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Analysis report number:	2201194
Customer number:	181193
Performance of the test:	Ms. Erlin
Reviewed and approved:	Mr. Treiber
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Date:	24/01/2022

ANALYSIS REPORT

1. General Information

Order Number:	220113-TSC-001
Date of order:	13/01/2022
Sample received:	19/01/2022
Date of test / Test period:	19/01/2022 - 21/01/2022

2. Order

Test parameter:	Strong jet water test IPX6 according to DIN EN 60529: 2014-09
	Steam jet test test IPX9K according to ISO 20653: 2013-02

3. Test object

Specimens:	Empty housing
Quantity of specimens:	4
Name of specimens:	Specimen 001 (T07 empty housing VA0.1.K1.BOR)
	Specimen 002 (T07 empty housing VA2.3.K3.BOR2)
	Specimen 003 (T07 empty housing VA2.3.K3.BOR5)
	Specimen 004 (T07 empty housing VA4.1.K.PS1)
Sampling:	Customer
Sample storage:	Solid samples 4 weeks and liquid samples up to 2 weeks from the date of the test report

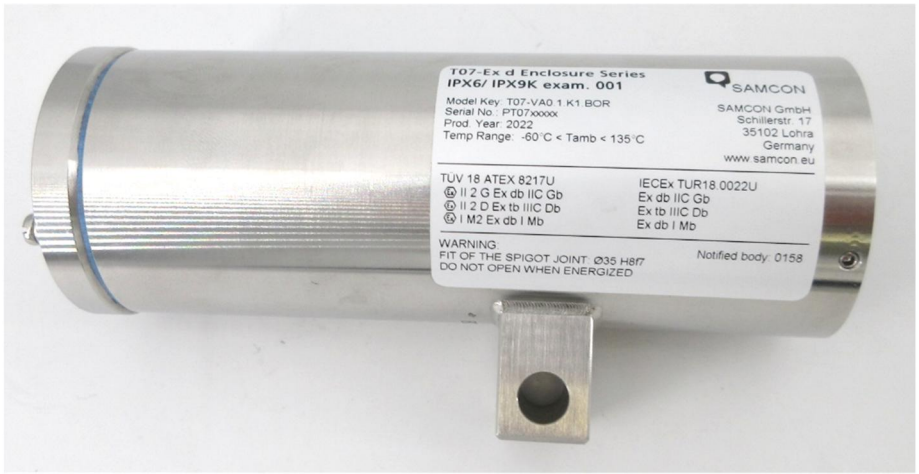


Fig. 1: Samples in delivery condition

4. Test equipment and test conditions

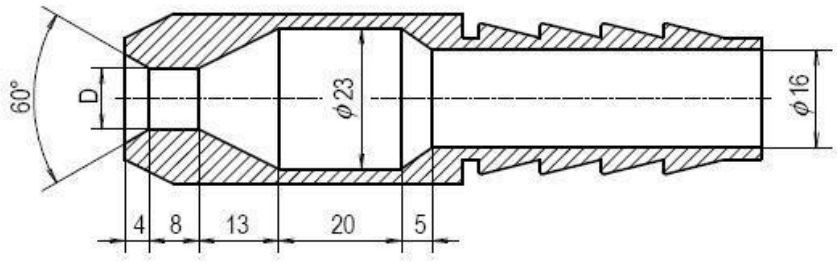
Above named specimens shall be subjected to a development-related degree of protection test IPX6 and IPX9K. The specimens are passive during the testing.

Water room WR-20
Turntable TT-50
High velocity water device HVW 300
Nozzle head IPX6 NH12.5
Nozzle adapter NHA 25.4
Flowmeter IFM 0-300l
Temperature transmitter IFM 0-100°C

Tab. 1: Test Equipment for strong water jet test IPX6

Nozzle diameter:	12.5 mm
Water flow rate:	100 l/min ± 5%
Distance Nozzle – DUT:	2.5 m to 3 m
Exposure time:	3 min
Water temperature:	Difference of the temperature of the equipment under test no more than 5 °C.
Operating mode:	The test is carried out on a turntable.
Acceptance criteria:	Water directed against the enclosure from any direction as a strong jet shall have no harmful effects.

Tab. 2: Test conditions for strong water jet test IPX6



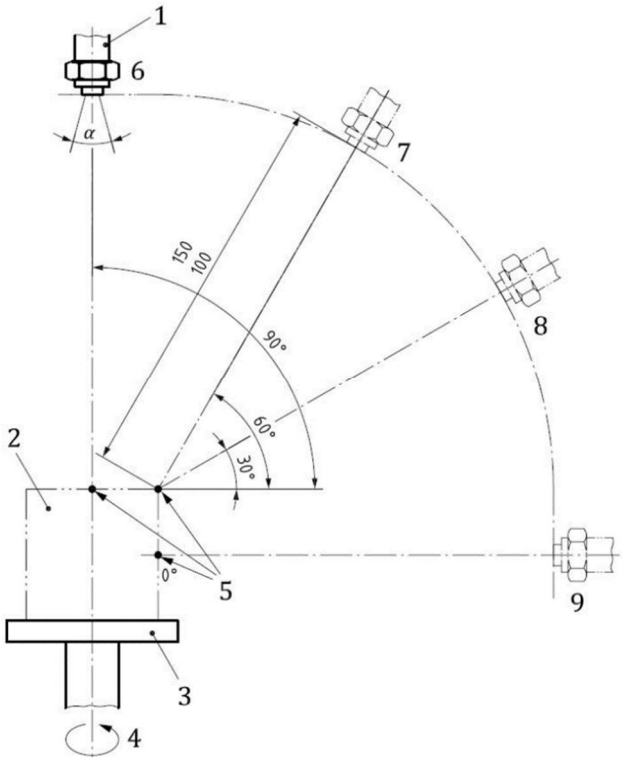
Sketch 1: Nozzle for protection class test IPX6 (dimensions in mm)

