ZEHNTNER
TESTING INSTRUMENTS

PRODUCT OVERVIEW

Measuring and Testing Equipments

Gloss - Chalking - Laboratory

Standards

01 Gloss - GlossHaze - Chalking

Standard	Geometry	Products	Page
ASTM C 346	45°	ZGM 1020, 1022 ZOL 1150	5 5
ASTM D 523	20°, 60°, 85°	ZGM 1020, 1022 ZGM 1023 ZGH 1024 ZGM 1110 ZGM 1120 ZOL 1150	5 5 6 4 4 5
ASTM D 2457	20°, 60°, 85°	ZGM 1020, 1022 ZGM 1023 ZGH 1024 ZGM 1110 ZGM 1120 ZOL 1150	5 5 6 4 4 5
ASTM D 2457	45°	ZGM 1020, 1022 ZOL 1150	5 5
BS 3900	20°, 60°, 85°	ZGM 1020, 1022 ZGM 1023 ZGH 1024 ZGM 1110 ZGM 1120 ZOL 1150	5 5 6 4 4 5
DIN 54502	45° DIN	ZGM 1120	4
DIN 54502	75° DIN	ZGM 1120 ZOL 1150	4 5
DIN 55984	45/0°	ZOL 1150 ZRM 1021	5 6
DIN 67530	20°, 60°, 85°	ZGM 1020, 1022 ZGM 1023 ZGH 1024 ZGM 1110 ZGM 1120 ZOL 1150	5 5 6 4 4 5

Zehntner GmbH

Standards

01 Gloss - GlossHaze - Chalking

Standard	Geometry	Products	Page
ECCA-T14		ZHC 1200	6
EN 1436	45/0°	ZRM 1021	6
EN ISO DIN 2813	20°, 60°, 85°	ZGM 1020, 1022 ZGM 1023 ZGH 1024 ZGM 1110 ZGM 1120 ZOL 1150	5 5 6 4 4 5
EN ISO 2814	45/0°	ZRM 1021	6
EN ISO DIN 4628-6		ZHC 1200	6
EN ISO 7668	20°, 60°, 85°	ZGM 1023 ZGM 1110 ZGM 1120 ZOL 1150	5 4 4 5
EN ISO 7668	45°	ZGM 1120	4
EN ISO 8254-1	75° Tappi	ZGM 1020, 1022 ZGM 1023 ZGM 1120 ZOL 1150	5 5 4 5
EN ISO 8254-2	75° DIN	ZGM 1120 ZOL 1150	4 5
EN ISO 8254-3	20° Tappi	ZGM 1120	4
EN DIN 13523-14		ZHC 1200	6
EN 14086	45° DIN	ZGM 1120	4
Tappi T 480	75° Tappi	ZGM 1020, 1022 ZGM 1023 ZGM 1120 ZOL 1150	5 5 4 5
Tappi T 653	20° Tappi	ZGM 1120	4
Zehntner	75°	ZGM 1020, 1022 ZGM 1023	5 5
Zehntner	GlossHaze	ZGH 1024 ZOL 1150	6 5

02 Laboratory

Standard	Products	Page
ASTM D 522	ZCY 2400 ZCO 2410	17 18
ASTM D 713	ZND 2050-54	13
ASTM D 823	ZUA 2000 ZUA 2002 ZAF 2010 ZFR 2040 ZWA 2121 ZAA 2300	8 8 9 9 9 7
ASTM D 1200	ZFC 3010, 3015 ZTJ 3020	18 19
ASTM D 1210	ZGR 2020-2024	12
ASTM D 1212	ZWW 2100-2108	14
ASTM D 1316	ZGR 2020-2024	12
ASTM D 1475	ZPM 3030	19
ASTM D 2794	ZIT 2440	18
ASTM D 3359	ZCC 2080 ZCC 2087 ZCF 2088 ZMG 2151 ZCT 2160 ZSF 2196	15 16 15 14 15 17
ASTM D 3363	ZSH 2090	16
ASTM D 4138	ZPI 2195	13
ASTM D 4400	ZLA 2130	10

02 Laboratory

Standard	Products	Page
ASTM D 4414	ZND 2050-2054 ZNW 2055	13 14
ASTM D 6677	ZMG 2151	14
DIN 50986	ZPI 2195	13
DIN 53211	ZFC 3011, 3012 ZTJ 3020	18 19
DIN 55656	ZHT 2092-2093 ZST 2095	16 17
DIN 55677	ZLA 2130	10
ECCA-T 4	ZSH 2090	16
EN ISO 1519	ZCY 2400	17
EN ISO DIN 1524	ZGR 2020-2024	12
EN ISO 2409	ZCC 2080 ZCC 2087 ZCF 2088 ZCT 2160 ZMG 2151 ZSF 2196	15 16 15 15 14 17
EN ISO 2431	ZFC 3013, 3014 ZTJ 3020	18 19
EN ISO DIN 2808	ZND 2050-2054 ZNW 2055 ZWW 2100-2108 ZMG 2151 ZPI 2195	13 14 14 14 13

02 Laboratory

Standard	Products	Page
EN ISO 2811-1	ZPM 3030	19
EN ISO 6272-1	ZIT 2440	18
EN ISO 6272-2	ZIT 2440	18
EN ISO 6860:2004-12	ZCO 2410	18
EN 13523-4	ZSH 2090	16
EN ISO 15184	ZSH 2090	16
ISO/DIS 17872	ZSF 2196	17
FED-STD 141C	ZFR 2040	9
FTMS 141a Meth. 6222	ZCO 2410	18
FTMS 141a Meth. 6223	ZCO 2410	18
FTMS 141a Meth. 2161	ZFR 2040	9
FTMS 141a Meth. 2162	ZFR 2040	9
MIL C 27 227	ZSH 2090	16
NEN 5350	ZSH 2090	16
SIS 184187	ZSH 2090	16
SNV 37100	ZPM 3030	19
SNV 37113	ZSH 2090	16
VDA 621-103	ZPM 3030	19
ZTV-M 02	ZND 2052 ZNW 2055	13 14

Zehntner-products have a warranty period of two years, except where indicated otherwise. Accumulators, some options as well as maintenance and calibration are without warranty.

ZGM 1110

Glossmeter

- For measurement of all gloss ranges from matt to high gloss, with automatic gloss range shift up to 2'000 GU
- The precision glossmeter leaves nothing to be desired: small in dimension, luminous graphical OLED display which is switchable for left-handed use, SD-RAM memory card and USB-interface for PC operation
- Single, multiple and continuous measurements (min. interval of 2 s) can be taken
- Continuous statistics (average, standard deviation, max., min.)
- Versatile measuring and data analysis software "GlossTools" with additional features, free of charge
- Latest technology and intuitive operational elements like the rotary push button for rapid menu-guidance
- Measuring system with high long-term stability ensures constant measuring accuracy and thus reliable measu-ring results; automatic self-diagnosis avoids mismeasurements

Geometry	triple-angle 20°, 60° and 85°
Measuring range	0 - 2'000 GU, automatic gloss range shift
Repeatability	0 - 199.9 GU: 0.1 GU, 200 - 2'000 GU: 0.2 %
Reproducibility	0 - 199.9 GU: 0.5 GU, 200 - 2'000 GU: 0.4 %
Measuring sensor adaption	V (λ)
Display	OLED, 128 pixel x 64 pixel or via PC / laptop
Light source	LED
Power supply	battery type AA for approx. 10'000 measurements or USB-powered
Calibration	traceable to BAM (Federal Institute for Materials Research and Testing, Germany)
Operating system	Windows® 8 , Windows® 7, Windows Vista®, Windows® XP SP2 or later
Dimensions (LxWxH)	111.5 mm x 35 mm x 72 mm (4.39" x 1.38" x 2.83")
Weight	363 g (0.80 lbs)
Standards	ASTM D 523, ASTM D 2457, BS 3900, EN ISO DIN 2813, DIN 67530

ZGM 1120

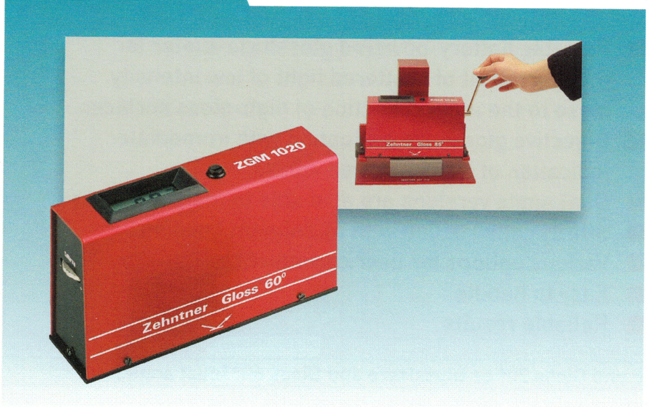
Glossmeter

- New generation of portable precision glossmeter with smallest dimensions for measurement of all gloss ranges of all surfaces from matt to high gloss, even on very confined surfaces
- The ZGM 1120 opens the gateway to a more efficient and productive quality control: the first gloss measuring sensor transmitting the measuring data directly to the PC / laptop via USB-interface
- Latest technology and very easy to use
- Useful for the various needs of production and demanding requirements in the laboratory

<table>
<tr><td>Geometry</td><td>20°</td><td>60°</td><td>85°</td><td>20° Tappi T 653</td><td>75° Tappi T480</td><td>45° DIN 54502</td><td>75° DIN 54502</td></tr>
<tr><td>1-angle</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr>
<tr><td>2-angles</td><td colspan="2">●</td><td></td><td colspan="2">●</td><td colspan="2">●</td></tr>
<tr><td>3-angles</td><td colspan="3">●</td><td></td><td></td><td></td><td></td></tr>
</table>

Measuring range	0 - 2'000 GU
Repeatability	0 - 199.9 GU: 0.1 GU, 200 - 2'000 GU: 0.1 %
Reproducibility	0 - 199.9 GU: 0.5 GU, 200 - 2'000 GU: 0.4 %
Measuring sensor adaption	V (λ)
Light source	LED
Power supply	USB-powered
Calibration	traceable to BAM (Federal Institute for Materials Research and Testing, Germany)
Operating system	Windows® 8, Windows® 7, Windows Vista®, Windows® XP SP2 or later
Dimensions (LxWxH)	depending on version
Weight	depending on version
Standards	depending on version: ASTM D 523, ASTM D 2457, BS 3900, EN ISO DIN 2813, DIN 67530, EN ISO 7668, EN ISO 8254-1, EN ISO 8254-2, EN ISO 8254-3, EN 14086, DIN 54502, Tappi T 480, Tappi T 653

