

...what about
straightness?

STRAIGHT-line®

High-precision straightness measurement with STRAIGHT-line

■ There are several ways of checking straightness, but most of them are so complex and involve so much outlay that operators have to be highly qualified.

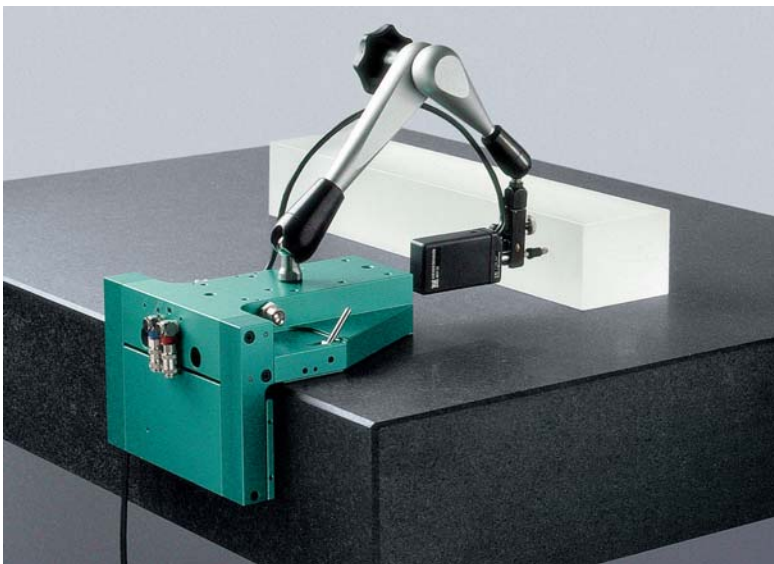
For fast and easy straightness measurement to the highest precision, *Kunz precision* has developed the STRAIGHT-line measuring slide. The special feature of this innovative product is its vacuum air-bearing system.



Air unit SA 50/100

materials are hard stone or ceramic, which can be finished to the highest precision.

Thanks to this sophisticated vacuum air-bearing system, the STRAIGHT-line measuring slide requires only two guideway surfaces, one horizontal and one lateral.



Straightness measurement with STRAIGHT-line 150/3

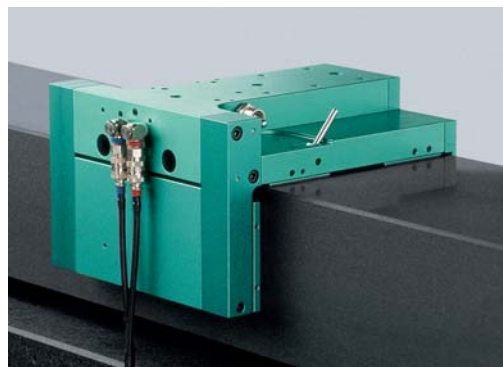
The STRAIGHT-line slide is held by vacuum against the guideways, but direct contact is at the same time prevented by air-bearings. This ensures stable and practically invariable



Straightness measurement with STRAIGHT-line 100

Measurement accuracy largely depends on the precision of these two surfaces. The side plate of the STRAIGHT-line slide is fitted with bearings matching the lateral guideway surface. Not only does this enhance measuring precision, but it significantly reduces guideway production costs.

Since only two guideways are required, completely new possibilities are opened up. For example a test plate with machined lateral guide surface can be used. The high resistance of the lateral guideway to thermal distortion guarantees the highest possible precision under workshop conditions.



Measuring slide STRAIGHT-line 150/4

ble prestressing. The STRAIGHT-line slide is operated from the local compressed air network via an air unit. The best guideway

*Squareness
measurement with
STRAIGHT-line 100*



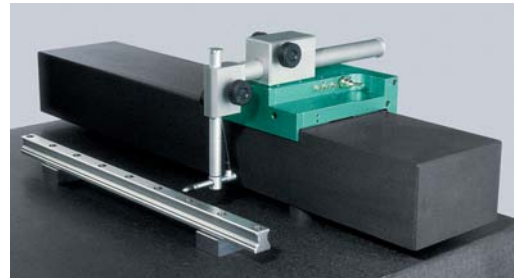
With two machined lateral guideway surfaces, high-precision squareness measurements can be carried out quickly and reliably.

STRAIGHT-line can be automated to various degrees. The simplest and most cost-effective version is with friction gear drive, but fully automated versions are available complete with control system.

