

POROSCOPE® HV5, HV20, HV40
Porosity Test Using High Voltage



In order to protect objects, which are made of steel or metal, they are coated with corrosion resistant materials such as rubber, synthetics or enamel. The protective coatings must be tight, that is, free of pores, cracks or embedded foreign objects, to keep aggressive materials from the carrier material that is in danger of corrosion. Fine pores or cracks cannot be entirely avoided in any coating process.

Fine pores or cracks cannot be entirely avoided in any coating process. With the POROSCOPE®, even pores and cracks, not visible to the eye, can be discovered and counted in electrically non-conducting protective coatings.



Pore testing of the enamel coating of a boiler, using the POROSCOPE®



Testing the interior coating of a pipe with the POROSCOPE®, using a rotating electrode on a rod extension system

The POROSCOPE is used for quick and reliable pore tests on coated metals. Typical applications:

- Enamel- or plastic-coated mineral oil tanks, agitator kettles, pipelines, boilers and heat exchangers
- Plastic-coated food packages
- Corrosion protection coatings on offshore installations

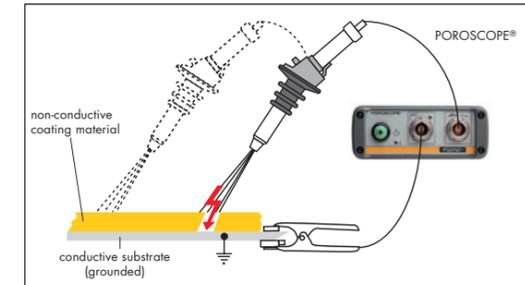


Testing the outer coating of a pipeline after a repair



Testing the interior coating of pipes during pipe manufacturing

Test Method



The test method is based on the fact that all electrically insulating coating materials have a much higher disruptive strength than air.

At the POROSCOPE the suitable test voltage is set according to the disruptive strength and thickness of the coating. Alternatively, a test standard can be selected and a coating thickness can be set. The POROSCOPE then adjusts the appropriate high voltage automatically. The specimen is grounded and the electrode is moved slowly across the surface to be measured. The voltage drops briefly when the electrode passes a defective spot, a sparkover as well as an optical and acoustical signal indicating the pore.

Safety

The POROSCOPE was developed with extreme care regarding safety. The safety requirements of the ISO 2746 are fulfilled in all points through the following design characteristics:

- The high voltage is directly generated in probe head. Thus, a high voltage cable is not necessary, which would store additional charge of electricity. This additional charge would lead to a higher discharge current in the case of an electrical shock.
- The high voltage is switched off automatically, if the instrument is overloaded for a longer period of time.
- Insulated and earthed hand piece, therefore no electrostatic charging of the operator.
- Protective resistor that limits to the current to a safe level.
- Push button for switching on the high voltage. Only as long as the button is depressed, the high voltage is generated.



a) test head b) sweeper electrode c) grounding terminal d) supply unit

Features

- Robust instruments for harsh use on construction sites or in manufacturing
- Three instrument versions with different test voltage ranges:
HV5: 0,8 – 5 kV
HV20: 4 – 20 kV
HV40: 8 – 40 kV
- Maximum safety through high voltage generation in the test head
- Intuitive operation with menu navigation, rotary button and illuminated display in the operator's field of vision
- Extensive electrode selection
- Continuously adjustable test voltage
- Electronic test voltage monitoring and display of the test voltage that is present directly at the electrode
- Optical and acoustical pore indication on the test head
- Adjustable detection sensitivity
- Also suitable for testing electrostatically chargeable materials
- Battery operation by means of a Li-ion battery with smart battery technology, a controller monitors the battery state permanently and avoids deep discharge

Standards

Testing in accordance with AS 3894.1, ASTM D4787, ASTM D5162, ASTM G62, EN 14430, NACE SP0188, NACE SP0490, NACE SP0274

Selection table for rotating electrodes and thread reducers

Pipe ø inside [mm]	Rotation electrodes			Thread reducer		
	Type	Weight [g]	Order no.	Type	Weight [g]	Order no.
8 (0.31")	ZH3y	8	600-713	M8/M4	50	600-723
9 (0.35")			600-714			
10 (0.39")						
11-12 (0.43-0.47")	ZH3z					
13-14 (0.51-0.55")	ZH3a	10	600-699	M8/M5	50	600-721
15-16 (0.59-0.63")						
18-20 (0.71-0.79")	ZH3b	30	600-700	-	-	-
22-25 (0.87-0.98")				-	-	-
28-30 (1.10-1.18")				-	-	-
33-40 (1.30-1.57")	ZH3c	40	600-701	-	-	-
50-65 (1.97-2.56")	ZH3d		600-702	-	-	-
80 (3.1")	ZH3e1	60	600-703	M8/M12	100	600-722
100 (3.94")	ZH3e2	100	600-704			
125 (4.92")	ZH3f1	220	600-705			
150 (5.91")	ZH3f2	350	600-706			
200 (7.87")	ZH3g	1300	600-707			
250 (9.84")	ZH3h	1600	600-708			
300 (11.81")	ZH3i	1800	600-709			
350 (13.78")	ZH3k	2000	600-710			

