Industry & Facilities Division

Third Party Inspection Report

INSPECTION REPORT No. INS/SR/SHOP-26/074	**Revision No.04**
☐ Initial ☐ Interim ☒ Final ☐ Resident ☐ Remote	
Inspection requested by: INS/SR/SHOP-26/074	
Inspection performed as Recognised Authority: ☐ Yes, :*(Recognition)* ☒ No	
BV Job Nr: INS/SR/SHOP-26/074	

Project: Interchangeability between FITOK and Swagelok 316 SS tube fittings	**IPO Ref** *(If applicable): / (BV internal P/o)*
BV Client: FITOK Incorporated	**P/o nr:FK-2607024** *(client to BV)*
Manufacturer/Vendor: FITOK (Wuhan) Incorporated & FITOK Incorporated	**P/o nr:/** *(client to Manufacturer)*
Sub-Vendor *(If applicable): /*	
Inspection Location (Address): No. 16, Jinyang Avenue, Yangluo Economic Development Zone, Xinzhou District, Wuhan City, Hubei Province No. 164, Xinqu Village Section, Tiantou Community, Shijing Sub-district, Pingshan District, Shenzhen City, Guangdong Province	**Previous Inspection** *(If applicable): / (Date)*
Inspection Location (GPS Coordinates): /	**Next Inspection** *(If applicable): / (Date)*
Inspection performed on: Sep. 7 &8 &9 &10 &11, 2026	**Total No. of Inspection Days: 5 Days**

MATERIAL / SUBJECT OF INSPECTION ☐ **Refer to attachment section J instead** *(Indicate if separate material list is provided in attachment)*	**ITEM / TAG Nr**	**QTY** As per P/O	**QTY** Offered for inspection
Swagelok & FITOK Double Ferrule Tube Fittings	ML6（Φ6 ×1 mm）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	ML10（Φ10×1.5 mm）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	ML12（Φ12×1.5mm）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	ML16（Φ16 ×2mm）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	ML18（Φ18×2 mm）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	FL4 （Φ1/4"×0.49"）	12PCS	12PCS
Swagelok & FITOK Double Ferrule Tube Fittings	FL6 （Φ3/8"×0.65"）	10PCS	10PCS
Swagelok & FITOK Double Ferrule Tube Fittings	FL8 （Φ1/2"×0.65"）	12PCS	12PCS
Swagelok & FITOK Double Ferrule Tube Fittings	FL12 （Φ3/4"×0.83"）	12PCS	12PCS

A – INSPECTION RESULT		
☒ **Satisfactory** **(Without comments)**	☐ **Satisfactory with comments** **(Any of trailing Punch or Non Conformity items is still open)**	☐ **Not Satisfactory** **(NCR raised during the inspection)**

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Inspection Summary: (for details refer to section E)

As per NOI (Technical and Commercial Agreement of Shop Inspection Service - INS/SR/SHOP-26/074) document, BV inspectors participated in the on-site work of the inspection of FITOK and Swagelok double ferrule tube fittings interchangeability test, and witnessed the following details and results:

1. Tightness Test
2. Helium Leak Test
3. Burst Test
4. Re-assembly Test
5. Vibration Test

The validity of this inspection result is strictly limited to the specific samples inspected by BV, and solely reflects the condition of said samples at the time of inspection. Factors outside the inspection process, such as samples alteration before/after inspection, alteration caused by transportation/storage conditions, or third-party substitution, are not within the scope of our liability.

Open Non Conformities:	☐ Yes, details in section G	☒ No
Open Punch List Items:	☐ Yes, details in section H	☒ No
Release Note Issued:	☐ Yes, number(s): *(Release Note number)*	☒ No
BV Traceability Stamping:	☐ Yes,	☒ No

BV Inspector: Zhu Pingjian & Zhang Haihong *(Name and Signature)* Zhu Pingjian Zhang Haihong	**BV Coordinator: Chunjie Xu** *(Name and Signature)* Chunjie Xu
BV Office: BVQS	**Inspection Report Date: Sep 12 2026**
Distribution: ☒ **CLIENT** ☒ **BV** ☐ **MANUFACTURER** ☐ **OTHER:**	**Attachments Report:** ☒ Yes, details in section J ☐ No

B - REFERENCE DOCUMENTATION:

☐ **Refer to attachment section J instead**
(Indicate if separate document list is provided in attachment)

Title	Reference n°	Rev.	Approval status	Approved by	Date
Standard Specification for Performance of Piping and Tubing Mechanically Attached Fittings	ASTM F1387	/	Effective	ASTM	July 1, 2023
FITOK& Swagelok double ferrule tube fittings interchangeability test Report briefing note	/	00	Approved	Client	/

