

# ZUA 2000

## Universal Applicator

### Instruction manual





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## **Exclusion of liability**

Illustrations, descriptions as well as the technical specifications conform to the instruction manual on hand at the time of publishing or printing. However, Zehntner GmbH Testing Instruments policy is one of continuous product development. All changes resulting from technical progress, modified construction or similar are reserved without obligation for Zehntner to update.

Some of the images shown in this instruction manual may be of a pre-production model and/or are computer generated; therefore the design / features of the delivered product may differ in various aspects.

The instruction manual has been drafted with the utmost care. Nevertheless, errors cannot be entirely excluded. The manufacturer will not be liable for errors in this instruction manual or for damages resulting from any errors.

The manufacturer will be grateful at any time for suggestions, proposals for improvement and indications of errors.

## 1 Description of device

The ZUA 2000 is an applicator for universal use, with gap height adjustable from 0  $\mu\text{m}$  bis 3'000  $\mu\text{m}$  (0 mil – 118.11 mil) for preparing uniform films or wedge-shaped layers up to a difference of 3'000  $\mu\text{m}$  (118.11 mil) on flat substrates.

In particular, this instrument has the following features:

- Easy to handle
- Reliable results
- Easy to dismantle and reassemble for cleaning

## 2 Safety information

### 2.1 Symbols used



This note comprises instructions needed to follow directions, specifications, proper working procedure and to avoid data loss, damage or destruction of the instrument.



This note signifies a warning about dangers to life and limb if the apparatus is handled improperly. Observe these notes and be particularly careful in these cases. Also inform other users on all safety notes. Besides the notes in this instruction manual the generally applicable safety instructions and regulations for prevention of accidents must be observed.

### 2.2 Safety notes and hints



The ZUA 2000 is exclusively intended for the application of wedge-shaped or uniform films of coatings. Any other use is considered as being not in accordance with the intentions of the manufacturer and is conducted at the user's own risk. The manufacturer is not liable for any resulting damages.



Every person operating or maintaining the ZUA 2000 must have read and understood this instruction manual in its entirety, in particular the safety precautions and warnings.



Unauthorized modifications and changes of the ZUA 2000 are not permitted.



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**Zehntner GmbH Testing Instruments** refuses all warranty and liability claims for damages caused by usage of the ZUA 2000 in combination with **non-original accessories**, or accessories from 3<sup>rd</sup> party suppliers.



All local safety regulations apply for the operation of the ZUA 2000.

### 3 Delivery of device

#### 3.1 Damages during carriage

On the receipt of the goods, check for any visible damages on the packaging. If it is undamaged you may sign the receipt of the goods. If you do suspect by your visual inspection that damage has occurred, make a note of the visible damage on the delivery receipt and request the courier to countersign it. Moreover, the courier service must be held responsible for the damage in writing.

If a hidden damage is discovered while unpacking, you have to inform and hold the courier liable immediately in the following way: "When opening the parcel we had to notice that ... etc." This superficial checking of the goods has to be done within the time limit set by the carrier, which is normally 7 days. However, the period could vary depending on the courier. Hence, it is recommended to check the exact time limit when receiving the goods.




If there are any damages also inform your authorized Zehntner agent or **Zehntner GmbH Testing Instruments** immediately.

#### 3.2 Shipment

Should the device be transported again, it must be packaged properly. Preferably use the original packaging for later shipments. Additionally use filling material in the package to protect the device from any shock during carriage.





### 3.3 Standard delivery



The following parts are included in the delivery:

1 Applicator	
1 Certificate of manufacturer	
1 Carrying case	

In case of custom-made film widths the carrying case might differ from the above or not be provided at all.