Selection table for rods and centering devices

Pipe ø inside [mm]	Rod system				Centering device			
	Type	Weight [g]	Length [mm]	Order no.	Type	Weight [g]	ID [mm]	Order no.
8(0.31")	ZH8c	30	250(9.84")	600-717	-	-	-	-
9(0.35")	ZH8d	60	500(19.69")	600-718	ZH4z1	3	9-10(0.35-0.39")	600-734
10(0.39")	ZH8e	120	1000(39.37")	600-719	ZH4z2		11-12(0.43-0.47")	600-735
11-12(0.43-0.47")	ZH8a ZH8b	250 450	500(19.69") 1000(39.37")	600-715 600-716	ZH4a1	5	13-14(0.51-0.55")	600-724
13-14(0.51-0.55")					ZH4a2	6	15-16(0.59-0.63")	600-725
15-16(0.59-0.63")					ZH4b1	8	18-20(0.71-0.79")	600-726
18-20(0.71-0.79")					ZH4b2	11	22-25(0.87-0.98")	600-727
22-25(0.87-0.98")					ZH4c1	15	28-30(1.10-1.18")	600-728
28-30(1.10-1.18")					ZH4c2	20	33-40(1.30-1.57")	600-729
33-40(1.30-1.57")					ZH4d	30	50-65(1.97-2.56")	600-730
50-65(1.97-2.56")					ZH4e	260	80-100(3.1-3.94")	600-731
80(3.1")					ZH4f	320	125-150 (4.92-5.91")	600-732
100(3.94")					ZH4g	400	200-350 (7.87-13.78")	600-733
125(4.92")								
150(5.91")								
200(7.87")								
250(9.84")								
300(11.81")								
350(13.78")								

Elastic spacer

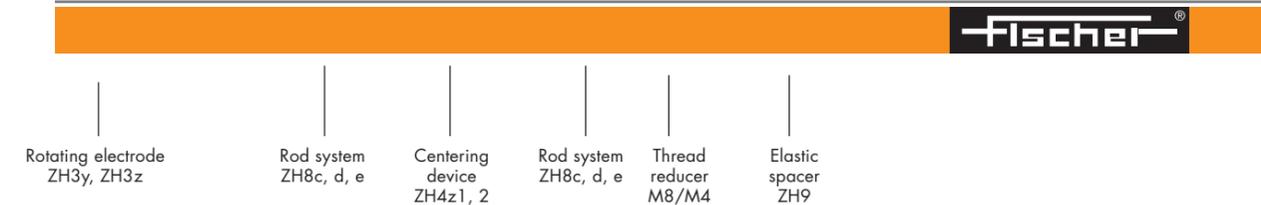
Type	Weight [g]	Length [mm]	Description	Order no.
ZH9	145	160(6.3")	Avoids tilting when inserting into greater pipe depths	600-720

Ordering Examples

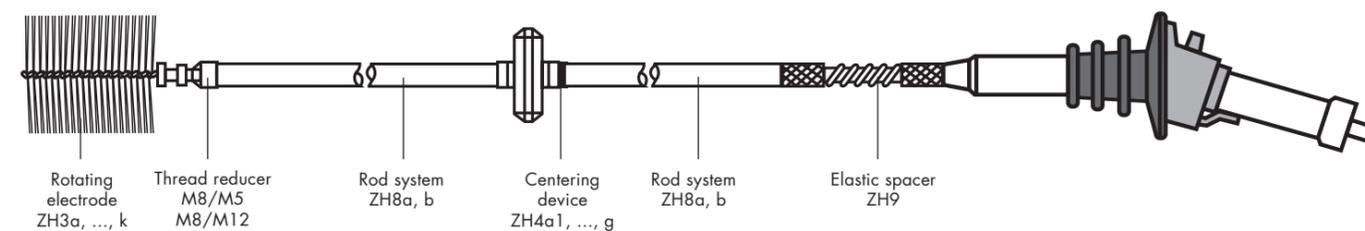
Example 1: Test system for testing enamel coatings	Order no.
Test instrument POROSCOPE® HV40	604-521
Sweeper electrode ZH6b	600-996

Example 2: Test system for testing interior pipe walls	Order no.
Test instrument POROSCOPE® HV40	604-521
Elastic spacer ZH9	600-720
2 x Rod system ZH8b	600-716
Centering device ZH4e	600-731
Thread reducer M8/M12	600-722
Rotating electrode ZH3e1	600-703

Pipe ID < 13 mm



Pipe ID ≥ 13 mm



Global Sales Global Application Global Service



www.helmut-fischer.com

Headquarter:
Helmut Fischer GmbH
Institut für Elektronik und Messtechnik
Industriestraße 21
71069 Sindelfingen

10-17

932004 9/14

Design and specifications are subject to change without notice.

fischer®