Water room WR-20
Turntable TT-50
Steam jet device
Flat-jet nozzle IPX9/IPX9K 0°
Flat-jet nozzle IPX9/IPX9K 30°
Flat-jet nozzle IPX9/IPX9K 60°
IPX9/IPX9K 90° flat fan nozzle
High pressure unit NILFISK
Flow measurement VSE
Temperature transmitter IFM
Pressure sensor HD IFM

Tab. 3: Test Equipment for Steam jet test IPX9K

Water pressure:	8,000 kPa to 10,000 kPa
Water temperature:	+80°C ± 5 °C
Nozzle opening angle:	(30 ±10) ° Flat fan nozzle
Nozzle distance to test specimen:	100 mm to 150 mm
Spray angle:	all accessible jet angles
Spray duration per accessible room direction:	30 s per angle (0°, 30°, 60°, 90°)
Water flow rate:	14 l to 16 l / min
Turntable:	5 U / min
Sample operating condition:	passive
Acceptance criteria:	Water directed against the enclosure at high pressure and high temperatures must not have any harmful effects.

Tab. 4: Test conditions for Steam jet test IPX9K



Legend:
1 Nozzle
2 Test sample
3 Rotary plate
4 Rotary axis
5 Reference points (0°, 30°, 60°, 90°)
6 Position 1
7 Position 2
8 Position 3
9 Position 4

Sketch 2: Test setup for steam jet test IPX9K

5. Testing procedure

5 a) Strong jet water test IPX6:

The test specimens were individually fixed on the turntable of the water jet device and exposed to the strong water jet load IPX6 (**Tab. 1 and 2**). At the end of the 3-minute exposure period, the test specimens were dried externally with a fleece and visually inspected for water ingress through the respective viewing pane. During the visual inspection of the test specimens through the viewing window, no water ingress into the inside of the housing was detected (Fig. 2 to Fig. 9). In the case of test specimen 004, a slight accumulation of water was detected between the red and the black seal of the cover (Fig. 9).

Fig. 2: Test specimen 001 before the strong water jet test IPX6

Fig. 3: Test specimen 001 after the strong water jet test IPX6 - No water ingress

