Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

Distributor: SPI Supplies / Structure Probe Inc.
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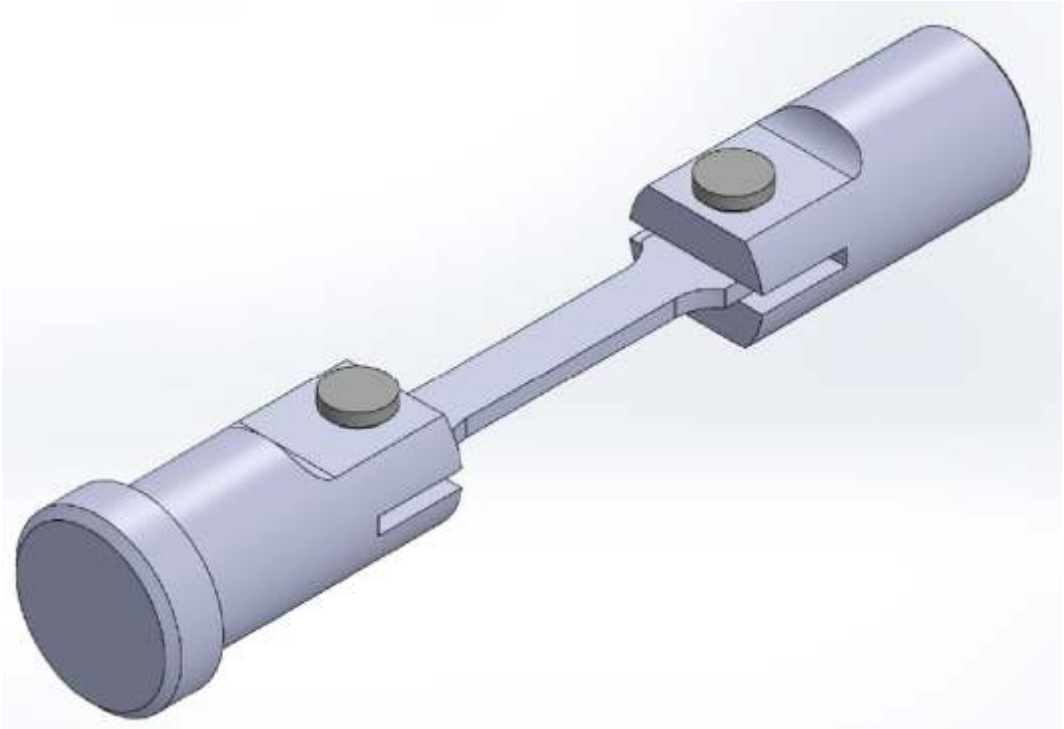
SPI Catalog #: 09000-AB

Overview

of the most popular standard



Grippers

Custom made grippers on request

Version H (March 2019)

Available threadsizes for Kammrath & Weiss grippers

please specify when ordering

loadcell / MZ.Vx =	1N	10 N	20 N	50 N	100 N	200 N	500 N	1000 N	2000 N	5000 N	10000 N	15000 N
01a	-	-	-	-	-	-	-	M10	M10	M10	-	-
01b	-	-	-	-	-	-	-	-	-	-	M10	M10
02	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
04a	-	-	-	-	-	-	-	M10	M10	M10	M10	-
04b	-	-	-	-	-	-	-	M10	M10	M10	M10	-
04c	-	-	-	-	-	-	-	-	-	M10	M10	M10
04d	-	-	-	-	-	-	-	-	-	M10	M10	M10
07	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
09	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
10	-	-	-	-	-	-	-	M10	M10	M10	-	-
11	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
12	-	-	-	-	-	-	M5	M10	M10	M10	M10	-
13	-	-	-	-	-	-	M5	M10	M10	M10	M10	-
14	-	-	-	-	M5	M5	M5 or M10	M10	M10	-	-	-
15	-	-	-	-	-	-	M5 or M10	M10	M10	-	-	-
16	no thread	M5	M5	-	-	-	-	-	-	-	-	-
17a/b	-	-	-	M5	M5	M5	M5 or M10	M10	M10	-	-	-
18	-	-	-	M5	M5	M5	M5 or M10	M10	M10	-	-	-
19	-	M5	M5	M5	M5	M5	M5 or M10	M10	M10	M10	-	-
20a	-	M5	M5	M5	M5	M5	M5 or M10	-	-	-	-	-
20b	-	M5	M5	M5	M5	M5	M5 or M10	-	-	-	-	-
31	-	-	-	-	-	-	-	M10	M10	-	-	-
32	-	-	-	-	-	-	-	M10	M10	M10	-	-
33	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
36	no thread	-	-	-	-	-	-	-	-	-	-	-
41	no thread	-	-	-	-	-	-	-	-	-	-	-
44	-	M5	M5	M5	M5	M5	M5	-	-	-	-	-
45	-	-	-	-	-	-	-	M10	M10	M10	-	-

- not available

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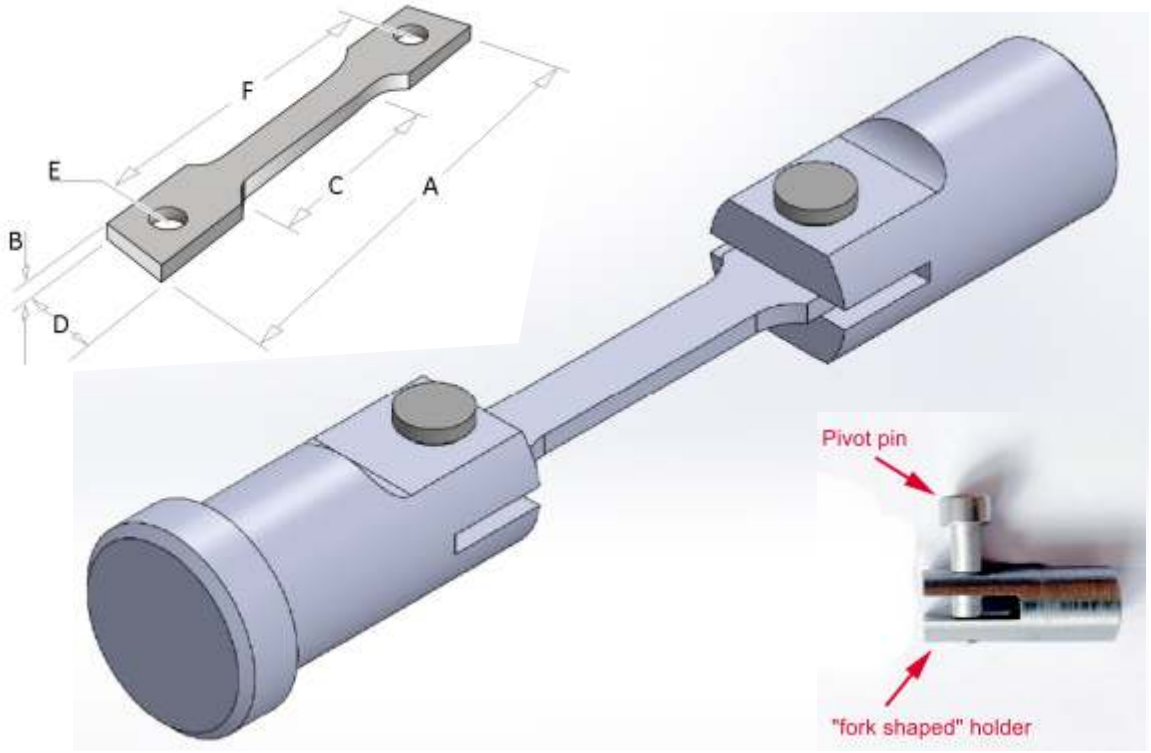
Special Developments for Microscopy

Materials Testing

MZ.VO1a (a = for medium forces)

for tensile tests only and medium forces; for flat specimens with reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The specimens should have uniform thickness. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. This self-aligning holder is for tensile testing only and the thread size is depending on the load cell. Samples should be shaped to accept the pins. See sketch above.