C – ATTENDEES

Name	Position	Representing
Zhu Pingjian	Inspector	BV
Zhang Haihong	Inspector	BV
Wang Shenghua	Product Engineer	FITOK
Mr. Li Gong	Product Engineer	FITOK

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D - MEASURING & TESTING EQUIPMENT USED

☐ **Refer to attachment section J instead**
(Indicate if separate equipment list is provided in attachment)

Equipment Type	Equipment Identity n°	Last Calibration Date	Expiry Date
Precision pressure gauge	E250311157	2026/03/22	2027/03/21
Precision pressure gauge	ST26071269	2026/08/17	2027/08/16
Precision pressure gauge	ST26010242	2026/02/07	2027/02/06
Electric vibration test system	230611060/2311384/233911104	2026/06/01	2027/05/31
Timepiece	FK-T-1228	2026-01-15	2027-01-14
Timepiece	FK-T-1227	2026-01-15	2027-01-14
Pressure gauge with back connection	FK-T-1385	2026-04-22	2026-10-21
Standard leak holes of helium mass spectrometry leak detector	WFK-T-745	2025-12-22	2026-12-21
Digital Pressure Gauge	FK-T-955	2026-04-21	2027-04-20
Timepiece	FK-T-1225	2026-01-15	2027-01-14
Pressure gauge	FK-T-603	2026-06-24	2027-06-23
Pressure gauge with back connection	FK-T-1353	2026-07-24	2027-07-23

E - INSPECTION DETAILS

E – General

As per NOI (Technical and Commercial Agreement of Shop Inspection Service - INS/SR/SHOP-26/074) document, BV inspectors participated in the on-site work of the inspection of FITOK and Swagelok double ferrule tube fittings interchangeability test, and witnessed the following details and results:

1. Tightness Test
2. Helium Leak Test
3. Burst Test
4. Re-assembly Test
5. Vibration Test

E1 – Details of Witness (W) & Hold (H) Inspection Points

1.Tightness Test(W)
Test method: Under normal temperature conditions, install the sample and connect it to the pressure source (pressure test bench), place it in the test bench box, submerge it in water, and then cover it with a protective cover. Increase the pressure to 1WP for the air tightness test and maintain the pressure for 1 minute. Test indicators: No phenomena such as bubble overflow or rupture were found on the surface of the sample. Test result was as follows: Test Item List
Reference: ASTM F1387;
Test result: Pass.

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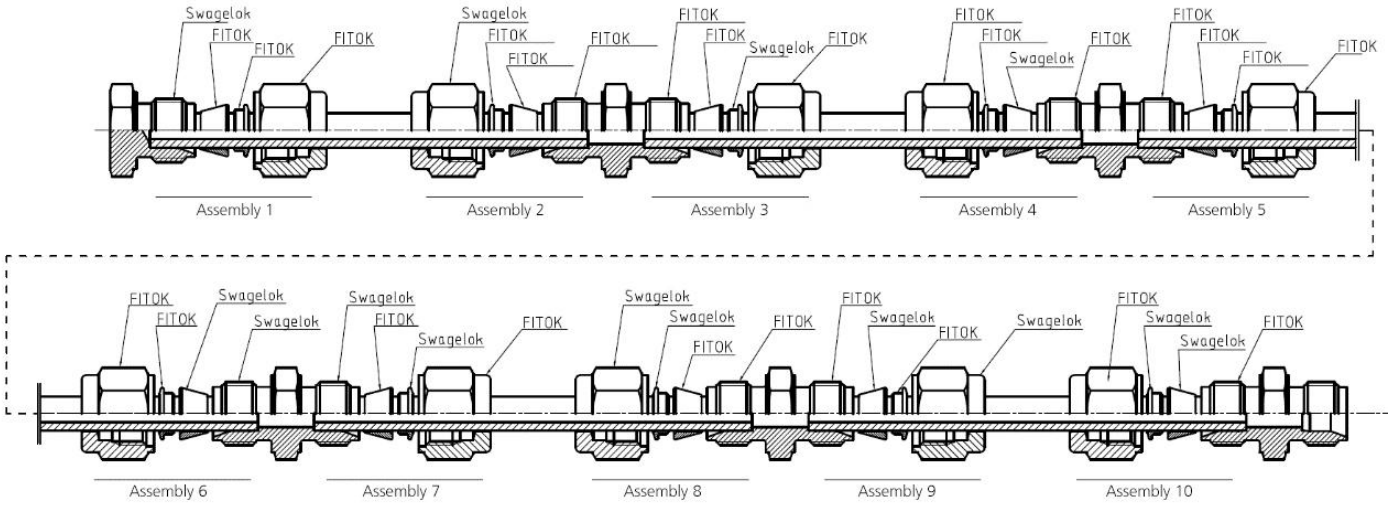
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2. Helium Leak Test(W)
Test method: Under normal temperature conditions, helium detection of the product is conducted using the vacuum hood mode. Blow clean the outer wall of the inner cavity of the sample, then connect the vacuum cover test fixture connect the vacuum cover to the helium leak detection testing instrument, start the helium leak detection testing instrument to evacuate the air, and fill the product with 1WP of helium gas and air mix the pressure and conduct helium detection using a helium leak testing instrument: the detection time should be ≥15 seconds, and the maximum leakage rate should be read. The leakage rate should be $\leqslant 1.0x10^{-9}$ mbar.l/s. Test result was as follows: Test Item List
Reference basis: /;
Test result: Pass.