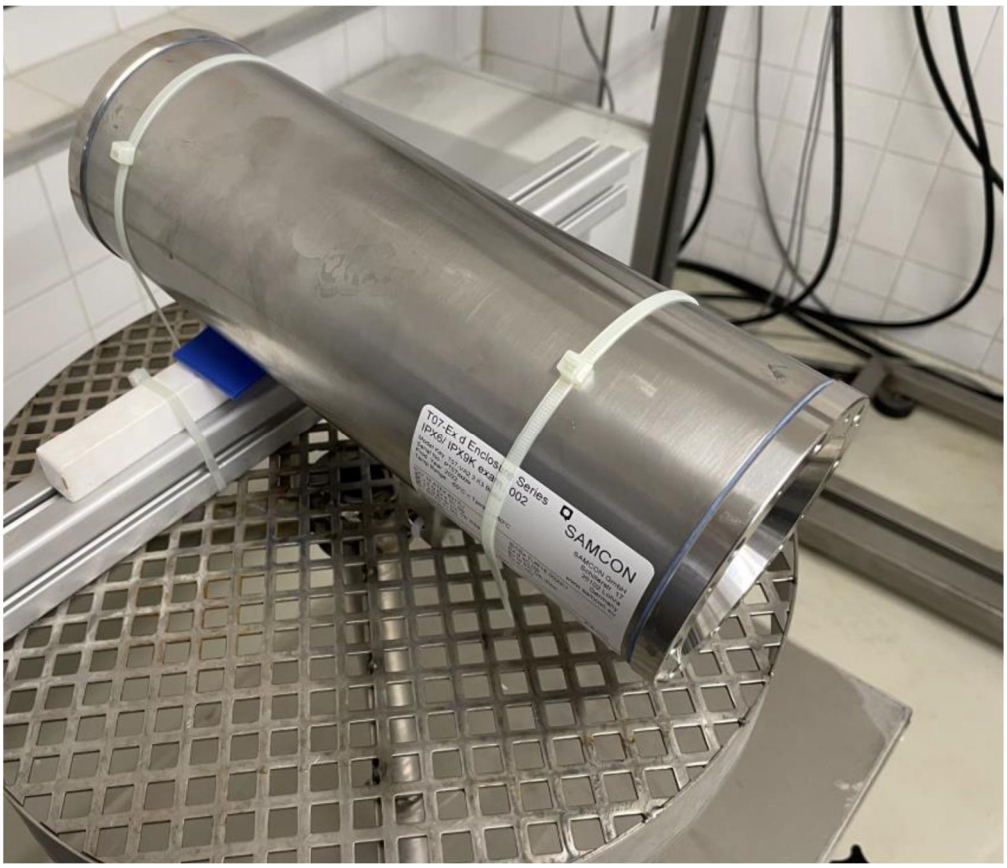


Fig. 4: Test specimen 002 before the strong water jet test IPX6

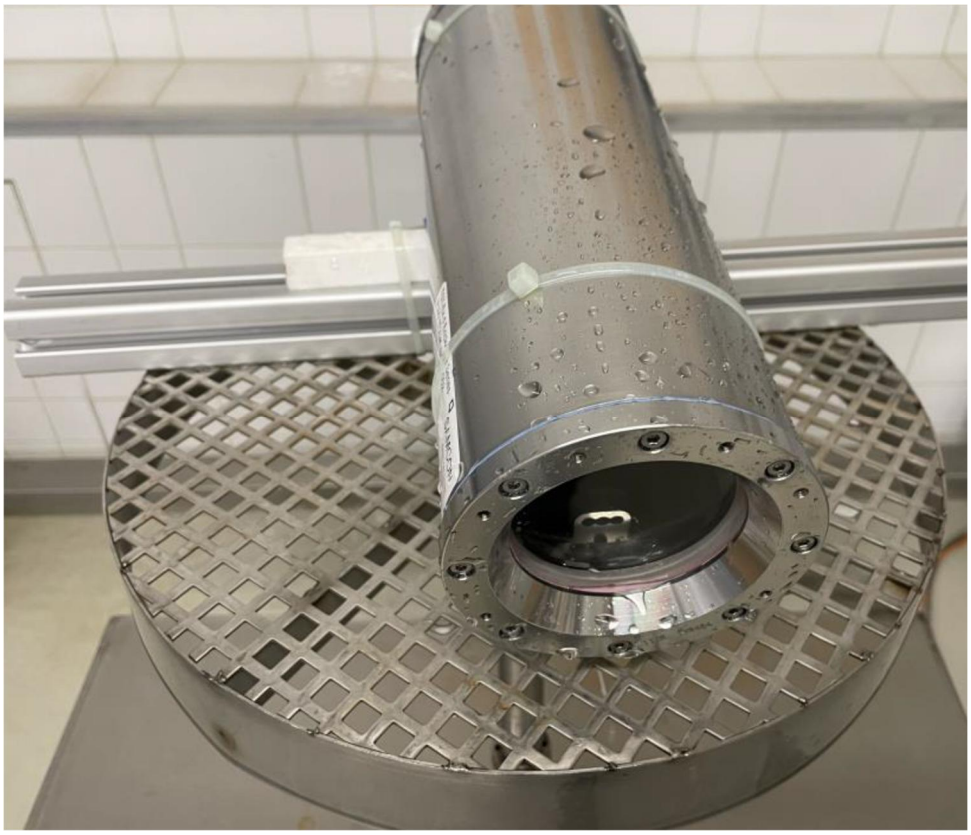


Fig. 5: Test specimen 002 after the strong water jet test IPX6 - No water ingress

