

**PAINT BORER
518 S**

**PAINTXPLORER
548**

Wedge Cut Method



PAINT BORER 518 S



PAINTXPLORER 548

testing equipment for quality management

ERICHSEN

Technical Description

DIN 50 986
ISO 2808
ASTM D 4138
NF T 30-123

- Thickness measurement of all coatings on any substrate
- Measurement of individual layers of a multi-layer coating

Universal Thickness
Measuring Instruments

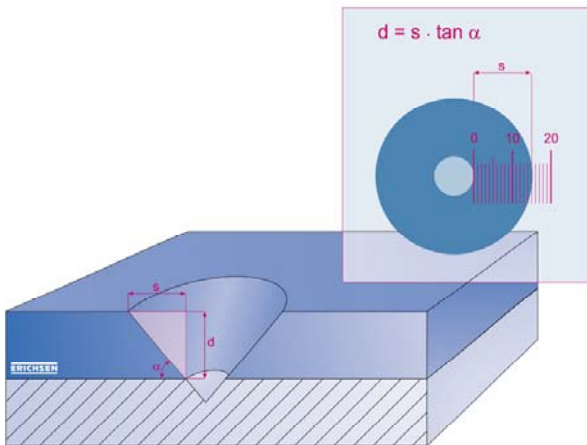
Thickness Measuring Instrument PAINT BORER 518 S



PAINT BORER with specimen platform

The Measuring Principle

The **PAINT BORER 518 S** operates in accordance with the standardised wedge cut method in which the specimen is cut at a defined angle. From the projected width of the cut face the layer thickness can be calculated making use of a simple geometrical relationship. With **Model 518 S** the damage to the coating is limited to a small conical hole as illustrated in the sectional view. In the measuring microscope a system of concentric circles is visible and from the difference in the radii of the circles which are measured using the measuring microscope, the film thickness can be calculated by multiplying with a known factor.



The Measuring Instrument

The **PAINT BORER 518 S** is a very compact instrument. All the principal components - the drilling device, the measuring microscope, the specimen illumination and the battery - are enclosed in a sturdy housing. A slide moving on horizontal slide-ways houses the drill and microscope and gives the **PAINT BORER 518 S** its particular feature: the instrument itself does not have to be moved for measuring after drilling.

The drill is spring mounted in the slide so that it can be pressed down onto the specimen with minimum force, the drill being switched on automatically when this is done. The carbide drills are easy to exchange and supplied with different accurately maintained cutting angles for 4 standard measuring ranges. The measuring microscope with a magnification factor of 50 has a measuring scale with 100 lines so that a resolution of 1% is obtained irrespective of the measuring range.

The light switch on the front plate of the **PAINT BORER 518 S** can be set for either continuous or interrupted illumination to prolong battery life. A 9 volt rechargeable battery is employed; mains operation with the charging unit is possible.

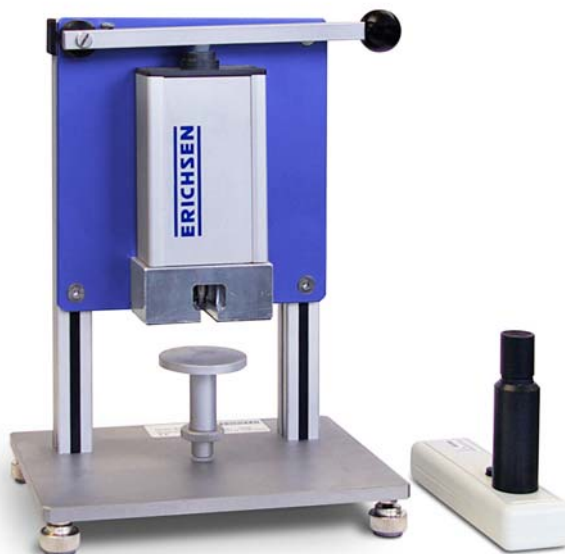
Due to the mobility of the microscope into two directional axes (turned by 90° from one another) with the possibility of turning the scale, the **PAINT BORER 518 S** is especially suitable for the evaluation of elliptical holes that arise with curved specimens.

The Operation

The coating thickness measurement with **PAINT BORER 518 S** is very simple: Apply a contrast mark (felt tip pen) and place the measuring instrument on the specimen. Move the drill into position over the test point and lower it causing the motor to switch on. Drill the coating through to the substrate. Move the microscope over the hole and switch the lamp on. Count the number of scale marks between the base material and the contrast mark and multiply this value by the scale factor which gives the measuring results.

Special applications (individual layers of a multi-layer system, measurements on curved specimens) are dealt with in the operating instructions.

Thickness Measuring Instrument PAINTXPLOER 548



PAINTXPLOER 548 with drilling stand and measuring microscope

The Measuring Principle

The **PAINTXPLOER 548** functions in accordance with the same measuring principle of the standardized wedge cut method as the **PAINT BORER 518 S**.