3.Burst Test(W)
Test method: Under normal temperature conditions, connect the sample piece to the water pressure test bench, empty the gas in the sample chamber, and increase the pressure at a constant speed to 4WP for water pressure explosion sample. No leakage or rupture was found. Continue to increase the pressure until the explosion occurs, and record the explosion pressure. A burst pressure of ≥4WP is considered qualified. Test result was as follows: Test Item List
Test index: Burst pressure ≥4WP;
Reference: ASTM F1387;
Test result: Pass.

4. Re-assembly Test(W)
Test method: Under normal temperature conditions, the sample is refilled 25 times to conduct an air tightness test. Connect the product to the pressure source and place it inside the water pressure test bench. Submerge into water, cover the protective cap, increase the pressure to 1WP, and maintain the pressure for 1 minute. No phenomena such as bubble overflow or rupture were found on the surface of the sample upon observation. Test result was as follows: Test Item List
Reference basis: /;
Test result: Pass.

Port assembly schematic diagram



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Test Item List

Inspection of Swagelok & FITOK double ferrule tube fittings interchangeability test

Port specification	ML6 (Φ6 mm)	ML10 (Φ10 mm)	ML12 (Φ12mm)	ML16 (Φ16 mm	ML18 (Φ18 mm)	FL4 (Φ1/4")	FL6 (Φ3/8")	FL8 (Φ1/2")	FL12 (Φ3/4")
Tightness Test	Pass (42MPa)	Pass (40MPa)	Pass (33MPa)	Pass (33MPa)	Pass (29MPa)	Pass (51.7MPa)	Pass (44.8MPa)	Pass (36MPa)	Pass (30MPa)
Helium Leak Test Test time (≥15 s)	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s	≤$1.0x10^{-12}$ mbar.l/s
Burst Test	Pass (216MPa)	Pass (173MPa)	Pass (138MPa)	Pass (159MPa)	Pass (121MPa)	Pass (280MPa)	Pass (215MPa)	Pass (153MPa)	Pass (131MPa)
Re-Assembly Test	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

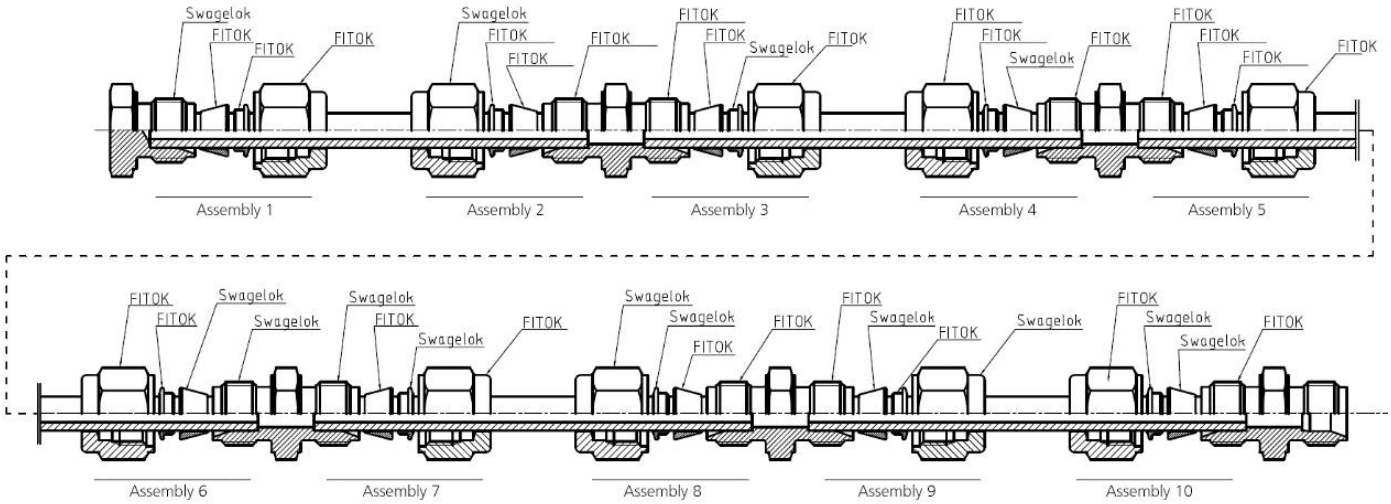
5.Vibration Test(W)