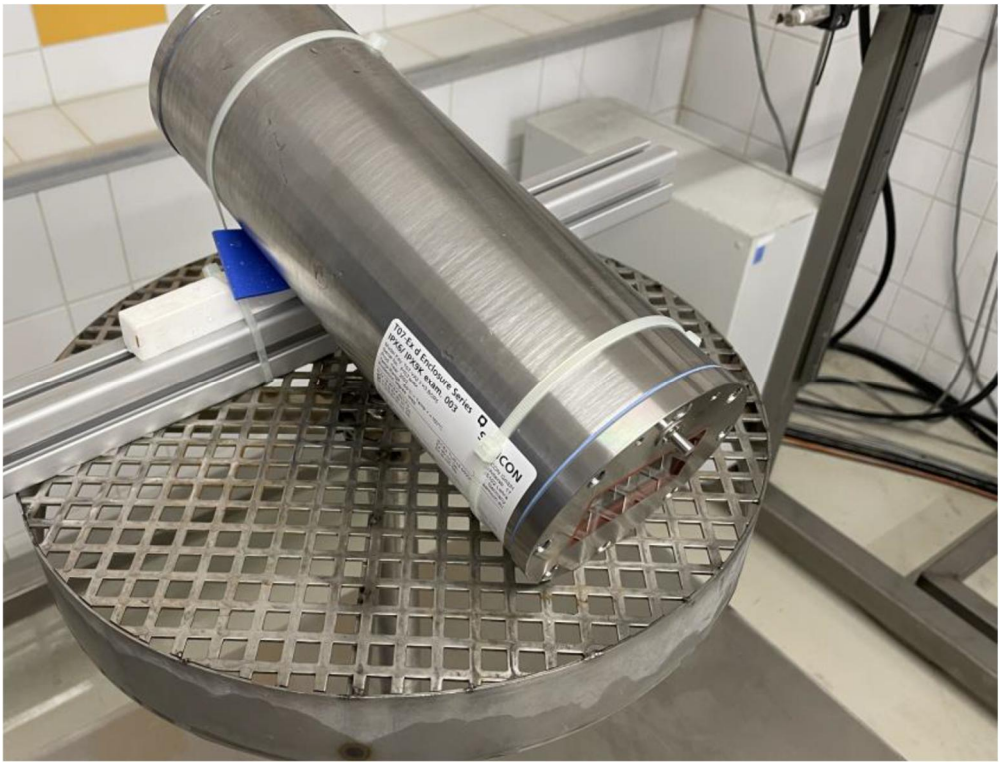


Fig. 6: Test specimen 003 before the strong water jet test IPX6

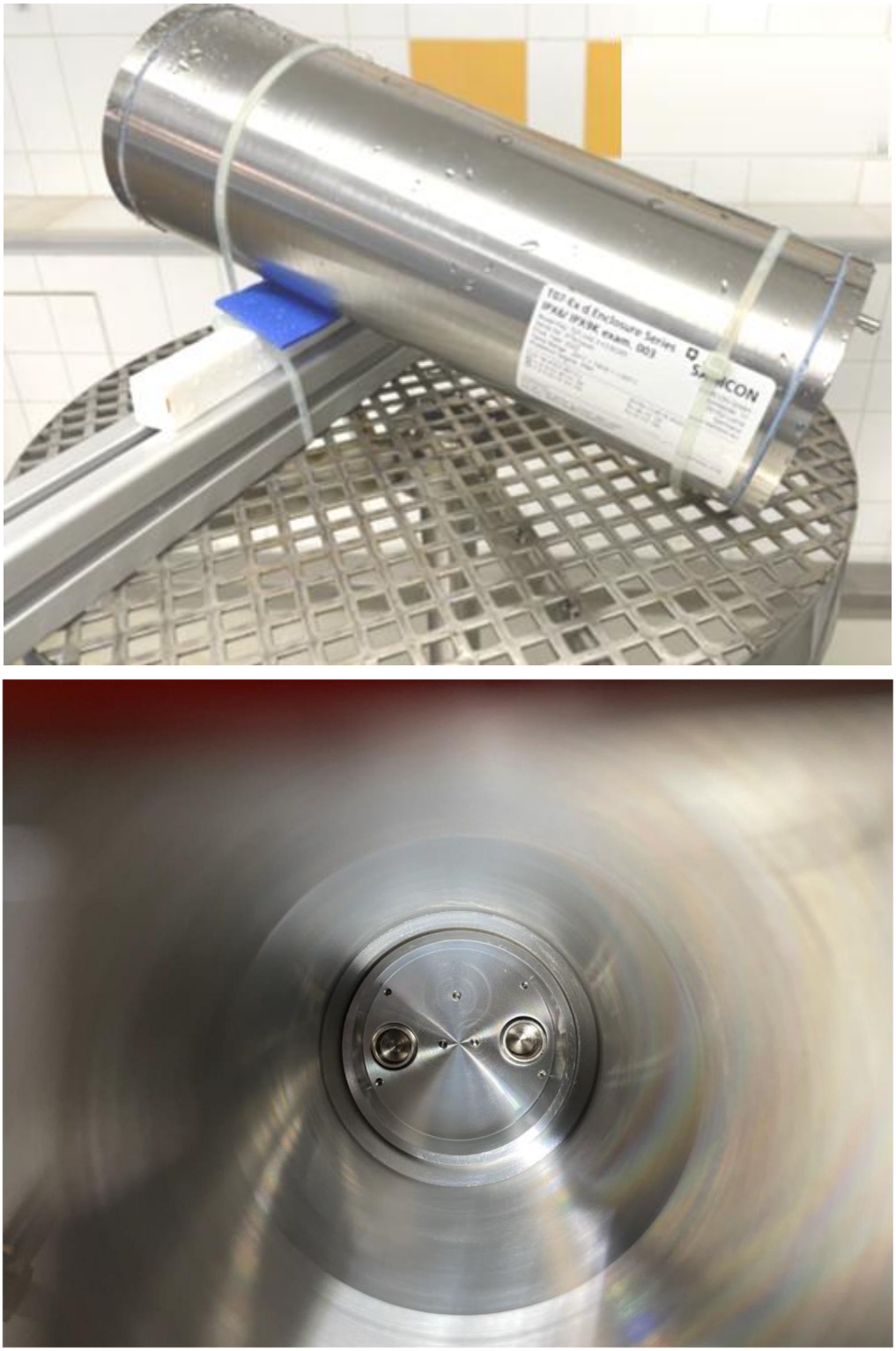


Fig. 7: Test specimen 003 after the strong water jet test IPX6 - No water ingress

Fig. 8: Test specimen 004 before the strong water jet test IPX6

Fig. 9: Test specimen 004 after the strong water jet test IPX6 - No water ingress inside the enclosure; water accumulation between outer red and black seal

5 b) Steam jet test IPX9K:

The test specimens were individually fixed on the turntable of the steam jet device and exposed to the steam jet load (**Tab. 3 and 4**). At the end of the 2-minute exposure period, the test specimens were dried externally with a fleece, opened and visually inspected for water ingress.

The visual inspection of the test specimens did not reveal any water penetration into the interior of the housing (**Fig. 10 - 21**). In the case of test item 004, a slight accumulation of water was detected between the red and the black seal of the cover (**Fig. 20 and 21**). Further inspections will be performed by the customer.

