Engineering

Quality testing at the highest level

KS Test Engineering

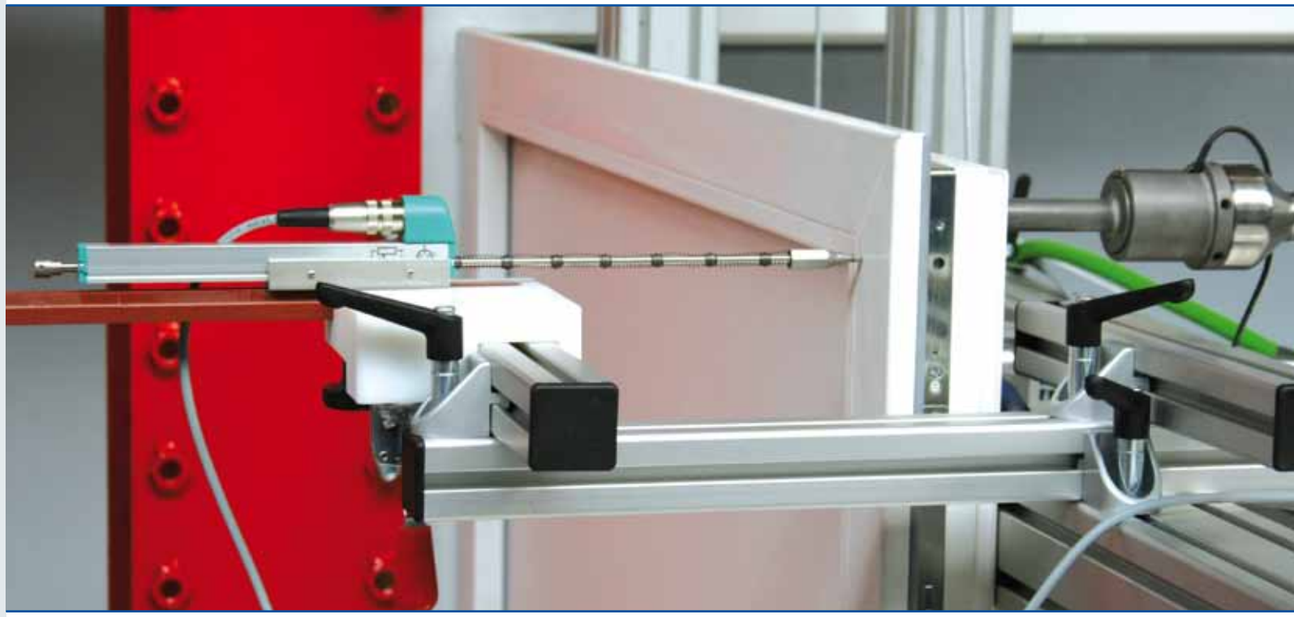
1.950 x Project experience

55 supplying countries

1.950 x Made in Germany

Since 1976 on the market

KS Test Engineering



KS engineering creating values

Often complaints and product defects cause financial problems. But what is more unpleasant that they damage the image. To prevent this, most of the manufacturers of windows and curtain walls play safe and use in their manufacturing plants own test rigs.
This increases the quality and safety standard and is guaranteed well received by the customers.

For decades K.Schulten stands for advanced development and manufacture of test rigs for windows, doors, shutters, gates, curtain walls and fittings at the highest technical level. Our test systems are worldwide in action at providers, window manufacturers, institutes and universities.

Continuous performance tests, aerial survey, test of air permeability and wind resistance tests are only a small selection of tests that can be perfomed with our equipment. They guarantee accurate test readings about the quality and function, independently of material, make and size of the test elements.

Besides the passion for our products the customers needs are our priority. We adjust the test rigs specifically to your needs and continue to set the best technical solution. Since more than 36 years.

Authentic, precise and durable

The **KS Test Rig** for windows, doors, gates, shutters and curtain walls

Air leakage measurements, water tightness tests and wind resistance tests according to european and international standards will be conducted with the KS Test Rig. It is characterized by a reliable continuous operation and provides accurate test readings about quality and function of the test elements.

Numerous materials, makes and sizes of windows can be tested on the equipment. It is available standard in three different formats of heights and widths, as well as available in two construction dephts.

On request we will be pleased to fit the size to your requirements and available space at your site.

Test standards, Germany, Europe			
Test area	Air permeability	Water tightness	Wind resistance at wind load
Windows and doors	EN 1026 EN 12207 EN 14351-1 § 4.14	EN 1027 EN 12208	EN 12210 EN 12211
Curtain walls	EN 12152 EN 12153	EN 12154 EN 12155	EN 12179 EN 13116
Gates	EN 12426 EN 12427	EN 12425 EN 12489	EN 12424 EN 12444
Shutters (external connections)			EN 13659

Test run:	
Brasilien	ABNT NBR 10821-2§6.1 ABNT NBR 10821-3§5-7
Chile	NCH 446 NCH 890 NCH 891 NCH 892
Argentinien	IRAM 11507-5 RAM 11523 IRAM 11590 IRAM 11591
Amerika	ASTM E 283-04 / ASTM E 330-02 / ASTM E 331-00 / ASTM E 2268-04 / AAMA 501

Furtermore test standards that can be tested with KS Test Rigs:
Instruction of the resistance of external wall systems according EN 12865
Air permeability of components EN 12114
Air tightness of shutter boxes according ift-guide line AB-02/1

KS Test Engineering

Manual clamping devices in combination with a solid clamping system provides an optimal sealing of the test room.

Electrical deflection sensor provides accurate results about the deformation of the test block.

The upper test chamber cover can be positioned easily and is also available with motor drive*.