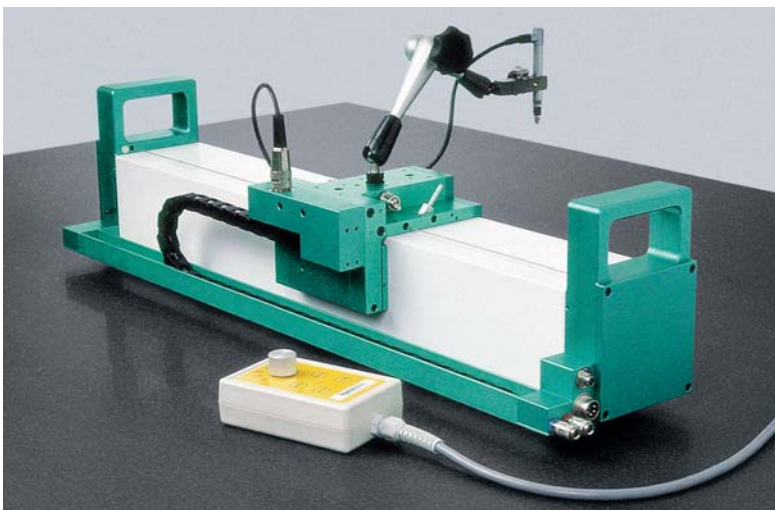
STRAIGHT-set®

STRAIGHT-set, the portable straightness measuring unit

■ STRAIGHT-set is a complete straightness measuring unit on the same basis as STRAIGHT-line, but very easily transportable. The slide is protected against damage by



*Straightness measurement with
STRAIGHT-set 150*



*Special motorized model
STRAIGHT-set in ceramic*

end-stops and clamps. Straightness and parallelity measurements can be carried out quickly and easily in all kinds of locations with this portable unit.

A typical application is fast and reliable linearity measurements on construction sites.

The STRAIGHT-set measuring unit is available in various sizes and versions.

SWISS-precision

Hard stone and ceramic to the highest precision

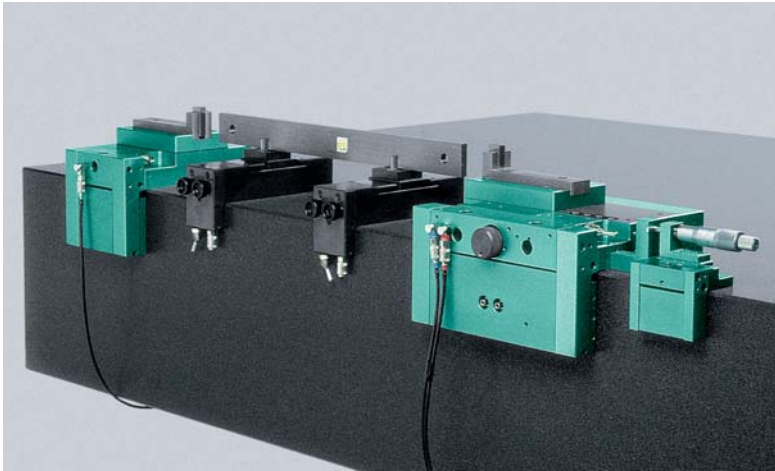
■ Hard stone, ceramic and quartz glass are finished at *Kunz precision* in Zofingen to the very highest precision. Under strict quality control, a wide variety of high-precision products are finished in specially air-conditioned cleanrooms. Based on our vast

experience and know-how, we also undertake customized finishing to the highest standards.

For this demanding work we use the latest metrology equipment, such as laser-interferometers, etc.

STRAIGHT-dist®

High-precision length measurement with STRAIGHT-dist



Length measurement equipment STRAIGHT-dist with fine adjust

■ STRAIGHT-dist, designed on the same principle as STRAIGHT-line, is a high-precision length measuring unit developed for calibration laboratories. This sophisticated system can be used for a wide variety of length measurement applications ranging up to several metres. As length measuring system, a laser-interferometer or electronic scaling system can be used. The laser-interferometer is aligned to the extrapolated measuring axis, this preventing Abbe offset error.

Special equipment is available for true-to-type calibration of gauges, step gauges, glass scales, etc.