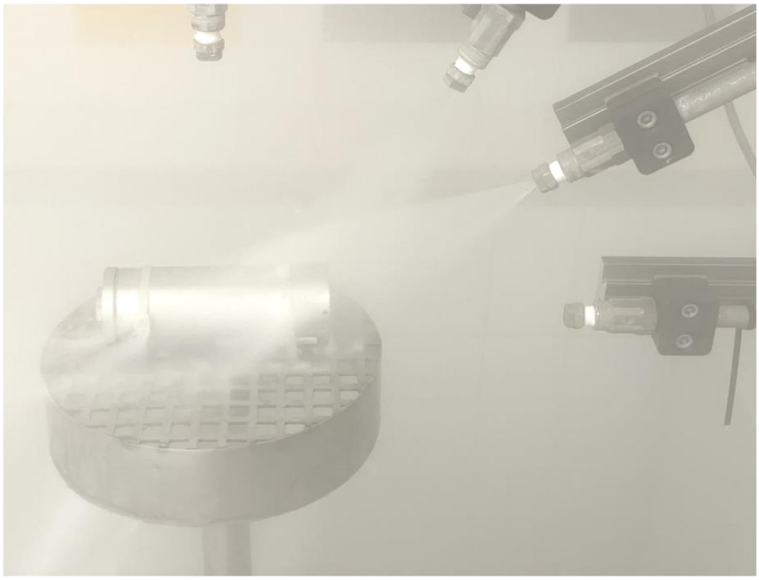


Fig. 10: Test specimen 001 before and during the steam jet test IPX9K

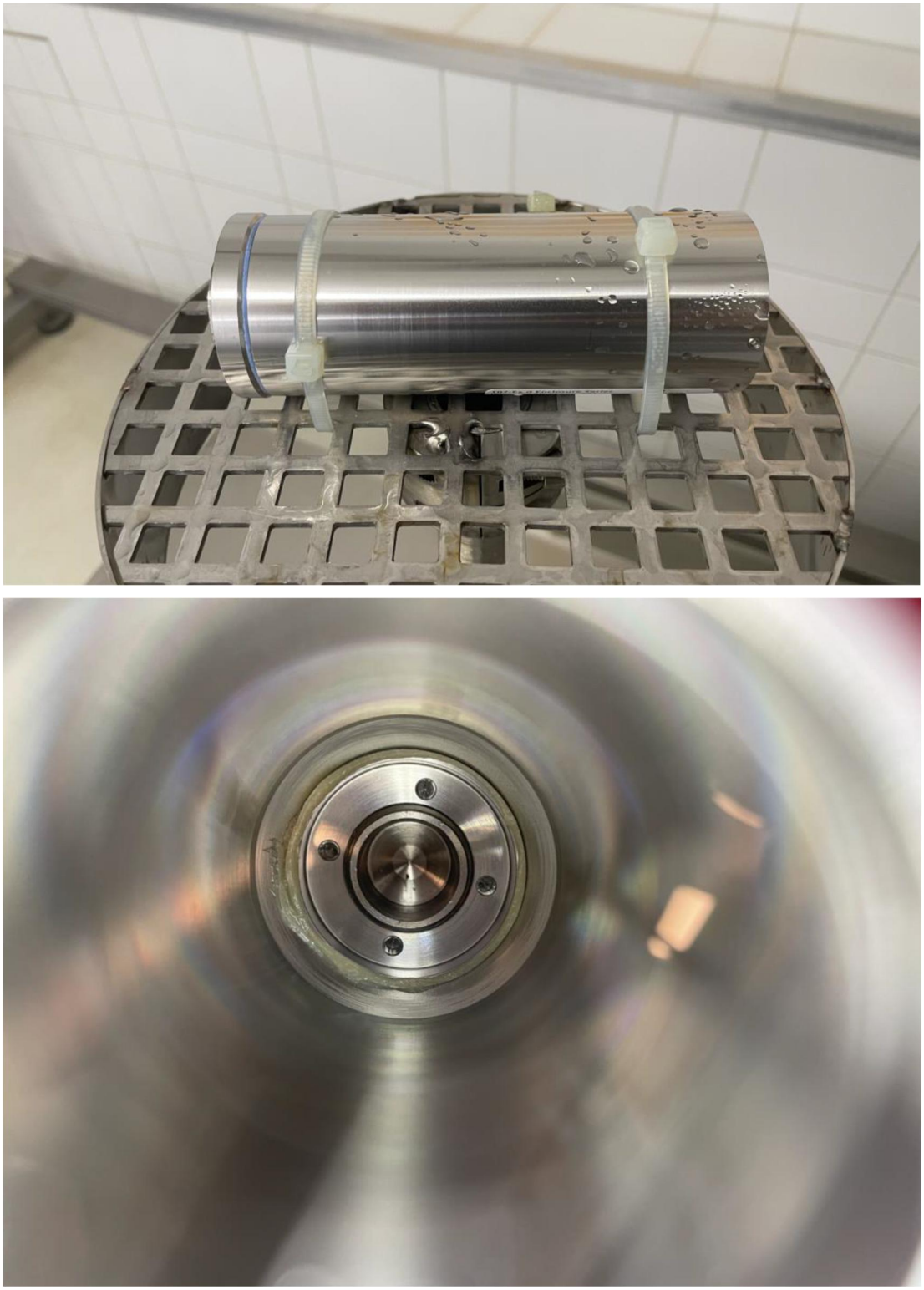


Fig. 11: Test specimen 001 after the steam jet test IPX9K - no water ingress

Fig. 11: Test specimen 001 after the steam jet test IPX9K - no water ingress