Advantages of the KS Test Rig

- Easy to handle
- Durable, solid construction
- Base plate of stainless steel
- Stable clamping system
- Force-fit assemblage proven by KS Clamping System
- Operator near test block
- Pneumatic quick release*
- Electronic deflection sensor*
- Special size realizable
- Not necessary the mounting of the test block in the frame
- Suitable for different materials and makes
- Size of the elements flexible testable
- Upper test chamber cover is electronically adjustable*
- Low maintenance
- EC- conform
- Size according to customer requirements to implement

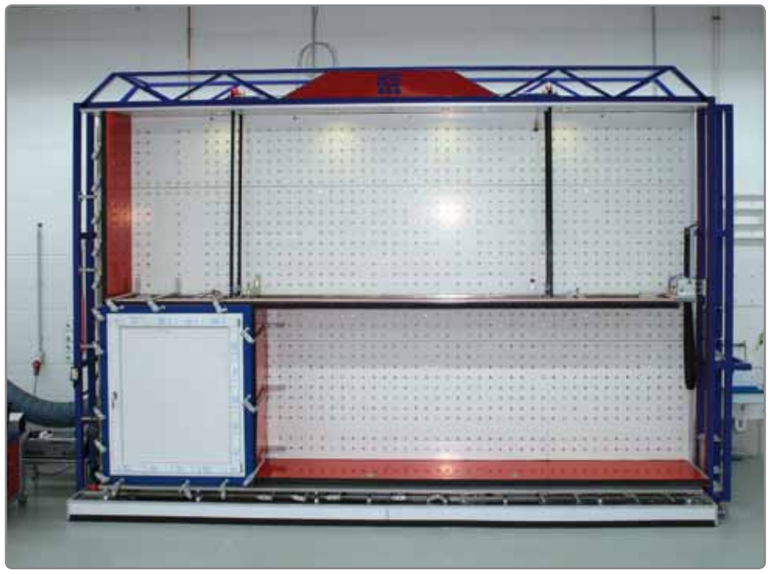


Fig.shows a special model: lightening, rotary fixtures, upper test chamber cover electrically adjustable.

Technical data KS Test Rig			
Prüfanlage	**KS 2223**	**KS 3025**	**KS 4040**
Test block width	2.200 mm	3.000 mm	4.000 mm
Test block height	2.300 mm	2.500 mm	4.000 mm
Test room depth or	450 mm 650 mm	450 mm 650 mm	450 mm 650 mm
External measures width	3.010 mm	3.710 mm	4.710 mm
External measures height	3.100 mm	3.800 mm	4.800 mm
External measure depth or	890 mm 1.090 mm	890 mm 1.090 mm	1.500 mm 1.700 mm
Other sizes without additional charge possible.			

* Optional availabe

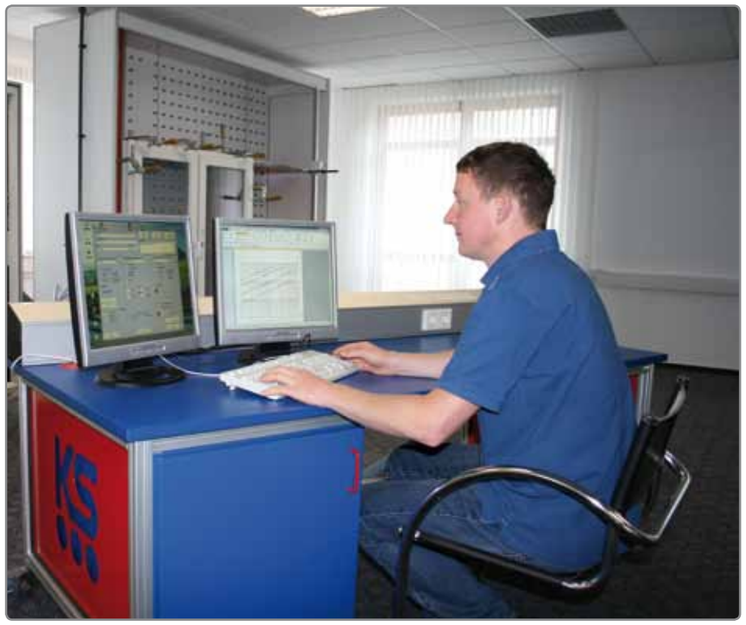
Stainless steel base plate made of stainless steel. Interior wall with aluminium coating.

For a maximum comfort and precise results

The KS PC-Control

The PC-Control test rig for windows, doors and curtain walls is standard equipped with a full automatic PC-Control. The delivery includes - besides the corresponding hard- and software - a desk, a monitor, a keypad and a colour printer.

A maximum comfort offers you the software KS Wacs that regulates and controls the total test rig.
A in-house software programmers have developed the KS Wacs especially for the european and international standard requirements.
It offers complete standard test procedures. All measurement results will be shown as easy understandable as a graph or table. The classification of the measured values in the standard classification the program takes over automatically. Errors in the evaluation will be thereby significantly reduced.



Advantages of KS PC-Control

- Menu guided control according EN standards
- Easy to operate
- Classification of the elements during the test
- Conversion from pascal in all interna tional dimensions (km/h, m/s, Bft, mph) during the test
- Output of the deflection values during the test
- Automatically generate of the test reports
- Directly measurement system in norm m³/h shows precise measure results
- No consideration of correction values necessary due to precise valuation
- Interface for the data transfer in Microsoft Excel
- Demonstration of the measure results in Microsoft Excel and standard logging of the measure results
- Saving the measure data manual or automated
- Easy and precise accessing of the required pressure steps
- Exactly measure values through vernier adjustment of all sensors
- Protective device for the sensors at wrong operating of the test rig
- Remote maintenance online for more comfort
- Prepared by customer network connection

Remote controll via Internet.

KS Test Engineering

Two manual control units for selection

KS MSD Digital und KS ASD Digital

The both manual control units scored with a easy operation and a clearly demonstration of the measurements results. All measuring sensors can be readjust individually. That has got the advantage that the test values will be detected very precise. A protective device avoid sonsors to be damaged by wrong operation.

The KS MSD Digital is controlled comfortable from your desk. All measuring results will be shown on big digital displays.

At the cheaper version the KS ASD Digital are only determined digital a part of the measuring results. Others, for example, the water quantity are shown by measuring tubes.

KS MSD Digital with a big digital display for demonstration of the automatic generated test readings.

KS ASD Digital with manuall water-level control.

Technical data compressor* (examples)	KS PC KS MSD Digital KS ASD Digital	KS PC KS MSD Digital	KS PC KS MSD Digital	KS PC KS MSD Digital
Electrical connection	7 kW	9 kW	18 kW	20 kW
Air connection	1/4“, 6 bar	1/4“, 6 bar	1/4“, 6 bar	1/4“, 6 bar
Water supply**	40-100 l/min, 4-6 bar	40-100 l/min, 4-6 bar	40-100 l/min, 4-6 bar	40-100 l/min, 4-6 bar
Work pressure (+/-) at test rig	3.500 Pa	3.500 Pa	5.000 Pa	6.000 Pa
Air volume flow at test rig	2.000 m³/h	3.000 m³/h	5.000 m³/h	6.000 m³/h
Volume flow for air leakage measurement	300 m³/h	300 m³/h	400 m³/h	500 m³/h

* Depending on test rig size and required standards. Other compressor on request possible.
** Only by equipment of the test rig with fresh water system. The standard includes a water circulating system.

