



**Inspection Report**  
No. K12435/T21

on the test  
of a technical appliance

Applicant:

**HANSUN ENGINEERING CO., LTD**

27, Noksansandan 361-ro, Gangseo-gu,  
Busan, Korea

Reference number:

KP-20-112

Test Centre for Equipment Safety and Industrial Technology



Applicant .....	<b>HANSUN ENGINEERING CO., LTD.</b> 27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea
Manufacturer .....	<b>HANSUN ENGINEERING CO., LTD.</b> 27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea
Mark of origin .....	_
Inspection site .....	<b>HANSUN ENGINEERING CO., LTD.</b> 27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea
Testing site .....	<b>HANSUN ENGINEERING CO., LTD.</b> 27, Noksansandan 361-ro, Gangseo-gu, Busan, Korea
Kind of test .....	Verification tests
Product description .....	S-LOK Stainless Steel Tube Fittings
• Type designation(s) .....	1/4", 3/8", 1/2", 3/4", 1"
Inspection requirements.....	ASTM F1387 - 19
Receiving date .....	03.03.2020
Inspection period.....	11.05.2020 to 25.02.2021
Test result.....	The inspected samples are in compliance with the test criteria.
Remark.....	The issue of this document does not relieve the supplier/manufacturer from its responsibility to its client to supply the item(s) concerned in full compliance with the requirements.

Inspected confirmation.

05.03.2021

**Byung-Ho Bae, TÜV NORD Korea Ltd.**  
Technical inspector

**In-Hwan Kim, TÜV NORD Korea Ltd.**  
Technical inspector



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**1. Inspection and test result**

1.1. Examination of specimen (A2)

-Test method: ASTM F1387-19, Annex A2

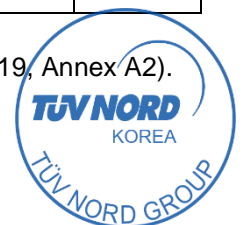
-Sample: 48 ea of each size

Tube size	Specimen No.	Requirement	Result
1/4"	1/4"-I1, 1/4"-I2, 1/4"-I3, 1/4"-I4, 1/4"-I5, 1/4"-I6	No unusual circumstances	No
	1/4"-F1, 1/4"-F2, 1/4"-F3, 1/4"-F4, 1/4"-F5, 1/4"-F6		No
	1/4"-T1, 1/4"-T2, 1/4"-T3, 1/4"-T4, 1/4"-T5, 1/4"-T6		No
	1/4"-B1, 1/4"-B2, 1/4"-B3, 1/4"-B4		No
	1/4"-R1, 1/4"-R2, 1/4"-R3, 1/4"-R4, 1/4"-R5, 1/4"-R6		No
	1/4"-TC1, 1/4"-TC2, 1/4"-TC3, 1/4"-TC4, 1/4"-TC5, 1/4"-TC6, 1/4"-TC7, 1/4"-TC8, 1/4"-TC9, 1/4"-TC10		No
	1/4"-S1, 1/4"-S2, 1/4"-S3, 1/4"-S4, 1/4"-S5		No
	1/4"-V1, 1/4"-V2, 1/4"-V3, 1/4"-V4, 1/4"-V5		No
3/8"	3/8"-I1, 3/8"-I2, 3/8"-I3, 3/8"-I4, 3/8"-I5, 3/8"-I6	No unusual circumstances	No
	3/8"-F1, 3/8"-F2, 3/8"-F3, 3/8"-F4, 3/8"-F5, 3/8"-F6		No
	3/8"-T1, 3/8"-T2, 3/8"-T3, 3/8"-T4, 3/8"-T5, 3/8"-T6		No
	3/8"-B1, 3/8"-B2, 3/8"-B3, 3/8"-B4		No
	3/8"-R1, 3/8"-R2, 3/8"-R3, 3/8"-R4, 3/8"-R5, 3/8"-R6		No
	3/8"-TC1, 3/8"-TC2, 3/8"-TC3, 3/8"-TC4, 3/8"-TC5, 3/8"-TC6, 3/8"-TC7, 3/8"-TC8, 3/8"-TC9, 3/8"-TC10		No
	3/8"-S1, 3/8"-S2, 3/8"-S3, 3/8"-S4, 3/8"-S5		No
	3/8"-V1, 3/8"-V2, 3/8"-V3, 3/8"-V4, 3/8"-V5		No



Tube size	Specimen No.	Requirement	Result
1/2"	1/2"-I1, 1/2"-I2, 1/2"-I3, 1/2"-I4, 1/2"-I5, 1/2"-I6	No unusual circumstances	No
	1/2"-F1, 1/2"-F2, 1/2"-F3, 1/2"-F4, 1/2"-F5, 1/2"-F6		No
	1/2"-T1, 1/2"-T2, 1/2"-T3, 1/2"-T4, 1/2"-T5, 1/2"-T6		No
	1/2"-B1, 1/2"-B2, 1/2"-B3, 1/2"-B4		No
	1/2"-R1, 1/2"-R2, 1/2"-R3, 1/2"-R4, 1/2"-R5, 1/2"-R6		No
	1/2"-TC1, 1/2"-TC2, 1/2"-TC3, 1/2"-TC4, 1/2"-TC5, 1/2"-TC6, 1/2"-TC7, 1/2"-TC8, 1/2"-TC9, 1/2"-TC10		No
	1/2"-S1, 1/2"-S2, 1/2"-S3, 1/2"-S4, 1/2"-S5		No
	1/2"-V1, 1/2"-V2, 1/2"-V3, 1/2"-V4, 1/2"-V5		No
3/4"	3/4"-I1, 3/4"-I2, 3/4"-I3, 3/4"-I4, 3/4"-I5, 3/4"-I6	No unusual circumstances	No
	3/4"-F1, 3/4"-F2, 3/4"-F3, 3/4"-F4, 3/4"-F5, 3/4"-F6		No
	3/4"-T1, 3/4"-T2, 3/4"-T3, 3/4"-T4, 3/4"-T5, 3/4"-T6		No
	3/4"-B1, 3/4"-B2, 3/4"-B3, 3/4"-B4		No
	3/4"-R1, 3/4"-R2, 3/4"-R3, 3/4"-R4, 3/4"-R5, 3/4"-R6		No
	3/4"-TC1, 3/4"-TC2, 3/4"-TC3, 3/4"-TC4, 3/4"-TC5, 3/4"-TC6, 3/4"-TC7, 3/4"-TC8, 3/4"-TC9, 3/4"-TC10		No
	3/4"-S1, 3/4"-S2, 3/4"-S3, 3/4"-S4, 3/4"-S5		No
	3/4"-V1, 3/4"-V2, 3/4"-V3, 3/4"-V4, 3/4"-V5		No
1"	1"-I1, 1"-I2, 1"-I3, 1"-I4, 1"-I5, 1"-I6	No unusual circumstances	No
	1"-F1, 1"-F2, 1"-F3, 1"-F4, 1"-F5, 1"-F6		No
	1"-T1, 1"-T2, 1"-T3, 1"-T4, 1"-T5, 1"-T6		No
	1"-B1, 1"-B2, 1"-B3, 1"-B4		No
	1"-R1, 1"-R2, 1"-R3, 1"-R4, 1"-R5, 1"-R6		No
	1"-TC1, 1"-TC2, 1"-TC3, 1"-TC4, 1"-TC5, 1"-TC6, 1"-TC7, 1"-TC8, 1"-TC9, 1"-TC10		No
	1"-S1, 1"-S2, 1"-S3, 1"-S4, 1"-S5		No
	1"-V1, 1"-V2, 1"-V3, 1"-V4, 1"-V5		No

The inspected specimens are in compliance with the test criteria (ASTM F1387-19, Annex A2).

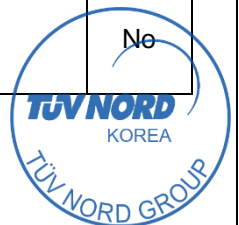


1.2. Pneumatic proof test (A3)

- Test method: ASTM F1387-19, Annex A3
- Sample: 48 ea of each size
- Ambient temperature: +21°C ~ +25°C
- Test pressure: 0.69 MPa at Step 1 and 3.45 MPa at Step 2
- Test medium: nitrogen
- Test time: 5 minutes at each step

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-I1, 1/4"-I2, 1/4"-I3, 1/4"-I4, 1/4"-I5, 1/4"-I6	0.69 MPa	No evidence of leakage	No
		3.45 MPa		No
	1/4"-F1, 1/4"-F2, 1/4"-F3, 1/4"-F4, 1/4"-F5, 1/4"-F6	0.69 MPa		No
		3.45 MPa		No
	1/4"-T1, 1/4"-T2, 1/4"-T3, 1/4"-T4, 1/4"-T5, 1/4"-T6	0.69 MPa		No
		3.45 MPa		No
	1/4"-B1, 1/4"-B2, 1/4"-B3, 1/4"-B4	0.69 MPa		No
		3.45 MPa		No
	1/4"-R1, 1/4"-R2, 1/4"-R3, 1/4"-R4, 1/4"-R5, 1/4"-R6	0.69 MPa		No
		3.45 MPa		No
	1/4"-TC1, 1/4"-TC2, 1/4"-TC3, 1/4"-TC4, 1/4"-TC5, 1/4"-TC6, 1/4"-TC7, 1/4"-TC8, 1/4"-TC9, 1/4"-TC10	0.69 MPa		No
		3.45 MPa		No
	1/4"-S1, 1/4"-S2, 1/4"-S3, 1/4"-S4, 1/4"-S5	0.69 MPa		No
		3.45 MPa		No
	1/4"-V1, 1/4"-V2, 1/4"-V3, 1/4"-V4, 1/4"-V5	0.69 MPa		No
		3.45 MPa		No