### 3.4 Options

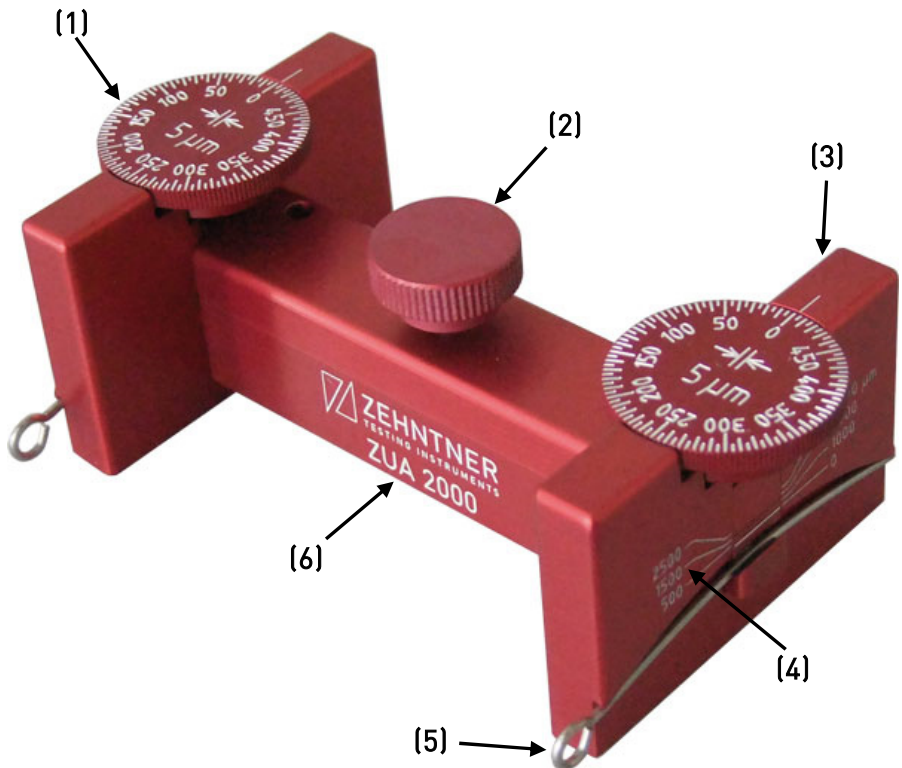
Custom-made film widths and gap heights	
ZAA 2300 Automatic Film Applicator	
ZAA 2600 Automatic Film Applicator	
ZPV 2030 Precision-Vacuumpates	

ZTC 2200 Test Charts	
ACC596 Calibration and certification	

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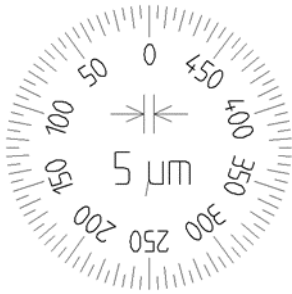


#### 4 Device overview



- (1) **Adjusting wheel** (both side)
- (2) **Fixing screw**
- (3) **Side plate** (both sides)
- (4) **Side scale** (both sides)
- (5) **Retaining spring** (both sides)
- (6) **Application blade**

#### 4.1 Setting ranges



0 µm - 3'000 µm gap height on the application blade (6)

Adjusting wheel (1):

1 scale gradient = 5 µm

1 full turn = 500 µm

Side scale (4):

1 scale gradient = 500 µm

#### 4.2 Retaining spring

For easier handling, Zehntner decided to produce a retaining spring which can be used for all of the following applications:

- manual application with ZUA 2000
- automatic application with ZAA 2300 and ZAA 2600
- heatable application with ZAA 2300 and ZAA 2600



Retainer spring for all applications

**!** Should you have one of the former retaining springs, please observe their correct use.

Retaining spring	manual application	with ZAA 2300 / ZAA 2600	with heatable ZAA 2300 / ZAA 2600
	X		
	X	X	
	X	X	X

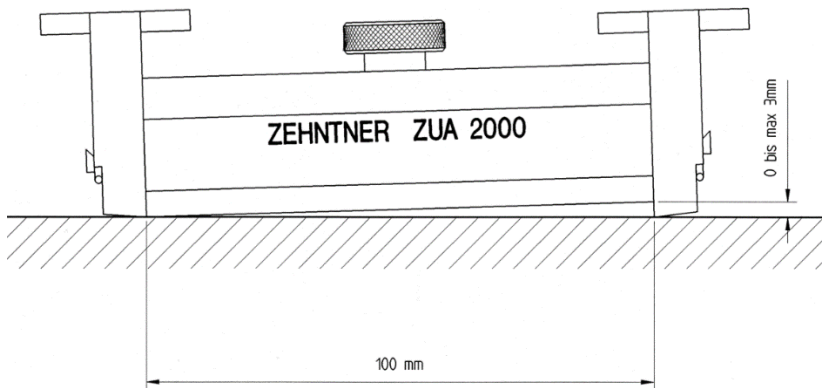
## 5 Handling

### 5.1 Setting the applicator

- Place the ZUA 2000 on a plane base e.g. vacuum plate, glass plate, test chart.
- Loosen the fixing screw (2).
- Set the desired film thickness with the adjusting wheels (1). Pay also attention to the side scales (4) to make sure that the ZUA 2000 is in the correct range.
- ! Please note, that the effective resulting wet film thickness is generally less than the set gap height.
- Slightly tighten the fixing screw (2) to fix the setting.