ZGM 1020 - 1023

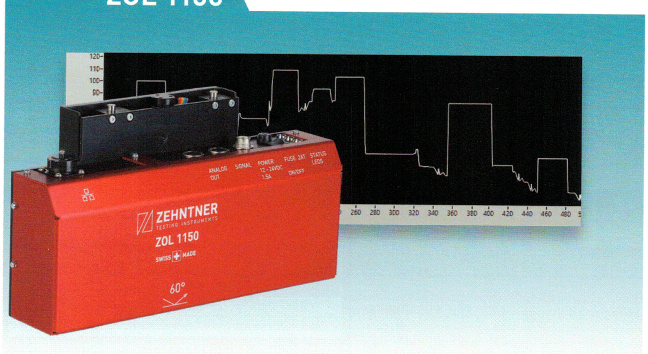


Glossmeter

- Portable, accumulator-powered precision glossmeters for measurement of all gloss ranges for all surfaces from matt to high gloss, usable in all industries
- The classic glossmeter
- Objective gloss evaluation with immediate indication of the measured value
- Sturdy construction with aluminium housing and high quality standard
- Various options for user convenience
- Easy to handle
- Reliable results

Geometry	ZGM 1020 single angle: 20°, 20° mini, 45°, 45° mini, 60°, 60° mini, 75°, 75° DIN, 75° Tappi or 85°, ZGM 1022 dual angle: 20° and 60°, 20° and 75°, 20° and 85° or 45/0° and 60°, respectively 20°, 45° or 60° mini-measuring-head in combination with 20°, 45°, 60°, 75° or 85° in the basic unit ZGM 1023 measuring range of 0 - 1´999 GU: 20° or 60°, measuring range of 0 - 19.99 GU: 75°
Measuring range	ZGM 1020, ZGM 1022: 0 - 199.9 GU, ZGM 1023.20, ZGM 1023.60: 0 - 1´999 GU, ZGM 1023.75: 0 - 19.99 GU
Measuring accuracy	± 1 %
Measuring sensor adaption	V (λ)
Display	LCD, 3 ½ digits
Light source	halogen lamp, standard illuminant A
Power supply	integrated, rechargeable accumulator
Calibration	traceable to BAM (Federal Institute for Materials Research and Testing, Germany)
Dimensions (LxWxH)	single and dual angle versions: 190 mm x 53 mm x 110 mm (7.48" x 2.09" x 4.33"), mini-measuring-heads: 20°: 60 mm x 12 mm x 55 mm (2.36" x 0.47" x 2.17"), 45°: 68 mm x 12 mm x 39 mm (2.68" x 0.47" x 1.54"), 60°: 78 mm x 12 mm x 40 mm (3.07" x 0.47" x 1.57")
Weight	single and dual angle versions: 1 kg (2.20 lbs), mini-measuring-heads: 60 g - 78 g (0.13 lbs - 0.17 lbs)
Standards	depending on version: ASTM C 346, ASTM D 523, ASTM D 2457, BS 3900, EN ISO DIN 2813, DIN 67530, EN ISO 7668, Tappi T 480, EN ISO 8254-1

ZOL 1150



Online-Glossmeter

- Tailored gloss-measuring system for industrial areas for contactless online measurement of all gloss ranges from matt to high gloss up to 2´000 GU
- Progressive with the latest digital communication and different analog outputs
- Online monitoring of gloss, brightness and glosshaze during the production with up to 1´000 measurements per second
- Multi-angle measuring-heads
- Reliable results

Geometry	depending on version
Measuring range	0 - 1´999 GU
Measuring accuracy	0 - 199.9 GU: ≈ 0.2 GU, 0 - 1´999 GU: ≈ 2 GU, depending on the chosen specifications and under perfectly ideal conditions in a clean environment
Measuring sensor adaption	V (λ)
Interfaces	RS 232, RS 485 or Ethernet
Analog output	0-10V, 0-20mA or 4-20mA
Light source	LED
Power supply	230 V 50 Hz, 115 V 60 Hz or 12 - 24 VDC
Calibration	traceable to BAM (Federal Institute for Materials Research and Testing, Germany)
Operating system for optional software	Windows® 8, Windows® 7, Windows Vista®, Windows® XP SP2 or later
Measuring distance to material	20°: 10 mm (0.39") 60°: 10 mm (0.39") 85°: 2.7 mm (0.11")
Standards	depending on version: ASTM C 346, ASTM D 523, ASTM D 2457, BS 3900, EN ISO DIN 2813, DIN 67530, EN ISO 7668, Tappi T 480, DIN 54502, EN ISO 8254-1

ZGH 1024

GlossHaze

- Portable battery-powered glosshaze-meter for measurement of scattered light of low intensity close to the main reflection of high-gloss surfaces
- Objective glosshaze evaluation with immediate indication of the measured value
- Dual angle versions are also able to measure gloss
- Sturdy construction with aluminium housing
- Various options for user convenience
- Easy to handle
- Reliable results

Geometry	GlossHaze (single angle), GlossHaze and Gloss 20° or GlossHaze and Gloss 60° (dual angle)
Measuring accuracy	± 1 %
Measuring sensor adaption	V (λ)
Display	LCD, 3 ½ digits
Light source	halogen lamp, standard illuminant A
Power supply	integrated, rechargeable accumulator
Dimensions (LxWxH)	190 mm x 53 mm x 110 mm (7.48" x 2.09" x 4.33")
Weight	1 kg (2.20 lbs)

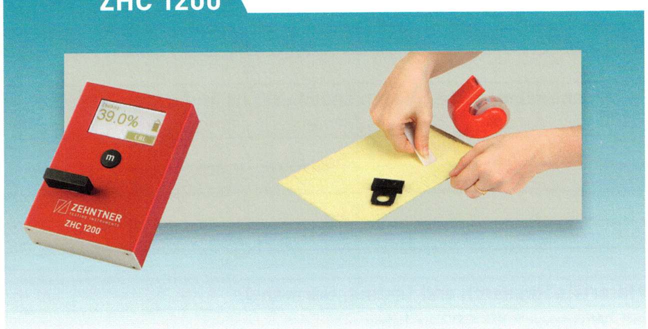
ZRM 1021

Reflectometer 45/0°

- Portable and sturdy battery-powered precision reflectometer for determination of whiteness, lightness, opacity and hiding power of paints, inks and coatings
- For the determination of the luminance factor β for dry road markings
- Easy to handle
- Reliable measuring values

Geometry	45/0°
Measuring accuracy	± 1 %
Measuring sensor adaption	V(λ)
Display	LCD, 3 ½ digits
Light source	halogen lamp, standard illuminant C
Power supply	integrated, rechargeable battery
Dimensions (LxWxH)	190 mm x 53 mm x 110 mm (7.48" x 2.09" x 4.33")
Weight	1 kg (2.20 lbs)
Standards	EN ISO 2814, DIN 55984, EN 1436

ZHC 1200

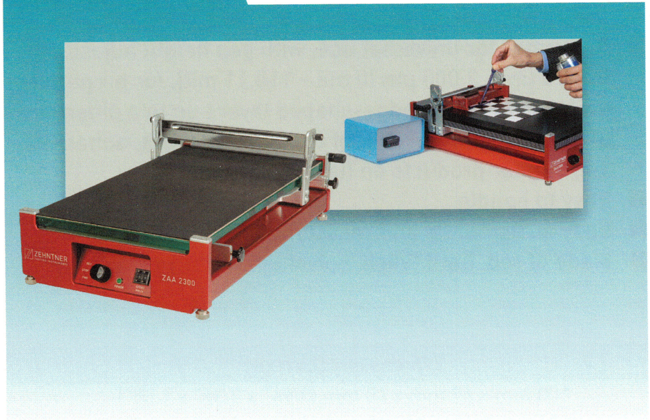


HELMEN®-Chalking tester

- Unique measuring instrument for quantitative determination of degree of chalking resulting from natural or artificial weathering of coatings using a specimen holder as well as for direct measurement of light-transmitting properties (luminous transmittance) of samples
- The very first chalking tester with a touchscreen, on which you can immediately read off the degree of chalking
- Superior sensitivity at the most crucial initial chalking stages and high accuracy also with regard to coloured pigments

Measuring range	0 % to 100 % chalking (relative)
Measuring area	14 mm (0.55") in diameter
Accuracy	± 1 %
Display	monochrome touchscreen, 128 x 64 pixel white luminous graphical display
Power supply	2 batteries AA or USB-powered
Dimensions (LxWxH)	154 mm x 105 mm x 33.2 mm (6.06"x4.13"x1.31"), specimen for transmittance: length: min. 32 mm (1.26"), width: min. 16 mm - max. 25 mm (min. 0.63" - max. 0.98"), thickness: max. 3 mm (0.12")
Weight	613 g (1.35 lbs)
Standards	EN DIN 13523-14, EN ISO DIN 4628-6, ECCA-T14

ZAA 2300



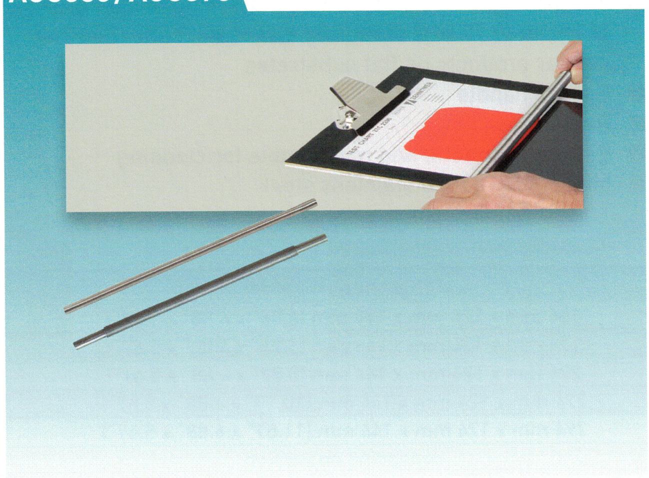
Automatic film applicator coater

- Automatic laboratory equipment for accurate and reproducible application of coating materials, adhesives and similar products, independent of the operator
- Multifunctional use with reversible, double sided glass plate (glass/printing blanket), easy to turn over or to change
- Adjustable application area with moveable start and stop positions
- Optional versions equipped with isolation plate for use with heatable vacuum plates or heating plates
- Made of red anodised aluminium (housing), glass (glass surface of glass plate) and rubber coated cotton (printing blanket)