Tube size	Specimen No.	Test pressure	Requirement	Result
3/8"	3/8"-I1, 3/8"-I2, 3/8"-I3, 3/8"-I4, 3/8"-I5, 3/8"-I6	0.69 MPa	No evidence of leakage	No
		3.45 MPa		No
	3/8"-F1, 3/8"-F2, 3/8"-F3, 3/8"-F4, 3/8"-F5, 3/8"-F6	0.69 MPa		No
		3.45 MPa		No
	3/8"-T1, 3/8"-T2, 3/8"-T3, 3/8"-T4, 3/8"-T5, 3/8"-T6	0.69 MPa		No
		3.45 MPa		No
	3/8"-B1, 3/8"-B2, 3/8"-B3, 3/8"-B4	0.69 MPa		No
		3.45 MPa		No
	3/8"-R1, 3/8"-R2, 3/8"-R3, 3/8"-R4, 3/8"-R5, 3/8"-R6	0.69 MPa		No
		3.45 MPa		No
	3/8"-TC1, 3/8"-TC2, 3/8"-TC3, 3/8"-TC4, 3/8"-TC5, 3/8"-TC6, 3/8"-TC7, 3/8"-TC8, 3/8"-TC9, 3/8"-TC10	0.69 MPa		No
		3.45 MPa		No
	3/8"-S1, 3/8"-S2, 3/8"-S3, 3/8"-S4, 3/8"-S5	0.69 MPa		No
		3.45 MPa		No
	3/8"-V1, 3/8"-V2, 3/8"-V3, 3/8"-V4, 3/8"-V5	0.69 MPa		No
		3.45 MPa		No



Tube size	Specimen No.	Test pressure	Requirement	Result
1/2"	1/2"-I1, 1/2"-I2, 1/2"-I3, 1/2"-I4, 1/2"-I5, 1/2"-I6	0.69 MPa	No evidence of leakage	No
		3.45 MPa		No
	1/2"-F1, 1/2"-F2, 1/2"-F3, 1/2"-F4, 1/2"-F5, 1/2"-F6	0.69 MPa		No
		3.45 MPa		No
	1/2"-T1, 1/2"-T2, 1/2"-T3, 1/2"-T4, 1/2"-T5, 1/2"-T6	0.69 MPa		No
		3.45 MPa		No
	1/2"-B1, 1/2"-B2, 1/2"-B3, 1/2"-B4	0.69 MPa		No
		3.45 MPa		No
	1/2"-R1, 1/2"-R2, 1/2"-R3, 1/2"-R4, 1/2"-R5, 1/2"-R6	0.69 MPa		No
		3.45 MPa		No
	1/2"-TC1, 1/2"-TC2, 1/2"-TC3, 1/2"-TC4, 1/2"-TC5, 1/2"-TC6, 1/2"-TC7, 1/2"-TC8, 1/2"-TC9, 1/2"-TC10	0.69 MPa		No
		3.45 MPa		No
	1/2"-S1, 1/2"-S2, 1/2"-S3, 1/2"-S4, 1/2"-S5	0.69 MPa		No
		3.45 MPa		No
	1/2"-V1, 1/2"-V2, 1/2"-V3, 1/2"-V4, 1/2"-V5	0.69 MPa		No
		3.45 MPa		No



Tube size	Specimen No.	Test pressure	Requirement	Result
3/4"	3/4"-I1, 3/4"-I2, 3/4"-I3, 3/4"-I4, 3/4"-I5, 3/4"-I6	0.69 MPa	No evidence of leakage	No
		3.45 MPa		No
	3/4"-F1, 3/4"-F2, 3/4"-F3, 3/4"-F4, 3/4"-F5, 3/4"-F6	0.69 MPa		No
		3.45 MPa		No
	3/4"-T1, 3/4"-T2, 3/4"-T3, 3/4"-T4, 3/4"-T5, 3/4"-T6	0.69 MPa		No
		3.45 MPa		No
	3/4"-B1, 3/4"-B2, 3/4"-B3, 3/4"-B4	0.69 MPa		No
		3.45 MPa		No
	3/4"-R1, 3/4"-R2, 3/4"-R3, 3/4"-R4, 3/4"-R5, 3/4"-R6	0.69 MPa		No
		3.45 MPa		No
	3/4"-TC1, 3/4"-TC2, 3/4"-TC3, 3/4"-TC4, 3/4"-TC5, 3/4"-TC6, 3/4"-TC7, 3/4"-TC8, 3/4"-TC9, 3/4"-TC10	0.69 MPa		No
		3.45 MPa		No
	3/4"-S1, 3/4"-S2, 3/4"-S3, 3/4"-S4, 3/4"-S5	0.69 MPa		No
		3.45 MPa		No
	3/4"-V1, 3/4"-V2, 3/4"-V3, 3/4"-V4, 3/4"-V5	0.69 MPa		No
		3.45 MPa		No





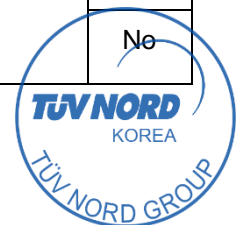
Tube size	Specimen No.	Test pressure	Requirement	Result
1"	1"-I1, 1"-I2, 1"-I3, 1"-I4, 1"-I5, 1"-I6	0.69 MPa	No evidence of leakage	No
		3.45 MPa		No
	1"-F1, 1"-F2, 1"-F3, 1"-F4, 1"-F5, 1"-F6	0.69 MPa		No
		3.45 MPa		No
	1"-T1, 1"-T2, 1"-T3, 1"-T4, 1"-T5, 1"-T6	0.69 MPa		No
		3.45 MPa		No
	1"-B1, 1"-B2, 1"-B3, 1"-B4	0.69 MPa		No
		3.45 MPa		No
	1"-R1, 1"-R2, 1"-R3, 1"-R4, 1"-R5, 1"-R6	0.69 MPa		No
		3.45 MPa		No
	1"-TC1, 1"-TC2, 1"-TC3, 1"-TC4, 1"-TC5, 1"-TC6, 1"-TC7, 1"-TC8, 1"-TC9, 1"-TC10	0.69 MPa		No
		3.45 MPa		No
	1"-S1, 1"-S2, 1"-S3, 1"-S4, 1"-S5	0.69 MPa		No
		3.45 MPa		No
	1"-V1, 1"-V2, 1"-V3, 1"-V4, 1"-V5	0.69 MPa		No
		3.45 MPa		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A3).



- 1.3. Hydrostatic proof test (A4)
  - Test method: ASTM F1387-19, Annex A4
  - Sample: 48 ea of each size
  - Ambient temperature: +21°C ~ +26°C
  - Test pressure: 6.9 bar to 150% of W.P.
  - Test medium: water
  - Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-I1, 1/4"-I2, 1/4"-I3, 1/4"-I4, 1/4"-I5, 1/4"-I6	6.9 bar	No evidence of leakage	No
		780 bar		No
	1/4"-F1, 1/4"-F2, 1/4"-F3, 1/4"-F4, 1/4"-F5, 1/4"-F6	6.9 bar		No
		780 bar		No
	1/4"-T1, 1/4"-T2, 1/4"-T3, 1/4"-T4, 1/4"-T5, 1/4"-T6	6.9 bar		No
		780 bar		No
	1/4"-B1, 1/4"-B2, 1/4"-B3, 1/4"-B4	6.9 bar		No
		780 bar		No
	1/4"-R1, 1/4"-R2, 1/4"-R3, 1/4"-R4, 1/4"-R5, 1/4"-R6	6.9 bar		No
		780 bar		No
	1/4"-TC1, 1/4"-TC2, 1/4"-TC3, 1/4"-TC4, 1/4"-TC5, 1/4"-TC6, 1/4"-TC7, 1/4"-TC8, 1/4"-TC9, 1/4"-TC10	6.9 bar		No
		780 bar		No
	1/4"-S1, 1/4"-S2, 1/4"-S3, 1/4"-S4, 1/4"-S5	6.9 bar		No
		780 bar		No
	1/4"-V1, 1/4"-V2, 1/4"-V3, 1/4"-V4, 1/4"-V5	6.9 bar		No
		780 bar		No



Tube size	Specimen No.	Test pressure	Requirement	Result
3/8"	3/8"-I1, 3/8"-I2, 3/8"-I3, 3/8"-I4, 3/8"-I5, 3/8"-I6	6.9 bar	No evidence of leakage	No
		495 bar		No
	3/8"-F1, 3/8"-F2, 3/8"-F3, 3/8"-F4, 3/8"-F5, 3/8"-F6	6.9 bar		No
		495 bar		No
	3/8"-T1, 3/8"-T2, 3/8"-T3, 3/8"-T4, 3/8"-T5, 3/8"-T6	6.9 bar		No
		495 bar		No
	3/8"-B1, 3/8"-B2, 3/8"-B3, 3/8"-B4	6.9 bar		No
		495 bar		No
	3/8"-R1, 3/8"-R2, 3/8"-R3, 3/8"-R4, 3/8"-R5, 3/8"-R6	6.9 bar		No
		495 bar		No
	3/8"-TC1, 3/8"-TC2, 3/8"-TC3, 3/8"-TC4, 3/8"-TC5, 3/8"-TC6, 3/8"-TC7, 3/8"-TC8, 3/8"-TC9, 3/8"-TC10	6.9 bar		No
		495 bar		No
	3/8"-S1, 3/8"-S2, 3/8"-S3, 3/8"-S4, 3/8"-S5	6.9 bar		No
		495 bar		No
	3/8"-V1, 3/8"-V2, 3/8"-V3, 3/8"-V4, 3/8"-V5	6.9 bar		No
		495 bar		No



