classed installations.
6. IEx requirements have not been verified and it should be agreed with the client and electrical plan approval surveyor for each application

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.

The Design Appraisal Document No. LR2004619TA and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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