STRAIGHT-soft®

STRAIGHT-soft, the high-precision measuring and evaluation software

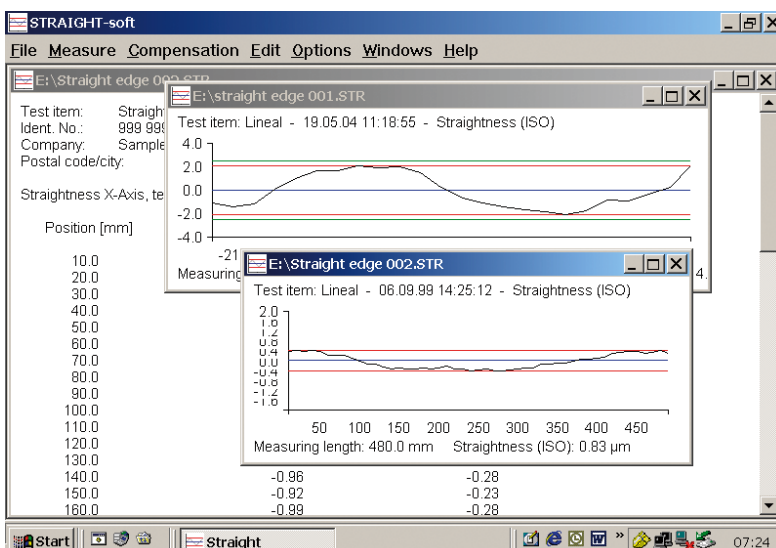
■ STRAIGHT-soft is a simple, user-friendly measuring and evaluation program running under Microsoft Windows. It can be reliably operated even by unpractised users thanks

to menu-based help windows for each application.

STRAIGHT-soft supports users in the acquisition, processing and storage of measurement data. Each element is explained in clear diagrammatic form, and all data is tabulated in the text displays.

Each reading is taken by moving the measuring traverse to the respective position. Coordinates are either entered from the keyboard or taken over directly via the serial interface.

Testpieces do not have to be aligned precisely for measurement, since alignment is automatically computed based on linear regression.



Technical data

STRAIGHT-line®		Typ 100	Typ 150	Typ 200
Overall dimensions	Length	120 mm	170 mm	190 mm
	Depth	110 mm	170 mm	230 mm
	Height	85 mm	115 mm	115 mm
Required guide surface area	horizontal lateral	100 mm 60 mm	145 mm 75 mm	195 mm 75 mm
Vacuum air-bearings	topface	4	3 or 4	4
Mass		1200 g	2550 g	4200 g
Vacuum suction force	horizontal	> 70 N	> 200 N	> 220 N
	vertical	>120 N	> 220 N	> 270 N
Standard repetition accuracy**		0.30 µm	0.30 µm	0.30 µm
	Ultra-precision (optional) **	0.05 µm	0.05 µm	0.05 µm
Maximum edge bevelling		5 mm	7 mm	7 mm
Air unit	SA-100	5-10 bar <40 l/min	5-10 bar <40 l/min	5-10 bar <40 l/min
Optionally mototrised	intern	no	yes	yes
	extern	yes	yes	yes

Recommended guideway surface quality: DIN 876/00

STRAIGHT-set®	Typ 100	Typ 150	Typ 200
Straightedge: Height (with feet + 20 mm) Width Length (other dimensions upon request)	70 mm	100 mm	150 mm
	100 mm	150 mm	200 mm
	300, 500, 800 mm	800, 1000, 1200, 1600 mm	1600, 2000, 2500 mm
Standard linear precision *	1µm + 1x10 ⁻⁶ L	1µm + 1x10 ⁻⁶ L	1µm + 1x10 ⁻⁶ L
	Ultra-precision (optional)	0,5µm + 0,5x10 ⁻⁶ L	0,5µm + 0,5x10 ⁻⁶ L
Roll motion	1"	1"	1"
Standard repetition accuracy**	0.30 µm	0.30 µm	0.30 µm
	Ultra-precision (optional) **	0.05 µm	0.05 µm
Mass per 100 mm (without traverse)	1.9 kg	4.0 kg	8.1 kg
Support points (straightedge)	3	3	3
STRAIGHT-line® with counter-support	Typ 100/4	Typ 150/4	Typ 200/4
Air treatment unit SA-100	5-10 bar <40 l/min	5-10 bar <40 l/min	5-10 bar <40 l/min
Motorized slide (optional)	yes	yes	yes

* Precision data apply to the straightedge. Thermal stability 0.1° C. L = traverse distance.
Other qualities (0,2µm + 0,2x10⁻⁶ L) upon request.

** Repetition accuracy does not include for sensor error, and is based on constant compressed air flow under thermally stable conditions.

STRAIGHT-line® and STRAIGHT-set® are made in Switzerland by Kunz precision.
Technical alterations reserved. Patents pending.



■ «Products in highest precision always require exact measuring equipment and measuring procedures. It is our daily challenge to realise even higher accuracy – a challenge which is fascinating and motivating.»

Ernst Kunz



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