Tube size	Specimen No.	Test pressure	Requirement	Result
1/2"	1/2"-I1, 1/2"-I2, 1/2"-I3, 1/2"-I4, 1/2"-I5, 1/2"-I6	6.9 bar	No evidence of leakage	No
		525 bar		No
	1/2"-F1, 1/2"-F2, 1/2"-F3, 1/2"-F4, 1/2"-F5, 1/2"-F6	6.9 bar		No
		525 bar		No
	1/2"-T1, 1/2"-T2, 1/2"-T3, 1/2"-T4, 1/2"-T5, 1/2"-T6	6.9 bar		No
		525 bar		No
	1/2"-B1, 1/2"-B2, 1/2"-B3, 1/2"-B4	6.9 bar		No
		525 bar		No
	1/2"-R1, 1/2"-R2, 1/2"-R3, 1/2"-R4, 1/2"-R5, 1/2"-R6	6.9 bar		No
		525 bar		No
	1/2"-TC1, 1/2"-TC2, 1/2"-TC3, 1/2"-TC4, 1/2"-TC5, 1/2"-TC6, 1/2"-TC7, 1/2"-TC8, 1/2"-TC9, 1/2"-TC10	6.9 bar		No
		525 bar		No
	1/2"-S1, 1/2"-S2, 1/2"-S3, 1/2"-S4, 1/2"-S5	6.9 bar		No
		525 bar		No
	1/2"-V1, 1/2"-V2, 1/2"-V3, 1/2"-V4, 1/2"-V5	6.9 bar		No
		525 bar		No



Tube size	Specimen No.	Test pressure	Requirement	Result
3/4"	3/4"-I1, 3/4"-I2, 3/4"-I3, 3/4"-I4, 3/4"-I5, 3/4"-I6	6.9 bar	No evidence of leakage	No
		510 bar		No
	3/4"-F1, 3/4"-F2, 3/4"-F3, 3/4"-F4, 3/4"-F5, 3/4"-F6	6.9 bar		No
		510 bar		No
	3/4"-T1, 3/4"-T2, 3/4"-T3, 3/4"-T4, 3/4"-T5, 3/4"-T6	6.9 bar		No
		510 bar		No
	3/4"-B1, 3/4"-B2, 3/4"-B3, 3/4"-B4	6.9 bar		No
		510 bar		No
	3/4"-R1, 3/4"-R2, 3/4"-R3, 3/4"-R4, 3/4"-R5, 3/4"-R6	6.9 bar		No
		510 bar		No
	3/4"-TC1, 3/4"-TC2, 3/4"-TC3, 3/4"-TC4, 3/4"-TC5, 3/4"-TC6, 3/4"-TC7, 3/4"-TC8, 3/4"-TC9, 3/4"-TC10	6.9 bar		No
		510 bar		No
	3/4"-S1, 3/4"-S2, 3/4"-S3, 3/4"-S4, 3/4"-S5	6.9 bar		No
		510 bar		No
	3/4"-V1, 3/4"-V2, 3/4"-V3, 3/4"-V4, 3/4"-V5	6.9 bar		No
		510 bar		No



Tube size	Specimen No.	Test pressure	Requirement	Result
1"	1"-I1, 1"-I2, 1"-I3, 1"-I4, 1"-I5, 1"-I6	6.9 bar	No evidence of leakage	No
		600 bar		No
	1"-F1, 1"-F2, 1"-F3, 1"-F4, 1"-F5, 1"-F6	6.9 bar		No
		600 bar		No
	1"-T1, 1"-T2, 1"-T3, 1"-T4, 1"-T5, 1"-T6	6.9 bar		No
		600 bar		No
	1"-B1, 1"-B2, 1"-B3, 1"-B4	6.9 bar		No
		600 bar		No
	1"-R1, 1"-R2, 1"-R3, 1"-R4, 1"-R5, 1"-R6	6.9 bar		No
		600 bar		No
	1"-TC1, 1"-TC2, 1"-TC3, 1"-TC4, 1"-TC5, 1"-TC6, 1"-TC7, 1"-TC8, 1"-TC9, 1"-TC10	6.9 bar		No
		600 bar		No
	1"-S1, 1"-S2, 1"-S3, 1"-S4, 1"-S5	6.9 bar		No
		600 bar		No
	1"-V1, 1"-V2, 1"-V3, 1"-V4, 1"-V5	6.9 bar		No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A4).



1.4. Impulse test (A5) and Repeated assembly test (A9)

1.4.1. Impulse test (A5)

-Test method: ASTM F1387-19, Annex A5

-Sample: 6 ea of each size

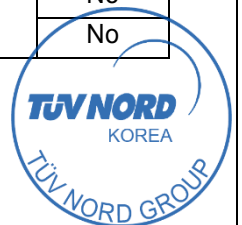
-Ambient temperature: +22°C ~ +25°C

-Test pressure: 20±5% of W.P. to 133% of W.P.

-Test medium: oil

-Test cycle: total one million (10<sup>6</sup>) cycles

Tube Size	Specimen No.	Working pressure	Test pressure	Requirement	Result
1/4"	1/4"-I1	520 bar	48 bar to 740 bar	No leakage during 10 <sup>6</sup> cycles	No
	1/4"-I2				No
	1/4"-I3				No
	1/4"-I4				No
	1/4"-I5				No
	1/4"-I6				No
3/8"	3/8"-I1	330 bar	47 bar to 451 bar	No leakage during 10 <sup>6</sup> cycles	No
	3/8"-I2				No
	3/8"-I3				No
	3/8"-I4				No
	3/8"-I5				No
	3/8"-I6				No
1/2"	1/2"-I1	350 bar	48 bar to 470 bar	No leakage during 10 <sup>6</sup> cycles	No
	1/2"-I2				No
	1/2"-I3				No
	1/2"-I4				No
	1/2"-I5				No
	1/2"-I6				No
3/4"	3/4"-I1	340 bar	45 bar to 510 bar	No leakage during 10 <sup>6</sup> cycles	No
	3/4"-I2				No
	3/4"-I3				No
	3/4"-I4				No
	3/4"-I5				No
	3/4"-I6				No
1"	1"-I1	400 bar	35 bar to 541 bar	No leakage during 10 <sup>6</sup> cycles	No
	1"-I2				No
	1"-I3				No
	1"-I4				No
	1"-I5				No
	1"-I6				No



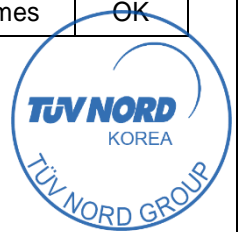
1.4.2. Repeated assembly test (A9) during Impulse test

-Test method: ASTM F1387-19, Annex A9

-Sample: 3 ea of each size

-Test period: before start, 25% of cycles, 50% of cycles, 75% of cycles and after completion of cycles (before post testing)

Tube Size	Specimen No.	Assembly at each cycles					Result
		0	250 000 (25%)	500 000 (50%)	750 000 (75%)	1 000 000 (100%)	
1/4"	1/4"-I4	1 time	3 times	3 times	3 times	2 times	OK
	1/4"-I5	1 time	3 times	3 times	3 times	2 times	OK
	1/4"-I6	1 time	3 times	3 times	3 times	2 times	OK
3/8"	3/8"-I4	1 time	3 times	3 times	3 times	2 times	OK
	3/8"-I5	1 time	3 times	3 times	3 times	2 times	OK
	3/8"-I6	1 time	3 times	3 times	3 times	2 times	OK
1/2"	1/2"-I4	1 time	3 times	3 times	3 times	2 times	OK
	1/2"-I5	1 time	3 times	3 times	3 times	2 times	OK
	1/2"-I6	1 time	3 times	3 times	3 times	2 times	OK
3/4"	3/4"-I4	1 time	3 times	3 times	3 times	2 times	OK
	3/4"-I5	1 time	3 times	3 times	3 times	2 times	OK
	3/4"-I6	1 time	3 times	3 times	3 times	2 times	OK
1"	1"-I4	1 time	3 times	3 times	3 times	2 times	OK
	1"-I5	1 time	3 times	3 times	3 times	2 times	OK
	1"-I6	1 time	3 times	3 times	3 times	2 times	OK





1.4.3. Hydrostatic proof test after Impulse test

-Test method: ASTM F1387-19, Annex A4

-Ambient temperature: +22°C ~ +24°C

-Test pressure: 6.9 bar to 150% of W.P.

-Test medium: water

-Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-I1, 1/4"-I2, 1/4"-I3, 1/4"-I4, 1/4"-I5, 1/4"-I6	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-I1, 3/8"-I2, 3/8"-I3, 3/8"-I4, 3/8"-I5, 3/8"-I6	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-I1, 1/2"-I2, 1/2"-I3, 1/2"-I4, 1/2"-I5, 1/2"-I6	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-I1, 3/4"-I2, 3/4"-I3, 3/4"-I4, 3/4"-I5, 3/4"-I6	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-I1, 1"-I2, 1"-I3, 1"-I4, 1"-I5, 1"-I6	6.9 bar	No evidence of leakage	No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A5 & A9).



1.5. Flexure fatigue test (A6) and Repeated assembly test (A9)

1.5.1. Flexure fatigue test (A6)

-Test method: ASTM F1387-19, Annex A6

-Sample: 6 ea of each size

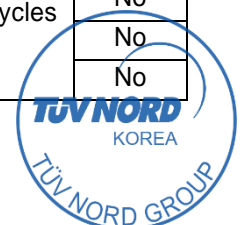
-Ambient temperature: +19°C ~ +29°C

-Test pressure: W.P.