Versions	Drawing speed	Resolution	Dimensions (LxWxH)
ZAA 2300	0 - 99 mm/s (0 - 3.90"/s)	1 mm/s (0.04"/s)	unit: 565 x 382 x 190 mm (22.24" x 15.04" x 7.48"); glass plate: 553 x 300 x 15 mm (21.77" x 11.81" x 0.59"); application length: 1 mm - 400 mm (0.04" - 15.75"); application width: 1 mm - 300 mm (0.04" - 11.81"); substrate thickness up to 11 mm (0.43")
ZAA 2300.H for heatable plates			
ZAA 2300.F	0 - 247.5 mm/s (0 - 9.74"/s)	2.5 mm/s (0.10"/s)	
ZAA 2300.FH for heatable plates			
ZAA 2300.FF	0 - 495 mm/s (0 - 19.49"/s)	5 mm/s (0.20"/s)	
ZAA 2300.FFH for heatable plates			

Tolerance of drawing speed	2300 and 2300.H: 0 - 90 mm/s (0 - 3.54"/s): ± 1 %, > 90 mm/s (> 3.54"/s): ± 3 % 2300.F and 2300.FH: 0 - 225 mm/s (0 - 8.86"/s): ± 1 %, > 225 mm/s (> 8.86"/s): ± 3 % 2300.FF and 2300.FFH: 0 - 450 mm/s (0 - 17.72"/s): ± 1 %, > 450 mm/s (> 17.72"/s): ± 3 %
Power supply	100 V - 240 V, 50 Hz - 60 Hz
Weight, total	20 kg (44.09 lbs), versions for heatable plates 22.8 kg (50.27 lbs)
Weight glass plate	6.4 kg (14.11 lbs)
Standards	ASTM D 823

ACC586/ACC378

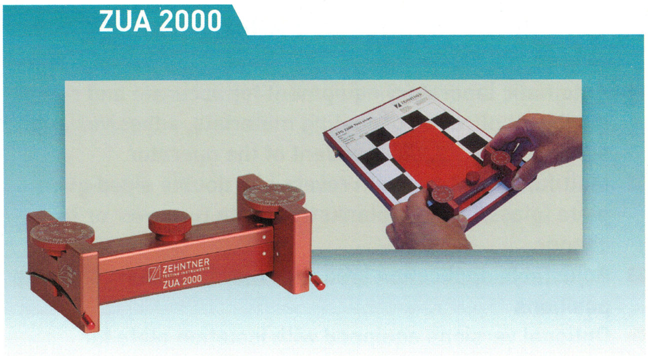


Wire-bar applicator / Profile rod

- Applicators for preparing uniform films of coating materials, adhesives and similar products on flat and flexible substrates with ZAA 2300 Automatic film applicator coater or for manual application
- Especially suitable for flexible substrates e.g. paper, foils, cardboard, test charts, textiles, leather etc.; because small unevenness of the substrate will be levelled through the applicator
- Several layers can be applied successively or close together
- For very thin layers, e.g. on foils or paper
- Easy to handle
- Reliable results
- Easy to clean
- Made of stainless steel

Versions	Type	Wet film thicknesses	Film width	Weight
ACC586	wire-bar	25, 50, 75, 100, 125, 150, 175, 200, 250, 300 or 500 µm (0.98, 1.97, 2.95, 3.94, 4.92, 5.91, 6.89, 7.87, 9.84, 11.81 or 19,69 mil)	≈ 305 mm (12,01")	≈ 378 g - 481 g (0.83 lbs - 1.06 lbs)
ACC378	profile rod	4.57, 6.86, 9.14, 11.43, 13.72, 16.00, 18.29, 20.57, 22.86, 27.43, 32.00, 36.58, 41.15, 45.72, 50.29, 54.86, 59.44, 64.01, 68.58, 73.15, 77.72, 82.30, 86.87, 91.44, 96.01, 100.58, 105.16, 109.73, 114.30, 125.73, 137.16, 148.59, 160.02 or 171.45 µm (0.18, 0.27, 0.36, 0.45, 0.54, 0.63, 0.72, 0.81, 0.90, 1.08, 1.26, 1.44, 1.62, 1.80, 1.98, 2.16, 2.34, 2.52, 2.70, 2.88, 3.06, 3.24, 3.42, 3.60, 3.78, 3.96, 4.14, 4.32, 4.50, 4.95, 5.40, 5.85, 6.30, 6.75 mil)	≈ 320 mm (12,60")	≈ 358 g (0.79 lbs)

Total length	405 mm (15,94")
Warranty	none



Universal applicator

- Applicator for universal use, with gap height adjustable from 0 µm - 3'000 µm (0 mil - 118.11 mil), for preparing uniform films or wedge-shaped layers up to a difference of 3'000 µm (118.11 mil) of coating materials, adhesives and similar products on flat substrates
- Easy to handle
- Easy to dismantle and reassemble for cleaning
- Made of red, hard finish, solvent-resistant aluminium

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

Adjustable gap heights	0 µm - 3'000 µm (0 mil - 118.11 mil)
Graduation / resolution	5 µm (0.20 mil)
Tolerance	± 10 µm (0.39 mil)
Weight	from 229 g to 479 g (0.50 lbs to 1.06 lbs), depending on version
Standards	ASTM D 823

Universal applicator

- Applicator for universal use, with gap height adjustable from 0 µm - 1'000 µm (0 mil - 39.37 mil), for preparing uniform films or wedge-shaped layers up to a difference of 20 µm (0.79 mil) of coating materials, adhesives and similar products on flat substrates
- Easy to handle
- Reliable results
- Easy to dismantle and reassemble for cleaning
- Made of hardened stainless steel

Versions	Film width	Dimensions (LxWxH)
ZUA 2002.80	80 mm (3.15")	154 mm x 124 mm x 144 mm (6.06" x 4.88" x 5.67")
ZUA 2002.100	100 mm (2.36")	174 mm x 124 mm x 144 mm (6.85" x 4.88" x 5.67")
ZUA 2002.150	150 mm (5.90")	224 mm x 124 mm x 144 mm (8.82" x 4.88" x 5.67")
ZUA 2002.200	200 mm (7.90")	274 mm x 124 mm x 144 mm (10.79" x 4.88" x 5.67")
ZUA 2002.220	220 mm (8.70")	294 mm x 124 mm x 144 mm (11.57" x 4.88" x 5.67")
ZUA 2002.S	on request	depending on version

Adjustable gap heights	0 µm - 1'000 µm (0 mil - 39.37 mil)
Graduation / resolution	1 µm (0.04 mil)
Wedge-shaped layer	0 µm - max. 20 µm (0 mil - max. 0.79 mil)
Weight, net	approx. 1.8 kg (3.97 lbs) depending on version
Weight, gross incl. accessories	approx. 9 kg (19.84 lbs) depending on version
Standards	ASTM D 823

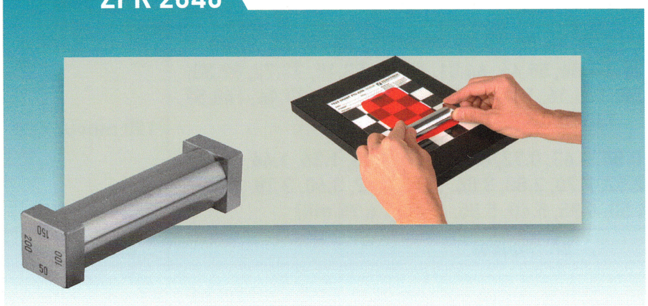
ZAF 2010

4-sided applicator frame

- Applicator for preparing uniform films of coating materials, adhesives and similar products on flat substrates
- The 4-sided applicator frame has the big advantage that the coating material filled in cannot get below the guide surfaces. So there is no risk of falsified results
- Easy to handle
- Made of stainless steel

Versions	Gap heights	Film width	Dimensions (LxWxH)	Weight	Standards
ZAF 2010.6030	30, 60, 90 and 120 µm (1.18, 2.36, 3.54 and 4.72 mil)	60 mm (2.36")	70 mm x 29 mm x 14 mm (2.76" x 1.14" x 0.55")	174 g (0.38 lbs)	ASTM D 823
ZAF 2010.6050	50, 100, 150 and 200 µm (1.97, 3.94, 5.91 and 7.87 mil)				
ZAF 2010.60S	on request from 5 µm to 2'000 µm (0.20 - 78.74 mil)				
ZAF 2010.8030	30, 60, 90 and 120 µm (1.97, 3.94, 5.91 and 7.87 mil)	80 mm (3.15")	90 mm x 29 mm x 14 mm (3.54" x 1.14" x 0.55")	186 g (0.41 lbs)	
ZAF 2010.8050	50, 100, 150 and 200 µm (1.97, 3.94, 5.91 and 7.87 mil)				
ZAF 2010.80S	on request from 5 µm to 2'000 µm (0.20 - 78.74 mil)				
ZAF 2010.2S	on request from 5 µm to 2'000 µm (0.20 - 78.74 mil)	on request from 10 mm - 200 mm (0.39" - 7.87")	depending on film width		

ZFR 2040

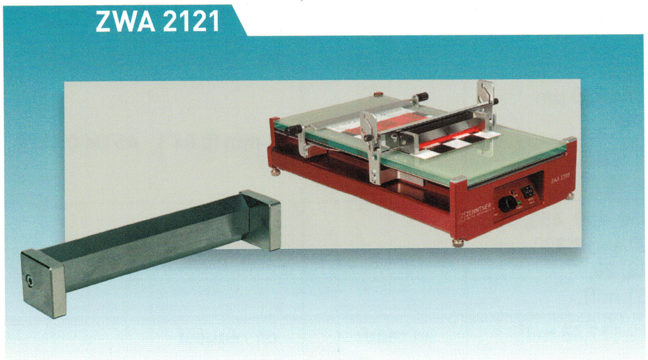


4-sided applicator

- Applicator for preparing uniform films of coating materials, adhesives and similar products on flat substrates
- Easy to handle
- Reliable results
- Easy to clean
- Made of stainless steel