Test method: Under normal temperature conditions, connect the sample to the pressure source (water pressure test bench), empty the gas in the cavity and place it inside the water pressure test bench, then immerse it in water cover the protective cover, increase the pressure to 1WP at a constant speed, and conduct a 2-hour endurance test in three directions (X-axis, Y-axis and Z-axis) respectively at the applicable frequency, the applicable frequency should not exceed 60Hz. No phenomena such as bubble overflow or rupture were found on the surface of the sample upon observation. Only the FL4, FL8 and FL12 models will be tested vibration test. Test result was as follows:

Reference: ASTM F1387;

Test result: Pass.

Port assembly schematic diagram



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Serial Number	Axial position test	Hydraulic Test		Pressure gauge number	Time	Vibration frequency	Conclusion
		Start	Conclusion				
FL4 (Φ1/4"× 0.49")	Y-axis	7500psi	7550psi	WFK-T-1769	2h	⩽60HZ	ACC
	X-axis	7600psi	7800psi				ACC
	Z-axis	7725psi	7900psi				ACC
FL8 (Φ1/2"× 0.65")	Y-axis	5275psi	5400psi	WFK-T-1986	2h	⩽60HZ	ACC
	X-axis	5500psi	5750psi				ACC
	Z-axis	5650psi	5750psi				ACC
FL12 (Φ3/4"× 0.83")	Y-axis	4270psi	4400psi	WFK-T-1546	2h	⩽60HZ	ACC
	X-axis	4400psi	4500psi				ACC
	Z-axis	4600psi	4740psi				ACC

E2 – Details of Monitoring and Surveillance Patrols

☐ **Tick if conducted during the visit**

None

E3 – Details of Certificates Review

☐ **Tick if conducted during the visit**

None

F – HEALTH, SAFETY & ENVIRONMENT COMMENTS

(Comment on Observations and Actions Taken During the Inspection)

Before or during the inspection activities, no health and safety issues or violations were found, and PPE was worn as required by regulations.

G- NON CONFORMITIES

☐ **Refer to attachment section J instead**
(Indicate if separate punch list is provided in attachment)

Item	Description	Status	Raised on	Report Nr.	Closed on	Report Nr.	Comments
NA	NA	NA	NA	NA	NA	NA	NA

H – PUNCH LIST ITEMS

☐ **Refer to attachment section J instead**
(Indicate if separate punch list is provided in attachment)

Item	Description	Status	Raised on	Report Nr.	Closed on	Report Nr.	Comments
NA	NA	NA	NA	NA	NA	NA	NA

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I - DIGITAL PICTURES

	
Sample inspection	Sample inspection
	
Tightness Test	Tightness Test

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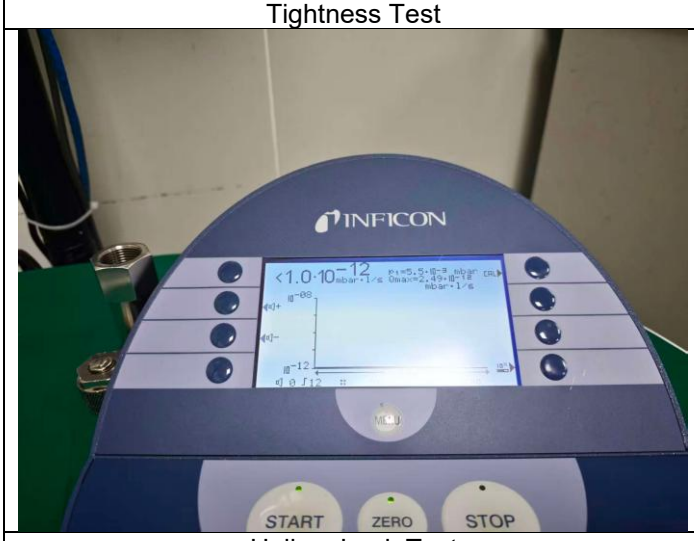
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Tightness Test