Specifications

	load cell	10 N	1000 N	5000 N
grippers	tensile tests	no	yes	yes
	compression tests	no	no	no
	thread load cell		M10	M10
	maximum load		1000 N to 5000N	
	included in a tensile module		standard clamp with 5kN tensile module	
	purpose		tensile tests only, medium forces	
specimen	A-overall length		30 to 60 mm	
	B-thickness (has to be decided in advance)		0.5 to 5 mm	
	C-length of narrow area		10 to 40 mm	
	D-width at clamping ends		up to 10 -16 mm	
	E-diameter of pivot holes (depends on sample size)		4 mm	
	F-distance of pivot holes		20 to 50 mm	
	specimen can be mounted with some tilt		infinitely tiltable	
	optional cooling/heating module usable with holder		yes	yes

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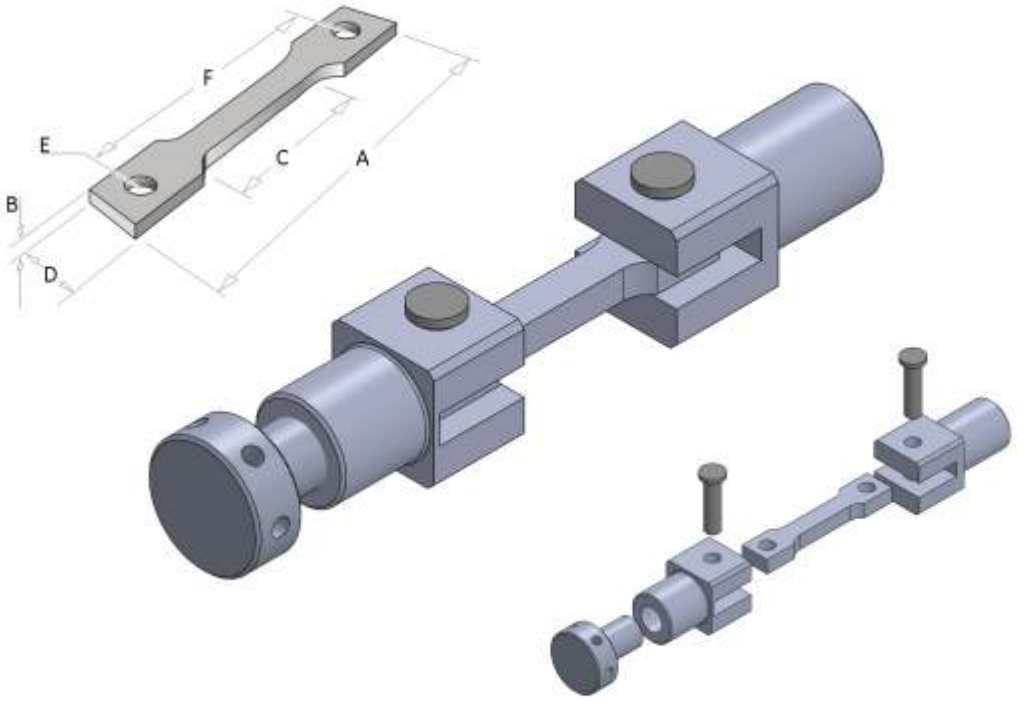
Special Developments for Microscopy

Materials Testing

MZ.VO1b (b = for high forces)

for tensile tests only and high forces; for flat specimens with reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The specimens should have uniform thickness. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. This self-aligning holder is for tensile testing only and the thread size is depending on the load cell. Samples should be shaped to accept the pins. See sketch above.

Specifications

	load cell	10 N	10000 N	15000 N
grippers	tensile tests	no	yes	yes
	compression tests	no	no	no
	thread load cell		M10	M10
	maximum load		10000 N to 15000N	
	included in a tensile module		standard clamp with 10kN or 15kN tensile module	
	purpose		tensile tests only, high forces	
specimen	A-overall length		30 to 60 mm	
	B-thickness (has to be decided in advance)		0.5 to 5 mm	
	C-length of narrow area		10 to 40 mm	
	D-width at clamping ends		up to 10 -16 mm	
	E-diameter of pivot holes (depends on sample size)		4 mm	
	F-distance of pivot holes		20 to 50 mm	
	specimen can be mounted with some tilt		infinitely tiltable	
	optional cooling/heating module usable with holder		yes	yes

Materials Testing

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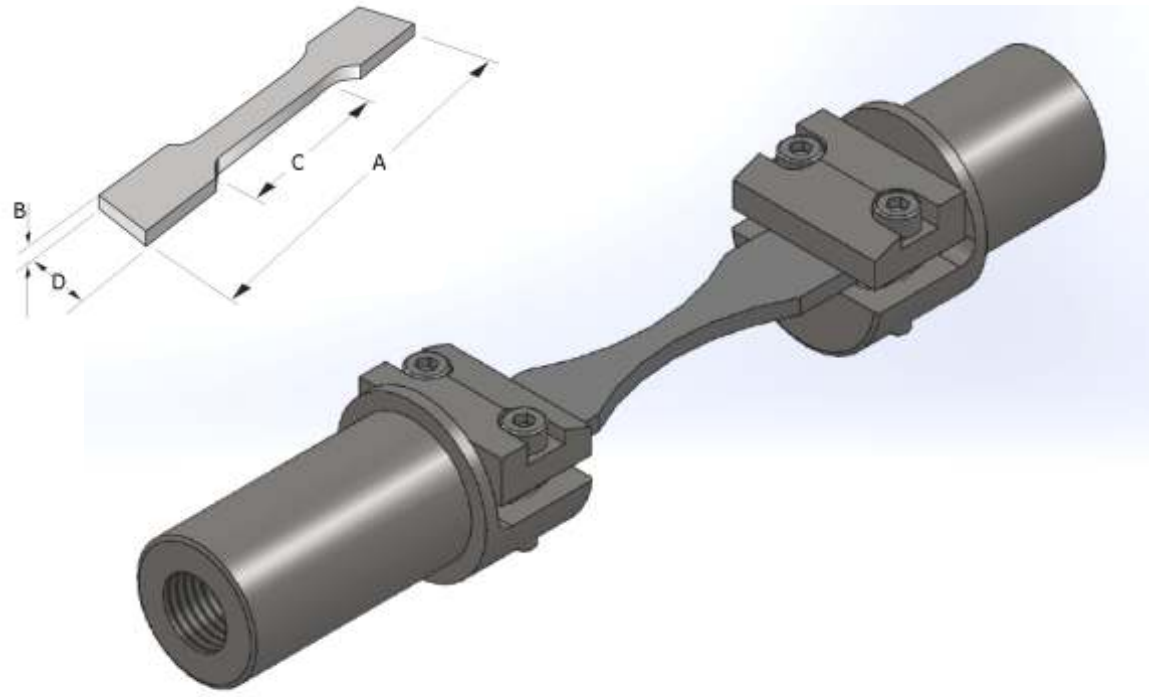
Special Developments for Microscopy

MZ.VO2

for tensile/compression tests and low forces; for flat specimens without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The specimens should have uniform thickness. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. See sketch above.

Specifications

	load cell	10 N	500 N	10000 N
grippers	tensile tests	yes	yes	no
	compression tests	yes	yes	no
	thread load cell	M5	M5	
	maximum load	10 N to 500 N		
	included in a tensile module	standard for tensile/compression modules with load cells <= 500N		
	purpose	tensile and compression tests		
specimen	A-overall length	30 to 60 mm		
	B-thickness	0,2 to 1 mm		
	C-length of narrow area	10 to 40 mm		
	D-width at clamping ends	10 mm		
	E-diameter of pivot holes	no pivot holes		
	F-distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	infinitely tiltable		
	optional cooling/heating module usable with holder	yes	yes	

Materials Testing

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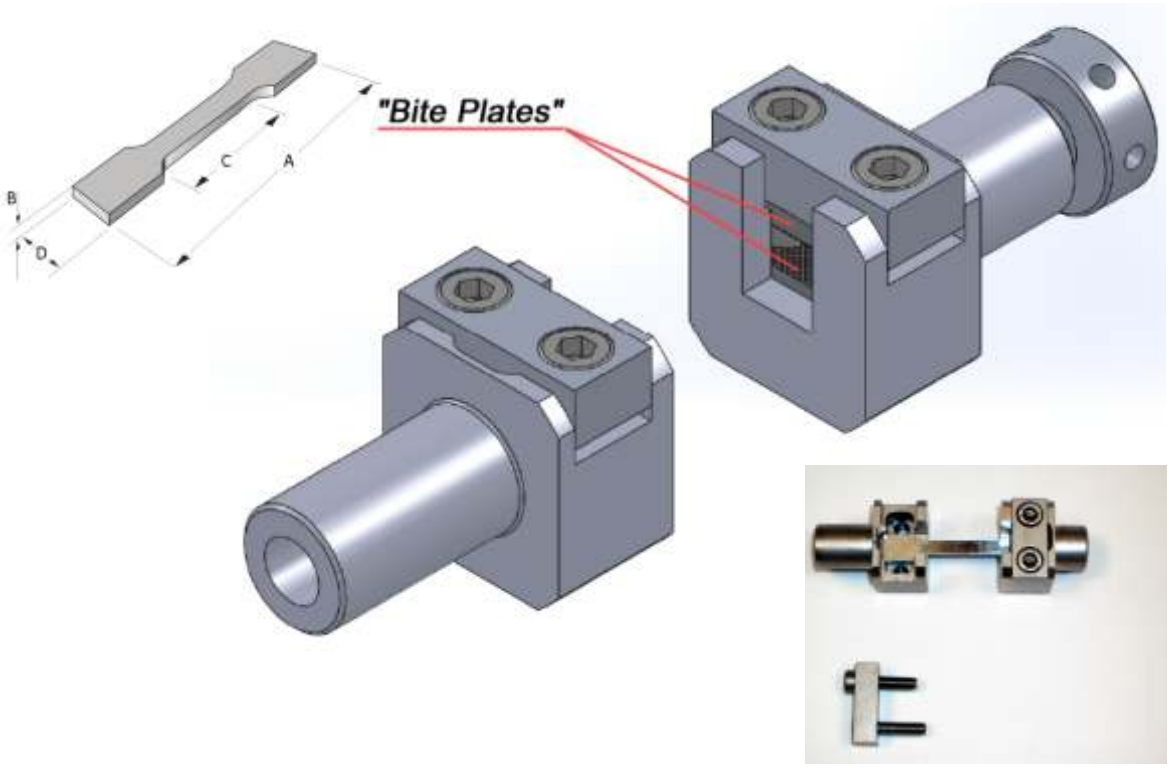
Special Developments for Microscopy

MZ.VO4a (a = square version; only for broad tensile module MZ.Mb)

for tensile/compression tests and high forces; for flat specimens without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used with a wide spindle distance tensile module as an exchangeable clamping device and can be exchanged with others in minutes. The specimens should have uniform thickness (in this case to be 2 mm). The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. See sketch above. For very long elongation ratio, use short area of interest (narrow portion) at start.