-Test medium: oil

-Test cycle: total 30 000 cycles

Tube Size	Specimen No.	Test pressure		Test stress value		Requirement	Result
		W.P	Actual	Spec.	Actual		
1/4"	1/4"-F1	520 bar	570 bar	1768.9	1830.6 ~ 1996.6	No leakage during 30 000 cycles	No
	1/4"-F2						No
	1/4"-F3						No
	1/4"-F4						No
	1/4"-F5						No
	1/4"-F6						No
3/8"	3/8"-F1	330 bar	350 ~360 bar	1550.1	1639.5 ~ 1954.6	No leakage during 30 000 cycles	No
	3/8"-F2						No
	3/8"-F3						No
	3/8"-F4						No
	3/8"-F5						No
	3/8"-F6						No
1/2"	1/2"-F1	350 bar	400 ~410 bar	1476.8	1719.3 ~ 2169.9	No leakage during 30 000 cycles	No
	1/2"-F2						No
	1/2"-F3						No
	1/2"-F4						No
	1/2"-F5						No
	1/2"-F6						No
3/4"	3/4"-F1	340 bar	360 ~410 bar	1411.4	1565.9 ~ 1806.2	No leakage during 30 000 cycles	No
	3/4"-F2						No
	3/4"-F3						No
	3/4"-F4						No
	3/4"-F5						No
	3/4"-F6						No
1"	1"-F1	400 bar	400 ~415 bar	1467.3	1521.8 ~ 2225.7	No leakage during 30 000 cycles	No
	1"-F2						No
	1"-F3						No
	1"-F4						No
	1"-F5						No
	1"-F6						No



1.5.2. Repeated assembly test (A9) during Flexure fatigue test

-Test method: ASTM F1387-19, Annex A9

-Sample: 3 ea of each size

-Test period: before start, 25% of cycles, 50% of cycles, 75% of cycles and after completion of cycles (before post testing)

Tube Size	Specimen No.	Assembly at each cycles					Result
		0	7 500 (25%)	15 000 (50%)	22 500 (75%)	30 000 (100%)	
1/4"	1/4"-F4	1 time	3 times	3 times	3 times	2 times	OK
	1/4"-F5	1 time	3 times	3 times	3 times	2 times	OK
	1/4"-F6	1 time	3 times	3 times	3 times	2 times	OK
3/8"	3/8"-F4	1 time	3 times	3 times	3 times	2 times	OK
	3/8"-F5	1 time	3 times	3 times	3 times	2 times	OK
	3/8"-F6	1 time	3 times	3 times	3 times	2 times	OK
1/2"	1/2"-F4	1 time	3 times	3 times	3 times	2 times	OK
	1/2"-F5	1 time	3 times	3 times	3 times	2 times	OK
	1/2"-F6	1 time	3 times	3 times	3 times	2 times	OK
3/4"	3/4"-F4	1 time	3 times	3 times	3 times	2 times	OK
	3/4"-F5	1 time	3 times	3 times	3 times	2 times	OK
	3/4"-F6	1 time	3 times	3 times	3 times	2 times	OK
1"	1"-F4	1 time	3 times	3 times	3 times	2 times	OK
	1"-F5	1 time	3 times	3 times	3 times	2 times	OK
	1"-F6	1 time	3 times	3 times	3 times	2 times	OK



1.5.3. Hydrostatic proof test after Flexure fatigue test

- Test method: ASTM F1387-19, Annex A4
- Ambient temperature: +22°C ~ +24°C
- Test pressure: 6.9 bar to 150% of W.P.
- Test medium: water
- Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-F1, 1/4"-F2, 1/4"-F3, 1/4"-F4, 1/4"-F5, 1/4"-F6	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-F1, 3/8"-F2, 3/8"-F3, 3/8"-F4, 3/8"-F5, 3/8"-F6	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-F1, 1/2"-F2, 1/2"-F13, 1/2"-F4, 1/2"-F15, 1/2"-F6	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-F1, 3/4"-F2, 3/4"-F3, 3/4"-F4, 3/4"-F5, 3/4"-F6	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-F1, 1"-F2, 1"-F3, 1"-F4, 1"-F5, 1"-F6	6.9 bar	No evidence of leakage	No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A6 & A9).



1.6. Tensile test (A7)

-Test method: ASTM F1387-19, Annex A7

-Sample: 6 ea of each size

-Ambient temperature: +24°C ~ +26°C

Tube Size	Specimen No.	Tensile load (N)		Requirement	Result
		Calculated load	Actual load		
1/4"	1/4"-T1	4090	9907.8	No separation of joint	No
	1/4"-T2		10402.8		No
	1/4"-T3		9390.8		No
	1/4"-T4		6599.6		No
	1/4"-T5		10764.8		No
	1/4"-T6		8076.2		No
3/8"	3/8"-T1	6640	8457.2	No separation of joint	No
	3/8"-T2		10152.7		No
	3/8"-T3		6724.2		No
	3/8"-T4		6718.7		No
	3/8"-T5		6774.2		No
	3/8"-T6		6823.6		No
1/2"	1/2"-T1	11750	24681.0	No separation of joint	No
	1/2"-T2		27445.0		No
	1/2"-T3		24697.9		No
	1/2"-T4		22357.6		No
	1/2"-T5		24191.0		No
	1/2"-T6		23001.8		No
3/4"	3/4"-T1	25850	35873.1	No separation of joint	No
	3/4"-T2		35353.5		No
	3/4"-T3		37943.8		No
	3/4"-T4		36436.8		No
	3/4"-T5		35238.7		No
	3/4"-T6		39806.6		No
1"	1"-T1	40350	47834.9	No separation of joint	No
	1"-T2		48548.3		No
	1"-T3		58808.6		No
	1"-T4		52706.3		No
	1"-T5		62418.2		No
	1"-T6		53412.4		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A7).



1.7. Hydrostatic burst test (A8)

-Test method: ASTM F1387-19, Annex A8

-Sample: 4 ea of each size

-Ambient temperature: +24°C ~ +26°C

-Test pressure: 4 times of W.P.

-Test time: minimum 1 minute for holding pressure

Tube Size	Specimen No.	Test pressure (bar)		Requirement	Result
		4 x W.P.	Actual pressure		
1/4"	1/4"-B1	2080	2100	No leak No burst	No
	1/4"-B2		2100		No
	1/4"-B3		2100		No
	1/4"-B4		2100		No
3/8"	3/8"-B1	1320	1400	No leak No burst	No
	3/8"-B2		1400		No
	3/8"-B3		1400		No
	3/8"-B4		1400		No
1/2"	1/2"-B1	1400	1500	No leak No burst	No
	1/2"-B2		1500		No
	1/2"-B3		1500		No
	1/2"-B4		1500		No
3/4"	3/4"-B1	1360	1400	No leak No burst	No
	3/4"-B2		1400		No
	3/4"-B3		1400		No
	3/4"-B4		1400		No
1"	1"-B1	1600	1650	No leak No burst	No
	1"-B2		1650		No
	1"-B3		1650		No
	1"-B4		1650		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A8).



1.8. Rotary flex test (A10)

- Test method: ASTM F1387-19, Annex A10
- Sample: 6 ea of each size
- Ambient temperature: +24°C ~ +26°C
- Test pressure: 34.5 bar
- Test bending moment: min. 35% of ultimate tensile strength (of tubing material)
- Test medium: oil
- Test rate: rotary motion at min. 1750 rpm
- Test cycle: total 10<sup>6</sup> cycles

Tube Size	Specimen No.	Actual pressure (bar)	Test axial stress value (Bending moment)	Requirement	Result
1/4"	1/4"-R1	40	532	No loss of pressure	No
	1/4"-R2	40	532		No
	1/4"-R3	42	532		No
	1/4"-R4	42	532		No
	1/4"-R5	40	532		No
	1/4"-R6	40	532		No
3/8"	3/8"-R1	40	527	No loss of pressure	No
	3/8"-R2	40	527		No
	3/8"-R3	42	527		No
	3/8"-R4	42	527		No
	3/8"-R5	39	527		No
	3/8"-R6	39	527		No
1/2"	1/2"-R1	40	528	No loss of pressure	No
	1/2"-R2	40	528		No
	1/2"-R3	40	528		No
	1/2"-R4	40	528		No
	1/2"-R5	39	528		No
	1/2"-R6	39	528		No
3/4"	3/4"-R1	40	525	No loss of pressure	No
	3/4"-R2	40	525		No
	3/4"-R3	40	525		No
	3/4"-R4	40	525		No
	3/4"-R5	39	525		No
	3/4"-R6	39	525		No
1"	1"-R1	42	531	No loss of pressure	No
	1"-R2	40	531		No
	1"-R3	42	531		No
	1"-R4	42	531		No
	1"-R5	42	531		No
	1"-R6	42	531		No



1.8.1. Hydrostatic proof test after Rotary flex test

- Test method: ASTM F1387-19, Annex A4
- Ambient temperature: +22°C ~ +24°C
- Test pressure: 6.9 bar to 150% of W.P.
- Test medium: water
- Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-R1, 1/4"-R2, 1/4"-R3, 1/4"-R4, 1/4"-R5, 1/4"-R6	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-R1, 3/8"-R2, 3/8"-R3, 3/8"-R4, 3/8"-R5, 3/8"-R6	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-R1, 1/2"-R2, 1/2"-RI3, 1/2"-R4, 1/2"-RI5, 1/2"-R6	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-R1, 3/4"-R2, 3/4"-R3, 3/4"-R4, 3/4"-R5, 3/4"-R6	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-R1, 1"-R2, 1"-R3, 1"-R4, 1"-R5, 1"-R6	6.9 bar	No evidence of leakage	No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, Annex A10).





1.9. Thermal cycling test (S2)

-Test method: ASTM F1387-19, S2

-Sample: 5 ea of each size for high temp. and 5 ea of each size for low temp.

-Test temperature

Ambient temp. to High temp. : 70°F to 500°F

Low temp. to Ambient temp. : 0°F to 70°F

-Test pressure: W.P.

-Test medium: glycerin for high temp. and ethylene-glycol for low temp.