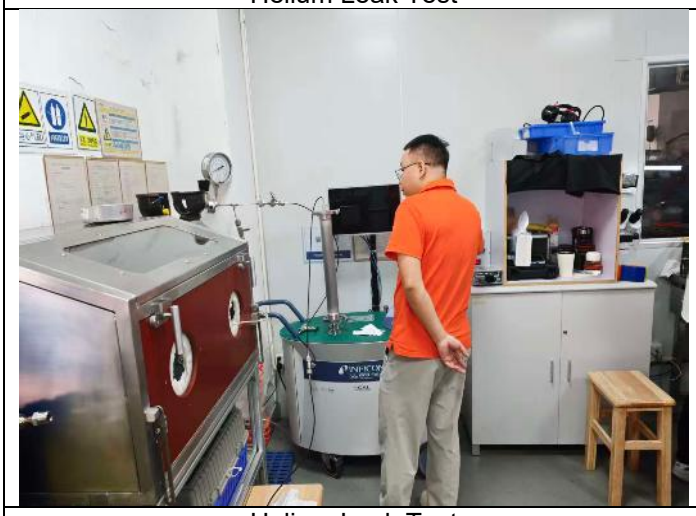
Tightness Test



Helium Leak Test



Helium Leak Test



Helium Leak Test



Helium Leak Test

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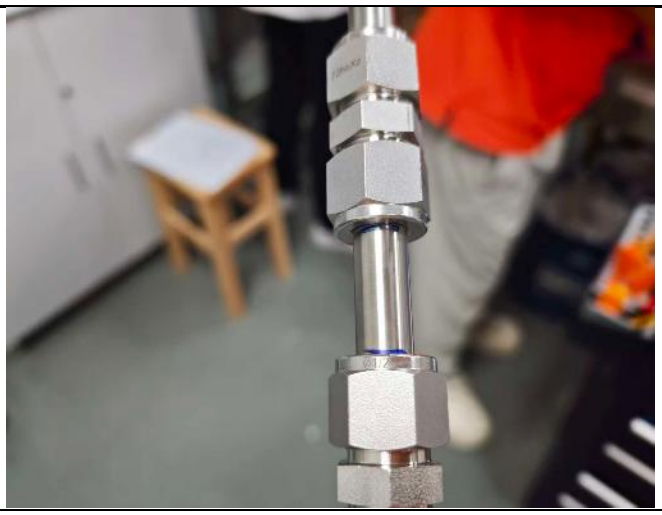
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Helium Leak Test