The Measuring Instrument

The **PAINTXPLOER 548** has been developed to extend the range of the application of the **PAINT BORER 518 S**, especially targeting sensitive drillings, particularly into rigid/brittle materials. It is possible that, already at minor eccentric irregular running of the drill used or of its centre axle, such materials can be subject to breaking off of the cutting edges including chipping off, leading afterwards during the optical measurement with the microscope also to limitedly definable transitions between the layers to be measured.

To minimise these limitations the **PAINTXPLOER 548**, a convenient tabletop unit, is equipped with an improved rotating/sliding high precision axle-bearing device. Although the application can be considered as mobile in the range of the length of the mains cable, it is nevertheless the question of a laboratory equipment. It can either be held in hand or used in connection with the measuring stand that is included in the scope of supply.

The appropriate measuring microscope is not integrated in the housing, as for the **PAINT BORER 518 S**, but is available separately, if required, as a self-contained component (e. g. for the evaluation of damages of lacquers, corrosion creep, pores etc.) which results in the slender handy design of the **PAINTXPLOER 548**.

The Operation

In principle, the **PAINTXPLOER 548** is used in the same way as the **PAINT BORER 518 S**:

- Application of a contrast mark.
- Placing the instrument onto the specimen, positioning the drill directly above the test point. When using the stand, position the test point on the specimen directly beneath the drill. Then fix the specimen from underneath by rotating the pressure plate.
- Drilling through the layer to the substrate.
- Carrying out the measurement with the help of the microscope considering the scale factor.

The geometry of the specimen admissible for the coating thickness measurement with the **PAINTXPLOER 548** depends on whether the drilling unit is used with or without drilling stand.

Configuration	Geometry of the specimen			
	Length (mm)	Width (mm)	Thickness (mm)	Curvature
Drilling unit only	min. 40	min. 80	optional	not admissible
Drilling unit and drilling stand	min. 10	min. 15 max. 110	max. 20	radius > 1 m

Technical Data (Model 518 S)

Dimensions (L x W x H): 145 x 55 x 110 mm
 Net weight: approx. 850 g
 Measuring accuracy: 1%
 Rechargeable battery: 6F 22 (6LR 61)

Min. dimensions of sample:
without specimen table 150 x 25 mm
with specimen table 10 x 6 mm

Order Informations	
Ord.-No.	Product Description
0136.03.31	PAINT BORER 518 S
Included in the scope of supply:	
<ul style="list-style-type: none"> ◆ drill no. 5 ◆ felt tip pen ◆ screw driver ◆ rechargeable battery (9 V) ◆ charging unit 230 V, 50 Hz (other voltages on request) ◆ carrying case ◆ operating instructions 	

Accessories/Spare Parts	
Ord.-No.	Product Description
910927241	Drill No. 2 (2 - 200 µm)
910927741	Drill No. 4 (5 - 500 µm)
910928241	Drill No. 5 (3 - 300 µm) – Spare part
0326.01.32	Specimen platform for clamping specimen panels of any shape or profile

Drills for Models 518 S and 548

Drill	No. 2	No. 5	No. 4
Measuring range (µm)	2 - 200	3 - 300	5 - 500
Cutting angle (α)	5,7°	8,5°	14°
Factor f (µm/sc.div.)	2	3	5
tan α	0.10	0.15	0.25
Geometry	two-edged		single-edged
Head dia.	5 mm		
Material	carbide		

Technical Data (Model 548)

Drilling Unit
 Dimensions (H x W x D): 145 x 70 x 40 mm
 Net weight: approx. 600 g
 Number of revolutions of the drill: approx. 500 rpm
 Mains supply (plug-in power pack): (100 - 240) VAC, (47 - 63) Hz
 Power supply (plug-in power pack): 18 VDC / 0,8 A

Drilling Stand
 Dimensions (H x W x D): 280 x 190 x 120 mm
 Net weight: approx. 3.2 kg

Measuring Microscope (456-50)
 Dimensions (H x W x D): 105 x 130 x 40 mm
 Net weight: approx. 150 g
 Magnification factor: 50
 Measuring range: 2 mm
 Scale division: 20 µm

Order Informations	
Ord.-No.	Product Description
0280.01.31	PAINTXPLORER 548
Included in the scope of supply:	
<ul style="list-style-type: none"> ◆ drilling stand ◆ drill no.5 ◆ 1 felt pin each black/silver ◆ screw driver ◆ tool for change of drills ◆ power pack (100 - 240) VAC, (47 - 63) Hz ◆ plastic case ◆ operating instructions 	

Accessories/Spare Parts	
Ord.-No.	Product Description
910927241	Drill No. 2 (2 - 200 µm)
910927741	Drill No. 4 (5 - 500 µm)
910928241	Drill No. 5 (3 - 300 µm) – Spare part
0836.01.32	Measuring microscope 456-50

The right of technical modifications is reserved.
 Group 10 - TBE 518 S/548 – III/2009