Professional, comfortable, PC-controlled

The KS Clamping Bridge Test Rig for windows and doors

With the KS Clamping Bridge Test Rig all elements sizes are flexible testable. The assembling of the test elements is especially comfortable: They can be easily and rapidly clamped due to the clamping brigde system and furthermore the test sample remains nevertheless freely accesible.

The basic construction consists of solid steel, the base plate of exclusive stainless steel. All other components who comes into contact with water are also made of stainless, water resistant material.

The construction contains a closed water system circulation system. It can optionally be equipped with a fresh water system. Entirely at the discretion of the users.

The upper horizontal window holding fixture can be conveniently positioned electrically.

High quality and durable: The base plate of stainless steel.

The electronic deflection sensor* to measure the deflection of the test sample provide accurate test results.

Well equipped: the desk incl. PC,printer and monitor.

Advantages KS Clamping Bridge Test Rig

- Easy to handle
- Durable, solid construction
- Flexible clamping size
- Basic construction of massive stainless steel
- Base plate of stainless steel
- Solid clamping system
- Special size realizable
- Near of test block, none clamping bridge at operating side
- Electronic deflection sensor*
- Precise measurement results
- Low maintenance
- EC-conform
- PC controlled
- Online remote maintenance
- Size according to customer requirements to implement

Technical data KS Clamping Bridge Test Rig			
Test block width	4.000 mm	External measure width	5.420 mm
Test block height	2.800 mm	External measure height	3.900 mm
Test room depth	650 mm	External measure depth	1.620 mm
Other sizes without additional charges possible.			

* Optional available

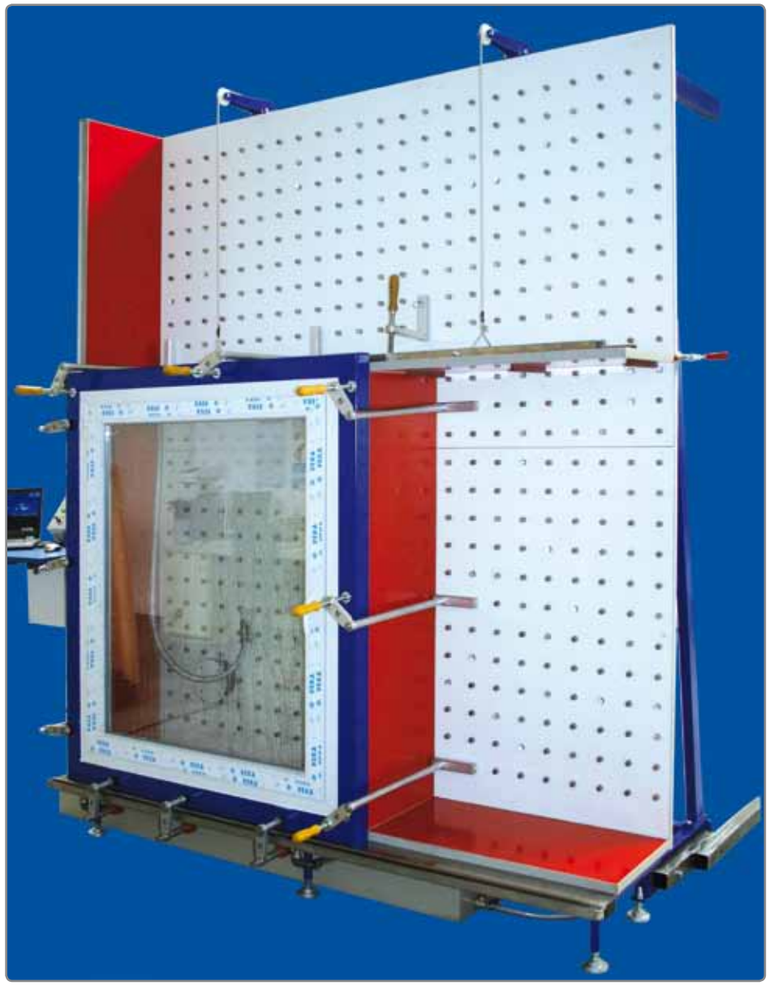
Workplace inclusive

We offer you not only the control incl.the necessary Hard- and Software, but also a suitable workplace.

You can decide for the smart one the desk or still rather a standing desk with integrated monitor that is perfectly convenient for small rooms.
The equipment as measuring desk and control desk stored the technical equipment space saving and offers nevertheless enough place for desk work.

Optional available: Standing desk that flexibly adapts to the room.

All good things come in three: The model as a measuring desk and control desk*.



Advantages KS Euro CE

- Easy to handle
- Durable, massive construction
- Solid clamping system
- Force-fit assemblage through proven KS clamping system
- Close to the test sample, no span bridge
- No mounting of the test sample in the frame required
- Element size according to flexible grid specification
- Precise measuring results
- Low maintenance
- CE-conform

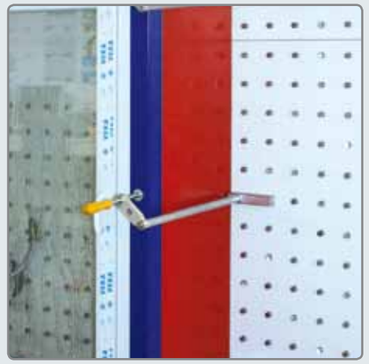
Compact and functional

The Test Rig KS Euro CE for windows and doors

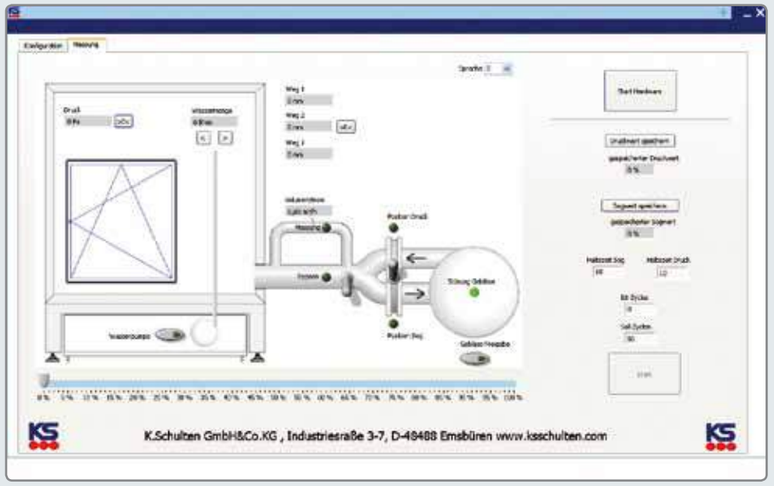
The KS Euro CE is an inexpensive alternative in contrast to the KS PC Test Rig. It is suitable for tests according to the european standards for air permeability after EN 1026 and water tightness after EN 1027. A wind resistance test similar to EN 12211 can be simulated.