Versions	Gap heights	Film width	Standards
ZFR 2040.6030	30, 60, 90 and 120 µm (1.18, 2.36, 3.54 and 4.72 mil)	60 mm (2.36")	ASTM D 823-95, FED-STD 141C, FTMS 141a methods 2161, 2162 (withdrawn)
ZFR 2040.6050	50, 100, 150 and 200 µm (1.97, 3.94, 5.91 and 7.87 mil)		
ZFR 2040.60S	on request from 10 µm to 2'000 µm (0.39 mil - 78.74 mil)		
ZFR 2040.8030	30, 60, 90 and 120 µm (1.18, 2.36, 3.54 and 4.72 mil)	80 mm (3.15")	
ZFR 2040.8050	50, 100, 150 and 200 µm (1.97, 3.94, 5.91 and 7.87 mil)		
ZFR 2040.80S	on request from 10 µm to 2'000 µm (0.39 mil - 78.74 mil)		
ZFR 2040.S1S	on request from 10 µm to 2'000 µm (0.39 mil - 78.74 mil)	on request from 10 mm to 100 mm (0.39" - 3.94")	
ZFR 2040.S2S	on request from 10 µm to 2'000 µm (0.39 mil - 78.74 mil)	on request from 101 mm to 200 mm (3.94" - 7.87")	

ZWA 2121

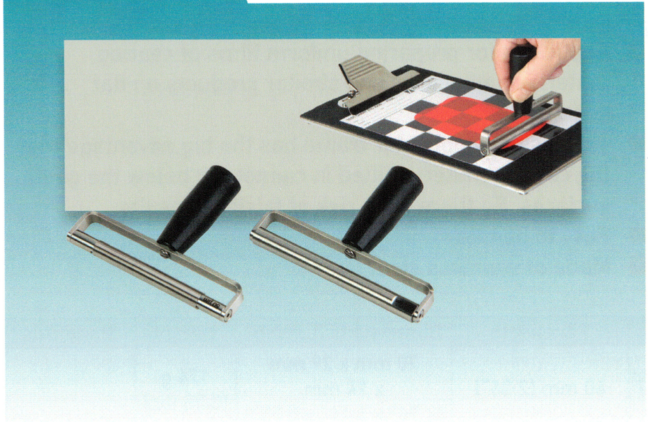


Wasag applicator

- Applicator for preparing uniform films of coating materials, adhesives and similar products on flat substrates
- For double sided application
- The coating cannot get under the applicator support brackets and thereby falsify the applied film thickness
- Easy to handle
- Reliable results
- Easy to clean
- Made of stainless steel

Versions	Film width	Gap heights
ZWA 2121.80	80 mm (3.15")	2 on request from 15 µm to 2'000 µm (in steps of five) (0.59 mil - 78.74 mil)
ZWA 2121.120	120 mm (4.72")	
ZWA 2121.180	180 mm (7.09")	
ZWA 2121.230	230 mm (9.06")	
ZWA 2121.S1	on request from 20 mm to 500 mm (0.79" - 19.69")	
ZWA 2121.S2	on request from 20 mm to 500 mm (0.79" - 19.69")	with different gap heights per side (stepwise) from 15 µm to 2'000 µm (in steps of five) (0.59 mil - 78.74 mil)

ZSA 2110



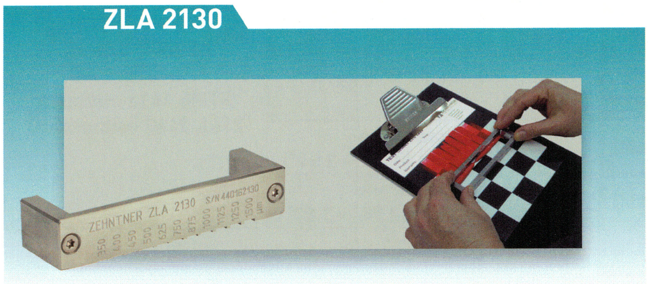
Wire-bar applicator / Profile rod

- Applicator for preparing uniform films of coating materials, adhesives and similar products on flat and flexible substrates
- Especially suitable for flexible substrates e.g. paper, foils, cardboard, test charts, textiles, leather etc.; because small unevenness of the substrate will be levelled by the applicator
- Several layers can be applied successively or close together
- For very thin layers, e.g. on foils or paper
- Easy to handle and to clean
- Reliable results
- Made of stainless steel

Versions	Set with	Wet film thicknesses	Film width
ZSA 2110.1.80	1 Wire-bar	20, 25, 50, 75, 100, 125, 150, 175 or 200 µm (0.79, 0.98, 1.97, 2.95, 3.94, 4.92, 5.91, 6.89 or 7.87 mil)	80 mm (3.15")
ZSA 2110.2.80	2 Wire-bars		
ZSA 2110.3.80	3 Wire-bars		
ZSA 2110.4.80	4 Wire-bars		
ZSA 2110.5.80	5 Wire-bars		
ZSA 2110.6.80	6 Wire-bars		
ZSA 2110.P.1.120	1 profile rod	4.57, 6.86, 9.14, 11.43, 13.72, 16.00, 18.29, 20.57, 22.86, 27.43, 32.00, 36.58, 41.15, 45.72, 50.29, 54.86, 59.44, 64.01, 68.58, 73.15, 77.72, 82.30, 86.87, 91.44, 96.01, 100.58, 105.16, 109.73, 114.30, 125.73, 137.16, 148.59, 160.02 or 171.45 µm (0.18, 0.27, 0.36, 0.45, 0.54, 0.63, 0.72, 0.81, 0.90, 1.08, 1.26, 1.44, 1.62, 1.80, 1.98, 2.16, 2.34, 2.52, 2.70, 2.88, 3.06, 3.24, 3.42, 3.60, 3.78, 3.96, 4.14, 4.32, 4.50, 4.95, 5.40, 5.85, 6.30 or 6.75 mil)	120 mm (4.72")
ZSA 2110.P.2.120	2 profile rods		
ZSA 2110.P.3.120	3 profile rods		
ZSA 2110.P.4.120	4 profile rods		
ZSA 2110.P.5.120	5 profile rods		
ZSA 2110.P.6.120	6 profile rods		
ZSA 2110.S	on request	on request	on request

Dimensions (LxWxH)	126 mm x 95 mm x 2 mm (4.96" x 3.74" x 0.08")
Weight, 1 applicator with handle	≈ 150 g (0.33 lbs)

ZLA 2130

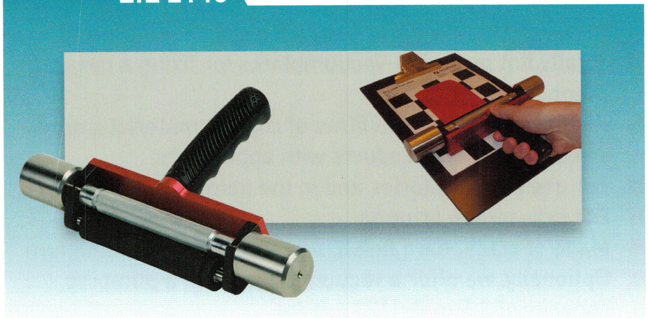


Sagging applicator

- For determination of sagging properties of coating materials and similar products on flat substrates
- Easy to handle
- Reliable results
- Easy to clean
- Made of stainless steel

Versions	Gap heights	Gap width	Gap distance	Standards
2130.A.75	75, 100, 125, 150, 175, 200, 225, 250, 275 and 300 µm (3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 mil)	6.35 mm (0.25")	1.6 mm (0.06")	ASTM D 4400
2130.A.350	350, 400, 450, 500, 625, 750, 875, 1´000, 1´125, 1´250 and 1´500 µm (14, 16, 18, 20, 25, 30, 35, 40, 45, 50 and 60 mil)			
2130.D	75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 800, 900, 1´000, 1´100, 1´200 and 1´300 µm (3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 32, 35, 39, 43, 47 and 51 mil)	10 mm (0.39")	2 mm (0.08")	DIN 55677
2130.S2	on request from 5 µm to 4´000 µm (0.20 mil - 157.48 mil)	on request	on request	

ZIL 2140



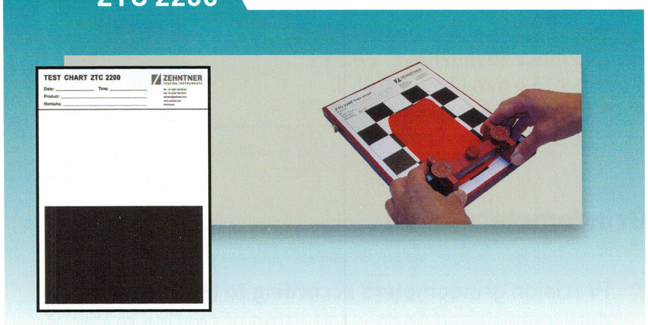
Ink-Lox proofer

- Laboratory test apparatus with various engraved and rubber rollers for application of defined layers of flexographic inks and other liquid coating materials on flat substrates
- High repeatability
- Easy to handle
- Made of plastic (handle), red anodised aluminium (frame), stainless steel (engraved rollers) and rubber (rubber rollers)

Engraved roller no.	No. of cells	Cell volume	Cell depth
80	80/cm (200/in)	10.01 cm³/m² (56.75x10^{-3} in³/ft²)	45 µm (1.77 mil)
120	120/cm (300/in)	8.40 cm³/m² (47.62x10^{-3} in³/ft²)	40 µm (1.57 mil)
140	140/cm (350/in)	6.10 cm³/m² (34.58x10^{-3} in³/ft²)	31 µm (1.22 mil)
160	160/cm (400/in)	4.10 cm³/m² (23.24x10^{-3} in³/ft²)	24 µm (0.94 mil)
180	180/cm (450/in)	3.80 cm³/m² (21.54x10^{-3} in³/ft²)	20 µm (0.79 mil)

Rubber roller no.	Property	Shore hardness
h	hard (rubber)	70° Sh A
s	hard (silicone)	70° Sh A
w	soft (rubber)	40° Sh A

