

**Film Applicator
Wasag System
Model 288**



**Quadruple Film
Applicator
Model 360**



**Staggered-Gap
Film Applicator
acc. to Krause
Model 421**

**Film Applicator
MULTICATOR 411**

**Spiral Film Applicator
Model 358**

**Film Applicator
BIRD 284**

**Film Applicator
BAKER 286**

Film Applicators

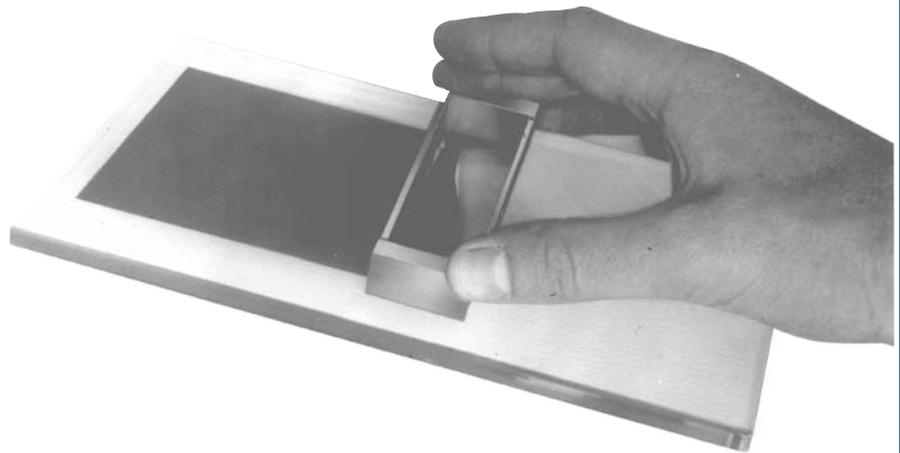


Fig. Cover picture Quadruple Film Applicator, Model 360

testing equipment for quality management

ERICHSEN

Every test on surface coating materials requires specimen panels on which the coating film has been applied evenly in a defined thickness.

The most important and commonest method of producing such panels is the film applicator with applicator blade or spiral, which is drawn across the panel by hand or electric motor drive.

ERICHSEN Film Applicators are designed to be convenient and easy to use and to clean.

Introduction

1. In defining coating thickness, we have to differentiate between

- Theoretical wet film thickness
- Practical wet film thickness and
- Dry film thickness.

The theoretical wet film thickness is the height of the applicator blade above the substrate. However, when the applicator is drawn across the substrate a shearing effect is observed in the film and this is dependent on the flow properties of the coating material and the speed with which the applicator is moved. The effect of this is that the practical wet film thickness is less than the theoretical. (In general, practical wet film thickness = approx. 60 - 70% of theoretical wet film thickness). The resulting dry film thickness depends on the reduction in volume during drying and is generally approx. 40 - 50% of the practical wet film thickness.

2. If the storage space for the coating material on a bar film applicator is wider than the recess through which the coating material flows, the edge zone of the applied film will be thicker by an uncontrolled amount. This comes into contact with the blade guide and so an unknown measurement will be added to the theoretical film thickness. This source of inaccuracy is eliminated on ERICHSEN Film Applicators (see Fig. 1).

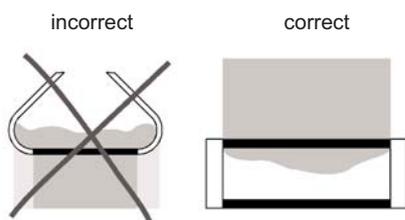


Fig. 1 Film Applicators

Film Applicator Wasag System, Model 288 and Quadruple Film Applicator, Model 360

These two models are supplied with the blade at a fixed gap height, selected from a range between 15 and 2000 μm .

Model 288 (Fig. 2) is provided with two and **Model 360** (see figure on front cover) with 4 working edges so that in this way several theoretical film thicknesses can be applied with a single instrument. Both models are corrosion resisting.

Reference Class:

All versions of Models 288 and 360 are supplied with a Manufacturer's Certificate M in accordance with DIN 55350-18 that includes among others the following information:

Gap heights (comparison of setting/actual values), evenness and roughness of the working edge, product identification, test equipments used with calibration status, date, name of inspector.

For checking the film applicators maximum deviations of 5 $\mu\text{m}/10\%$ / 10 μm are fixed for gap heights in the measuring range below 50 $\mu\text{m}/50 - 100\ \mu\text{m}/\text{over } 100\ \mu\text{m}$. The evenness/roughness should not exceed 3 $\mu\text{m}/0.5\ \mu\text{m}$ (R_a).