With a maximum clamping size up to 2200 mm width and 2500 mm height can even be tested easily and rapidly the doors and larger window elements.

The compact construction will be delivered as a complete unit and it is quickly ready for operation. By request it is also possible to get the equipment with a closed water circulation system.



Distance elements and manual clamps ensure for a force-fit assemblage of back board and test sample.



Simple operation – Clearly demonstration

The control ocurr manually by the KS Euro CE-software. All measuring results is mentioned clearly at a software surface. In addition is no separate PC required. The software will be directy installed at your PC or Laptop.

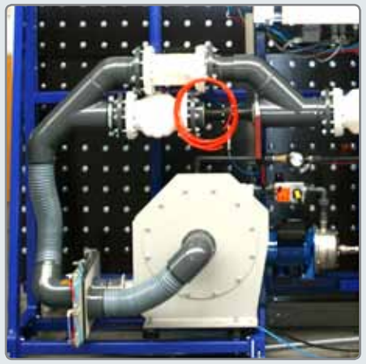
Test standards for KS Euro CE, Germany	
Test range	**windows / doors**
Air permeability	EN 1026
Water tightness	EN 1027

Water tightness windows		
Test procedure DIN EN 1027	Classification DIN EN 12208	
0	1 A	1 B
50	2 A	2 B
100	3 A	3 B
150	4 A	4 B
200	5 A	5 B
250	6 A	6 B
300	7 A	7 B
450	8 A	-
600	9 A	-
> 600	E xxx	-

1 A till 9 A : Suitability for unprotected installation position of the windows

1 B till 7 B : Suitability for protected installation position of the windows

0 Pa 15 min Application of pressure in steps each 5 min.



The compressor of KS Euro CE generates a pressure of +/- 2500 Pa at 300 m³/h.

Technical data KS Euro CE	
Electrical connection	400 V, 50 Hz 2 kW
Air connection	1/4“, 6 bar
Water Supply	2-20 l/min, 6 bar
Test block width	2.200 mm
Test block height	2.500 mm
Test block depth	450 mm
External measure width incl.operator station	3.150 mm
External measure height	3.050 mm
External measure depth	1.350 mm
Work pressure (+/-)	2.500 Pa
Air volume flow	300 m³/h
Volume flow for air leak measure	1-150 m³/h

Awesome the KS Curtain wallling test rig

A massive steel construction with even, few foints casing constitute the basic construction of the test assembling. The devision, for exapmle, two test rooms makes possible a flexible testing in related to the quantity and dimension of the curtain wall elements. The accession to the test rooms occur through a entrance door and a connecting door between both rooms. Through opening the connecting door occur a big testing room- depending on the requirements for the testing situation.

Freely movable bridges simulated in the test chamber floor. The height setting ocurrs standard all 100 mm. The grid dimension is individually adapted to customer request.

Mobile test container reduce costs and saves space.

Test standards, Germany	
Test area	Curtain walls
Air permeability	EN 12152 EN 12153
Water tightness	EN 12154 EN 12155 EN 13050
Resistance at wind load	EN 12179 EN 13116

All test results are directly displayed on a PC and evaluated.

A perfectly sealed test chamber is formed through a specially developed sealing system.

Wind generator* for the dynamic water tightness test according EN 13050.

Comfortable adjustable and optimally equipped

Despite the high weight the upper test area cover can be moved easily over an electric winch. The counter weights at the back side of the test wall absorb the high forces and replace the cover fluent in position. The test chamber is sealed off so quickly and free of leaks.

The construction is equipped with a complete grid spraying system, a high-performance blower, electronic deflection sensor* and a computer control. The corresponding software represents on easiest way, all assessments required by the standard.

Technical data KS Curtain Wall	
Electrical connection	400V, 50Hz, 30kW
Air connection	1/4“, 6 bar
Water circulating system	5.000 m³
Test block width	till 6.000 mm
Test block height	till 8.000 mm
Test room width	2.000, 4.000 or 6.000 mm
Test room depth	1.200 mm
External measure width	7.000 mm
External measure height	9.000 mm
External measure depth	2.500 mm
Working pressure (+/-)	5.000 Pa
Air volume flow at the test rig	7.000 m³/h
Volume flow for the air leak	0,5-1.500 m³/h
Other sizes without additional charges possible	