ZTC 2200

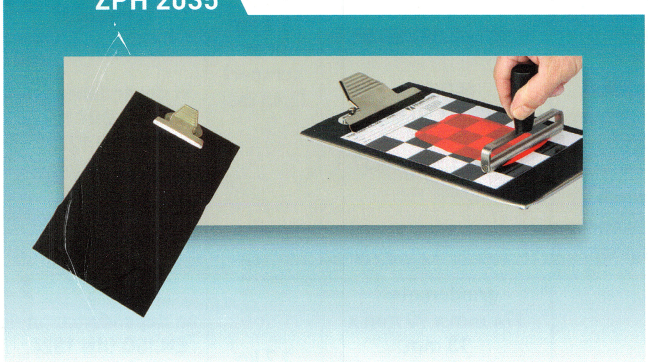


Test charts

- Test charts are a perfect substrate for preparing uniform films or wedge-shaped layers of coating materials, adhesives and similar products on flat substrates
- Determination of hiding power by visual inspection or with a reflectometer 45/0°
- High quality test charts in various sizes and designs, laminated or unlaminated, with or without optical brightener
- Easy to handle

Versions	Design:	square foot	horizontally half/half	zebra
	Dimensions:	A3 (297 mm x 420 mm x 0.05 mm) (11.69" x 16.54" x 0.002"), A4 (210 mm x 297 mm x 0.05 mm) (8.27" x 11.69" x 0.002"), A5 (148 mm x 210 mm x 0.05 mm) (5.83" x 8.27" x 0.002") or A6 (105 mm x 148 mm x 0.05 mm) (4.13" x 5.83" x 0.002")		
	Optical brightener:	with, not suitable for colour measurements or without, suitable for colour measurements		
	Lamination:	laminated and unlaminated		
Colour	white: 80-90 L-values, black: <7 L-values			
Warranty	none			

ZPH 2035



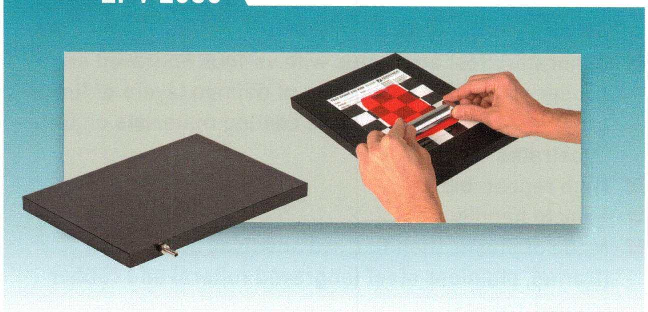
Specimen holder

- Specimen holder for fixing a variety of substrates, especially test charts for preparing uniform films of coating materials, adhesives and similar products in combination with wire-bar applicators or profile rods
- With clamp fixture for easy fixing
- Perfect for rapid applications e.g. in the production or reception control
- Easy to handle
- Made of anodised aluminium (base plate), rubber coated cotton (printing blanket) and chromium-plated steel (clamp fixture)

Versions	Dimensions (LxWxH)	Max. substrate dimensions	Weight
ZPH 2035.A5	300 mm x 172 mm x 40 mm (11.81" x 6.77" x 1.57")	A5: 260 mm x 172 mm x 5 mm (10.24" x 6.77" x 0.20")	582 g (1.28 lbs)
ZPH 2035.A4	410 mm x 260 mm x 40 mm (16.14" x 10.24" x 1.57")	A4: 370 mm x 260 mm x 5 mm (14.57" x 10.24" x 0.20")	1'157 g (2.55 lbs)
ZPH 2035.220.120	220 mm x 120 mm x 40 mm (8.66" x 4.72" x 1.57")	180 mm x 120 mm x 5 mm (7.09" x 4.72" x 0.20")	318 g (0.70 lbs)
ZPH 2035.S	on request	depending on version	

Warranty	none

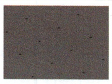
ZPV 2030



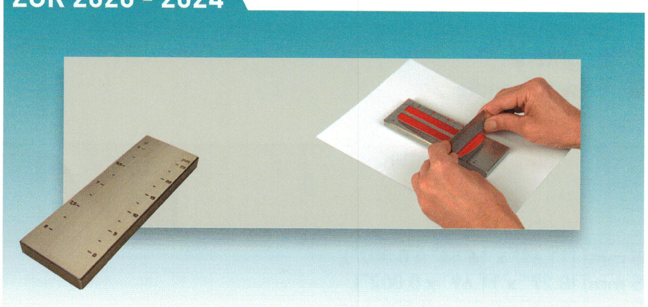
Precision-vacuumplates

- Totally flat precision-vacuumplates for fixing a large number of substrates
- For preparing uniform films of coating materials, adhesives and similar products with applicators
- For use in laboratories and in the field
- For silk-screen printing
- Made of black, hard finish, solvent-resistant aluminium
- Optionally, we offer a vacuum pump with a pumping capacity of 3.5 m³/h (123.6 ft³/h)

Versions	Dimensions (LxWxH)	Size of hole	Distance of hole	Weight
ZPV 2030.A4	307 mm x 220 mm x 20 mm (12.09" x 8.66" x 0.79")	Ø 1 mm (0.04")	14.4 mm x 14.4 mm (0.57" x 0.57")	3.0 kg (6.61 lbs)
ZPV 2030.S.A4.05mm		Ø 0.5 mm (0.02")		
ZPV 2030.A3	434 mm x 310 mm x 20 mm (17.09" x 12.20" x 0.79")	Ø 1 mm (0.04")	16.6 mm x 16.6 mm (0.65" x 0.65")	6.0 kg (13.23 lbs)
ZPV 2030.S.A3.05mm		Ø 0.5 mm (0.02")		
ZPV 2030.S	on request, length: from 10 mm to 1'900 mm (0.39" - 74.80"), width: from 10 mm to 1'300 mm (0.39" - 51.18")	on request	depending on version	depending on version

Vacuum	up to -0,8 bar		
Space without vacuum (distance of hole, groups of holes, resp.)	 zoom 1 mm	2030.A4: 14.4 mm x 14.4 mm (0.57" x 0.57"), 2030.A4.05mm: 10.5 mm x 10 mm (0.41" x 0.39") 2030.A3: 16.6 mm x 16.6 mm (0.65" x 0.65"), 2030.A3.05mm: 16.8 mm x 16.4 mm (0.66" x 0.65")	 zoom 0.5 mm

ZGR 2020 - 2024

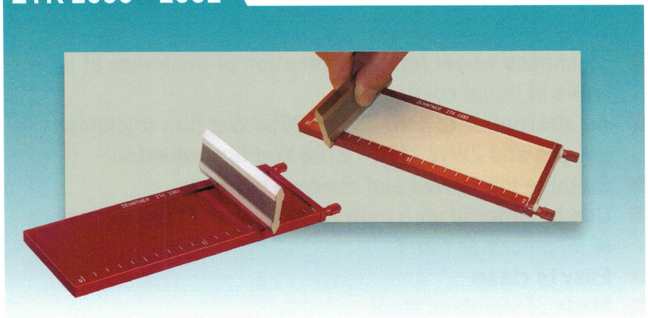


Grindometers

- Precision grindometers according to Hegman for determination of fineness of grind of coating materials, printing inks, pastes and similar products
- Easy to handle
- Easy to clean
- Made of hardened stainless steel
- Optionally, we offer ZRT 2025 Groove depth meter for a rapid and exact checking of grindometers

Versions	No. of grooves	Depth of the grooves		Dimensions (LxWxH)	Weight	Standards
ZGR 2020	2	0 µm - 100 µm (0 mil - 3.94 mil)	8 - 0 Hegman	grindometer: 174 mm x 60 mm x 13 mm (6.85" x 2.36" x 0.51") scraper: 75 mm x 40 mm x 8 mm (2.95" x 1.57" x 0.32")	1.2 kg (incl. scraper) (2.65 lbs)	EN ISO DIN 1524, ASTM D 1210, ASTM D 1316, EN 21524 (withdrawn in June 2002)
ZGR 2021		0 µm - 50 µm (0 mil - 1.97 mil)	8 - 4 Hegman			
ZGR 2022		0 µm - 25 µm (0 mil - 0.98 mil)	8 - 6 Hegman			
ZGR 2023		0 µm - 15 µm (0 mil - 0.59 mil)	8 - 6,8 Hegman			
ZGR 2020.S.1.34.0.100	1	0 µm - 100 µm (0 mil - 3.94 mil)	8 - 0 Hegman			in dependence on: EN ISO DIN 1524, ASTM D 1210, ASTM D 1316, EN 21524 (withdrawn in June 2002)
ZGR 2021.S.1.34.0.50		0 µm - 50 µm (0 mil - 1.97 mil)	8 - 4 Hegman			
ZGR 2022.S.1.34.0.25		0 µm - 25 µm (0 mil - 0.98 mil)	8 - 6 Hegman			
ZGR 2023.S.1.34.0.15		0 µm - 15 µm (0 mil - 0.59 mil)	8 - 6,8 Hegman			
ZGR 2024.0.100.0.50.0.25	3	0 µm - 100 µm (0 mil - 3.94 mil), 0 µm - 50 µm (0 mil - 1.97 mil) and 0 µm - 25 µm (0 mil - 0.98 mil)	-	grindometer: 174 mm x 90 mm x 13 mm (6.85" x 3.54" x 0.51") scraper: 100 mm x 40 mm x 7 mm (3.94" x 1.57" x 0.28")	1.7 kg (incl. scraper) (3.75 lbs)	in dependence on: EN ISO DIN 1524, ASTM D 1210, ASTM D 1316, EN 21524 (withdrawn in June 2002)
ZGR 2024	on request	on request, 0 µm - 1000 µm (0 mil - 39.37 mil)	on request, 8 - 0 Hegman, others in µm	depending on version		

ZTK 2060 - 2062

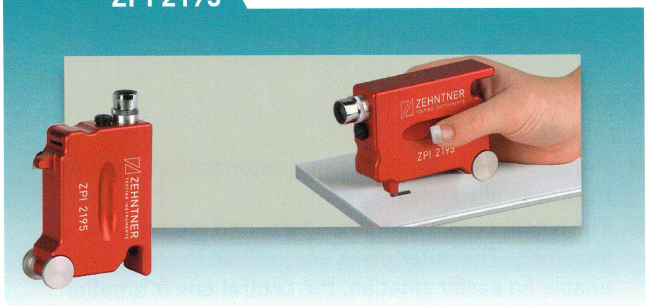


Drying gauges

- Gauges for testing coating materials and fillers for drying properties, shrinking, mud-crack, cracking and porosity
- Easy to handle
- Reliable results
- Easy to clean
- Made of red, hard finish, solvent-resistant aluminium (gauge) and hardened stainless steel (scraper)