Helium Leak Test



Burst Test



Burst Test



Burst Test



Burst Test

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Burst Test



Burst Test



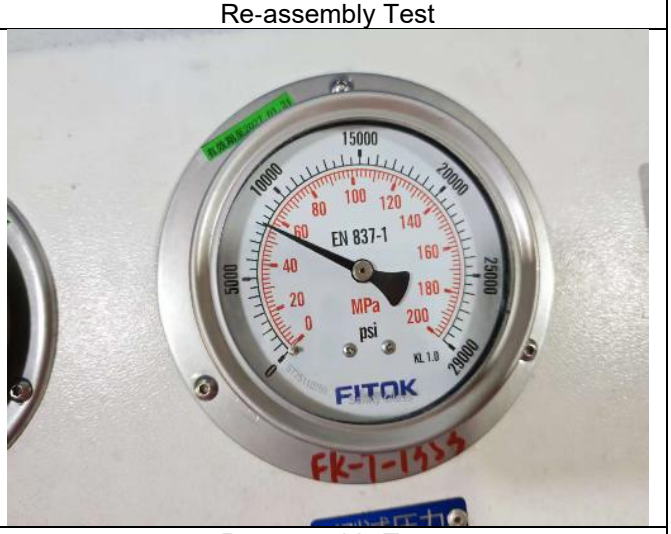
Re-assembly Test



Re-assembly Test



Re-assembly Test



Re-assembly Test

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Re-assembly Test



Re-assembly Test



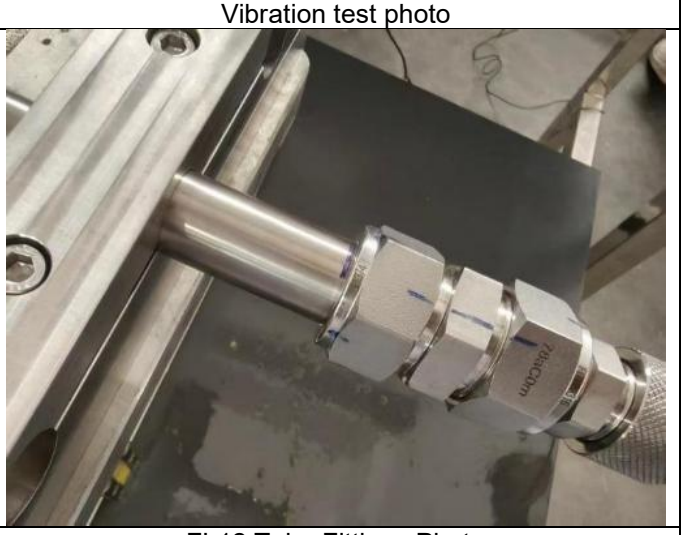
Vibration test photo



Vibration test photo



FL12 Tube Fittings Photo



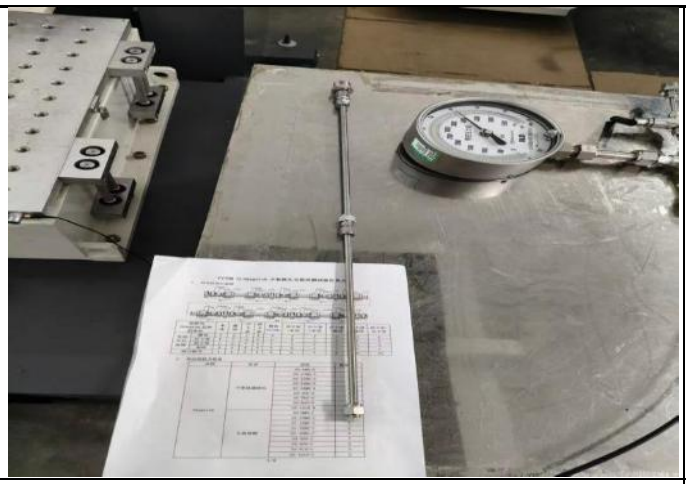
FL12 Tube Fittings Photo

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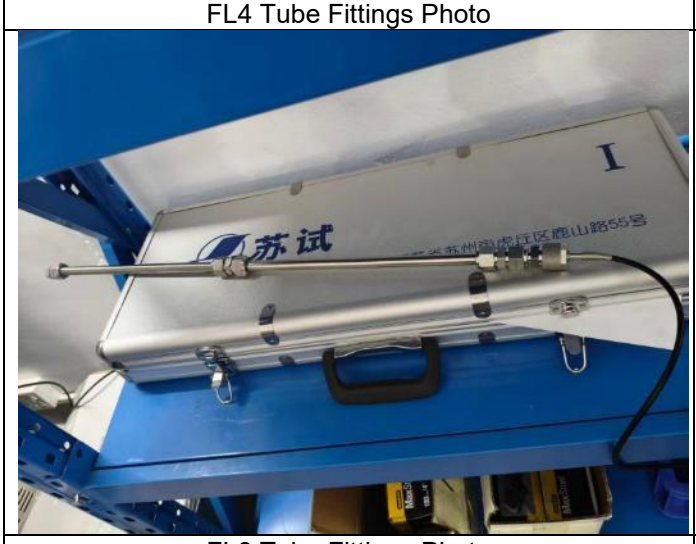
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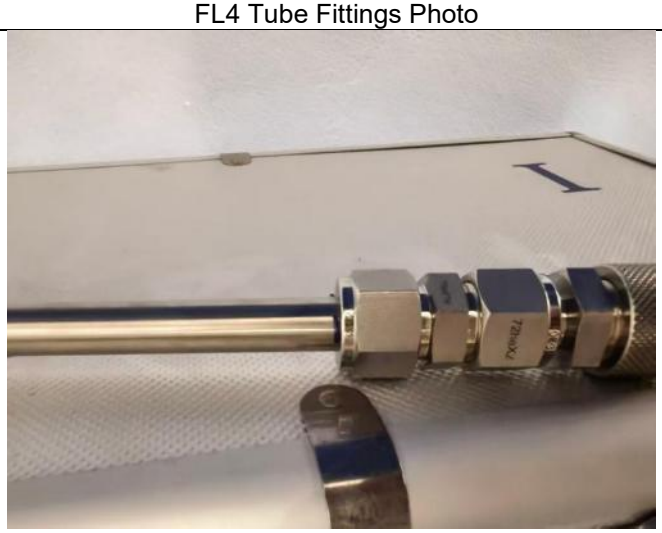
FL4 Tube Fittings Photo