* Optional available

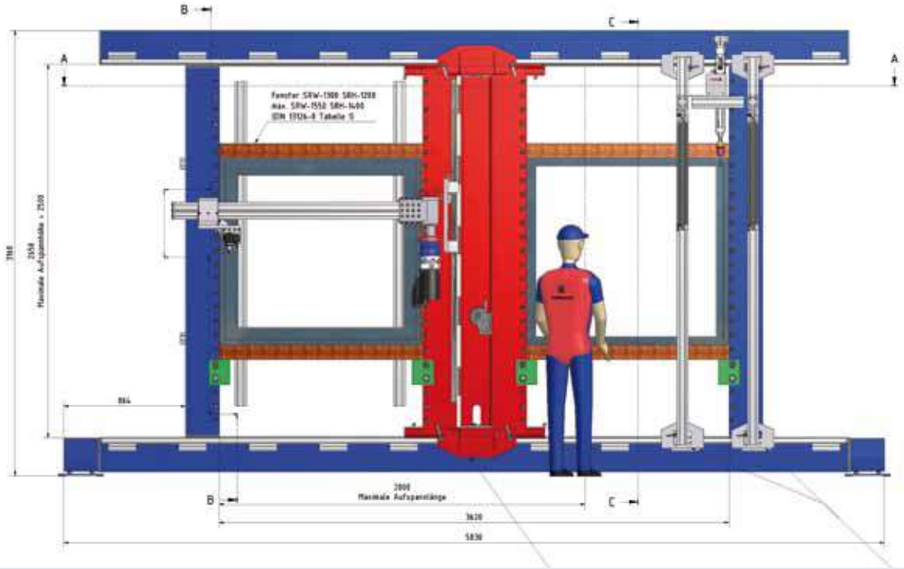
Advantages KS Curtain Walling

- Easy to handle
- Durable construction
- Electronical deflection sensor for measuring of the bending
- Perfectly sealed through especially developed sealed sytem
- Small, medium and bigger test room depending on requirements
- Water circulating system incl. drainage
- Grid allowance for the curtain walls elements according customers desires
- Precise measurements results
- Low maintenance
- EC-conform
- PC-controlled, network connection
- Size according to customer requirements to implement

Spraying system for the watering according EN 12155.

Water tightness curtain walls		
Class	Pressure steps in Pa and test time in min Pa/T	Water quantity l/(m² min)
R4	0/15, 50/5, 100/5, 150/5	2
R5	as R4 and 200/5, 300/5	2
R6	as R5 and 450/5	2
R7	as R6 and 600/5	2
RE_{xxx}	as R7, about 600/5 in steps of 50 PS and 5 min. time	2

Classification of the pressure steps after EN 12154



Authentic, precise and norm conform

The Fitting Testing Device KS BPA Servo PC for windows and doors

The Fitting Testing Device KS BPA Servo PC was constructed especially for durable function test of tilt and turn windows, tilt windows, glazed doors and doors as well as horizontally pivoted sash windows*. At this it will be tested the usability of the elements, the fittings and the handholds on functionality and durability under continuous stress. The complete computer-controlled construction fulfill the inspection specifications of the central norms EN 1191, EN 13126-8, EN 12046-1 and EN 12046-2, but also the european norms, for example EN 14608, EN 14609, EN 947, EN 948 and EN 1192.

Through the dichotomy of the construction are the dynamic and static tests parallel possible. For example it will be tested on the left side the durable function of the fittings and on the right side the distortion of elements. The modular assembly of the construction has the advantage that simplified versions and enhancements to customer requirements can be implemented quickly and without additional costs.

The assembly of the test elements requires little without big efforts easily by fixing the test block in a steel frame. The particularly high-quality equipment of the construction with linear axes and servo drives ensures standard norm courses of the opening speed as well as opening and closing movement of the test block.

Extension modules* for addition of the KS BPA Servo PC		
1	notch test	EN 12600, EN 13049, EN 1629* (EN 949)*
2	bulgar resistance	EN 1627*, EN 1628*
3	Crush on door leaf	EN 950*, EN 1192
4	horizontally pivoted sash window / reversible window	EN 13126-9

Pivoted rotating device (180°) sets up easily on a PC.

Determination of the operating forces directly on the grip via a transverse force independent multi-axis measurement system.

The software can be proud of

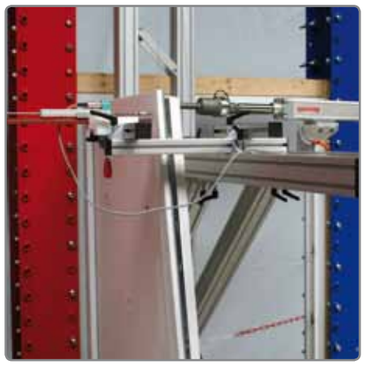
The Fitting Testing Device KS BPA Servo PC is equipped with a comfortable software package. This allows any test procedure automatically regulate, measure and record. The results are presented in Excel easily and understandable, as a graph or visualization. The allocation of the test results, that is given the classificate norm, occurs just as the fully automatic creation as like in a test report in MS Excel.

Especially, the software surface is very friendly designed. All test parameters like closing torque, opening speed and axis can be indicate freely and also during the test be adjusted.

Advantages
KS Fitting Testing Device

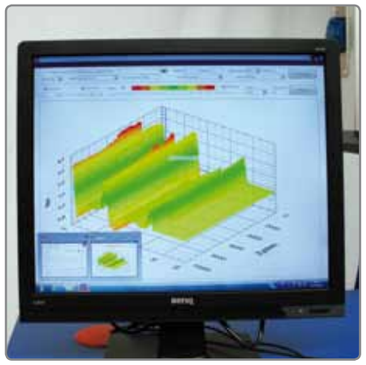
- Various test on one construction possible
- Fast, easy assembly of the test elements
- Also for multi-leaf, right and left tattered elements
- Stepless adjustment of test objects size
- Equipped with high-quality linear axis and servo drive
- Free adjustment of test parameters
- Visualization of all test sequences
- Graphical demonstration of measurement results
- Automatically classification
- EC-conform
- PC-controlled
- Remote maintenance via internet
- Network connection*
- Extension to other test standards*
- Size according to customer requirements to implement

Pneumatic back pressure unit*(20N) for durable function tests according EN 13126-8 § 7.3.2



High quality equipment with linear axle and servo drive for testing the static torsion.

Simple, menu-guided input of test parameters.



Three-dimensional demonstration of all test cycles.

Technical data KS Fitting Testing Device	
Electrical connection	400 V ,50 Hz, 3 kW
Air connection*	1/4“, 6 bar
Test block width	1.000 - 2.800 mm
Test block height	1.000 - 2.500 mm
Test block depth	40 - 200 mm
External measure width	5.830 mm
External measure height	3.160 mm
External measure depth	2.000 mm
Reomte maintenance internet access	
Other sizes without additional charges	

* Optional available, counter pressure unit needs 6 air connections

Fig. shows KS EBP 6035

Approved standard reliability

The Burglary Test Rig KS EBP for windows and doors

The burglary rates have risen constant in the last years. Thereby the importance of mechanical burglary protection increase more and more. Some window manufacturers take advantage of market niche and specialize in the manufacture of burglar-proof windows and doors.

Especially in this challenging area, it is to convince them with good products and to offer a consistent product quality according to standard specifications. External tests are usually associated with great organizational efforts and high investments. Therefore, more and more manufacturers decides for tests in their own company.