Versions	Test range	Graduation	Test area
ZTK 2060	0 mm to 3,0 mm (0" to 0.12")	0,1 mm (3.94 mil)	300 mm x 60 mm (11.81" x 2.36")
ZTK 2061	0 mm to 2,0 mm (0" to 0.08")	0,1 mm (3.94 mil)	200 mm x 60 mm (7.87" x 2.36")
ZTK 2062	on request	on request	on request

ZPI 2195

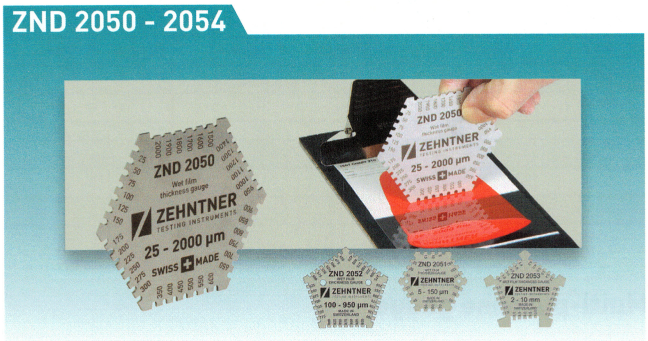


Paint inspection gauge (PIG)

- Destructive determination of dry film thickness of all types of single- or multi-coat systems using the wedge cut method as well as microscopic assessment in order to detect substrate and application defects
- Handy cutter holder for protecting the cutter, ensures clear vision for the correct positioning of the cutter
- Guide wheels for carrying out straight wedge cuts
- Made of red anodised aluminium

Accuracy	± 10% of the value or ± 1 scale division, with a lower limit of 2 µm (0.08 mil), respectively
Microscope	magnification: 50x, scale: 0 mm to 2.5 mm (0" to 0.10"), scale division: 20 µm (0.79 mil)
Power supply	1 battery alkali type AA, 9 V
Dimensions (LxWxH)	110 mm x 86 mm x 26 mm (4.33" x 3.39" x 1.02")
Weight	380 g (0.84 lbs)
Standards	ASTM D 4138, EN ISO 2808, DIN 50986

ZND 2050 - 2054

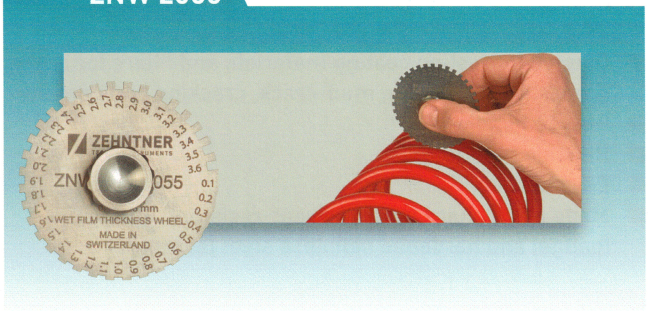


Wet film thickness gauges

- Comb gauges for determination of thickness of all types of liquid coatings
- An alternative to ZNW 2055 Wet film thickness wheel and ZWW 2100 - 2108 Wet film wheels
- Can be ordered with individual company logo for orders of 40 pieces or more
- Easy to clean
- Made of stainless steel except ZND 2050.A which is made of aluminium

Versions	Test range	Resolution	Standards
ZND 2050	25 µm - 2'000 µm (1 mil - 80 mil) (hexagonal)	25 - 300 µm (1 mil - 12 mil): 25 µm (1 mil); 300 - 1'000 µm (12 mil - 40 mil): 50 µm (2 mil); 1'000 - 2'000 µm (40 mil - 80 mil): 100 µm (4 mil)	EN ISO DIN 2808, ASTM D 4414, ASTM D 713 ZND 2052: additional ZTV-M 02
ZND 2050.A	25 µm - 2'000 µm (1 mil - 80 mil) (hexagonal)	25 - 300 µm (1 mil - 12 mil): 25 µm (1 mil); 300 - 1'000 µm (12 mil - 40 mil): 50 µm (2 mil); 1'000 - 2'000 µm (40 mil - 80 mil): 100 µm (4 mil)	
ZND 2051	5 µm - 150 µm (0.20 mil - 5.91 mil) (hexagonal)	5 µm - 45 µm (0.20 mil - 1.77 mil): 5 µm (0.20 mil); 50 µm - 110 µm (1.97 mil - 4.33 mil): 10 µm (0.39 mil); 110 µm - 150 µm (4.33 mil - 5.91 mil): 20 µm (0.79 mil)	
ZND 2052	100 µm - 950 µm (3.94 mil - 37.40 mil) (pentagonal)	25 µm (0.98 mil)	
ZND 2053	2 mm - 10 mm (0.08" - 0.39") (pentagonal)	2 mm - 6 mm (0.08" - 0.24"): 0.2 mm (7.87 mil) 6 mm - 10 mm (0.24" - 0.39"): 0.5 mm (19.69 mil)	
ZND 2054	on request	on request	

ZNW 2055

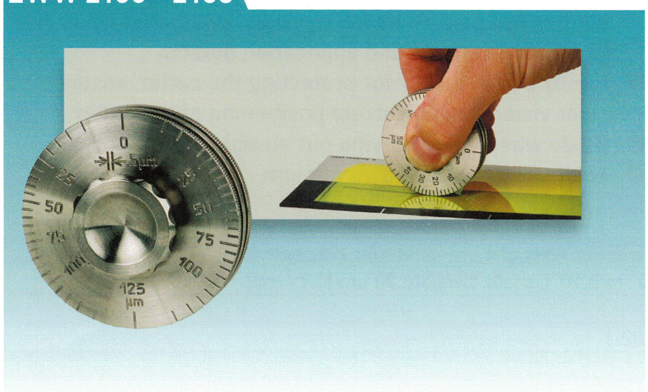


Wet film thickness wheel

- Thickness wheel for determination of thickness of all types of liquid coatings
- An alternative to ZND 2050 - 2054 Wet film thickness gauges and ZWW 2100 - 2108 Wet film wheels
- Suitable for convex and concave surfaces
- Can be ordered with individual company logo for orders of 40 pieces or more
- Easy to clean
- Made of stainless steel

Versions	Test range	Resolution	Standards
2055.05	5 µm - 180 µm (0.20 mil - 7.09 mil)	5 µm (0.20 mil)	EN ISO DIN 2808, ASTM D 4414, ZNW 2055.50: additional ZTV-M 02
2055.25	25 µm - 900 µm (0.98 mil - 35.43 mil)	25 µm (0.98 mil)	
2055.50	25 µm - 2'000 µm (1 mil - 80 mil)	25 - 300 µm (1 mil - 12 mil): 25 µm (1 mil); 300 - 1'000 µm (12 mil - 40 mil): 50 µm (2 mil); 1'000 - 2'000 µm (40 mil - 80 mil): 100 µm (4 mil)	
2055.01	100 µm - 3'600 µm (3.94 mil - 141.73 mil)	100 µm (3.94 mil)	
2055.S	on request	on request	

ZWW 2100 - 2108



Wet film wheels

- Precision instrument for rapid determination of film thickness of wet coatings
- The wheel consists of three disks and the finger grip assembly. The outer disks are profiled in order to enable an easier rotation, the central one is smaller in diameter and eccentric, thus providing a groove with increasing depth
- An alternative to ZND 2050 - 2054 Wet film thickness gauges and ZNW 2055 Wet film thickness wheel
- Easy to operate and clean
- Sturdy and extremely durable
- Made of stainless steel

Versions	Test range	Resolution	Versions	Test range	Resolution
ZWW 2100	0 µm - 25 µm (0 mil - 0.98 mil)	1 µm (0.04 mil)	ZWW 2105	500 µm - 1'000 µm (19.69 mil - 39.37 mil)	20 µm (0.79 mil)
ZWW 2101	0 µm - 50 µm (0 mil - 1.97 mil)	2 µm (0.08 mil)	ZWW 2106	0 µm - 1'000 µm (0 mil - 39.37 mil)	50 µm (1.97 mil)
ZWW 2102	0 µm - 125 µm (0 mil - 4.92 mil)	5 µm (0.20 mil)	ZWW 2107	0 µm - 1'500 µm (0 mil - 59.06 mil)	50 µm (1.97 mil)
ZWW 2103	0 µm - 250 µm (0 mil - 9.84 mil)	10 µm (0.39 mil)	ZWW 2108	on request	
ZWW 2104	0 µm - 500 µm (0 mil - 19.69 mil)	20 µm (0.79 mil)			

Dimensions (LxØ)	22 mm x Ø 50 mm (0.87" x Ø 1.97")
Weight	approx. 165 g (0.36 lbs)
Standards	EN ISO DIN 2808, ASTM D 1212

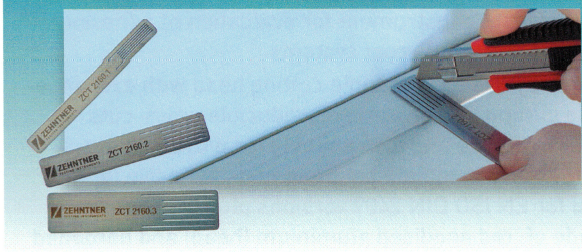
ZMG 2151

Multi-purpose gauge

- Multi-purpose surface testing equipment: Cross-cut tester for adhesion assessment of thin and thick single or multi-coat systems, applicator for preparation of wedge-shaped layers of coating materials, levelling applicator for determination of levelling properties and wet-film thickness gauge for testing the film thickness
- 6 different cross-cut tests with easy positioning by use of a vision panel integrated in one instrument, amongst others the lattice pattern with 11 cuts according to ASTM D 3359
- Made of stainless steel

Testing ranges	gap heights: 0 mm to 2 mm (0" - 0.08"), levelling: 0.25 mm to 4.0 mm (0.01" - 0.16"), wet film thickness: 50 µm to 500 µm (1.97 mil - 19.69 mil), cross-cut: 1 mm (0.04"), 1.5 mm (0.06"), 2 mm (0.08"), 3 mm (0.12") and X-cut
Dimensions (LxWxH)	81 mm x 68 mm x 1 mm (3.19" x 2.68" x 0.04")
Weight	36 g (0.08 lbs)
Standards	ASTM D 3359, ASTM D 6677, EN ISO 2409, EN ISO 2808
Warranty	none