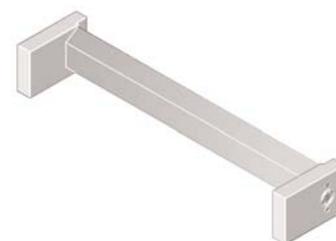


Fig. 2 Film Applicator System Wasag, Model 288

Ordering Information Model 288

Order No.	Film width	Dimensions (W x H x D)
0044.01.31	80 mm	105 x 40 x 38 mm
0044.02.31	120 mm	145 x 40 x 38 mm
0044.03.31	180 mm	205 x 40 x 38 mm
0044.04.31	230 mm	254 x 56 x 38 mm

The instruments have gaps in the range 15 μm to 2000 μm on the two sides - please specify when ordering.

Ordering Information Model 360

With 4 different gap heights of 30, 60, 90 and 120 μm , supplied with case

Order No.	Film width	Dimensions (W x H x D)
0046.01.31	13 mm	27 x 16 x 30 mm
0046.02.31	40 mm	54 x 16 x 30 mm
0046.03.31	60 mm	74 x 16 x 30 mm
0046.04.31	90 mm	104 x 16 x 30 mm

ditto, but with other gap heights (from 15 μm to 2000 μm available - please specify when ordering).

0046.05.31	13 mm	27 x 16 x 30 mm
0046.06.31	40 mm	54 x 16 x 30 mm
0046.07.31	60 mm	74 x 16 x 30 mm
0046.08.31	90 mm	104 x 16 x 30 mm

With side guide plates (see Fig. 3), with 4 different gap heights of 30, 60, 90 and 120 μm - please specify when ordering, with case

Order No.	Film width
0054.01.31	13 mm
0054.02.31	40 mm
0054.03.31	60 mm
0054.04.31	90 mm

ditto, but with other gap heights available (from 15 μm to 2000 μm - please specify when ordering)

0054.05.31	13 mm
0054.06.31	40 mm
0054.07.31	60 mm
0054.08.31	90 mm

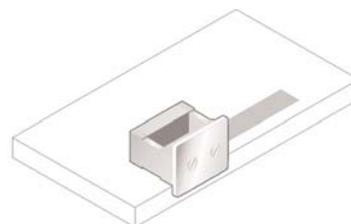


Fig. 3 Quadruple Film Applicator, Model 360, with side guide plate

Spiral Film Applicator, Model 358

Cards, plastic foils, leather, textiles and other flexible substrates frequently have uneven surfaces or bulging shapes. The use of a scraper type applicator can lead to uneven film thicknesses.

The solution to this problem is the spiral applicator. When the applicator is drawn across the substrate, the substrate is pressed down and held flat.

The grooves formed between the windings of the applicator have the effect of producing a wet film of defined thickness (Fig. 5). The theoretical film thickness is controlled by the gaps between the windings of the spiral. The roller with the spiral is held in a bracket with handle (Fig. 4). The instrument is corrosion resisting.



Fig. 4 Spiral Film Applicator, Model 358

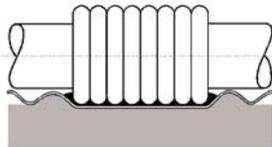


Fig. 5 Detail view of the turns of a spiral

Ordering Information Model 358		
Complete set consisting of holding bracket and 4 spiral rollers for film thicknesses to be specified with order (available sizes 10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 150 and 200 μm), complete with case.		
Order No.	Complete set with 4 spirals	Dimensions (W x H x D)
0045.01.31	80 mm wide	20 x 85 x 124 mm
0045.02.31	150 mm wide	20 x 85 x 194 mm
0045.03.31	220 mm wide	20 x 85 x 264 mm

Accessories/Spare Parts		
Order No.	Product Name	
0068.00.33	Single spiral roller	80 mm wide
0069.00.33	Single spiral roller	150 mm wide
0070.00.33	Single spiral roller	220 mm wide
0431.01.32	Holding bracket for spiral	80 mm wide
0431.02.32	Holding bracket for spiral	150 mm wide
0431.03.32	Holding bracket for spiral	220 mm wide

Film Applicator MULTICATOR 411

A frequent requirement is to produce a specimen panel with an accurately defined dry film thickness. For the reasons gone into earlier it is necessary to conduct trials to find the corresponding theoretical wet film thickness. It is of course possible to do this by using a series of applicator blades with different gap heights.

A simpler and more economical way is, however, to employ an applicator with adjustable gap height. The infinitely adjustable film applicator Model 411 can be used to apply wet films with a theoretical film thickness of between 1 and 1000 μm .

The storage space is limited by spring strips and the desired gap height is set on a micrometer screw (Fig.6).

The instrument is corrosion resisting.



