Certificate No: LR26230545TA
Issue Date: 22/05/2026
Expiry Date: 21/05/2031

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	**SEWON IND CO LTD**
Address	59 Hwangsagongdan ro, Beopsu-myeon Haman gun, Gyeongsangnam do, 52055, South Korea
Type	Metal Expansion Joint
Description	Single & Universal type metallic expansion bellows Flange : A240-316L Bellows (Inner/Outer) : 316L / 316L PIPE : A312-TP316L
Trade Name	SCF TYPE, SUC TYPE, SUL TYPE
Application	Marine use for cargo and associated piping system, etc. in ships constructed for the carriage of liquefied gases in bulk
Specified Standard	Lloyd's Register's Rules and Regulations for the Classification of Ships, July 2025, Part 5, Chapter 12 Lloyd's Register's Rules and Regulations for the Construction and Classification of Ships for the carriage of Liquefied Gases in Bulk, July 2025, Chapter 5 (incorporating IGC code) Lloyd's Register's Rules and Regulations for the Construction and Classification of Ships using Gases or other Low-flashpoint Fuel, July 2025, Part B-1, 16 (incorporating IGF code) Standards of the Expansion

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Engineering Piping - Senior Specialist to
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A member of the Lloyd's Register group

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Joint Manufacturers Association, Inc. (11th Edition)

Ratings

Single type (SCF)
Design pressure (bar): 10
Design temperature (°C): -165 ~ +80
Nominal pipe diameter (mm): 40A ~ 750A
Convolution pitch/height (mm): 16/13 ~ 26/32
Number of plies: 2 ~ 3

Single type (SCF)
Design pressure (bar): 15
Design temperature (°C): -165 ~ +80
Nominal pipe diameter (mm): 40A ~ 350A
Convolution pitch/height (mm): 16/13 ~ 22/28
Number of plies: 2 ~ 3

Universal type (SUC/ SUL)
Design pressure (bar): 10
Design temperature (°C): -165 ~ +80
Nominal pipe diameter (mm): 40A ~ 750A
Convolution pitch/height (mm): 16/13 ~ 26/32
Number of plies: 2 ~ 3

Universal type (SUC/ SUL)
Design pressure (bar): 15
Design temperature (°C): -165 ~ +80
Nominal pipe diameter (mm): 40A ~ 350A
Convolution pitch/height (mm): 16/13 ~ 22/28
Number of plies: 2 ~ 3

Additional Tests

The following tests are carried out on representative samples:-
1) Bursting test

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2) Pressure test
3) Cyclic test (9000 cycle)
4) Cyclic fatigue test (2,000,000 cycle)

Other Conditions

Where intended to be installed on an LR class ship, the following points are applicable:
1) Plans showing full details of construction with design conditions specified for the bellows intended duty in a specific piping system for a specific ship are to be submitted for approval.
2) The requirements for the design temperatures below -165°C shall be specially agreed with the Flag Administration in accordance with Chapter 6, Table 6.4 of the IGC Code.
3) Materials of Class I or II piping systems are to be produced at a works approved by LR with LR's material certificate in accordance with LR Ship Rules Part 5, Chapter12, Section 1.7.1 and 9.4.2.
4) The bellows are to be constructed, tested and installed onboard in accordance with Part 5, Chapter 13 of Lloyd's Register's Rules and Regulations for the Classification of Ships and Chapter 5 of Lloyd's Register's Rules and Regulations for the construction and Classification of Ships for the carriage of Liquefied Gases in Bulk to the satisfaction of the attending surveyors.
5) Metallic expansion joints are to be selected and installed in accordance with manufacture's instruction and recommendation.

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 Asia of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document BTS/ENG/M261624 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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