ZCT 2160

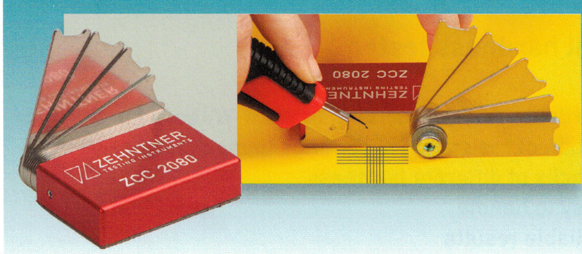


Cross-cut templet

- Small, sturdy test equipment for determination of adhesion of thin and thick, hard single or multi-coat systems
- Particularly suitable for the smallest substrates which are most difficult to access, as for example profiles
- Easy to handle
- Made of stainless steel

Dimensions (LxWxH)	1 mm (0.04") templet: 82 mm x 9.5 mm x 1 mm (3.23" x 0.37" x 0.04"); 2 mm (0.08") templet: 82 mm x 14.5 mm x 1 mm (3.23" x 0.57" x 0.04"); 3 mm (0.12") templet: 82 mm x 19.5 mm x 1 mm (3.23" x 0.77" x 0.04"); minimum size of support (it is assumed that the cuts are each 2 mm (0.08") longer than the lattice pattern): 1 mm (0.04") templet: 12 mm x 12 mm (0.47" x 0.47"); 2 mm (0.08") templet: 18 mm x 18 mm (0.71" x 0.71"); 3 mm (0.12") templet: 24 mm x 24 mm (0.94" x 0.94")
Weight	1 mm (0.04") templet: 5.6 g (0.20 oz); 2 mm (0.08") templet: 8.8 g (0.31 oz); 3 mm (0.12") templet: 11.8 g (0.42 oz)
Standards	ASTM D 3359, EN ISO 2409

ZCC 2080



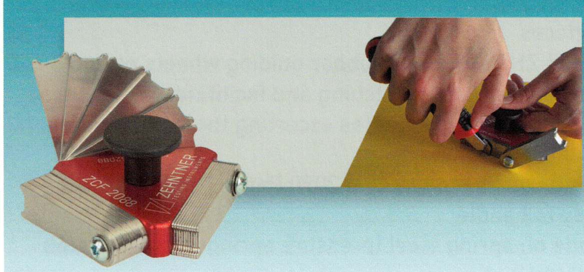
Cross-cut tester

- Sturdy test equipment for determination of adhesion of thin and thick single or multi-coat systems
- Easy to handle
- Made of red anodised aluminium (main body), stainless steel (shims)

Versions	Shims	Standards	Set
ZCC 2080.1K	10 x 1 mm (0.04")	ASTM D 3359, EN ISO 2409	with NT-cutter, adhesive tape
ZCC 2080.3K	6 x 3 mm (0.12")	EN ISO 2409	
ZCC 2080.1G	10 x 1 mm (0.04")	ASTM D 3359, EN ISO 2409	with NT-cutter, adhesive tape, brush and magnifier
ZCC 2080.3G	6 x 3 mm (0.12")	EN ISO 2409	

Dimensions (LxWxH)	65 mm x 60 mm x 15 mm (2.56" x 2.36" x 0.59")
Weight	285 g (0.63 lbs)

ZCF 2088



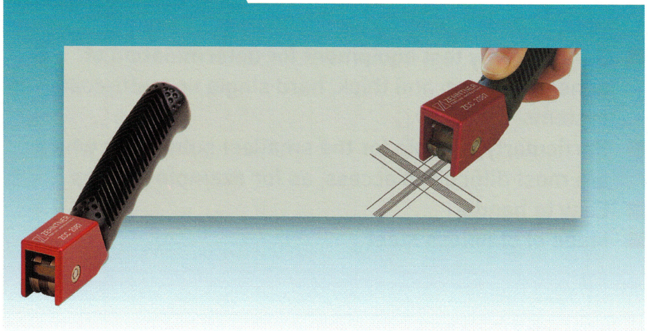
Cross-cut tester

- Sturdy test equipment for determination of adhesion of thin and thick single or multi-coat systems
- The unit is equipped with shims for 1 mm (0.04"), 2 mm (0.08") and 3 mm (0.12") cutting spaces and is hence suitable for all film thicknesses
- An alternative to our ZCC 2080 Cross-cut tester with an ergonomic handle for more comfortable and less tiring handling
- Made of red anodised aluminium (main body), stainless steel (shims) and plastic (handle)

Versions	Shims	Standards	Set
ZCF 2088.K	11 x 1 mm (0.04"), 6 x 2 mm (0.08") and 6 x 3 mm (0.12")	ASTM D 3359, EN ISO 2409	with NT-cutter and adhesive tape
ZCF 2088.G			with NT-cutter, adhesive tape, brush and magnifier

Dimensions (LxWxH)	90 mm x 90 mm x 42 mm (3.54" x 3.54" x 1.65")
Weight	440 g (0.97 lbs)

ZCC 2087

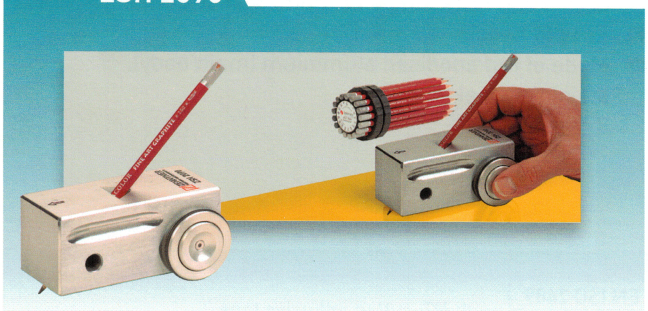


Cross-cut tester

- Sturdy testing instrument for evaluation of adhesion of single- or multi-coat systems
- Specially designed flexible cutting head with exchange-able cutting tool ensures reproducible cross-cuts
- Easy to handle and also suitable for untrained users
- Comes as a complete set (magnifier, adhesive tape and for EN ISO DIN 2409 versions plus brush)
- Made of: red anodised aluminium (head) and hardened steel (multi-blade cutting tool)

Versions	No. of cutting tools with no. of blades	Spacing of blades	Standards	Dimensions (LxWxH)	Weight
ZCC 2087.1	1 x 6	1 mm (0.04")	EN ISO DIN 2409	160 mm x 26 mm x 80 mm (6.30" x 1.02" x 3.15")	245 g (0.54 lbs)
ZCC 2087.2	1 x 6	2 mm (0.08")			
ZCC 2087.3	1 x 6	3 mm (0.12")			
ZCC 2087.4	3 x 6	1 mm, 2 mm and 3 mm (0.04", 0.08", 0.12")			
ZCC 2087.5	1 x 11	1 mm (0.04")	ASTM D 3359		
ZCC 2087.6	1 x 6	2 mm (0.08")			
ZCC 2087.15	1 x 6	1.5 mm (0.06")	-		

ZSH 2090

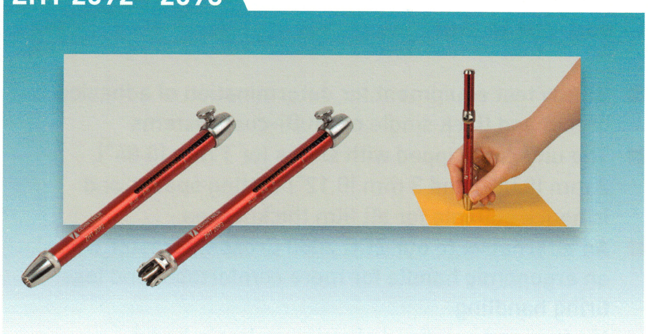


Pencil hardness tester

- Hardness tester according to Wolff-Wilborn for determi-nation of resistance of coatings to mechanical stress by pencils of different hardness
- Easy to handle
- Reliable results
- No maintenance required
- Made of steel (hardness tester), wood and graphite (pencils)

Dimensions (LxWxH)	110 mm x 80 mm x 58 mm (4.33" x 3.15" x 2.28")
Weight	2.1 kg (4.63 lbs) net, 2.7 kg (5.95 lbs) gross incl. accessories
Standards	EN ISO 15184, EN 13523-4, ASTM D 3363, NEN 5350, SIS 184187, SNV 37113, ECCA-T 4, MIL C 27 227

ZHT 2092 - 2093

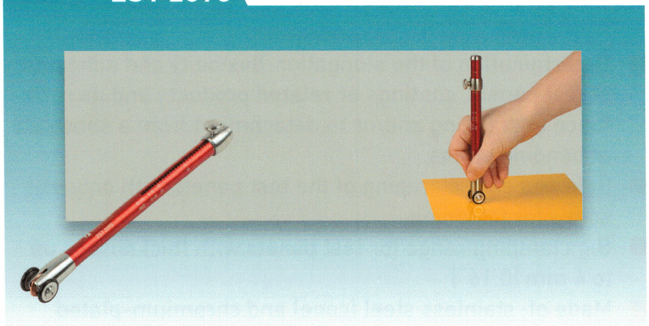


Pocket hardness tester

- Pocket tester for hardness tests on flat and curved surfaces
- Model ZHT 2093 with rubber guiding wheels protects soft surfaces against scratching and facilitates assessment
- Optional trolley facilitates excerting the correct pressure on the test panel
- An alternative to the ZSH 2090 Pencil hardness tester
- Easy to handle
- Made of: spring steel (pressure springs) and tungsten carbide (tip)

Versions	Testing head	Pictures testing head	Dimensions (LxØ)	Weight	Standards
ZHT 2092	standard		170 mm x Ø 15 mm (6.69" x Ø 0.59")	78 g (0.17 lbs)	DIN 55656
ZHT 2093	with rubber guiding wheels			73 g (0.16 lbs)	

ZST 2095



Mar resistance tester

- Pocket tester for determination of scratch resistance on painted or plastic surfaces
- Three colour coded pressure springs exert an adjustable force onto the test disc
- By means of the colour code on the scale the adjusted power can be read off easily
- Made of spring steel (pressure springs) and duroplast, copper, steel and PMMA (test discs)

