

# Advancing with technology

## High voltage porosity detection



## PoroTest 7

### Reliable porosity detection

For all insulating coatings on metal such as:

- coatings on oil, gas or water pipelines
- linings of tubes, vessels or storage tanks
- protective coatings on hulls, oil tanks, vessels, pipelines including fittings
- enamel, epoxy and plastics coatings

**With electronic control of test voltage**

# PoroTest 7

## Porosity detection and corrosion control

Flaws in protective coatings such as pores, cracks and fissures, if undetected, may impair the corrosion resistance of a product. The PoroTest 7 by ElektroPhysik has been specifically designed for non-destructive porosity testing of such coatings, based on **automatic test voltage control specific to the thickness of material to be tested and vice versa**. The major fields of application of the PoroTest 7 range from vendor inspection to quality assurance in corrosion protection.



Petrochemical industry

## Test principle and field of application

Designed for detecting flaws and pores, the PoroTest 7 can be used for testing all insulating coatings on conductive substrates such as steel, Aluminium, etc. The test instrument consists of a high voltage probe with an integrated high voltage generator



Shipbuilding

Photo: NWO

and a test electrode, which is simply connected to the probe. The control unit features a digital display and control pad. The control unit housing is fully portable and made of rugged ABS plastic with an integrated handle. The high voltage probe and control unit are connected via a rugged cable. To detect porosity, the appropriate test voltage specific to the material thickness is set on the control unit which applies, when activated, a spark discharge at the moment a material flaw is detected. In addition to the spark discharge, flaws are indicated by a visible and audible signal and counted.

Typical applications: Testing linings and coatings applied on ducts, pipes, hulls, oil and storage tanks, enamel, paint, rubber and bitumen linings, vessels and tanks, GFK and other plastics materials.

## Features

- Powerful and versatile gauge with new ergonomic design making it ideal for on-site testing
- Light-weight and hand-held test electrodes provide convenient operation
- User-friendly key-pad layout with menu driven operation
- Test method conforms to DIN 55 670
- 15 sensitivity settings
- Pre-set test voltages specific to material thickness

- Backlit display to indicate current test voltage, number of pores and material thickness
- High voltage probe with equipment-on and pore indicator (red LED)
- Residual voltage indicator
- Alarm signal when exceeding pore limit setting (Limit)
- Electrical safety provisions according to VDE 0411, part 1: probe voltage and maximum discharge rate stay below the limit values as specified by the safety standard.
- Power supply: AC operated or battery operated via integrated storage battery (C-cells)
- Low-battery indicator

## Product advantages

- Quick detection of local flaws in the insulating material being tested.
- Reliable detection of flaws according to the test conditions described in the DIN 55 670 standard
- Additional safety feature through residual voltage indicator
- New compact and ergonomic design, extremely light-weight and handy for easy handling
- Broad range of electrodes are available for a wide range of applications



Industrial steel constructions

- Optimum test voltage setting ensures safe testing without damaging the material being tested
- Variable test voltages
- Precise and stable test voltage settings achieved through electronic control
- No separate gauge required for measuring the current test voltage at the search electrode
- Test voltage directly indicated on the instrument's digital display
- User-selectable menu language: German, English, French and Spanish. Others available upon request.

### Variable high voltage probes



Non-destructive porosity detection requires adapted high voltages covering different ranges. The versatile PoroTest 7 offers 2 types of high voltage probes, which are interchangeable with the control unit. The test electrode of your selection directly plugs to the high voltage probe. The specific high voltage setting is entered on the control unit's touch pad and is displayed on the digital display and monitored via the electronic control. The PoroTest 7 is designed for safe use, the high voltage probes are designed and engineered to be insulated and absolutely risk free to the operator. Electrical safety conforms to the German standard VDE 0411, part 1: Both, the maximum discharge rate as well as the probe voltage never exceed the limit values as set forth in the safety standard.



Porosity detection on pipelines

### Test principle

When scanning the high voltage search electrode smoothly over the surface, flaws are detected through spark discharge to the conductive substrate.