With the KS burglary Test Rig you are well placed. It makes possible the test of resistance of the elements through static load according norm EN 1628:2011. Additionally we offer you the KS Pendulum Test Unit according EN 1629 for the burglary determination the resistance under dynamic load. This manual burglary test according EN 1630 can also be performed on the KS Burglary Test Rig. The appropriate normative tool sets, we are pleased to offer you.

Advantages
KS Burglary Test Rig

- Durable, stabil steel construction
- Fast, easy mounting in steel beam
- Test of two elements at same time possible
- Also for multi-leaf, right and left tattered elements
- Stepless adjustment of test objects
- Equipment with hydraulic drive or servo drive
- Optional with PC-control and servo drive
- Online remote maintenance and network connection
- Combination of fitting test rig and burglary test rig in one construction possible
- EC-conform
- Size according to customer requirements to implement

Fast mounting with clamping screw in the steel beam.

Adjusting the loading device on test position over crank drive or electronically*.

Various certification stamps transfer the test load on the element.

Constructed stabil and with SPS-control equipped

The KS Burglary Test Rig consist on a massive steel construction with two vertical element holders which are mounted on ball linings and thus can easily adjust measure of the window. On a third vertical beam are the loading device mounted. Depending on the equipment there is a hydraulic cylinder or cylinders with an electromechanical servo drive and the measuring device and the indenter mounted.

The loading device apply according the required standards “gradually and smoothly” up to 15 kN.
The test stamp transfer the test load to the desired test position. The deformation of the test element will be detected with help of the feeler gauge according EN 1628 and entered manually in the test report. Upon request, the determination of the deformation occurs between fixed and sash frame via two displacement sensors*.

Who likes the comfortable one decides for the equipment with PC-control. The activation of the test pressure occurs with that automatically.Two electrical way sensor* measures the deformation between blind frame and casement frame. All measures results will be determined electronic and will be shown on a Touch-Panel.

Technical data KS Burglary Test Rig

Test rig	KS EBP 6035	KS EBP 3025
Electrical connection	400 V, 50 Hz, 2 kW	400 V, 50 Hz, 2 kW
Test block width	6.000 mm	3.000 mm
Test block height	3.500 mm	2.500 mm
Test block depth	220 mm	220 mm
External measure width	9.200 mm	4.200 mm
External measure height	4.400 mm	3.400 mm
External measure epth	3.200 mm	3.200 mm
Other sizes without additional charges possible		

Burlgar resistance of windows, glazed doors and doors EN 1627:2011

Resistance class	Resistance time	Approach of the offender
WK 1	no manual test	Attempts to break with physical violence such as kicking, heaving, throwing shoulder, pushing up and pulling out.
WK 2	3 Min.	Experiments with simple tools, such as screwdrivers, pliers, wedge.
WK 3	5 Min.	Experiments with Tests with a second screwdriver and a crowbar
WK 4	10 Min.	Experiments with saws, impact tools, ax, crowbar, hammer, chisel, cordless drills.

* Optional available

Small but strong

The KS Pendulum Test Unit for windows and doors

Live Demo of youtube.com - Video KS Pendulum Test Unit

For the testing of the resistance of windows and doors the KS Pendulum Test Unit is the right choice. The mobile, compact test facility exist in two different specifications – with double tire or with sandbag* – it depends on the norm and test method.

The equipment with double tire fulfill the inspection request according to EN 13049 for fronts, EN 12600 for flat glass and EN 1629:2011 for burglary-resistant windows and doors under dynamic load.
All three norms defines the load of the elements at the collision of one soft and heavy impactor.

The second option is the equipment of the test rig with a 30 kg heavy drop shaped sandbag.
It allows the test procedure for determination of the resistance of doors according the norm EN 949.

Technical details KS Pendulum Test Unit	
Net weight	235 kg
Counter weights (removable)	5 x 20 kg
Weight double tire	50 kg
Weight sandbag	30 kg
Width of carrier	800 mm
Length of carrier	2000 mm
Mast height	2.000 mm - 7.500 mm
Testing height	0 - 6.000 mm

Equipment depending on norm standard with sandbag* or double tire possible.

Burglary-resistant of windows, glazed doors and doors Drop height for the dynamic test according EN 1629, List 5		
Resistance grade	Chassis of impactor	Drop height
WK 1	50 kg	450 mm
WK 2	50 kg	450 mm
WK 3	50 kg	750 mm
WK 4 - 6	Not dynamic test necessary	

* Optional available

The bullet force the point of impact on the test block.

By pulling the ripcord the pendulum is released.

The mast is moved by a crank drive to the desired impact position.

Standard conform reconstructed

The KS Glasmax attend as basic construction for the new KS Pendulum Test Unit. Instead of the equipment with glass suction unit, the KS Glasmax was converted according to the standard requirements.
The advantage is the test rig will be mobile and is therefore easy to position.

The impactors pendulous mounted on a mast with horizontal slewing mechanism and fixed on a steel cable. The pendulum is tiggered easy via a tigger line. The mast is adjustable by a crank drive in height, the horizontal slewing mechanism in the inclination. Thus the height that is specified in the norm can be set easily and quickly.

The impact spot on the test block according the norm, so-called load locus, can be positioned over a target ball. With that the operator can adjust the pendulum shuttle easy of the ground withour using a raised platform.
Even more comfortable is to set up the pendulum with the equipment of the test rig with electric drive* instead of hand winch.

Different drop heights can be adjusted easily.

Advantages
KS Pendulum Test Unit

- Mobile and compact
- Durable, massive construction
- Easy to handle
- Easy tiggering of the pendulum
- Angle of inclination easy adjustable
- Easy height adjustment by crank drive
- Multiple use as lifting equipment KS Glasmax possible

* Electric drive with charge

Secure emergency exit

Tested with the KS Smoke Tightness Test Rig

The complete computer-controlled KS Smoke Tightness Test Rig was developed specifically for the tests of smoke protection closures according EN 1634-3 and DIN 18095-2.

The test procedure demonstrate on simplified way, how behaves a door during a fire. For that the air passage is measured from one side of the room to the other under influence of different pressures and temperatures. The test is operated with air pressure. A integrated fog machine* clarify the leakage.

The KS Smoke Tightness Test Rig consists of a test room of stainless steel with open front side in that is mounted a test frame incl. test element. A pneumatic clamping system connect the frame with the test chamber very fast and without separate use of tool kits. A special sealing system at the front side of the test room brings an optimally sealed test chamber.