Specifications

	load cell	1000 N	5000 N	10000 N
grippers	tensile tests	yes	yes	yes
	compression tests	yes	yes	yes
	thread load cell	M10	M10	M10
	maximum load	1000 N to 10000 N		
	included in a tensile module	standard with option MZ.ZD and MZ.Mb		
	purpose	for flat, thick and heavy duty specimens		
specimen	A-overall length	30 to 60 mm		
	B-thickness	0.5 to 5 mm		
	C-length of narrow area	10 to 40 mm		
	D-width at clamping ends	10 mm		
	E-diameter of pivot holes	no pivot holes		
	F-distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with holder	yes	yes	yes

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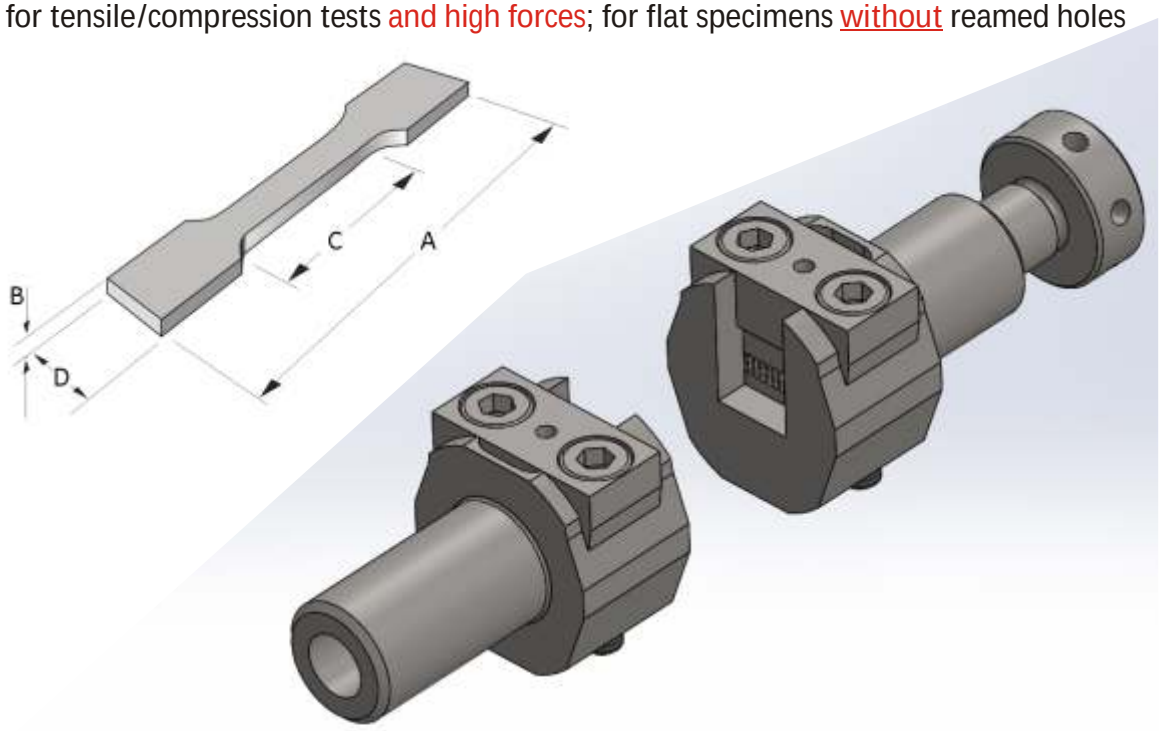
Special Developments for Microscopy

Materials Testing

MZ.VO4b (b = round version for EBSD)

for tensile/compression tests and high forces; for flat specimens without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the small spindle distance tensile module as an exchangeable clamping device. The specimens can be clamped under several ten degrees of tilt. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range is 10 to 40 mm. See sketch above. For very long elongation ratio, use short area of interest (narrow portion) at start.

Specifications

	load cell	1000 N	5000 N	10000 N
grippers	tensile tests	yes	yes	yes
	compression tests	yes	yes	yes
	thread load cell	M10	M10	M10
	maximum load	1000 N to 10000 N		
	included in a tensile module	standard for tensile/compression module MZ.Ms and option MZ.ZD		
	purpose	for flat specimens in tensile/compression tests in conjunction with EBSD		
specimen	A-overall length	30 to 60 mm		
	B-thickness	0.5 to 4 mm		
	C-length of narrow area	10 to 40 mm		
	D-width at clamping ends	10 mm		
	E-diameter of pivot holes	no pivot holes		
	F-distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with holder	yes	yes	yes

Materials Testing

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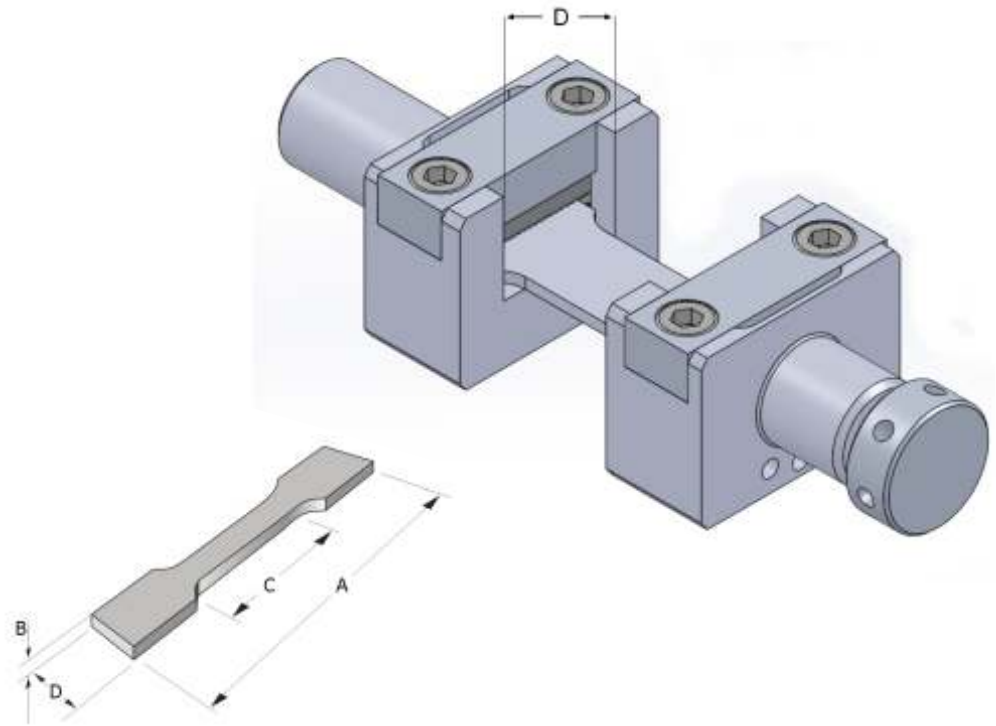
Special Developments for Microscopy

MZ.VO4c (c = "wider" version for broad specimens up to 18mm; only for broad tensile module MZ.Mb)

for tensile/compression tests and high forces; for flat specimens without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module with wide spindle distance as an exchangeable clamping device. In a standard tensile/compression tester, there is no tilted clamping possible (no EBSD). The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. See sketch above. For very long elongation ratio, use short area of interest (narrow portion) at start.

Specifications

	load cell	500 N	5000 N	15000 N
grippers	tensile tests	no	yes	yes
	compression tests	no	yes	yes
	thread load cell		M10	M10
	maximum load		5000 N to 15000 N	
	included in a tensile module		on Mz.Mb only	
	purpose		for wider than usual specimens up to 18 mm at highest loads	
specimen	A-overall length		30 to 60 mm	
	B-thickness		0.5 to 5 mm	
	C-length of narrow area		10 to 40 mm	
	D-width at clamping ends		up to 18 mm	
	E-diameter of pivot holes		no pivot holes	
	F-distance of pivot holes		no pivot holes	
	specimen can be mounted with some tilt		no	
	optional cooling/heating module usable with holder		yes	yes