Dimensions (LxØ)	190 mm x Ø 15 mm (7.48" x Ø 0.59")
Weight	94 g (0.21 lbs)
Standards	DIN 55656

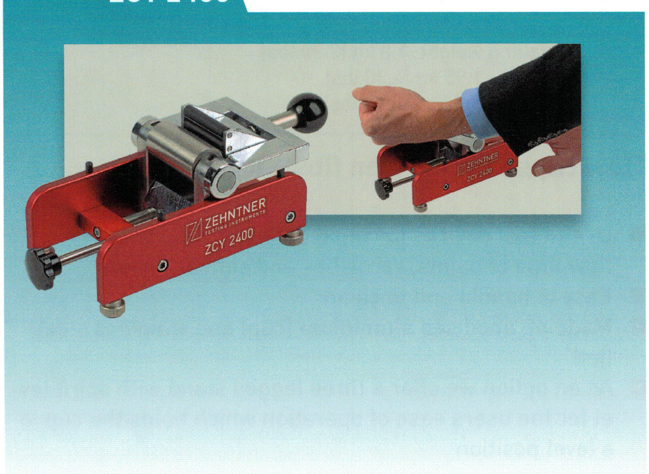
ZSF 2196

Scratching tool

- Scratching tool for carrying out scribe marks through coatings on metal substrates for corrosion testing or for cross-cut tests on curved surfaces
- Ergonomic design for comfortable and fatigue-proof handling
- Fast and easy changing of hard metal cutters for carrying out scribe marks according to Sikkens or Clemen or for cross-cut tests on curved surfaces, respectively
- Easy to handle
- Made of red anodised aluminium (scratching tool) and carbide (hard metal cutter)

Versions	Hard metal cutter	Standards	Dimensions (LxWxH)
2196.C	according to Clemen	ISO/DIS 17872	110 mm x 80 mm x 58 mm (4.33" x 3.15" x 2.28")
2196.S	1 mm (0.04") according to Sikkens		
2196.S0.5	0.5 (0.02") mm according to Sikkens		
2196.ZCC	for cross-cut	ASTM D 3359, EN ISO 2409	

ZCY 2400



Cylindrical mandrel tester

- Determination of the elongation/flexibility and adhesion of test panels, coatings or related products and its resistance to cracking and/or to detachment from a substrate at bending stress.
- Application of the bend test as quick pass/fail test with a single mandrel of specified diameter or as repeated procedure with decreasing mandrel diameters for determining the diameter of the first mandrel causing failure
- Innovative extra sturdy mandrels enable bending of comparatively thicker test panels and the use of comparatively smaller mandrel diameters
- Generously sized test area allows testing of larger test panels
- Made of: stainless steel (mandrels) and red anodised aluminium (housing)

Versions	Mandrel	Dimensions (LxWxH)	Test panels	Weight	Standards
2400.A.G	6 mandrels with diameter: 3.2 mm (0.13"), 6.4 mm (0.25"), 9.5 mm (0.37"), 12.7 mm (0.50"), 19 mm (0.75"), 25 mm (0.98")	230 mm x 158 mm x 115 mm (9.06" x 6.22" x 4.53")	max. width: 100 mm (3.94")	3.725 kg (8.21 lbs)	ASTM D 522
2400.A.K		230 mm x 123 mm x 115 mm (9.06" x 4.84" x 4.53")	max. width: 45 mm (1.77")	2.925 kg (6.45 lbs)	
2400.I.G	12 mandrels with diameter: 2 mm (0.08"), 3 mm (0.12"), 4 mm (0.16"), 5 mm (0.20"), 6 mm (0.24"), 8 mm (0.31"), 10 mm (0.39"), 12 mm (0.47"), 16 mm (0.63"), 20 mm (0.79"), 25 mm (0.98"), 32 mm (1.26")	230 mm x 158 mm x 115 mm (9.06" x 6.22" x 4.53")	max. width: 100 mm (3.94")	3.725 kg (8.21 lbs)	EN ISO 1519
2400.I.K		230 mm x 123 mm x 115 mm (9.06" x 4.84" x 4.53")	max. width: 45 mm (1.77")	2.925 kg (6.45 lbs)	

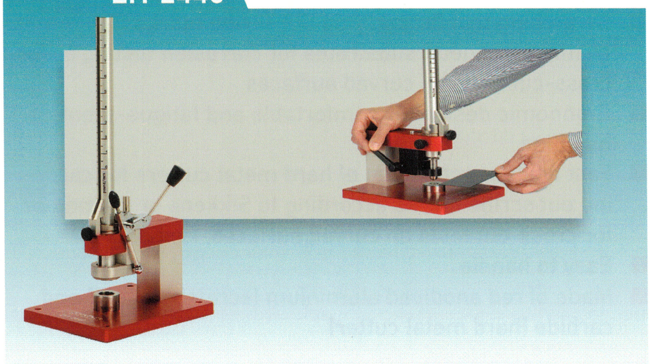
ZCO 2410

Conical mandrel tester

- Determination of the elongation/flexibility and adhesion of test panels, coatings or related products and its resistance to cracking and/or to detachment from a substrate at bending stress.
- Safe and easy clamping of the test panels with only one screw for fastening
- Big clamping range for test panels with thicknesses up to 4 mm (0.16")
- Made of: stainless steel (cone) and chromium-plated steel (remaining parts)

Dimensions (LxWxH)	instrument: 324 mm x 350 mm x 150 mm (12.76" x 13.78" x 5.91"), cone: length 203 mm (7.99"), greatest Ø: 38 mm (1.50"), smallest Ø: 3,1 mm (0.12") test panels: length: max. 200 mm (7.87"), width: max. 130 mm (5.12"), thickness: max. 1 mm (0.04") at steel, max. 2 mm (0.08") at aluminium, max. 4 mm (0.16") at materials with less bending stress than aluminium
Weight	10.7 kg (23.59 lbs)
Standards	ASTM D 522, EN ISO 6860:2004-12, FTMS 141a methods 6222, 6223

ZIT 2440



Impact tester

- Determination of impact resistance, deformability and elongation of coatings and substrates as well as adhesion of the coating
- A quick clamping device facilitates insertion and fixing of the sample
- The indenter can easily be lifted after the test in order to facilitate removal of the sample
- Suitable for single- and multiple-layer systems
- No maintenance necessary
- Easy and safe to handle
- Made of anodised aluminium

Versions	Dimensions		Weights	Standards
Basic set ZIT 2440.G	adjustable falling height: graduation resolution: total length guide tube:	max. 101.6 cm (40.00") 1 cm (0.39") and 0.50" 137 cm (53.94")	sada.: 4.9 kg (10.80 lbs)	
Set ZIT 2440.A	indenter Ø: die inside Ø: die outside Ø: thickness of test panel:	15.9 mm (0.63") 16.3 mm (0.64") 44 mm (1.73") max. 1 mm (0.04")	falling weight: 0.91 kg (2.01 lbs) Sada.: 1.95 kg (4.30 lbs) total: 6.6 kg (14.55 lbs)	ASTM D 2794 (ISO 6272-2)
Set ZIT 2440.I	hemispherical head Ø: die inside Ø: die outside Ø: thickness of test panel:	20 mm (0.79") 27 mm (1.06") 44 mm (1.73") max. 4 mm (0.16")	falling weight: 1.0 kg (2.20 lbs) Sada.: 1.95 kg (4.30 lbs) total: 6.85 kg (15.10 lbs)	ISO 6272-1

ZFC 3010 - 3015

Flow cups / Immersion flow cups

- Useful test devices for rapid determination of flow time of paints, varnishes and similar liquids
- Easy to handle and to clean
- Made of: anodised aluminium (cup) and stainless steel (jet)
- As an option we offer a three legged stand with spirit level for the users ease of operation which holds the cup in a level position

Versions	Cup	With fixed jet	Standards	Image
ZFC 3010	flow cup (Ford)	No. 1, 2, 3, 4 or 5	ASTM D 1200	
ZFC 3011	flow cup	No. 1, 2, 3, 4, 5, 6, 7 or 8	DIN 53211 (only jet No. 4, withdrawn in October 1996)	
ZFC 3012	immersion flow cup	No. 1, 2, 3, 4, 5, 6, 7 or 8	DIN 53211 (only jet No. 4, withdrawn in October 1996)	
ZFC 3013	flow cup	No. 3, 4, 5 or 6	EN ISO 2431	
ZFC 3014	immersion flow cup	No. 3, 4, 5 or 6	EN ISO 2431	
ZFC 3015	immersion flow cup (Ford)	No. 1, 2, 3, 4 or 5	ASTM D 1200	

Temperature control jacket

- Vessel for maintaining consistent temperature during viscosity determination with adjustable tripod and spirit level for secure and even standing
- Viscosity determination at temperatures different from ambient temperature
- Applicable to all flow cups corresponding to the standards
- Easy to handle
- Made of anodised aluminium

Versions	Application / standards	Flow cup	Dimensions (LxWxH)	Weight
3020.ISZ	for cylindrical Zehntner-Flow cups according to DIN 53211 or ASTM D 1200 with adaptor for flow cups according to ISO 2431		180 mm x 210 mm x 260 mm (7.09" x 8.27" x 10.24")	800 g (1.76 lbs)
3020.DFK	for conical Zehntner-Flow cups according to DIN 53211 or ASTM D 1200			750 g (1.65 lbs)
3020.FDF	with adaptors for flow cups of other manufactures according to DIN 53211 or ASTM D 1200			depending on adaptor

Metal pycnometer

- Laboratory device for determination of density of coating materials and similar products, in particular, liquids with low and medium viscosity
- Easy to handle
- Reliable results
- Easy to clean
- Made of stainless steel

Versions	Filling volume	Height / diameter	Manufacturing tolerance	Weight	Standards
3030.50	50 ml	35 mm x Ø 54 mm (1.38" x Ø 2.13")	± 0,2 %, related to the volume; as option ± 0,1 % with certificate of calibration	144.1 g (0.32 lbs)	ASTM D 1475, EN ISO 2811-1, SNV 37100, VDA 621-103 (withdrawn)
3030.100	100 ml	63 mm x Ø 54 mm (2.48" x Ø 2.13")		174.4 g (0.38 lbs)	
3030.S	on request	on request		on request	-

Alphabetical index

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