Fig. 13: Test specimen 002 before and during the steam jet test IPX9K

Fig. 14: Test specimen 002 after the steam jet test IPX9K - no water ingress

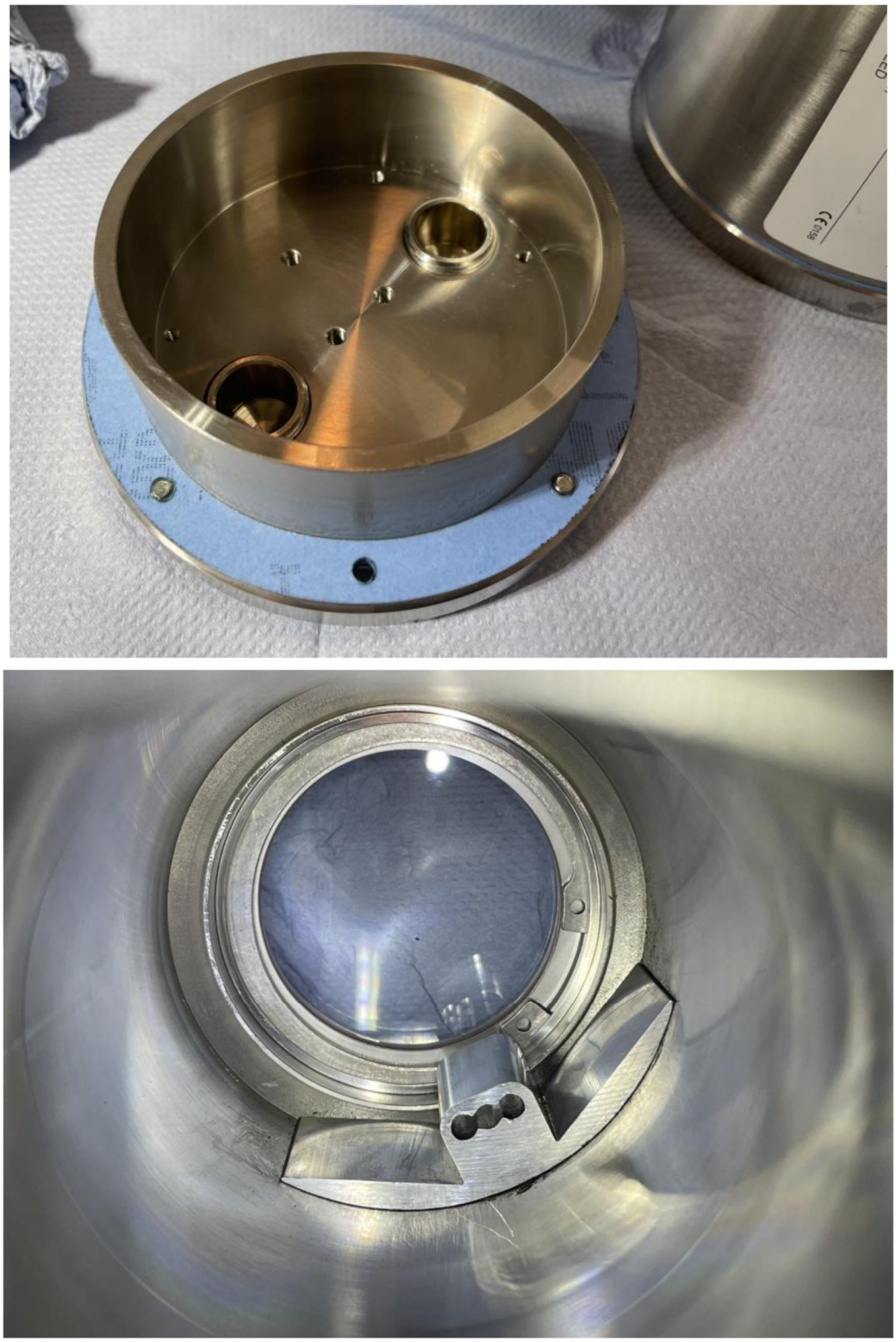


Fig. 15: Test specimen 002 after the steam jet test IPX9K - no water ingress