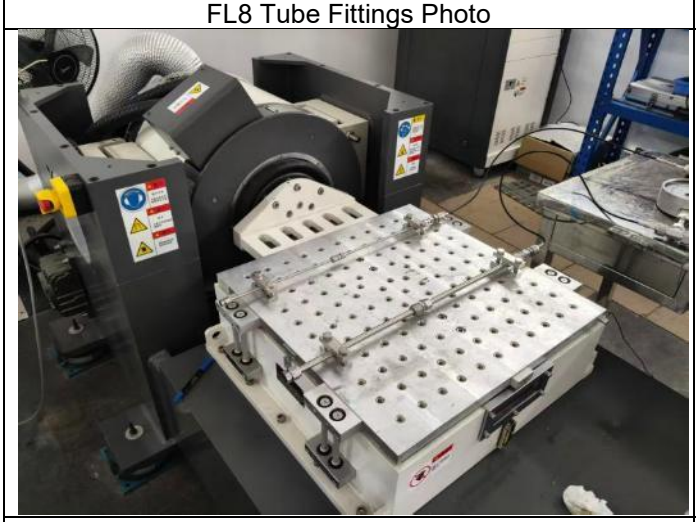
FL4 Tube Fittings Photo



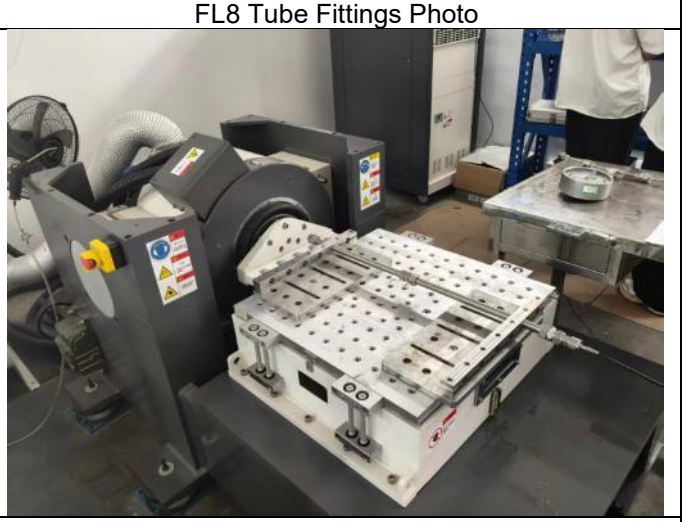
FL8 Tube Fittings Photo



FL8 Tube Fittings Photo



X-axis vibration test



Y-axis vibration test

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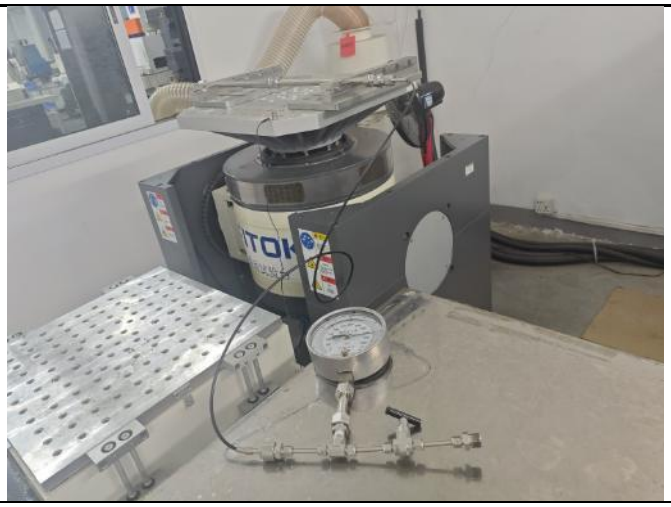
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Z-axis vibration test