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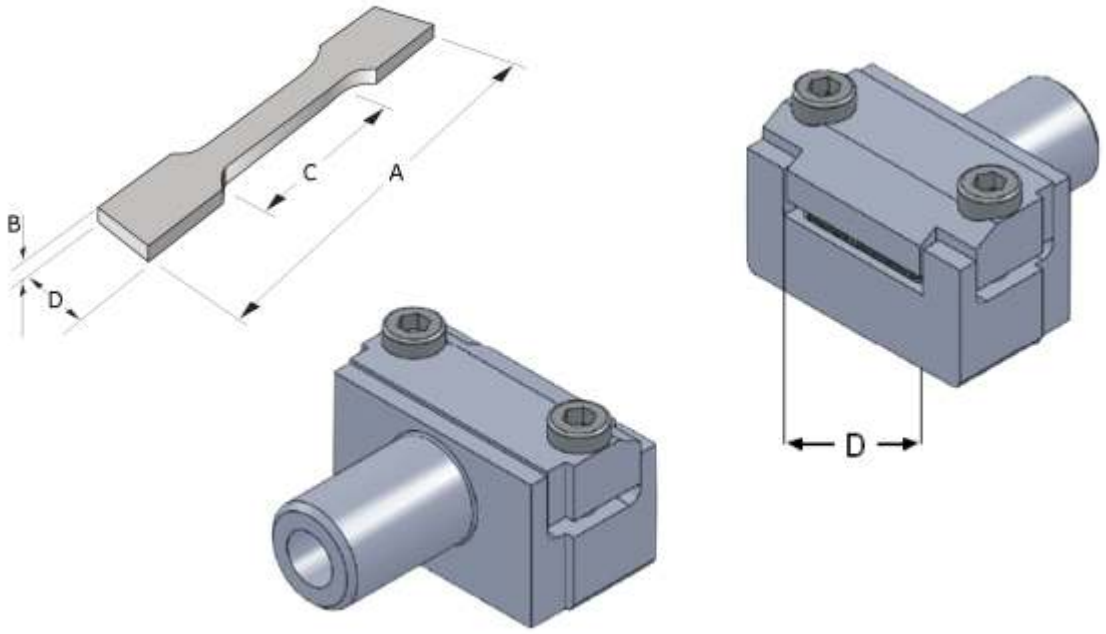
Special Developments for Microscopy

Materials Testing

MZ.VO4d (d = “extra wide” version for broad specimens up to 24mm; only for broad tensile module MZ.Mb)

for tensile/compression tests and high forces; for flat specimens (like foils) without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The specimens can be clamped horizontally only. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical length range C is 10 to 40 mm. See sketch above. For very long elongation ratio, use short area of interest (narrow portion). This is the widest clamping version with an overall width of 32mm.

It can be used only at the tensile tester with 58 / 60 mm leadscrew distance. This clamping set can only be used in a horizontal position; therefore it cannot be combined with EBSD.

Specifications

	load cell	1000 N	5000 N	15000 N
grippers	tensile tests	yes	yes	yes
	compression tests	yes	yes	yes
	thread load cell	M10	M10	M10
	maximum load	1000 N to 15000 N		
	included in a tensile module	on request on MZ.Mb only		
	purpose	for wider than usual specimens up to 24 mm at highest loads		
specimen	A-overall length	30 to 60 mm		
	B-thickness	0.1 to 2 mm		
	C-length of narrow area	10 to 40 mm		
	D-width at clamping ends	24 mm		
	E-diameter of pivot holes	no pivot holes		
	F-distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	no		
	optional cooling/heating module usable with holder	yes	yes	yes

Materials Testing

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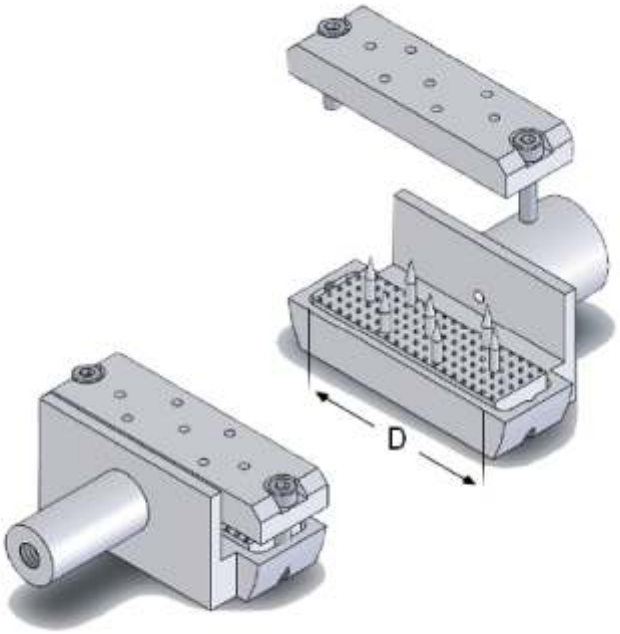
Special Developments for Microscopy

MZ.V07

for tensile/compression tests and low forces; for soft and pliable specimens



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The clamping shown here will be frequently used in the field of examination of biological investigations on their mechanical behavior. Specimens usually are soft samples, such as leaves fruits cut to stripes, leather, etc. They should be analysed in the environmental mode (low vacuum) mode of the SEM, unless they are perfectly dry. If the SEM cannot work in the environmental mode, then the observations ought to be done with a light-microscope. Note the “Bite Plates” which are equipped with exchangeable “teeth”; that will hold the mostly soft or pliable specimen in place.

Specifications

	load cell	10 N	500 N	10000 N
grippers	tensile tests	yes	yes	no
	compression tests	yes	yes	no
	thread load cell	M5	M5	
	maximum load	10 to 500 N (depends upon material and installed load cell)		
	included in a tensile module	on request on MZ.Mb only		
	purpose	for biological sheet specimens		
specimen	A-overall length	30 to 60 mm		
	B-thickness	1 to 5 mm		
	C-length of narrow area	10 to 40 mm		
	D-width at clamping ends	40 mm		
	E-diameter of pivot holes	no pivot holes		
	F-distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	no		
	optional cooling/heating module usable with holder	yes	yes	

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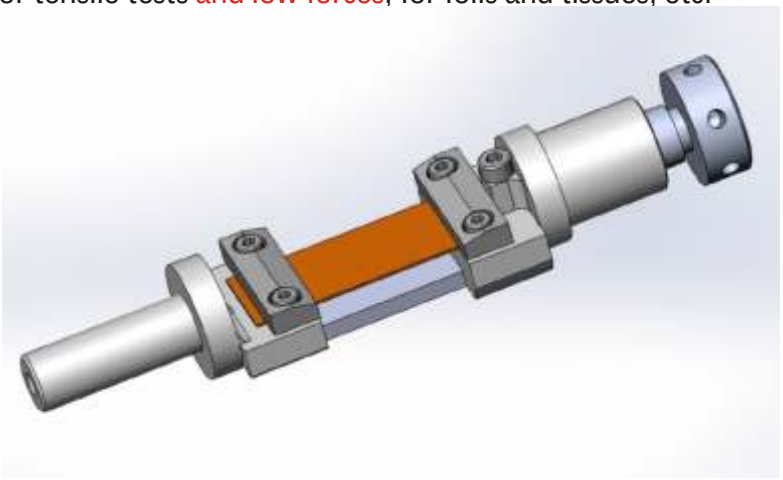
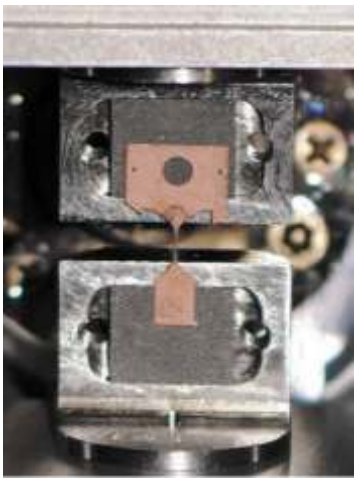
Special Developments for Microscopy

Materials Testing

MZ.V09

for tensile tests and low forces; for foils and tissues, etc.





The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The set is made of two “micro vises” one is fixed to the far end yoke of the tensile tester, and the other one is mounted to the yoke where the load cell is mounted. The edges of the small vises are polished and rounded off at their edges, to avoid rupture directly at the front end of the clamping device. An alignment block is placed underneath the specimen during the mounting procedure, so that the specimen will not sag. The photo (above right) is an example of how smaller samples are mounted in the gripper. There are precision cylinders at the end of each micro vise that fit into honed orifices of the two yokes.

Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. The two micro vises can be mounted in a tilt position for better viewing in the microscope.

Specifications

	load cell	10 N	500 N	10000 N
grippers	tensile tests	yes	yes	no
	compression tests	no	no	no
	thread load cell	M5	M5	
	maximum load	10 to 500 N (depends upon material and installed load cell)		
	included in a tensile module	on request		
	purpose	for foils and tissue etc.		
specimen	overall length	30 to 60 mm		
	thickness	0.1 to 2 mm		
	length of narrow area	10 to 40 mm		
	width at clamping ends	4 mm to 12 mm		
	diameter of pivot holes	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with holder	on request (not retrofittable)		

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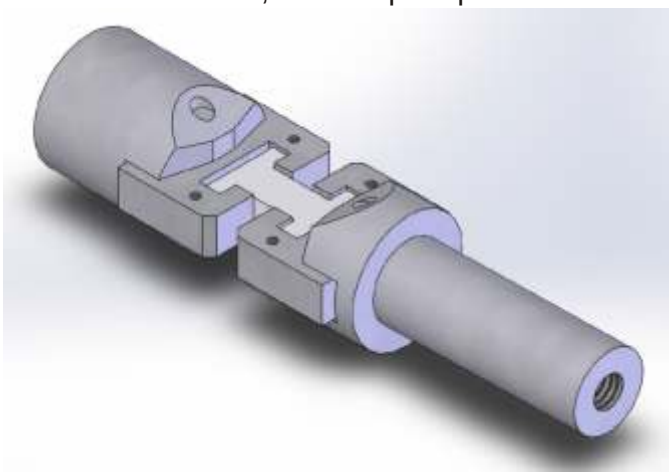
Special Developments for Microscopy

Materials Testing

MZ.V10

for tensile tests and medium forces; for T-shaped specimens



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The set is made of two “nests” for the T-shape. Both halves of this device are held in place by hardened pivots, in order to allow for self-alignment in the tensile direction. There are precision cylinders at the end of each one of the two holders that fit into honed orifices of the two yokes. Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. If the dimensions of the series of specimens are made available, one such set will be part of the shipment volume.
Static or dynamic testing.