-Test cycle: 3 cycles

Tube size	Specimen No.	Test temperature	Test cycle	Result
1/4"	1/4"-TC1, 1/4"-TC2, 1/4"-TC3, 1/4"-TC4, 1/4"-TC5	70°F to 500°F	3 cycles	OK
	1/4"-TC6, 1/4"-TC7, 1/4"-TC8, 1/4"-TC9, 1/4"-TC10	0°F to 70°F	3 cycles	OK
3/8"	3/8"-TC1, 3/8"-TC2, 3/8"-TC3, 3/8"-TC4, 3/8"-TC5	70°F to 500°F	3 cycles	OK
	3/8"-TC6, 3/8"-TC7, 3/8"-TC8, 3/8"-TC9, 3/8"-TC10	0°F to 70°F	3 cycles	OK
1/2"	1/2"-TC1, 1/2"-TC2, 1/2"-TC3, 1/2"-TC4, 1/2"-TC5	70°F to 500°F	3 cycles	OK
	1/2"-TC6, 1/2"-TC7, 1/2"-TC8, 1/2"-TC9, 1/2"-TC10	0°F to 70°F	3 cycles	OK
3/4"	3/4"-TC1, 3/4"-TC2, 3/4"-TC3, 3/4"-TC4, 3/4"-TC5	70°F to 500°F	3 cycles	OK
	3/4"-TC6, 3/4"-TC7, 3/4"-TC8, 3/4"-TC9, 3/4"-TC10	0°F to 70°F	3 cycles	OK
1"	1"-TC1, 1"-TC2, 1"-TC3, 1"-TC4, 1"-TC5	70°F to 500°F	3 cycles	OK
	1"-TC6, 1"-TC7, 1"-TC8, 1"-TC9, 1"-TC10	0°F to 70°F	3 cycles	OK



1.9.1. Hydrostatic proof test after Thermal cycling test

- Test method: ASTM F1387-19, Annex A4
- Ambient temperature: +22°C ~ +24°C
- Test pressure: 6.9 bar to 150% of W.P.
- Test medium: water
- Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-TC1, 1/4"-TC2, 1/4"-TC3, 1/4"-TC4, 1/4"-TC5, 1/4"-TC6, 1/4"-TC7, 1/4"-TC8, 1/4"-TC9, 1/4"-TC10	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-TC1, 3/8"-TC2, 3/8"-TC3, 3/8"-TC4, 3/8"-TC5, 3/8"-TC6, 3/8"-TC7, 3/8"-TC8, 3/8"-TC9, 3/8"-TC10	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-TC1, 1/2"-TC2, 1/2"-TC3, 1/2"-TC4, 1/2"-TC5, 1/2"-TC6, 1/2"-TC7, 1/2"-TC8, 1/2"-TC9, 1/2"-TC10	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-TC1, 3/4"-TC2, 3/4"-TC3, 3/4"-TC4, 3/4"-TC5, 3/4"-TC6, 3/4"-TC7, 3/4"-TC8, 3/4"-TC9, 3/4"-TC10	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-TC1, 1"-TC2, 1"-TC3, 1"-TC4, 1"-TC5, 1"-TC6, 1"-TC7, 1"-TC8, 1"-TC9, 1"-TC10	6.9 bar	No evidence of leakage	No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, S2).



1.10. Stress corrosion test (S4)

- Test method: ASTM F1387-19, S4
- Sample: 5 ea of each size
- Test temperature: +35± 2°C
- Test pressure: W.P.
- Test medium: water
- Test time: 50 hours

Tube Size	Specimen No.	W.P. (bar)	Test axial stress value		Requirement	Result
			Calculation	Actual		
1/4"	1/4"-S1	520	1769	1855	No leakage during testing	No
	1/4"-S2			1799		No
	1/4"-S3			1796		No
	1/4"-S4			1835		No
	1/4"-S5			1865		No
3/8"	3/8"-S1	330	1550	1558	No leakage during testing	No
	3/8"-S2			1573		No
	3/8"-S3			1586		No
	3/8"-S4			1578		No
	3/8"-S5			1554		No
1/2"	1/2"-S1	350	1477	1531	No leakage during testing	No
	1/2"-S2			1486		No
	1/2"-S3			1498		No
	1/2"-S4			1513		No
	1/2"-S5			1490		No
3/4"	3/4"-S1	340	1411	1452	No leakage during testing	No
	3/4"-S2			1433		No
	3/4"-S3			1486		No
	3/4"-S4			1435		No
	3/4"-S5			1461		No
1"	1"-S1	400	1467	1712	No leakage during testing	No
	1"-S2			1852		No
	1"-S3			1655		No
	1"-S4			1687		No
	1"-S5			1485		No



1.10.1. Hydrostatic proof test after Stress corrosion test

-Test method: ASTM F1387-19, Annex A4

-Ambient temperature: +22°C ~ +24°C

-Test pressure: 6.9 bar to 150% of W.P.

-Test medium: water

-Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-S1, 1/4"-S2, 1/4"-S3, 1/4"-S4, 1/4"-S5	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-S1, 3/8"-S2, 3/8"-S3, 3/8"-S4, 3/8"-S5	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-S1, 1/2"-S2, 1/2"-S3, 1/2"-S4, 1/2"-S5	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-S1, 3/4"-S2, 3/4"-S3, 3/4"-S4, 3/4"-S5	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-S1, 1"-S2, 1"-S3, 1"-S4, 1"-S5	6.9 bar	No evidence of leakage	No
		600 bar		No



1.10.2. Visual examination after Stress corrosion test and Hydrostatic proof test

-Test method: 10x power magnification acc. to ASTM F1387-19, S4

Tube Size	Specimen No.	Requirement	Result
1/4"	1/4"-S1	No cracking or pitting of exposed surface	No
	1/4"-S2		No
	1/4"-S3		No
	1/4"-S4		No
	1/4"-S5		No
3/8"	3/8"-S1	No cracking or pitting of exposed surface	No
	3/8"-S2		No
	3/8"-S3		No
	3/8"-S4		No
	3/8"-S5		No
1/2"	1/2"-S1	No cracking or pitting of exposed surface	No
	1/2"-S2		No
	1/2"-S3		No
	1/2"-S4		No
	1/2"-S5		No
3/4"	3/4"-S1	No cracking or pitting of exposed surface	No
	3/4"-S2		No
	3/4"-S3		No
	3/4"-S4		No
	3/4"-S5		No
1"	1"-S1	No cracking or pitting of exposed surface	No
	1"-S2		No
	1"-S3		No
	1"-S4		No
	1"-S5		No

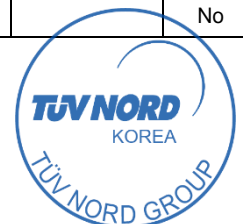
The inspected samples are in compliance with the test criteria (ASTM F1387-19, S4).



1.11. Vibration test (S8)

- Test method: ASTM F1387-19, S8
- Sample: 5 ea of each size
- Ambient temperature: +25°C ~ +26°C
- Test pressure: W.P.
- Test medium: water
- Test frequency: 4 Hz ~ 60 Hz

Tube Size	Specimen No.	W.P. (bar)	Test time(min.) per Hz							Requirement	Result
			4 ~ 15Hz	16 ~ 25Hz	26 ~ 33Hz	34 ~ 40Hz	41 ~ 50Hz	50 ~ 60Hz	60Hz		
1/4"	1/4"-V1	520	5	5	5	5	5	5	120	No leakage and no loss of pressure during testing	No
	1/4"-V2		5	5	5	5	5	5	120		No
	1/4"-V3		5	5	5	5	5	5	120		No
	1/4"-V4		5	5	5	5	5	5	120		No
	1/4"-V5		5	5	5	5	5	5	120		No
3/8"	3/8"-V1	330	5	5	5	5	5	5	120	No leakage and no loss of pressure during testing	No
	3/8"-V2		5	5	5	5	5	5	120		No
	3/8"-V3		5	5	5	5	5	5	120		No
	3/8"-V4		5	5	5	5	5	5	120		No
	3/8"-V5		5	5	5	5	5	5	120		No
1/2"	1/2"-V1	350	5	5	5	5	5	5	120	No leakage and no loss of pressure during testing	No
	1/2"-V2		5	5	5	5	5	5	120		No
	1/2"-V3		5	5	5	5	5	5	120		No
	1/2"-V4		5	5	5	5	5	5	120		No
	1/2"-V5		5	5	5	5	5	5	120		No
3/4"	3/4"-V1	340	5	5	5	5	5	5	120	No leakage and no loss of pressure during testing	No
	3/4"-V2		5	5	5	5	5	5	120		No
	3/4"-V3		5	5	5	5	5	5	120		No
	3/4"-V4		5	5	5	5	5	5	120		No
	3/4"-V5		5	5	5	5	5	5	120		No
1"	1"-V1	400	5	5	5	5	5	5	120	No leakage and no loss of pressure during testing	No
	1"-V2		5	5	5	5	5	5	120		No
	1"-V3		5	5	5	5	5	5	120		No
	1"-V4		5	5	5	5	5	5	120		No
	1"-V5		5	5	5	5	5	5	120		No



1.11.1. Hydrostatic proof test after Vibration test

-Test method: ASTM F1387-19, Annex A4

-Ambient temperature: +22°C ~ +24°C

-Test pressure: 6.9 bar to 150% of W.P.

-Test medium: water

-Test time: 5 minutes at second pressurization

Tube size	Specimen No.	Test pressure	Requirement	Result
1/4"	1/4"-V1, 1/4"-V2, 1/4"-V3, 1/4"-V4, 1/4"-V5	6.9 bar	No evidence of leakage	No
		780 bar		No
3/8"	3/8"-V1, 3/8"-V2, 3/8"-V3, 3/8"-V4, 3/8"-V5	6.9 bar	No evidence of leakage	No
		495 bar		No
1/2"	1/2"-V1, 1/2"-V2, 1/2"-V3, 1/2"-V4, 1/2"-V5	6.9 bar	No evidence of leakage	No
		525 bar		No
3/4"	3/4"-V1, 3/4"-V2, 3/4"-V3, 3/4"-V4, 3/4"-V5	6.9 bar	No evidence of leakage	No
		510 bar		No
1"	1"-V1, 1"-V2, 1"-V3, 1"-V4, 1"-V5	6.9 bar	No evidence of leakage	No
		600 bar		No

The inspected samples are in compliance with the test criteria (ASTM F1387-19, S8).