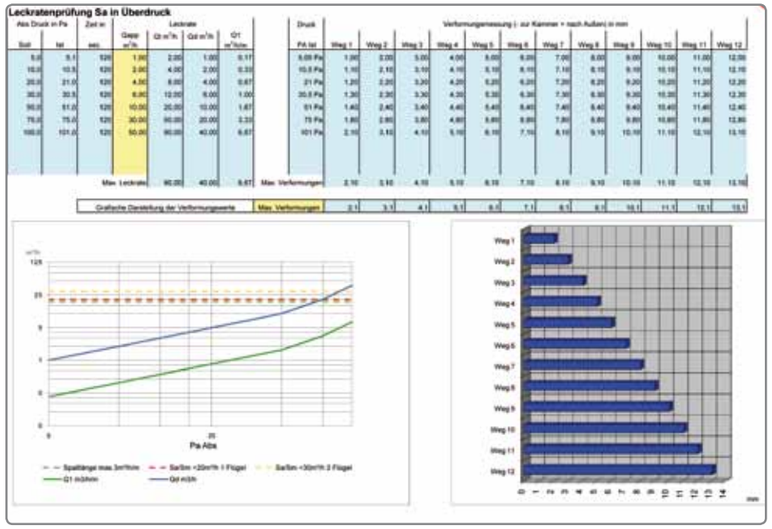
The test rig is equipped with a fully automated PC-control,a measuring system till 200 m²/h, a compressor till 250 Pa, a heating system and air circulation.

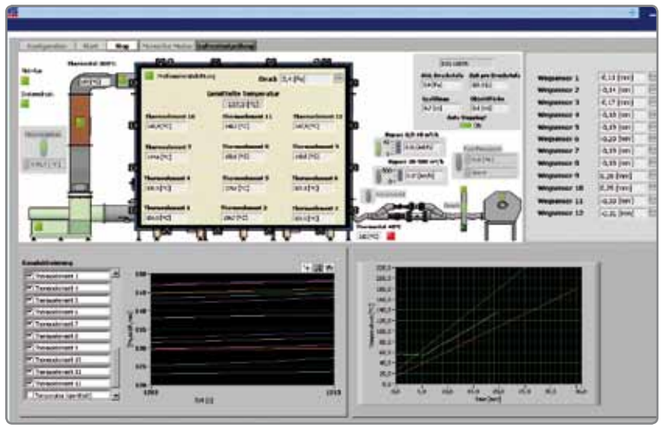
The test principle

At a standard testing procedure the deformation of the test sample or the breakdown of blinding because of heat damage.
Additionally a high pressure or low pressure is generated and the air volume is measured over a period of 2 minutes at 20°C, and accordingly 200°C and high pressure. The pressure difference from the inside to the outside pushes the smoke by all existing cracks and apertures that is generated by a fog machine. With that the leackages are visible.

Fast assembly of the test frame with pneumatic clamping system.

Automatic blinding of the test room by special KS Sealing System.





Automatic classification

The KS PC – Control with the special developed software is the highlight of the KS Smoke tightness device.
It demonstrate all measured data and results especially in user-friendly lists or charts that is requested after DIN 18095 and EN 1634-3.
All measures results will be transfer into a Excel list for furhter processing and will be allocate to the norm-classification.
The test report will be created automatically and can be printed.

Technical data KS Smoke Tightness Test Rig	
Electrical connection	150 kW
Air connection	¼”, 6 bar
Test block width	3.400 mm
Test block height	3.400 mm
Test block depth	80-300 mm
External measure width	4.900 mm
External measure height	4.700 mm
External measure depth	3.500 mm
Remote maintenance	Internet access

Quality wins out

Pull-Push Test Rig
KS ZDP 20 kN PC

Solid corner regions and certainly in the profile screwed fittings are no-wadays self-evident. To be sure that the products correspond to a certain quality standard, internal tests for the strength and deformation of windows and fittings are recommended.

With the automatic corner test rig KS ZDP 20 kN PC you are well positi-oned. It proves the pull out strength of fittings, corner brackets and shear brackets, as well as the corner break of blind frame and casement frame at Pull and Push effect.
Furthermore any continuous duty pressure and tensile tests up to 20 kN are performed.

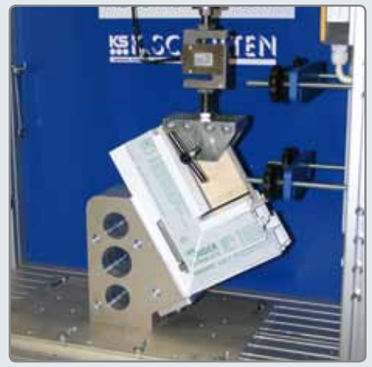
Test standard, Germany	
Test area	Norm / Guide line
Permitted sash weights	ift FE 13/01 (TBDK)
Break power plant	RAL-GZ 716/1
Strength of wel-ded corners	EN 514
Fitting excerpt	EN 13126-8

The Pull-Push unit is servo-controlled.

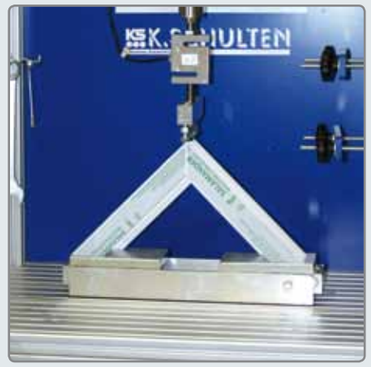
The recirculating ball screw sets 1-500 mm/min back ...

... at a maximum power of Pull-Push strength of 20 kN.

Modularly construction allows the use of various testing tools. Fig. shows the sheare bearing according TBDK/EN 13126-8.



Tool kit for testing of the corner bearing according to TBDK/EN 13126-8.



Testing of the corner strength of welded profiles after EN 514.