The advantage of T-shaped specimens is, that this clamping principle completely avoids slipping of the test object; its disadvantage is however, that the specimens must be machined to quite high precision. This device was designed for routine testing of series of always the same objects in the example shown above, this is a double T-shape. It fits a “nest” on both sides. The length of the area of interest in the middle of the specimen may vary, according to the user's individual requirements.

Specifications

	load cell	10 N	1000 N	5000 N
grippers	tensile tests	no	yes	yes
	compression tests	no	yes	yes
	thread load cell		M10	M10
	maximum load		1000 to 5000 N	
	included in a tensile module		on request	
	purpose		for T-shaped specimens	
specimen	overall length		30 to 60 mm	
	thickness		up to 4 mm	
	width of the area of interest		5 mm (or according to the user's requirements)	
	width of the head of the T-shape		10 mm (or according to the user's requirements)	
	diameter of pivot holes		no pivot holes	
	distance of pivot holes		no pivot holes	
	specimen can be mounted with some tilt		yes, +/- 20°	
	optional cooling/heating module usable with holder		on request (not retrofittable)	

Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V11

for tensile tests and low forces; for very small T-shaped specimens

The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The set is made of two “nests” for the T-shape. There are precision cylinders at the end of each one of the two holders that fit into honed orifices of the two yokes. Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. If the dimensions of the series of specimens are made available, one such set will be part of the shipment volume.

The advantage of T-shaped specimens is, that this clamping principle completely avoids slipping of the test object; its disadvantage is however, that the specimens must be machined to quite high precision. This device was designed for routine testing of series of always the same objects in the example shown above, this is a double T-shape. It fits a “nest” on both sides. The length of the area of interest in the middle of the specimen may vary, according to the user's individual requirements. The device is not suitable for compression testing.

Specifications

	load cell	10 N	500 N	2000 N
grippers	tensile tests	yes	yes	no
	compression tests	no	no	no
	thread load cell	M5	M5	
	maximum load	10 to 500 N		
	included in a tensile module	on request		
	purpose	for very small T-shaped specimens		
specimen	overall length	3 to 15 mm		
	thickness	up to 2 mm		
	width of the area of interest	0.5 to 5 mm (or according to the user's requirements)		
	width of the head of the T-shape	4 mm (or according to the user's requirements)		
	width at clamping ends	4 to 12 mm		
	diameter of pivot holes	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with gripper	on request (not retrofittable)		

Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V12

for tensile/compresssion tests and high forces; for round threaded specimens

The dimensions shown here are examples only, some of them may vary individually; see list.

Description

To be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The set is made of two cylinders with threaded holes. One of them is fixed to the far end yoke of the tensile tester, and the other one is mounted to the yoke where the load cell is mounted. There are precision cylinders at the end of each side that fit into honed orifices of the two yokes. Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. If the dimensions of the series of specimens is made available, one such set will be part of the shipment volume.
This clamping device was designed for routine testing of series of always the same objects in the example shown above, this is a threaded rod. Similiar elements are often times used and tested in machining or automotive plants. Their size may be varied, or the user will decide to machine the specimens to shape.

Specifications

	load cell	<= 500 N	5000 N	10000 N
grippers	tensile tests	yes	yes	yes
	compression tests	yes	yes	yes
	thread load cell	M5	M10	M10
	maximum load	500 to 10000N		
	included in a tensile module	on request		
	purpose	for threaded specimens		
specimen	overall length	30 to 60 mm		
	specimen size	10 mm rod with M10 threads machined to both ends		
	width of the area of interest			
	width of the head of the T-shape			
	Width at clamping ends	4 to 12 mm		
	diameter of pivot holes	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, any angle		
	optional cooling/heating module usable with gripper	no		

Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V13

for tensile/compression tests and high forces; for round specimens

The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device.
Static or dynamic testing can be done with this clamping mechanism. The set is made of two clamps (“micro vises”) with a round “nest” at their lower side, to which the cylindrical ends of the specimen fit exactly. The geometry of the specimen must be known, to determine the diameter of the “nests”, because these holders can only be made to fit one particular specimen diameter. One of these clamps is fixed to the far end yoke of the tensile tester, and the other one is mounted to the yoke where the load cell is mounted. There are precision cylinders at the end of each micro vise that fit into honed orifices of the two yokes. Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. If the dimensions of the series of specimens is made available, one such set will be part of the shipment volume. This clamping device was designed for routine testing of series of always the same objects in the example shown above, this is a round specimen with a thin portion in the middle, and a diameter of 10 mm at both ends. Similar elements are often times used and tested in machining or automotive plants. Their size may be varied, or the user will decide to machine the specimens to shape.

Specifications

	load cell	<= 500 N	5000 N	10000 N
grippers	tensile tests	yes	yes	yes
	compression tests	yes	yes	yes
	thread load cell	M5	M10	M10
	maximum load	500 to 10000N		
	included in a tensile module	on request		
	purpose	for round specimens		
specimen	overall length	30 to 60 mm		
	specimen size (cylinder machined to both ends)	10 mm		
	width of the area of interest	10 to 40 mm		
	Width at clamping ends	4 to 12 mm		
	diameter of pivot holes	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, any angle		
	optional cooling/heating module usable with gripper	no		

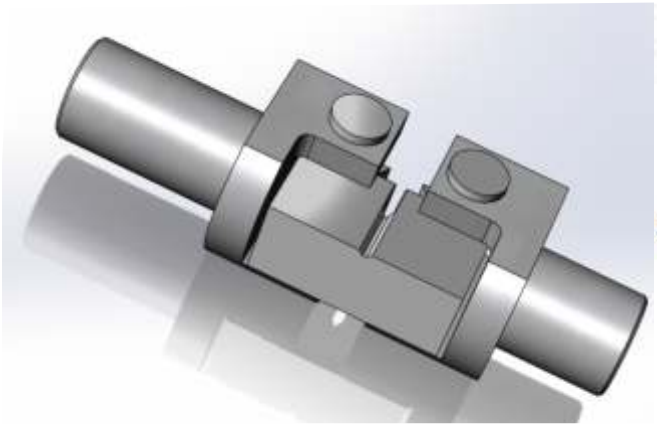
Materials Testing

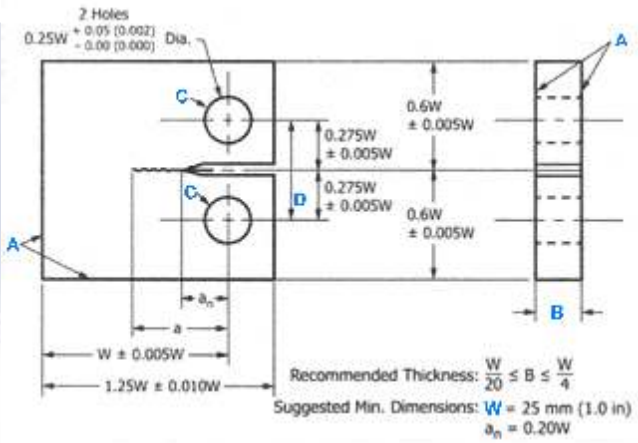
Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V14

for tensile tests and low or high forces; for DCB and CT Testing





The dimensions shown here as examples only, some of them may vary individually.

CT-specimen according ASTM E647-15

Description

Holder to be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The set is made of two similar clamps with precision cylinders at the end of each one of the two holders that fit into honed orifices of the two yokes.

Therefore the center line of the specimen is lined up very precisely with the plane formed by the lead screw center lines. If the dimensions of the series of specimens are made available, one such set will be part of the shipment volume.

The method of DCB (Dual Cantilever Beam) testing mainly shows the formation of an initial crack, and ist advancing through the specimen. Metallic, composite materials or polymer samples can be examined. There is quite a number of specimen geometries known. All of them have some kind of"notch", so that the crack initiation can be predicted. This notch can be oriented vertically or horizontally as shown above. Some procedures even use a wedge to apply the force to the specimen. There is not much space available between the leadscrews of the tensile testing module; therefore the example shown in the image above is an example of a very useful geometry. The specimen an be mounted horizontally or at some tilt angle.