## 2. List of test equipment

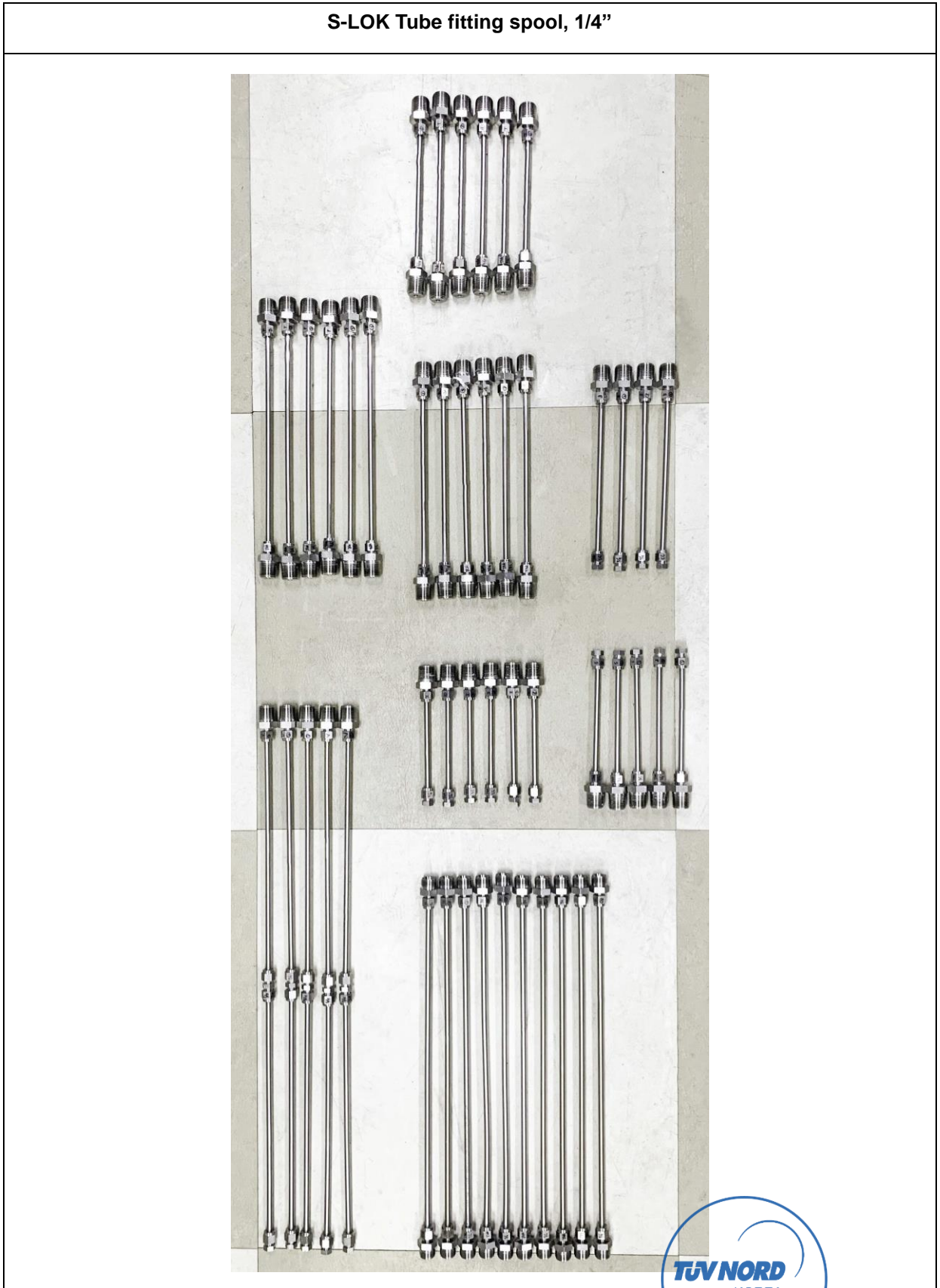
No.	Equipment description	Manufacturer	Model	Calibration date *	Due date
1	Pneumatic Tester	Enpos	KAG-152H	17.Jun. 2020	17.Jun. 2021
2	Burst Tester	Enpos	SH12-030-01	20.Jul. 2020	20.Jul. 2021
3	Impulse Tester	Korea Power Line	KPL-I-B-1500	29.Apr. 2020	29.Apr. 2021
4	Flexure Fatigue Tester	D.I.T	DIT-Fatigue960	17.Jun. 2020	17.Jun. 2021
5	Tensile Tester	Daekyung Tech	DTU-H	07.Oct. 2019	07.Oct. 2020
6	Rotary Flex Tester	Daeha	DHE-00075	17.Jun. 2020	17.Jun. 2021
7	Thermal Cycling Tester	D.I.T	DIT-TCT600	18.Feb. 2021	18.Feb. 2022
8	Stress Corrosion Tester	D.I.T	SST-966	17.Nov. 2020	17.Nov. 2021
9	Vibration Tester	Korea Clamp	KC-V60	21.Dec. 2020	21.Dec. 2021
10	Vickers Hardness Tester	Mitutoyo	HM-200	31.Mar. 2020	31.Mar. 2021