Test voltage can be adjusted from 500 Volt to 35.000 Volt. The instrument has been designed for testing insulating materials from approx. 30 microns to 11.3 mm (1 mils ... 444 mils) thickness.

### Adapted search electrodes

ElektroPhysik offers a comprehensive selection of special test electrodes such as:

- Rolling spring or ring electrodes for outside-tube testing
- Brush electrodes for inside or outside pipe and tube testing
- Sweeper electrodes for large surfaces of coatings made from plastics, enamel or rubber



Standard accessories

- Silicon-rubber electrodes for sensitive surfaces

Even complex shapes such as accoutrements or fittings can be tested confidently with specially designed adaptor brush electrodes.

### Compact and convenient design

The PoroTest 7 is a powerful tool for porosity detection and includes the following items:



Plastic carrying case with standard accessories

- Rugged plastics carrying case
- Control unit with integrated storage battery
- Connecting cable probe-control unit
- High-voltage electrode
- Metal sweeper electrode
- Equipotential cable, 5 m (16 ft) length
- Power cable
- Shoulder belt

## PoroTest 7

### Recommended accessories

- Aluminium case
- Brush electrodes
- Rolling spring electrodes
- Ring electrodes
- Right-angle electrodes (max. 500 mm/20" width)
- 3-pin plug, cable-free, directly plugs into the integrated signal contact (make contact)
- Earthing rod
- Signal output
- Connecting cable for control unit and high voltage probe in special lengths: 5 m (16 ft), 10 m (32 ft)
- Non-destructive coating thickness gauge, helps you to adjust test voltage specific to coating thickness



Electrodes selection

### High voltage probe P7, P30 or P35

Due to the characteristic dielectric strengths of different materials, they require different ranges of test voltages. To meet the requirements of such different applications, ElektroPhysik offers three high voltage probe models:

- **P 7** for thin coatings starting from 30 microns (1 mils) such as condenser or packaging films, paints, enamels
- **P 30** for coatings from 0.52 mm (20.5 mils) to 9.49 mm (373.6 mils)

- **P 35** for thick coatings ranging from 1.4 mm (55 mils) thickness and more such as protective linings in pipelines

### Further gauges from our range of products

- Coating thickness gauges
- Wall thickness gauges
- Gloss meters
- Hardness and roughness gauges
- Continuous measuring systems for flat films and sheets
- Continuous pinhole detection systems for flat films and sheets

### Technical specification

High voltage probe	P7	P30	P35
Operating range	0.5 ... 7 kV	3 ... 30 kV	6 ... 35 kV
Coating thickness	0.03 mm ... 1.7 mm 1 mils ... 67 mils	0.52 mm ... 9.49 mm 20.5 mils ... 373.6 mils	1.4 mm ... 11.3 mm 55 mils ... 444 mils
Voltage	DC		
Test voltage indication	LC-Display, 3-digit		
Accuracy of voltage setting	± (0.1 kV + 3% of reading)		
Dimensions/weight of high voltage probe	274 mm x 63 mm (l x dia)/550 g 10.8" x 2.48"/1.2 lbs/19.4 oz.		
Dimensions/weight of control unit	225 mm x 150 mm x 85 mm (L x W x H)/1400 g 8.87" x 5.9" x 3.35" (L x W x H)/3 lbs/49 oz.		
Alarm signal	90 dB, 0.1 s/Pore, continuous tone in case of short-circuit		
Signal output	potential free, U <sub>max.</sub> : 100 V, I <sub>max.</sub> : 0.4 A		
Storage battery	4 C-cells, IEC LR 14, 3.5 Ah, NiMH, replaceable		
Storage battery life at maximum voltage	PoroTest 7-P7 approx. 20 h continuous operation	PoroTest 7-P30 approx. 10 h continuous operation	PoroTest 7-P35 approx. 10 h continuous operation
Storage battery charging time	4 hrs quick charge		
Mains voltage	110 to 230 V, 50/60 Hz, automatic switch		
Operating temperature	0° ... +50°C/ 32° ... 122°F		
Humidity	avoid dew on the surface (refer to DIN 55 670)		
Standards	DIN 55 670, ASTM D 5162-01, AS 3894.1-2002		