Specifications

	load cell	100 N	500 N	2000 N
grippers	tensile tests	yes	yes	yes
	compression tests	no	no	no
	thread load cell	M5	M5 or M10	M10
	maximum load	depends upon the installed load gauge		
	included in a tensile module	on request		
	purpose	for DCB (Dual Cantilever Beam) or CT (Compact Tension) Testing		
specimen	A-overall length	1,25W		
	B-recommended thickness	see formula in above drawing according		
	C-diameter of the alignment pivots	0,25W		
	D-distance of pivot holes	0,55W (2x 0,275W)		
	W-suggested min. dimension	W = 25mm (1.0 in)		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with gripper	no	no	no

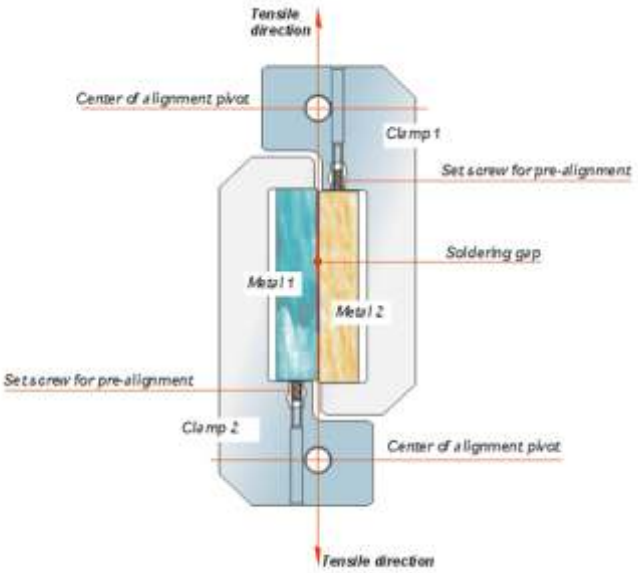
Kammrath Weiss GmbH

Special Developments for Microscopy

Materials Testing

MZ.V15

for Shear Tests and high forces; for Solder- or Cement Interfaces



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. Static or dynamic testing can be done with this clamping mechanism. The clamping device for this operation consists of two approximately C-shaped structures being mirror image to each other. Two reamed holes take hardened pivot pins, similar to those used in a “tensile module” tester. The two objects marked yellow and blue in the sketch above are lined up in such a way, that the soldered or cemented surfaces are oriented precisely along the line through the pivot holes (vertical line shown in red). Two set screws make setting up easy, using a flat surface (e.g. a glass plate).

In order to understand the mechanical strength behaviour of solder- or cement joints, one must apply tensile force exactly along the interface between the two objects soldered or cemented together (see sketch above).

Specifications

	load cell	100 N	500 N	2000 N
grippers	tensile tests	no	yes	yes
	compression tests	no	no	no
	thread load cell		M5 or M10	M10
	maximum load		500 N to 2000 N; depends upon the installed load gauge	
	included in a tensile module		on request	
	purpose		Shear Tests on Solder- or Cement Interfaces	
specimen	overall length		10 to 30 mm	
	thickness		4 mm (or according to the user's requirements)	
	width		4 mm (or according to the user's requirements)	
	length		25 mm (or according to the user's requirements)	
	diameter of the alignment pivots		4 mm	
	distance of pivot holes		to be determined	
	specimen can be mounted with some tilt		no	
	optional cooling/heating module usable with gripper		no	

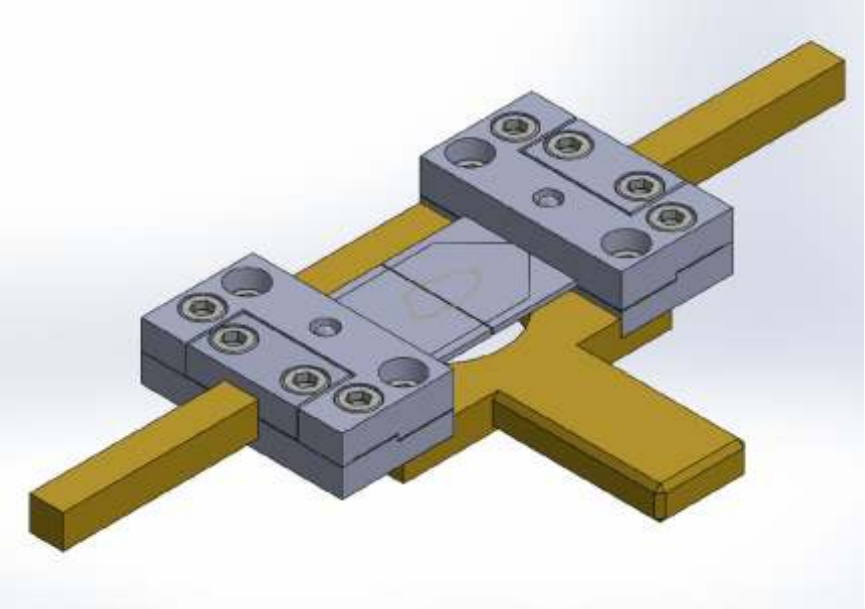
Kammrath Weiss GmbH

Special Developments for Microscopy

Materials Testing

MZ.V16 (only in combination with a K&W Fiber Tensile Module)

for tensile tests and very low forces; for ultra-thin (rubber) samples



Description

Holder to be attached to the fiber tensile module as an exchangeable clamping device. The specimens were cut in a microtome, and they come out in a somewhat irregular shape. To pick them up, a very fine paintbrush is used.

As an extremely thin slices of automotive tire rubber were cut using an ultra-microtome. These slices are so thin that they are almost transparent, so that they can be examined under load in a light microscope. The specimens are floated in alcohol, and caught with a very fine brush. They are then laid down across a see-through gap of 100 µm on the surface of the stainless steel surface, where the two halves meet (see sketch above). The alignment jig below the clamps will then be removed, and the tensile experiment begins: as the elongation proceeds, the gap will widen, and the changes in the rubber structure can be observed and recorded.

Specifications

	load cell	1 N	10 N	20 N
grippers	tensile tests	yes	yes	yes
	compression tests	no	no	no
	thread load cell	not available	M5	M5
	maximum load	1 N	10 N	20 N
	included in a tensile module	on request		
	purpose	ultra-thin cut rubber samples		
specimen	overall length	appr. 8 mm		
	thickness	several µm		
	width	appr. 5 mm (lengths and width come out usually irregular)		
	length of narrow area	10 to 50 mm		
	diameter of pivots holes	2 mm		
	distance of pivot holes	40 mm		
	specimen can be mounted with some tilt	horizontal		
	optional cooling/heating module usable with gripper	yes		

Materials Testing

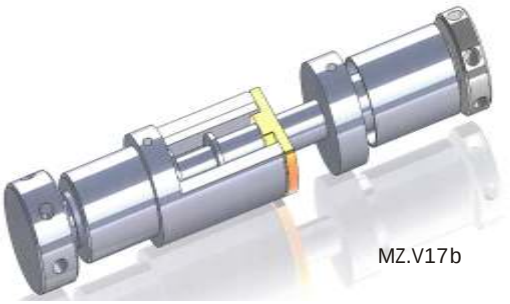
Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V17a/b (a = for big voluminous specimen; b = for small, compact specimen which can shatter, splinter or crumble)

for compression experiments or load cell calibration and low or high forces, no tensile tests !

MZ.V17a



MZ.V17b

Description

Inserts to be attached to the tensile /compression module as an exchangeable clamping device. The specimens must have plane-parallel ends, in order to avoid shear or bending action, which will spoil the results. If the specimens is apt to shatter or crumble, place a petri-dish underneath the clamping (on the specimen chamber floor), to collect the debris.

This device was created for various compression experiments. Such tests can be done with almost any material: concrete, medical pills, wood, sintered metal, polymers, biological material such as bovine teeth, etc.
Alternatively, this clamping set can be used for calibrating a load gauge: the gauge is then attached to the two adapters, using their M5 (or M10) threads. A calibrated load gauge of the same maximum load is mounted to the tensile/compression testing module. The signal of the two gauges will then be observed, and the reading of the gauge to be calibrated is protocolled for later calibration procedures. Such a test should be done by a Kammrath & Weiss engineer.

Specifications

	load cell	50 N	500 N	2000 N
grippers	tensile tests	no	no	no
	compression tests	yes	yes	yes
	thread load cell	M5	M5 or M10	M10
	maximum load	50 N to 2000 N; depends upon material and installed load cell		
	included in a tensile module	on request		
	purpose	compression experiments or load cell calibration		
specimen	overall length	5 mm to 25 mm		
	diameter or square section	approx. 5 mm to 12 mm diameter or square		
	width			
	length			
	diameter of the alignment pivots	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	Depending on the supporting clamps		
	optional cooling/heating module usable with gripper	no	no	no

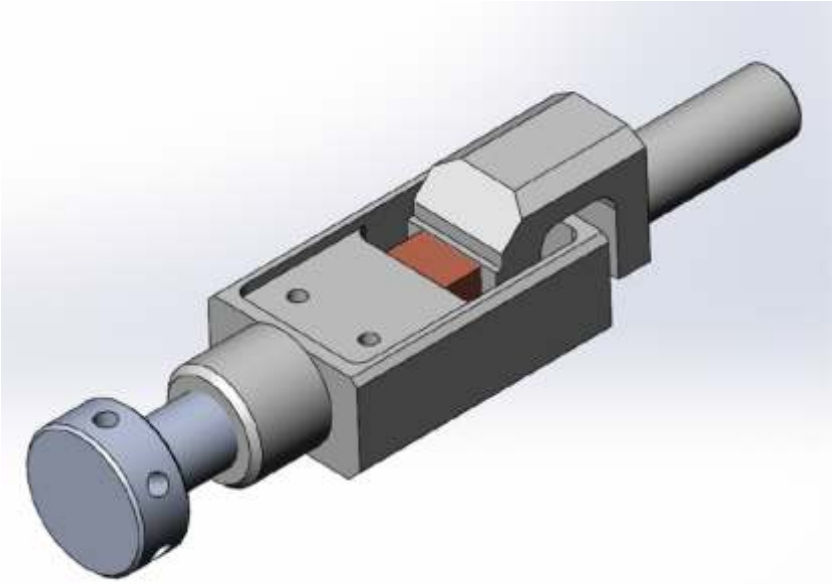
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V18

for compression experiments immersed in a liquid and for low or high forces, no tensile tests !