*(\*) The each calibration was valid during the relevant testing.*

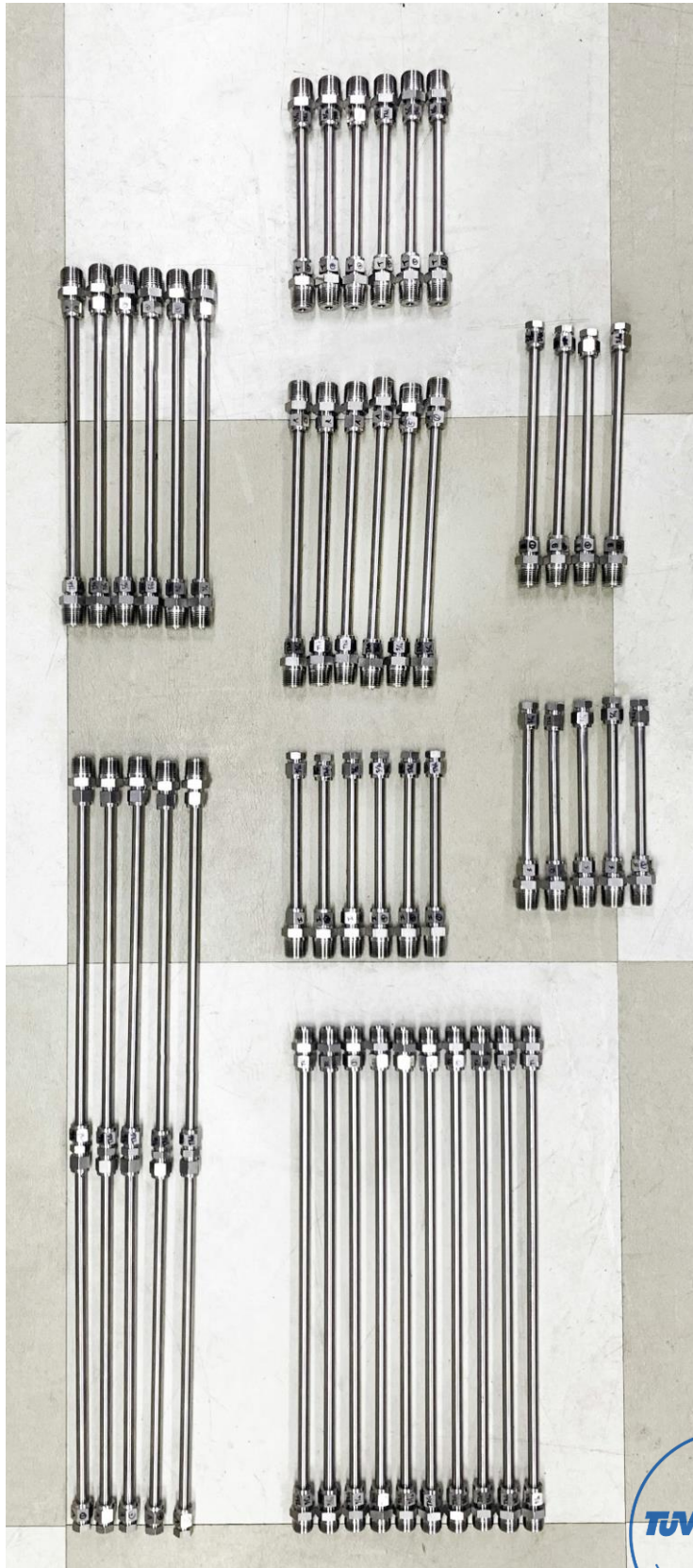




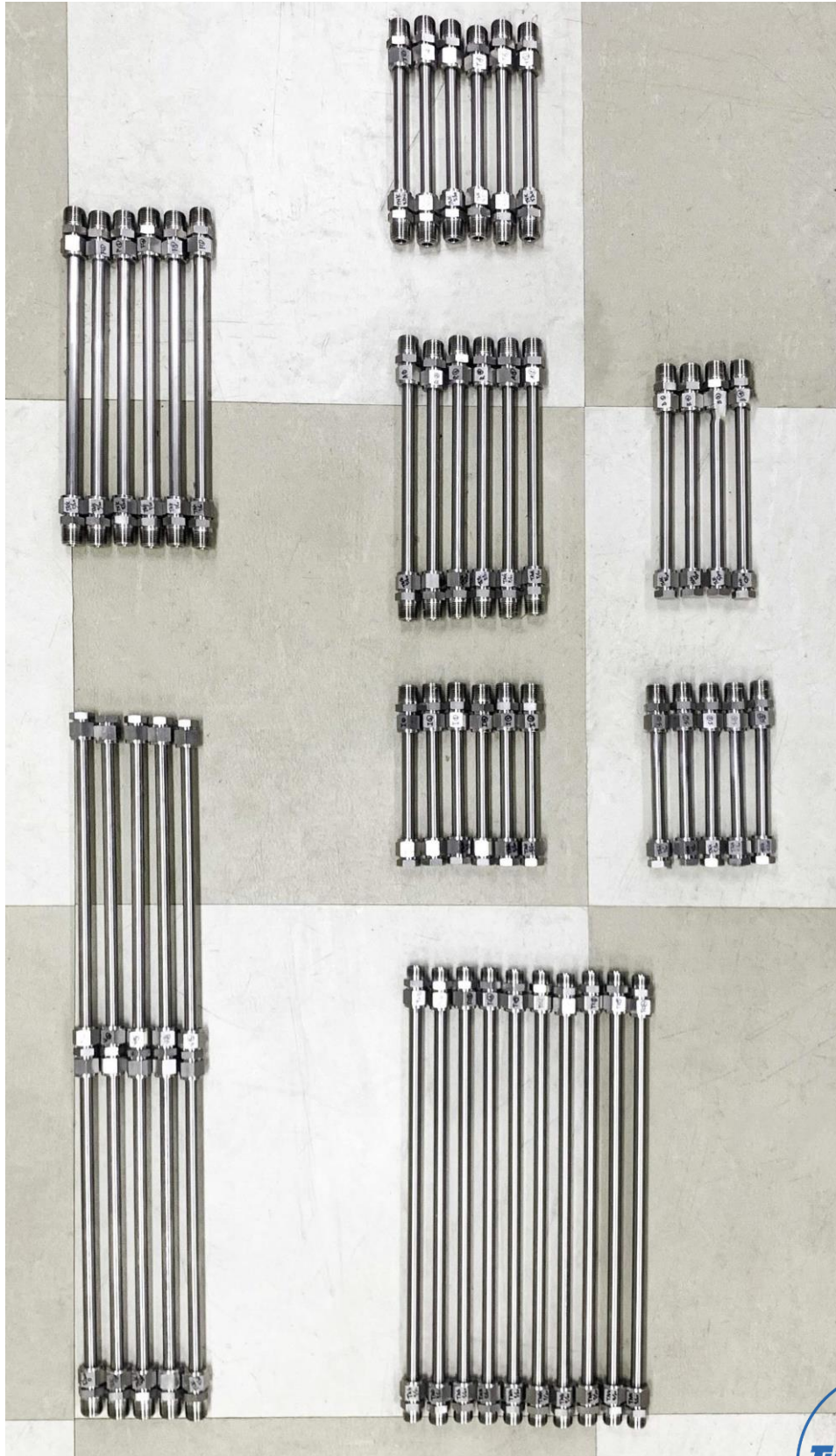
3. Picture of test specimens



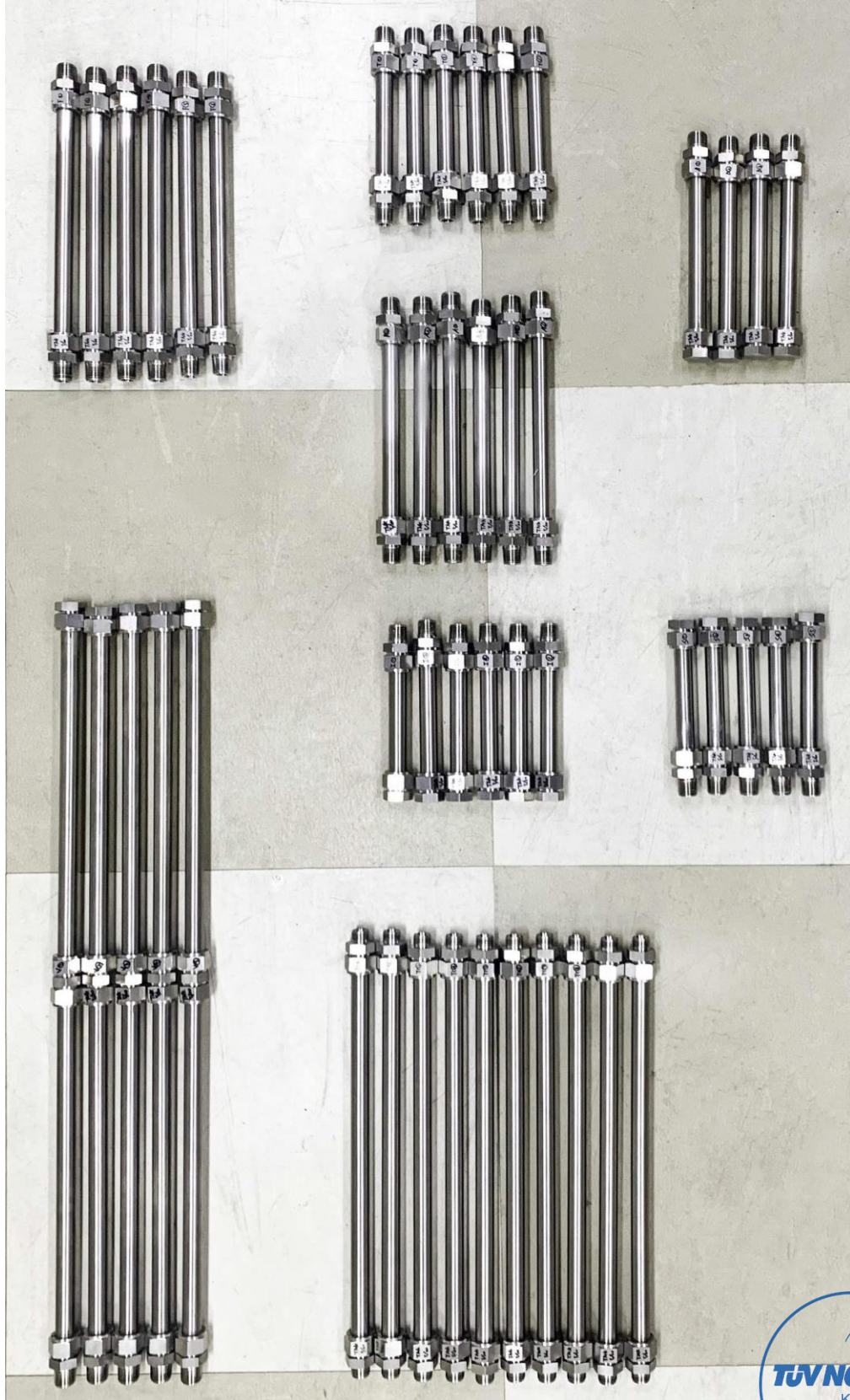
S-LOK Tube fitting spool, 3/8"



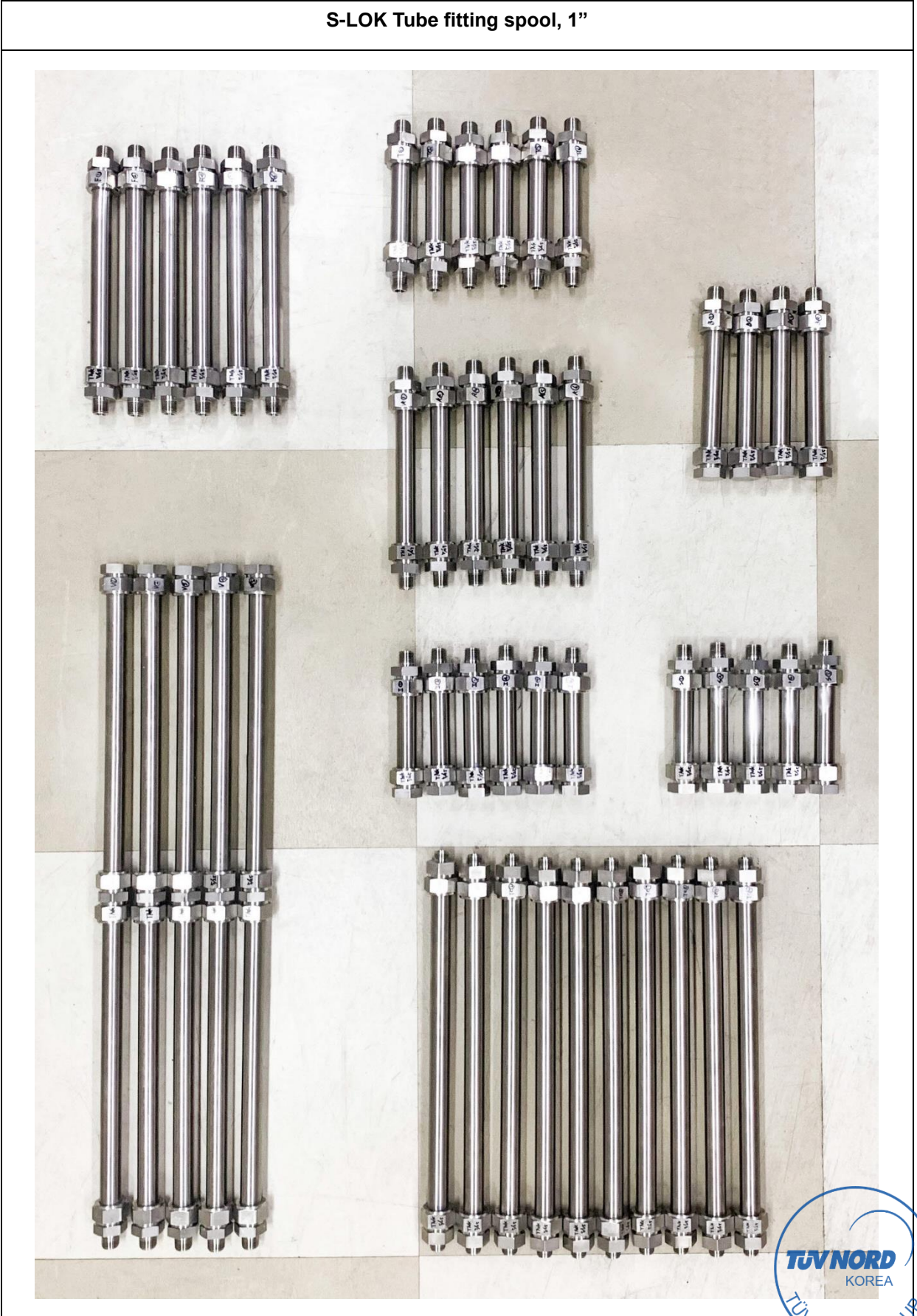
S-LOK Tube fitting spool, 1/2"