Fig. 6 Film Applicator MULTICATOR 411, with micrometer screw

Ordering Information MULTICATOR 411		
Gap height infinitely adjustable from 1 to 1000 μm , supplied in protective case.		
Order No.	Film width	Dimensions (W x H x D)
0047.01.31	80 mm	110 x 45 x 83 mm
0047.02.31	150 mm	180 x 45 x 83 mm
0047.03.31	220 mm	254 x 45 x 83 mm

Staggered-Gap Film Applicator acc. to Krause, Model 421

Purpose and Application

With Model 421 up to 10 parallel film strips of different thickness can be produced in a single application. This film applicator is therefore particularly suitable for investigations into properties that are dependent on film thickness such as

- Hiding Power
- Colour strength
- Hardening characteristics
- Adhesion
- Effect formation
- Lacquer interference.

When using the Model 421 in conjunction with the COATMASTER 509/MC-III it is possible to investigate hardening properties as a function of film thickness, immediately after application.

Furthermore, the Staggered-Gap Film Applicator 421 also provides simple means for investigating the relationship between application parameters (height of gap, drawing speed) and the resulting film (wet and dry film thickness).

Ordering Information Model 421/I	
With four drawing edges each for applying 10 films 20 mm wide, 2 mm space between them and 10 to 500 μm high (Fig. 7). Dimensions (W x H x D) 254 x 38 x 56 mm.	
Order No.	Steps in μm
0043.01.31	10 15 20 25 30 35 40 45 50 55 15 30 45 60 75 90 105 120 135 150 30 60 90 120 150 180 210 240 270 300 50 100 150 200 250 300 350 400 450 500

Ordering Information Model 421/II	
As above but for 6 films 35 mm wide, 2 mm space between the films and a gap height from 10 to 400 μm . Dimensions (W x H x D) 254 x 38 x 56mm.	
Order No.	Steps in μm
0043.02.31	10 20 30 40 50 60 50 65 80 95 110 125 100 125 150 175 200 225 200 240 280 320 360 400



Fig. 7 Staggered-Gap Film Applicator acc. to Krause, Model 421/I

The engraved step numbers refer to the bearing face of the invisible drawn down edge.

Recommended Auxiliary Equipment	
Order No.	Name
0571.01.32	Crystal Glass Plate (580 x 285 x 18 mm)
890919341	Wide Clamps (per pair)
0049.23.33	Test Charts - Form 09 (per 125 pcs.)
0084.01.31	Wet and Dry Film Thickness Gauge, Model 296
0046.01.32	Vacuum Suction Plate to ASTM D 823 - with suction holes
0047.01.32	Vacuum Suction Plate, simple type, with 2 continuous suction grooves

Film Applicator BIRD 284

The drawing edges of the standard version of this gap film applicator are ground to 4 different gap heights of 50, 100, 150 and 200 µm each so that it is possible to apply several corresponding theoretical film thicknesses using one instrument only.

The Film Applicator **BIRD 284** (Fig. 8) is available with 6 different film widths between 50 and 250 mm. It is corrosion resisting.



Fig. 8 Film Applicator BIRD 284

Ordering Information BIRD 284	
With 4 different gap heights of 50, 100, 150 and 200 µm (other gap heights on request).	
Order No.	Film width
0284.01.51	50 mm
0284.02.51	75 mm
0284.03.51	100 mm
0284.04.51	150 mm
0284.05.51	200 mm
0284.06.51	250 mm

Film Applicator BAKER 286

The 4 gap heights of the Film Applicator **BAKER 286** (Fig. 9) result from the different zero levels ground into the bearing faces of the metal blocks at the end.

The difference in height to the centre cylinder serving as drawing edge, forms the corresponding gap clearance. The standard version is available with 4 different gap heights of 30, 60, 90 and 120 µm and 10 film widths between 25 and 250 mm. The instrument is corrosion resisting.



Fig. 9 Film Applicator BAKER 286

Ordering Information BAKER 286	
With 4 different gap heights of 30, 60, 90 and 120 µm (other gap heights on request).	
Order No.	Film width
0286.01.51	25 mm
0286.02.51	50 mm
0286.03.51	60 mm
0286.04.51	75 mm
0286.05.51	100 mm
0286.06.51	125 mm
0286.07.51	150 mm
0286.08.51	175 mm
0286.09.51	200 mm
0286.10.51	250 mm

Further applicators for the laboratory included in our programme:

- **COATMASTER 509 MC** (Microprocessor controlled Film Applicator and Drying Test Instrument)
- Centrifugal Coating Applicator, **Model 334**

Subject to technical modifications.

Group 8 - TBE 284/286/288/358/360/411/421 - VIII/2007