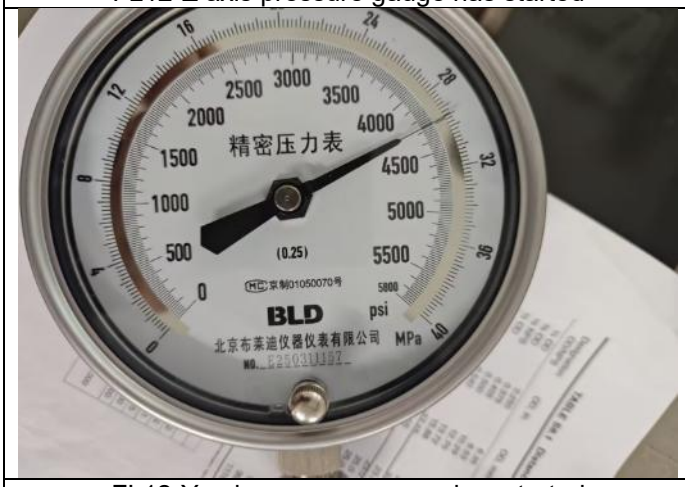
Z-axis vibration test



FL12-Z axis pressure gauge has started



FL12-Z axis pressure gauge is completed



FL12-Y axis pressure gauge has started



FL12-Y axis pressure gauge is completed

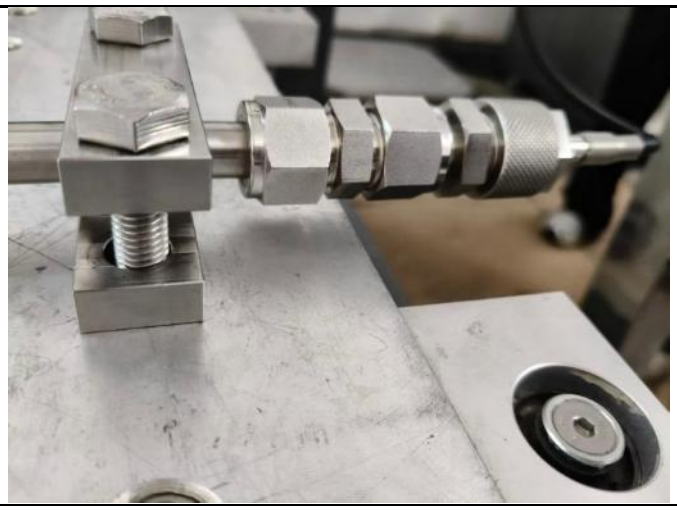
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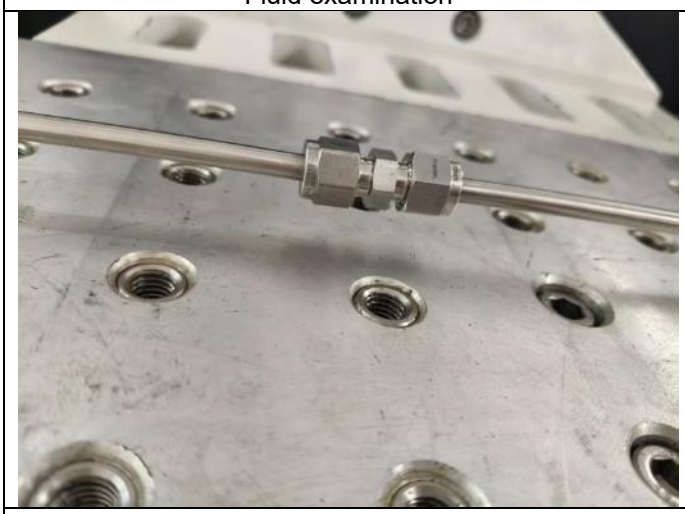
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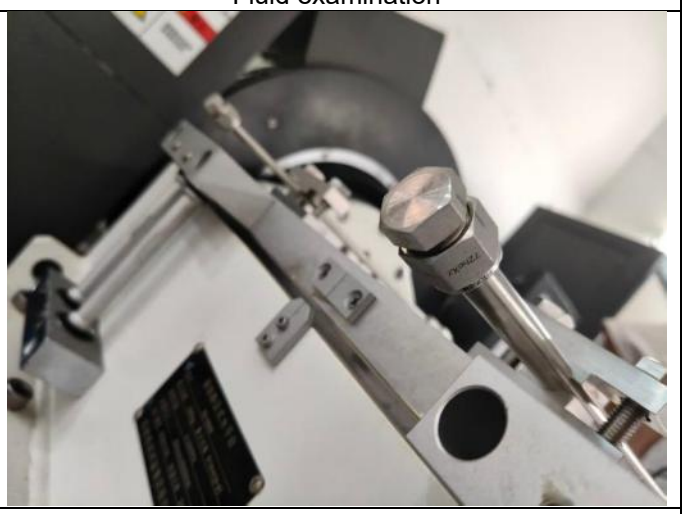
Fluid examination



Fluid examination



Fluid examination



Fluid examination



Pressure gauge



Verification tag

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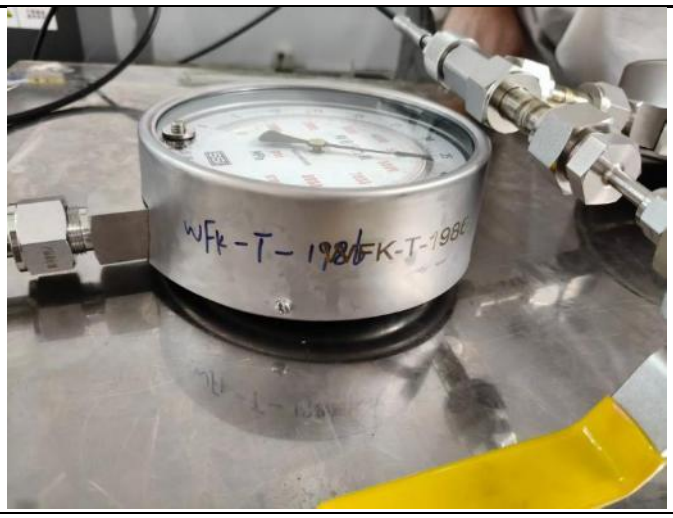
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Pressure gauge



Verification tag



Pressure gauge



Verification tag



Vibration equipment platform



Verification label

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J – ATTACHMENTS			
Item	**Attachment Name**	**Total Pages**	**Description**
/	/	/	/

END OF REPORT

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