Fig. 16: Test specimen 003 before and during the steam jet test IPX9K

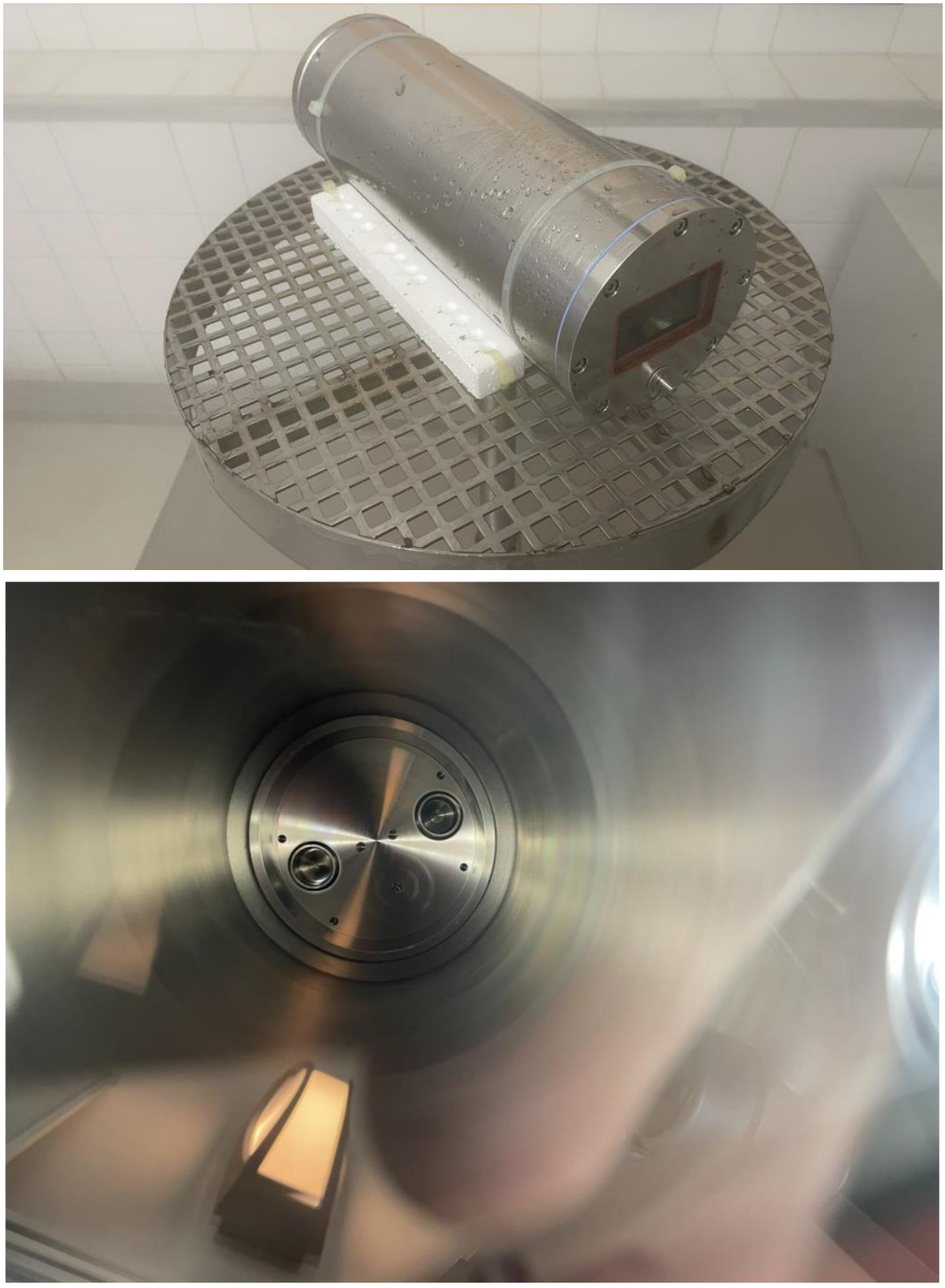


Fig. 17: Test specimen 003 after the steam jet test IPX9K - no water ingress

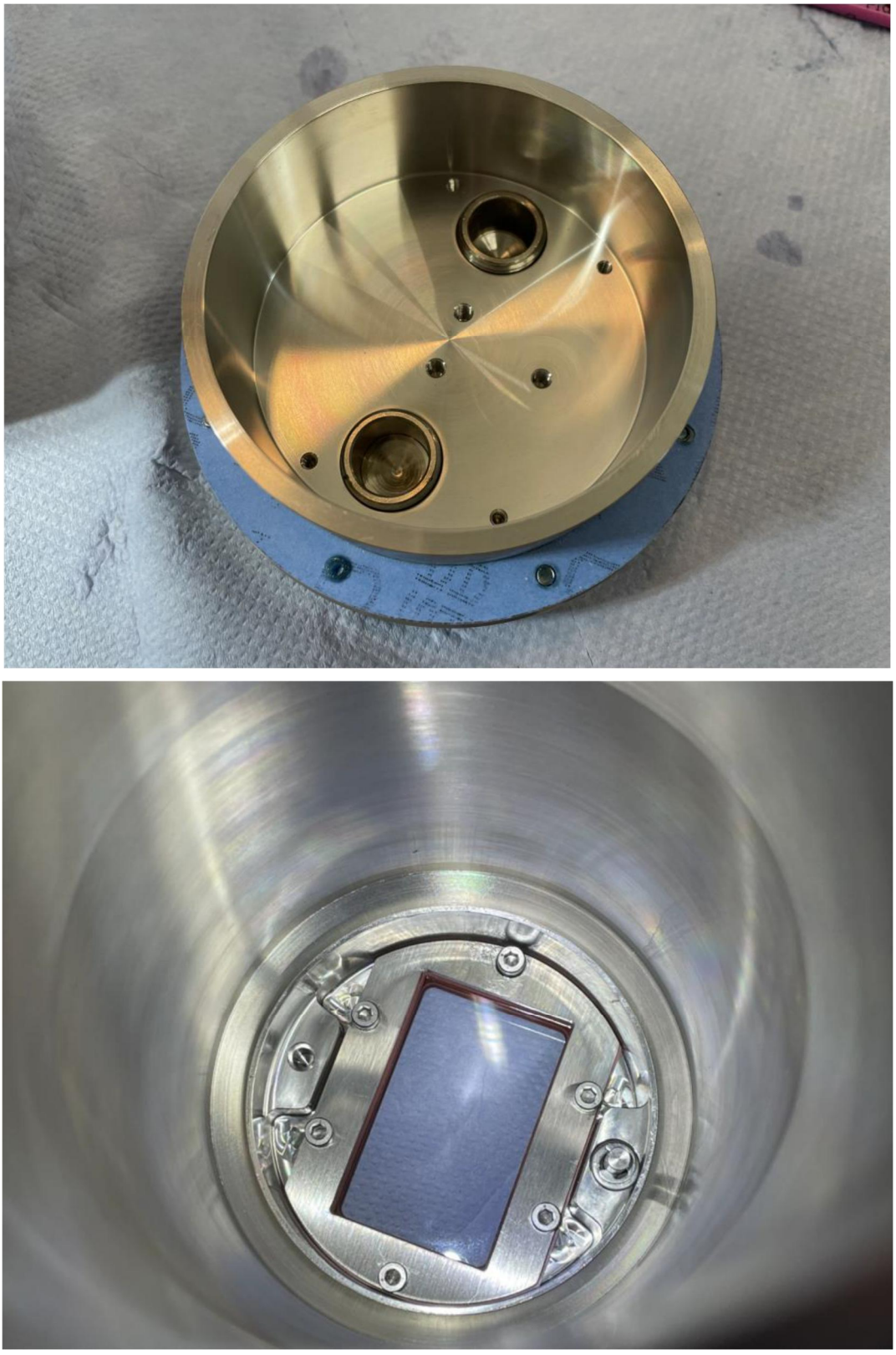
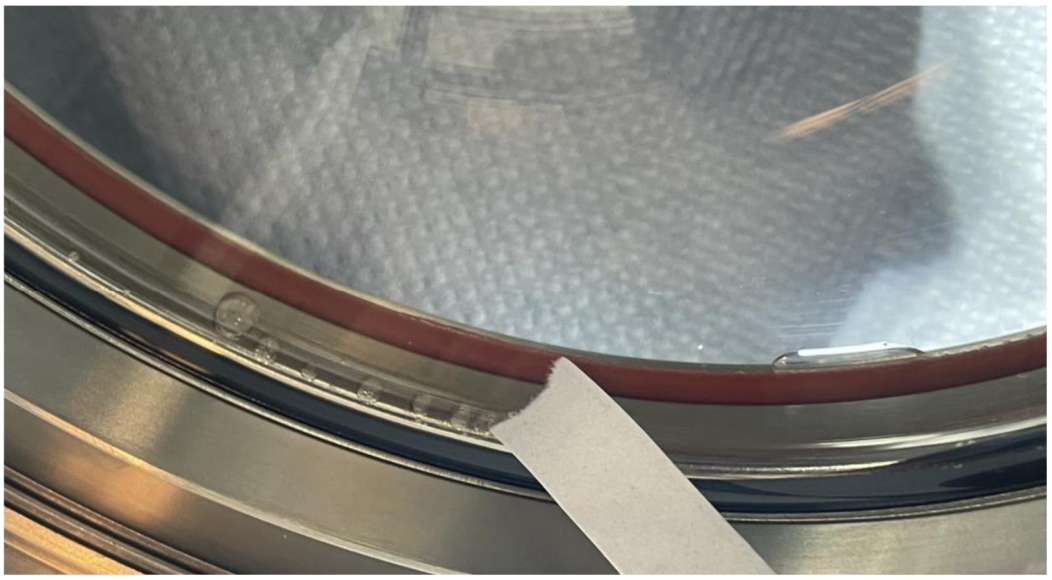


