

Type Approval Certificate

This is to certify that the undernoted product has been tested with satisfactory results in accordance with the relevant requirements of the LR Type Approval System.

This certificate is issued to:

PRODUCER	Hansun Engineering Co., Ltd
PLACE OF PRODUCTION	27, Noksansandan 361-ro, Gangseo-gu, Busan, Republic of Korea
DESCRIPTION	Double ferrule compression type of tube fittings for stainless, carbon steel and brass
TYPE	S-Lok Type
APPLICATION	High pressure tube connections for use in marine, offshore and industrial piping systems with hydraulic systems fluids, fuel oil, lubricating oil, fresh water, salt water, sanitary, gas, steam and condensate
STANDARD	Lloyd's Register Rules and Regulations for Classification of Ships, Part 5, Chapter 12, Section 5, July 2014 Lloyd's Register Type approval, July 2014, Test specification Number 2
RATING	Inch Tubing :

Tube O.D (inch)	Normal pressure ratings (psi)		
	Stainless steel	Carbon Steel	Brass
1/8"	10,900	10,900	3,400
3/16"	10,200	10,200	3,400
1/4"	10,200	10,200	3,500
5/16"	8,000	8,000	2,700
3/8"	6,500	6,500	2,200

Certificate No. 15/40037
Issue Date 09 March 2015
Expiry Date 08 March 2020
Sheet 1 of 2

Da-Young Kang
 Busan Technical Support

 Lloyd's Register Asia
 Digitally signed by Da-Young Kang
 Date: 2015.03.09 17:51:25 +09'00'
 D. Y. Kang

Busan Technical Support Office
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Lloyd's Register Group Limited, registered office:
 71 Fenchurch Street, London EC3M 4BS

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1/2"	6,700	6,700	2,200
5/8"	6,000	6,000	1,900
3/4"	5,800	5,800	1,800
7/8"	4,800	4,800	1,500
1"	4,700	4,700	1,500
1 1/4"	4,900	4,900	1,500
1 1/2"	4,900	4,900	1,500

Pressure-temperature ratings: see the producer's catalogue

**PERFORMANCE
TEST**

- 1) Leakage test
- 2) Bursting test
- 3) Repeated assembly test
- 4) Pull-out test
- 5) Impulse and vibration test
- 6) Vacuum test
- 7) Rotary flexure test

**OTHER
CONDITIONS**

Where the tube fittings are intended to be installed on a ship classed with LR, the following conditions of acceptance will be applicable:-

- 1) The fittings are to be installed in accordance with the manufacture's instruction.
- 2) Attention is drawn to Section 1.3.6 of IMO MSC/Circ. 1321- Guidelines for Measures to prevent Fires in Engine-Rooms and Cargo Pump-Rooms and Cargo Pump-Rooms which describes that compression couplings require careful attention to tightening procedures and torques to avoid leaks or damage to the pipe when subjected to over-tightening and they should not be used in the fuel supply line of the (oil engine) injection pumps and spill system.

"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 No. [15/40037](#) and its supplementary Type Approval Terms and Conditions form part of this Certificate

Certificate No. 15/40037
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Sheet 2 of 2

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Lloyd's Register Asia
LR031.1.2013.12

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Marine Design Appraisal Document

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Date
09 March 2015

Please quote the document number on all future communications

THE LR TYPE APPROVAL SYSTEM, 2002.

Issued to: HANSUN ENGINEERING CO.,LTD
for: S-LOK TUBE FITTINGS
TYPE APPROVAL CERTIFICATE No. 15/40037

The undernoted documents have been reviewed for compliance with the requirements of the LR Type Approval System, 2002 and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Request for Marine Services Form 2502 dated 21 January 2014
Application for Type approval Form LR2571 dated 28 January 2015
Catalogue of S-Lok Tube Fittings

TEST REPORTS

Busan Port e-mail dated 03 February 2015 accompanying "Inspection and Surveillance of Production Facilities"
Firm's Type approval test report for Tube fittings (S-Lok Type) witness by LR surveyor in Busan Port Office

Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

Lloyd's Register Asia reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the LR Type Approval System Procedure.

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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Part 1A

Subject: Pipe fittings

Product: Compression fittings (Part 1A)

Producer/Licence No.	Description of Product					Cert. No.																																																											
	Type	Details of Approval	Application	Remarks																																																													
Hansun Engineering Co. Ltd., 27, Noksansandan361-ro, Gangseo-gu, Busan, Korea, Republic of.	S-Lok Type	Double ferrule compression type of tube fittings for stainless, carbon steel and brass	<table><tr><td rowspan="2">Tube</td><td colspan="2">Normal pressure ratings (psi)</td></tr><tr><td>Stainless steel</td><td>Carbon Steel</td><td>Brass</td></tr><tr><td>O.D (inch)</td><td></td><td></td><td></td></tr><tr><td>1/8"</td><td>10,900</td><td>10,900</td><td>3,400</td></tr><tr><td>3/16"</td><td>10,200</td><td>10,200</td><td>3,400</td></tr><tr><td>1/4"</td><td>10,200</td><td>10,200</td><td>3,500</td></tr><tr><td>5/16"</td><td>8,000</td><td>8,000</td><td>2,700</td></tr><tr><td>3/8"</td><td>6,500</td><td>6,500</td><td>2,200</td></tr><tr><td>1/2"</td><td>6,700</td><td>6,700</td><td>2,200</td></tr><tr><td>5/8"</td><td>6,000</td><td>6,000</td><td>1,900</td></tr><tr><td>3/4"</td><td>5,800</td><td>5,800</td><td>1,800</td></tr><tr><td>7/8"</td><td>4,800</td><td>4,800</td><td>1,500</td></tr><tr><td>1"</td><td>4,700</td><td>4,700</td><td>1,500</td></tr><tr><td>1 1/4"</td><td>4,900</td><td>4,900</td><td>1,500</td></tr><tr><td>1 1/2"</td><td>4,900</td><td>4,900</td><td>1,500</td></tr></table>			Tube	Normal pressure ratings (psi)		Stainless steel	Carbon Steel	Brass	O.D (inch)				1/8"	10,900	10,900	3,400	3/16"	10,200	10,200	3,400	1/4"	10,200	10,200	3,500	5/16"	8,000	8,000	2,700	3/8"	6,500	6,500	2,200	1/2"	6,700	6,700	2,200	5/8"	6,000	6,000	1,900	3/4"	5,800	5,800	1,800	7/8"	4,800	4,800	1,500	1"	4,700	4,700	1,500	1 1/4"	4,900	4,900	1,500	1 1/2"	4,900	4,900	1,500	High pressure tube connections for use in marine, offshore and industrial piping systems with hydraulic systems fluids, fuel oil, lubricating oil, fresh water, salt water, sanitary, gas, steam and condensate	Expires: 08 March 2020
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