### 5.2 Manual application

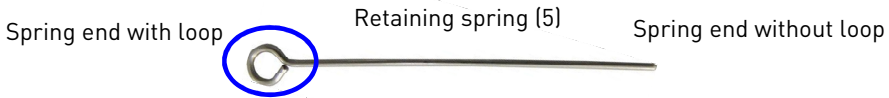
- ! Only use on solid substrates such as vacuum plates, glass plates, test panels, test charts or automatic film applicators.
- If necessary, adjust the ZUA 2000 as described in chapter 5.1 "Setting the applicator" on page 11.
- Pour to product to be tested in front of the application blade (6) in drawing direction and apply with uniform speed (about 25 mm/s / (1"/s)).
- Wedge-shaped applications can be carried out by setting different film thicknesses on the left and right side plates (3).



- Disassemble the ZUA 2000 afterwards and clean it with water or suitable solvent as described in chapter 6 "Maintenance and cleaning" on page 14.

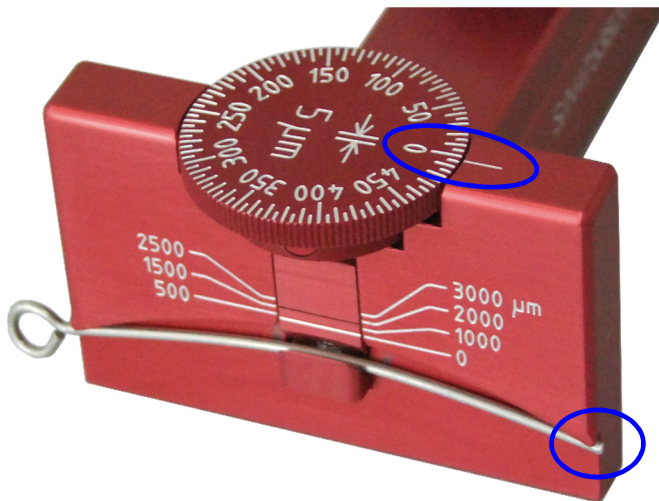
### 5.3 Application using an automatic film applicator

For applications with ZAA 2300 or ZAA 2600 Automatic Film Applicator the retaining spring (5) is used.



Both retaining-springs (5) have to be mounted to the ZUA 2000 so that the retaining loop ends show in the same direction.


We recommend to place the spring ends without loop on to the side of the ZUA with the mark for the adjusting wheel in order to see the set gap height properly.

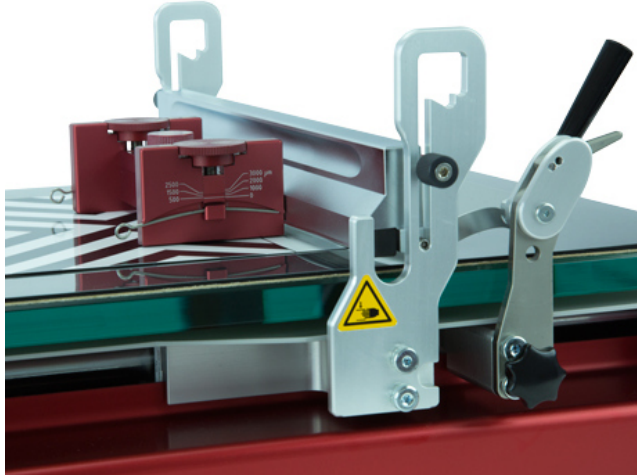


! The spring ends without loops should not protrude the side plates.

After mounting the retaining springs to the ZUA 2000, it can be used with an automatic film applicator. Please follow the instruction manual of the automatic film applicator.

! If an automatic film applicator of another manufacturer is used, a special weight support might be needed. In this case contact Zehntner GmbH Testing Instruments or an authorized Zehntner-agent.

- If the ZAA 2300 or ZAA 2600 Automatic Film Applicator is used, the ZUA 2000 can be placed in front of the weight.
-  Please make sure, that the spring ends without loop-are facing the weight.
- Carry out the application as described in the separate instruction manual of the ZAA 2300 or ZAA 2600 Automatic Film Applicator.