Description

Holder to be attached to the tensile/compression module as an exchangeable clamping device. This device was created for compression experiments under a liquid surface. This may be required in researching concrete, minerals, sintered materials, wood, or other water or liquid absorbing materials.

If the SEM is not able to work in the “environmental” or “low vacuum” mode, such experiments should be done at air, under a light or laser microscope. Tensile testing cannot be done, because the specimen is not clamped in grippers. The objects to be tested must have accurately planeparallel end surfaces to avoid bending, kinking or shear forces, which will spoil the results.

Specifications

	load cell	50 N	500 N	2000 N
grippers	tensile tests	no	no	no
	compression tests	yes	yes	yes
	thread load cell	M5	M5 or M10	M10
	maximum load	50 N to 2000 N; depends upon material and installed load cell		
	included in a tensile module	on request		
	purpose	compression experiments, immersed in a liquid		
specimen	overall length	5 to 15 mm		
	diameter or square section	approx. 5 to 12 mm diameter or square		
	width			
	length			
	diameter of the alignment pivots	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	no		
	optional cooling/heating module usable with gripper	no		

Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V19

for compression experiments and low or high forces, no tensile tests !

Description

Holder to be used in the tensile module as an exchangeable compression device.
Small clips at the front end will hold the compression samples in centerline of force and in place, so that they can not fall down while there is no compression force.
For brittle samples where there is the chance that pieces can fall into the vacuum chamber there is another version available. This version is also suitable for X-ray applications.

Specifications

	load cell	10 N	500 N	5000 N
grippers	tensile tests	no	no	no
	compression tests	yes	yes	yes
	thread load cell	M5	M5 or M10	M10
	maximum load	10 N to 5000 N; depends upon material and installed load cell		
	included in a tensile module	on request		
	purpose	compression specimen holder for low or high loads and small samples, e.g. ø 3mm		
specimen	overall length	5 mm to 60 mm		
	thickness	0.5 mm to 5 mm (depends of existing compression area of the device)		
	width			
	length			
	diameter of the alignment pivots	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, any tilt angle		
	optional cooling/heating module usable with gripper	no		

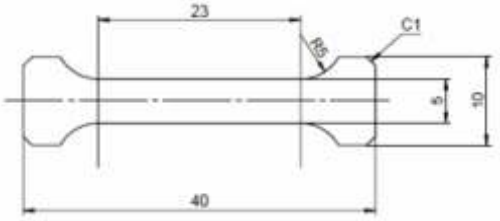
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V20a (a = usuable without optional cooling/heating module)

for tensile experiments and low forces; for small samples



Description

Holder to be used in the tensile module with high precise form fittings for tensile experiments.
Shape and dimensions can be dicussed.

Specifications

	load cell	10 N	500 N	5000 N
grippers	tensile tests	yes	yes	no
	compression tests	no	no	no
	thread load cell	M5	M5 or M10	
	maximum load	10 N to 500 N; depends upon material & installed load cell		
	included in a tensile module	on request		
	purpose	specimen holder with shaped inserts for small samples		
specimen	overall length	3 to 40 mm		
	thickness	0.5 to 2 mm		
	length of narrow area	1,5 to 23 mm		
	width at clamping ends	depends of the shaped inserts		
	diameter of the alignment pivots	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/-20°		
	optional cooling/heating module usable with gripper	no		

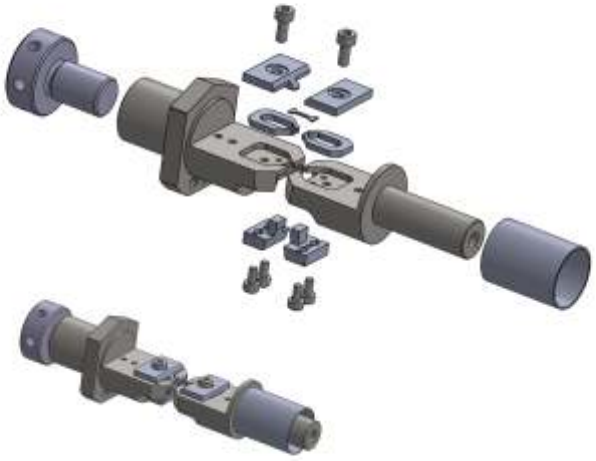
Kammrath Weiss GmbH

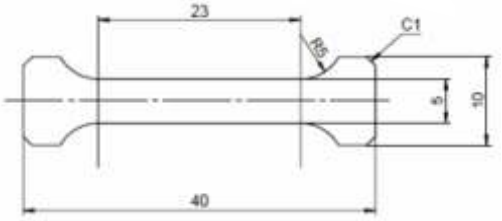
Special Developments for Microscopy

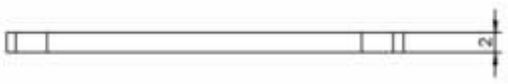
Materials Testing

MZ.V20b (b = usuable with optional cooling/heating module)

for tensile experiments and low forces; for small samples







Description

Holder to be used in the tensile module with high precise form fittings for tensile experiments. Shape and dimensions can be discussed.

Specifications

	load cell	10 N	500 N	5000 N
grippers	tensile tests	yes	yes	no
	compression tests	no	no	no
	thread load cell	M5	M5 or M10	
	maximum load	10 N to 500 N; depends upon material & installed load cell		
	included in a tensile module	on request		
	purpose	specimen holder with shaped inserts for small samples		
specimen	overall length	3 to 40 mm		
	thickness	0.5 to 2 mm		
	length of narrow area	1,5 to 23 mm		
	width at clamping ends	depends of the shaped inserts		
	diameter of the alignment pivots	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/-20°		
	optional cooling/heating module usable with gripper	yes		

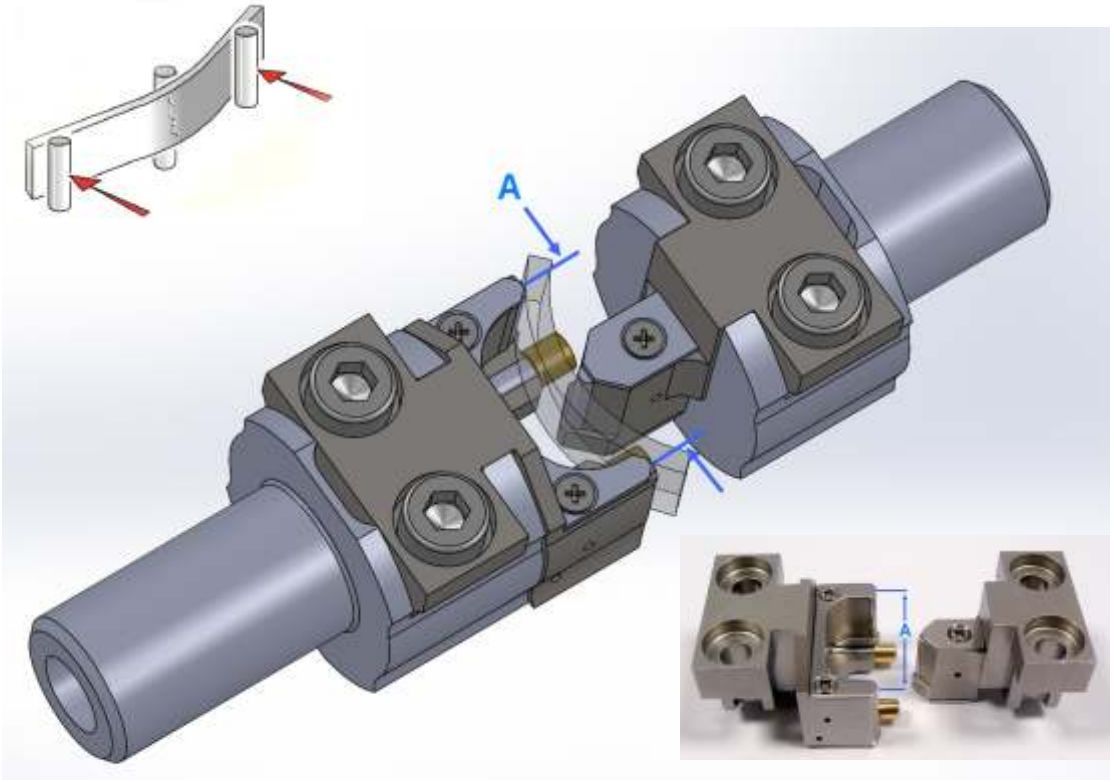
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V32a

for 3-point bending experiments and high forces (up to 5kN); for rectangular specimens



Description

3-point Bending inserts to be used in the tensile module as an exchangeable test device.
With this special adaptor in combination with the clamps MZ.V04a or MZ.V04b
the tensile module can be used for bending tests.
Rectangular specimens of various thickness, cut side viewed from above by the e-beam.