Fig. 18: Test specimen 003 after the steam jet test IPX9K - no water ingress

Fig. 19: Test specimen 004 before and during the steam jet test IPX9K

Fig. 20: Test specimen 004 after the steam jet test IPX9K - no water ingress inside the enclosure; water accumulation between outer red and black seal



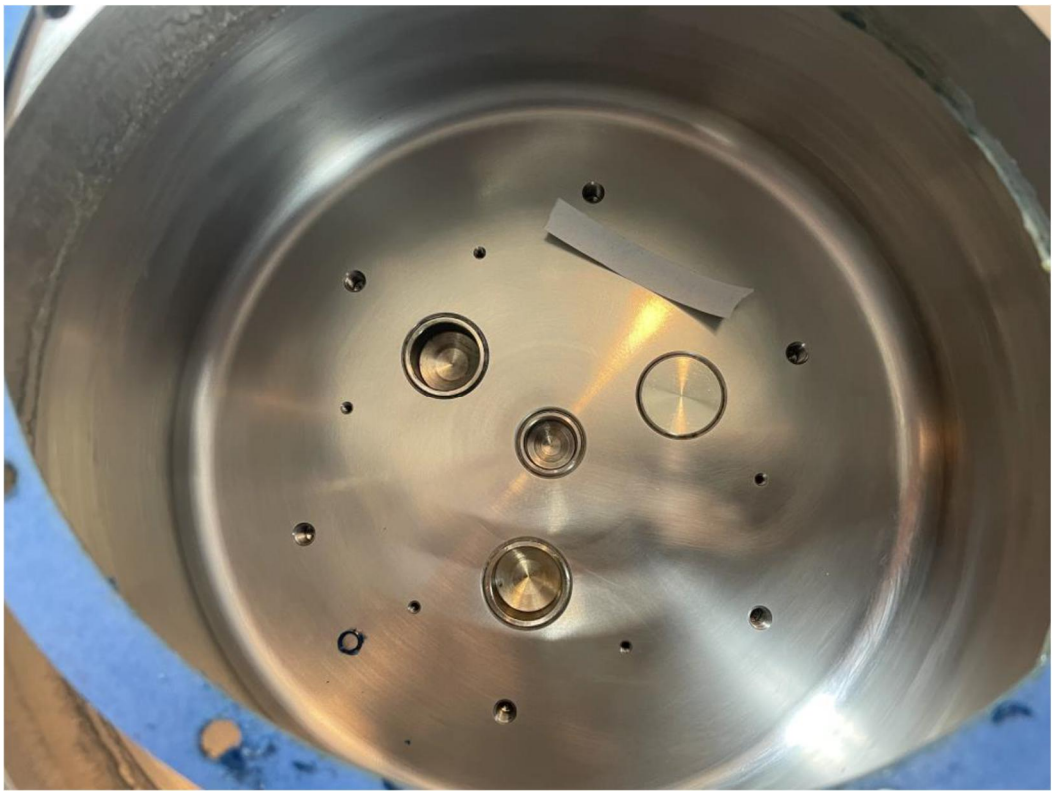


Fig. 21: Test specimen 004 after the steam jet test IPX9K - no water ingress inside the enclosure; water accumulation between outer red and black seal