## 6 Maintenance and cleaning

### 6.1 Maintenance and cleaning work that can be carried out by the user

Only the following maintenance and cleaning work shall be carried out by the user:

- Disassembling and cleaning the applicator (see chapter 6.2 on page 14).
- Reassembling the applicator (see chapter 6.3 on page 16).

! All other maintenance and repair work shall only be carried out by **Zehntner GmbH Testing Instruments** or your authorised Zehntner agent otherwise all guarantee and liability claims are void.

### 6.2 Disassembling and cleaning the applicator

The ZUA 2000 must be cleaned immediately after use. Depending on the degree of soiling it can be partly or totally disassembled:

- Loosen the fixing screw (2).
- Return the adjusting wheel (1) to 0  $\mu\text{m}$ .
- Place the ZUA 2000 on a support base and remove the retaining springs (5) on both sides, then remove the side plates (3).
- Clean all parts with water or with a suitable solvent.



! Take appropriate safety measures - such as wearing safety glasses - during disassembling and cleaning.

If the ZUA 2000 is heavily soiled, it has to be entirely disassembled and cleaned:

- Disassemble as described above, then:
  - Remove the adjusting wheel (1) and the fixing screw (2) from the application blade (6) completely.
  - Disassemble the application blade in its 3 parts, the upper part and the lower part containing the steel reinforcement.
- ! If the steel reinforcement is soiled so heavily that it does not fall out automatically, fasten a screw halfway into the thread of the steel reinforcement and use it to pull out the reinforcement.
- ! If the device has to be disinfected, do not use disinfectants that contain sodium hydroxide.
- Clean the parts with water or with a suitable solvent.



- ! Please take care not to damage the application surface of the application blade and the lower edges of the side plates, otherwise inexact or non-uniform applications may occur.

### 6.3 Reassembling the applicator

- ! All important parts are labelled with digits, matching a part of the serial number. In case of using several applicators, take care not to mix up these labelled components.

**The parts belonging to the right hand side of the applicator are marked with white dots, namely:**

- right adjusting wheel (1) – dot at the bottom
- right side plate (3) – dot at the inner side
- upper and lower part of the application blade (6)

If the applicator has been entirely disassembled, proceed as follows:

- Insert the steel reinforcement into the lower part of the application blade (6) then assemble the lower and upper part of the application blade matching the white dots.
- Screw both adjusting wheels (1) and the fixing screw (2) into the application blade (6) without tightening them. (If necessary, turn back one turn.)
- Attach the right side plate (3) to the right hand side of the application blade and fix it with one of the retaining springs (5). The adjustment wheel (1) might have to be returned to 0  $\mu\text{m}$  in order to insert the retainer spring (5).
- Add the left side plate (3) likewise.

- ! Store the applicator in the carrying case when not in use in order to avoid damages to the application surface and the bearing areas of the side plates.



## 7 Technical specifications

Film width	Dimensions (LxWxH)	Versions
60 mm (2.36")	100 mm x 60 mm x 40 mm (3.94" x 2.36" x 1.58")	ZUA 2000.60
80 mm (3.15")	120 mm x 60 mm x 40 mm (4.72" x 2.36" x 1.58")	ZUA 2000.80
100 mm (3.94")	140 mm x 60 mm x 40 mm (5.51" x 2.36" x 1.58")	ZUA 2000.100
150 mm (5.90")	190 mm x 60 mm x 40 mm (7.48" x 2.36" x 1.58")	ZUA 2000.150
200 mm (7.90")	240 mm x 60 mm x 40 mm (9.45" x 2.36" x 1.58")	ZUA 2000.200
220 mm (8.70")	260 mm x 60 mm x 40 mm (10.24" x 2.36" x 1.58")	ZUA 2000.220
on request	depending on version	ZUA 2000.S

Material:	red, hard finish, solvent-resistant aluminium
Adjustable gap heights:	0 µm – 3'000 µm (0 mil – 118.11 mil)
Wedge-shaped layer:	0 µm – 3'000 µm (0 mil – 118.11 mil)
Graduation / resolution:	5 µm (0.20 mil)
Tolerance:	±10 µm (0.39 mil)
Weight:	229 g – 479 g (0.50 lbs – 1.06 lbs) depending on version
Standards:	ASTM D823
Warranty:	2 years

## Glossary

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