S-LOK Tube fitting spool, 3/4"

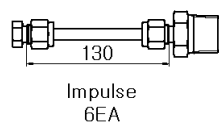
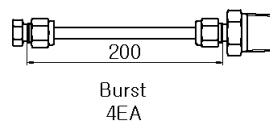
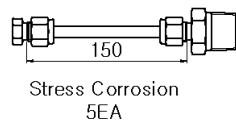
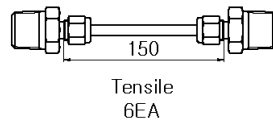
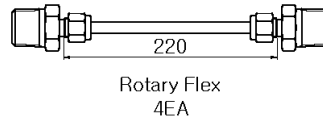
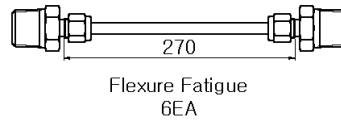
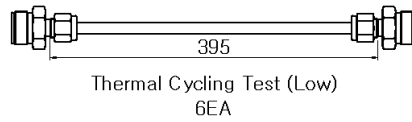
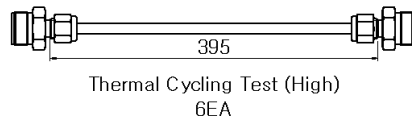
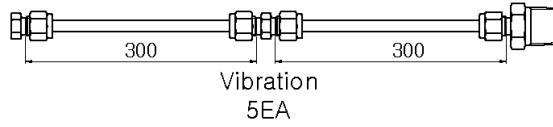


S-LOK Tube fitting spool, 1"

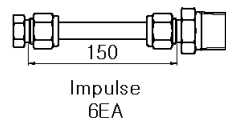
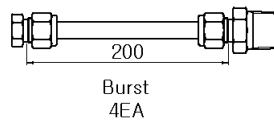
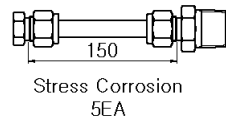
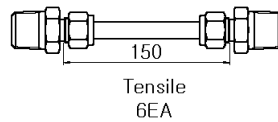
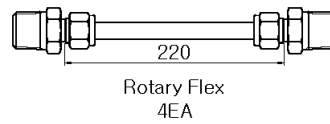
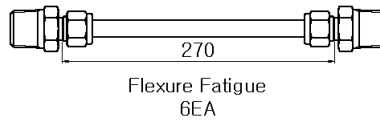
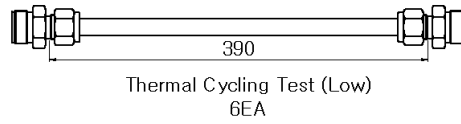
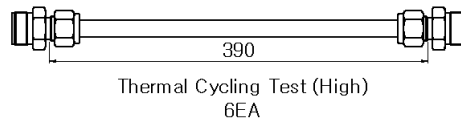
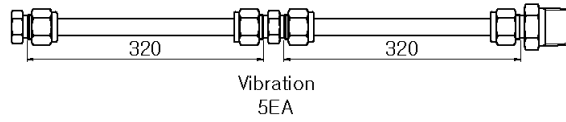


#### 4. Test spool

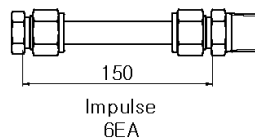
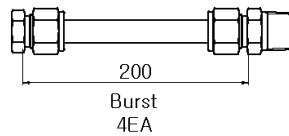
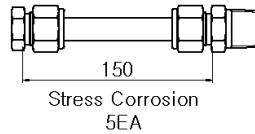
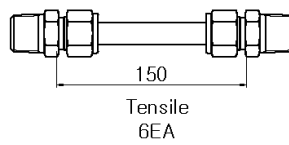
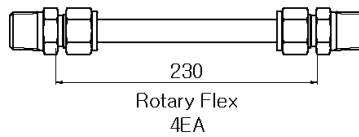
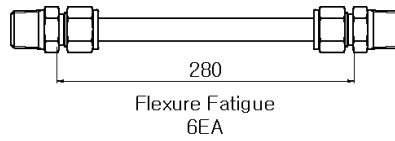
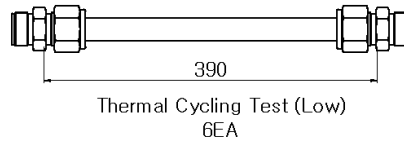
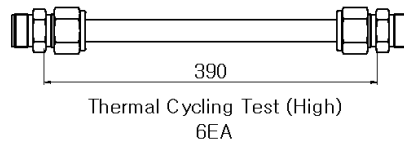
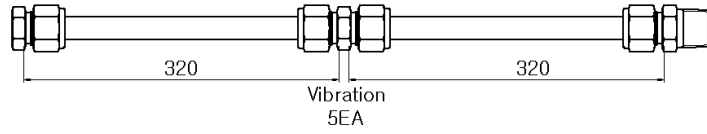
### < S-LOK Tube Fitting Spool Drawing, 1/4" >



# < S-LOK Tube Fitting Spool Drawing, 3/8" >

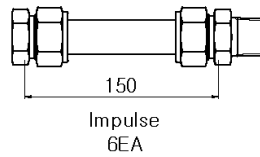
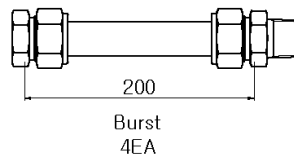
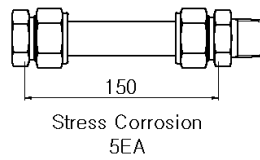
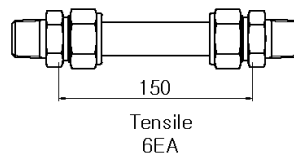
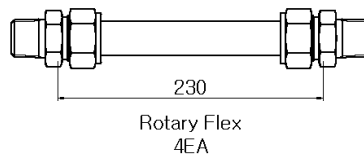
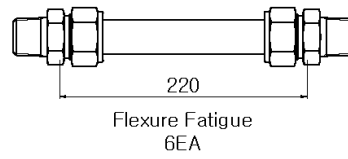
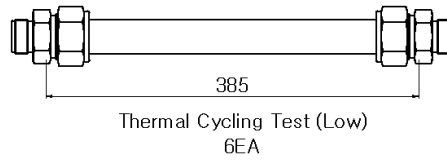
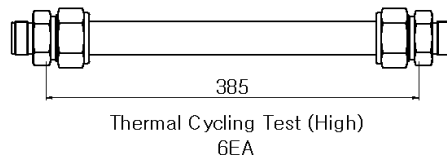
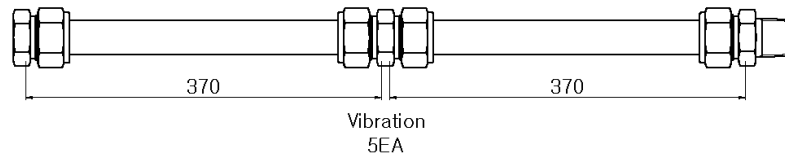


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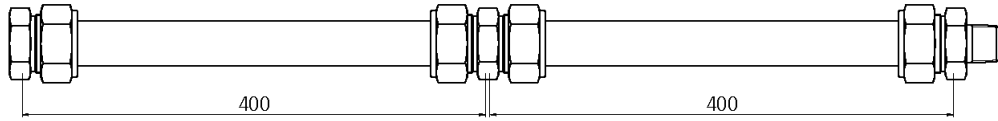




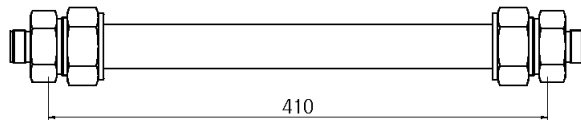
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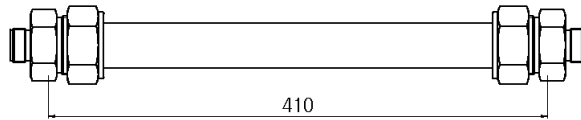
# < S-LOK Tube Fitting Spool Drawing, 1" >



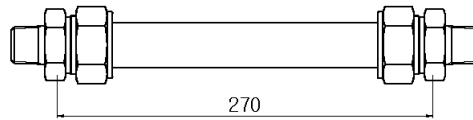
Vibration  
5EA



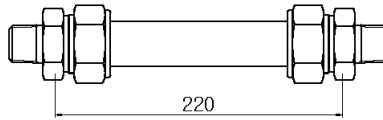
Thermal Cycling Test (High)  
6EA



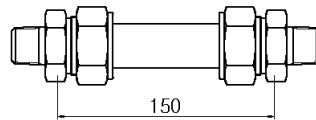
Thermal Cycling Test (Low)  
6EA



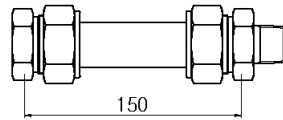
Flexure Fatigue  
6EA



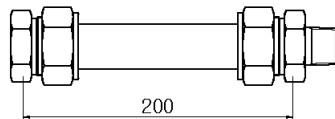
Rotary Flex  
4EA



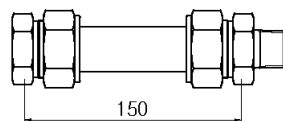
Tensile  
6EA



Stress Corrosion  
5EA



Burst  
4EA



Impulse  
6EA