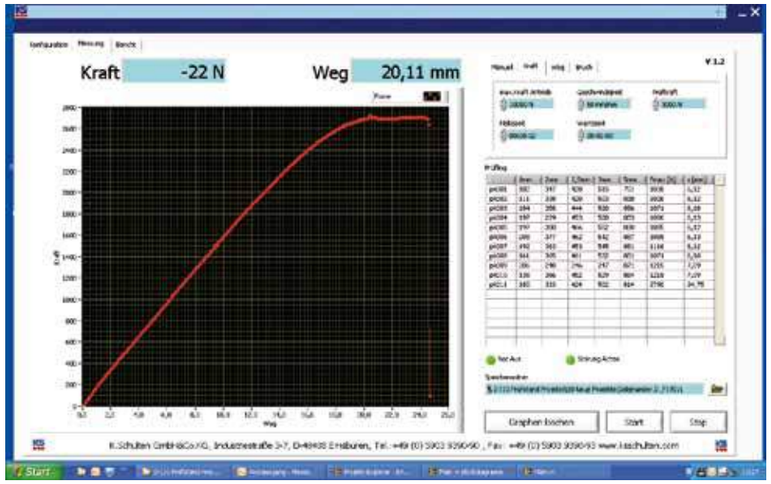
Everything under control with the KS ZDP 20 kN PC

The software is aligned especially to the requirements of window and door profiles. It can be effected, in addition to the standards and norms perform, as well as Pull-Push classical tests. The integrated control system consist of a high quality computer and a KS software at LabView Basis. The software is in german, english and other languages available. It makes the data export according MS Excel. The desired test parameter, for example maximum value of deformation or strength are adjustable.

All measurements will be determine electronic and shown on PC in a tabular and graphical form. The force-distance diagram illustrates at what load, for example, the arm bearing or pull up a corner breaks.
About the break detection in the software, this point is accurately determined and recorded.

Advantages KS ZDP 20 kN PC Pull-Push Test Rig

- Durable, stabil construction
- Easy mounting of the test block
- Fast reconstruction of the test tools
- Equipment with PC, printer,computer, desk
- PC-control and network connection as standard equipment
- Online remote maintenance
- EC-conform
- Low maintenance



Technical data KS ZDP 20 kN PC	
Electric connection	400 V, 50 Hz, 16 A, 2 kW
Test block width	1.200 mm
Test block height	800 mm
Test block depth	500 mm
External measure width	2.000 mm
External measure height	3.200 mm
External measure depth	700 mm
Weigth	480 kg

Corner Testing Apparatus KS EPM 2050

Corner joints in hardness test

The test of the corner resistance from welded profiles is one of the few quality checks of a window and door manufacturer. With the corner testing apparatus KS EPM 2050 goes such a test quickly and in compliance with standards according DIN 16830-1, EN 514 and RAL-GZ 716/1. Welding errors are immediately detected and corrected before it results in complaints.

The KS Corner Testing Apparatus exist in two different constructions. In the first version the pressure are applied on the top corner. In version two on the inside of the brackets. Both test methods are standards and depends from the test method that is decribed in the norm.
In France for example is used only the construction KS EPM 2050 SPA, while in Germany is still used mostly the KS EPM 2050.

The KS Corner Testing Apparatus is availble in two different construction.
(Fig. shows KS EPM 2050).

Easy applying of the corner joints without montage (construction 1).

Fast fastening of the test block with clamping system. (construction 2).

The assembly of the window corner into the test device is thinkable easy. At the first construction the corner will be put on the tilting holding fixture, at the second version with clampings seized.
By a big plate at the front side the test procedure is well visible.

Both construction tests the corner resistance according EN514.
(Fig. shows KS EPM 2050 SPA)

Manometer shows the breaking point of the corner in kN.

Advantage KS Corner Test Rig

- Durable, stabil construction
- Easy mounting of the test elements (construction 1)
- Fast use of the corner connection through clamping system (construction 2)
- Save place
- Pressure interface
- EC-conform
- Low maintenance

Both KS Corner Testing Apparatus works with a continuos hydraulic infeed that presses down evenly the axis at a speed of 50 mm/min. The built-in pressure relief valve shuts off automatically at a pressure of 20 kN.

The breakpoint of the corner is displayed is shown in kN on the manometer glass with maximum indicator. Optional it is possible a equipment with electronic power measurement and digital diyplay.

The mobile test device has a size of 850 x 1150 x 270 mm and thus constructed to save space. And it is applicable in small rooms.
It will either be placed on an existing shelf or delivered with table, all the way to space conditions and customer desire.

Technical data KS Corner Test Rig	
Electrical connection	250 V, 50 Hz 0,5 kW
Test block width	700 mm
Test block height	500 mm
Test block depth	200 mm
External measure width	850 mm
External measure height	1.150 mm
External depth	250 mm
Weight	150 kg

Satisfied customers are the best reference

A.C. Technometal Ltd., Cyprus
AGB, Italy
Architectural & Metal System, Cork, Ireland
Armetal, Saudi Arabia
ASAS, Istanbul, Turkey
Centrum stavebniho inzenyrstvi a.s., CZ
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LG-Chemicals, South Korea
Mess-und Test GmbH, Germany
MPA Materialprüfungsamt, Germany
PIV Prüfinstitut Velbert, Germany
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Sopac, France
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Techni Baie, France
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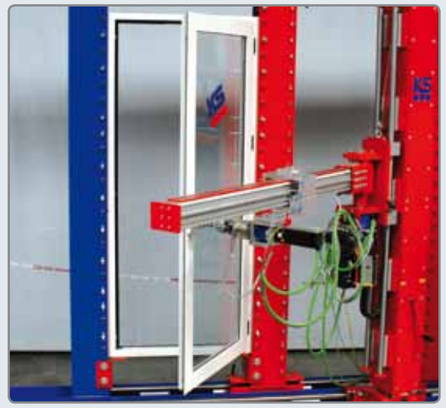
Tryba, France
Viking Windows A.S., Estonia

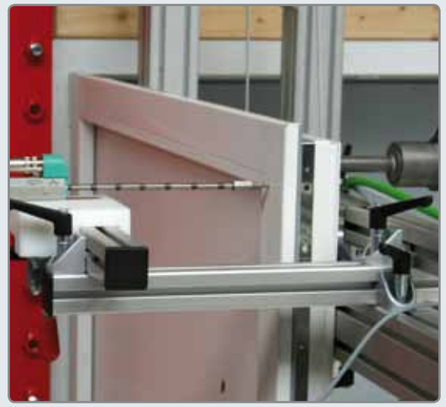
KS Test Engineering

KS Test Engineering

High quality



Precise



Reliable

K. Schulten GmbH & Co. KG
Industriestraße 3-7
D-48488 Emsbüren

Tel. +49 5903 9390-0
Fax +49 5903 9390-93

info@ksschulten.com
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