Specifications

	load cell	10 N	1000 N	5000 N
grippers	tensile tests	no	no	no
	bending tests	no	yes	yes
	thread load cell		M10	
	maximum load		1000 to 5000 N; depends upon installed load cell	
	included in a tensile module		on request	
	purpose		3-point bending experiments	
specimen	specimen size for a tensile module with:			
	38 mm spindle distance (MZ.Ms)		26 x 10 mm	
	58 mm spindle distance (MZ.Mb)		46 x 10 mm	
	60 mm spindle distance (MZ.Mb-L)		48 x 10 mm	
	specimen thickness		0.5 to 5 mm	
	bending movement		up to 5 mm	
	A-distance of outer pins		22 mm	
	B-distance of inner pins (anvil)		Single Pin	
	specimen can be mounted with some tilt		+20° / -20°	
	optional cooling/heating module usable with gripper		no	

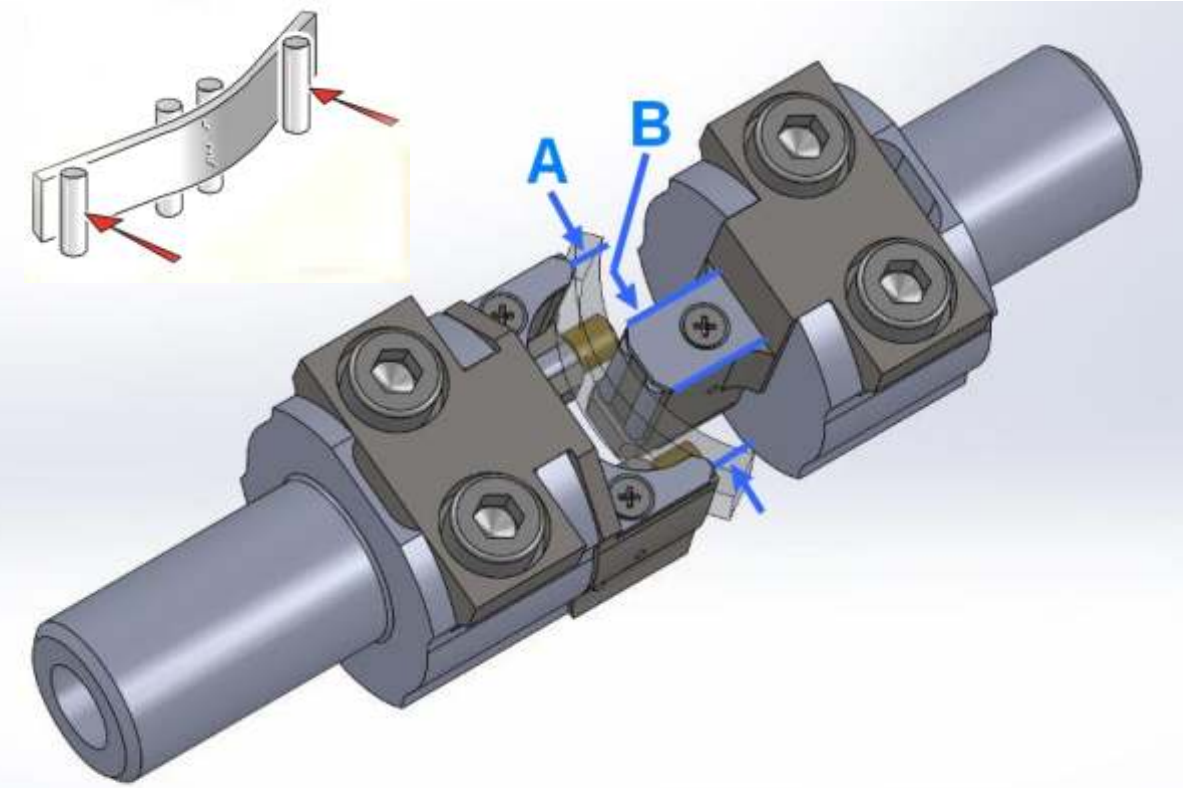
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V32b

for 4-point bending experiments and high forces (up to 5kN); for rectangular specimens



Description

4-point Bending inserts to be used in the tensile module as an exchangeable test device.
With this special adaptor in combination with the clamps MZ.V04a or MZ.V04b
the tensile module can be used for bending tests.
Rectangular specimens of various thickness, cut side viewed from above by the e-beam.

Specifications

	load cell	10 N	1000 N	5000 N
grippers	tensile tests	no	no	no
	bending tests	no	yes	yes
	thread load cell		M10	
	maximum load		1000 to 5000 N; depends upon installed load cell	
	included in a tensile module		on request	
	purpose		4-point bending experiments	
specimen	specimen size for a tensile module with:			
	38 mm spindle distance (MZ.Ms)		26 x 10 mm	
	58 mm spindle distance (MZ.Mb)		46 x 10 mm	
	60 mm spindle distance (MZ.Mb-L)		48 x 10 mm	
	specimen thickness		0.5 to 5 mm	
	bending movement		up to 5 mm	
	A-distance of outer pins		22 mm	
	B-distance of inner pins (anvil)		4 mm	
	specimen can be mounted with some tilt		+20° / -20°	
	optional cooling/heating module usable with gripper		no	

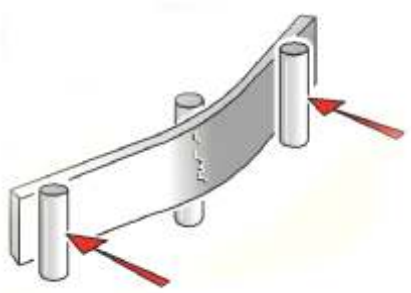
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V33

for 3-point bending experiments and low forces (up to 500 N); for retangular specimens



Description

To be used in the tensile module as an exchangeable test device.
Rectangular specimens of various thickness, cut side viewed from above by the microscope beam.

Specifications

	load cell	10 N	200 N	500 N
grippers	tensile tests	no	no	no
	bending tests	yes	yes	yes
	thread load cell		M5	
	maximum load		10 to 500 N; depends upon installed load cell	
	included in a tensile module		on request	
	purpose		3-point bending experiments	
specimen	specimen size for a tensile module with:			
	38 mm spindle distance (MZ.Ms)		26 x 10 mm	
	58 mm spindle distance (MZ.Mb)		46 x10 mm	
	60 mm spindle distance (MZ.Mb-L)		48 x 10 mm	
	specimen thickness		0.5 to 2 mm	
	bending movement		up to 5 mm	
	A-distance of outer pins		10 to 20 mm	
	B-distance of inner pins		Single Pin	
	specimen can be mounted with some tilt		no	
	optional cooling/heating module usable with gripper		no	

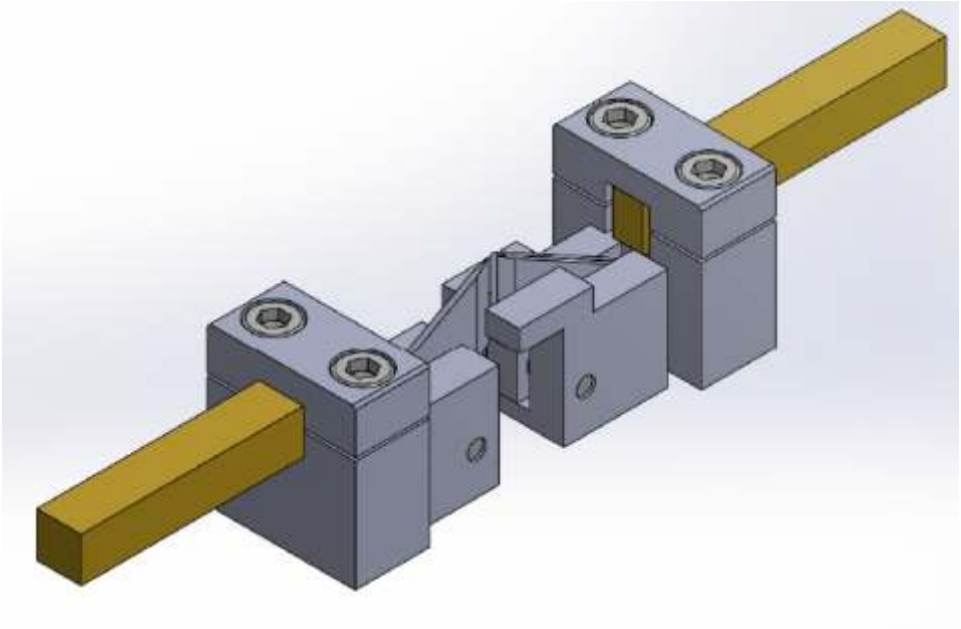
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V36 (only in combination with a K & W Fiber Tensile Module)

for bending experiments and very low forces; for fibers specimens



Description

This very unique fixture can be mounted in the “Fiber Tensile Module” instead of the standard fiber clamping. It was made especially according to a customer's request, in order to make use of the extremely fine load measuring capability off the fiber tester.
The idea was, to bend fine wires, whiskers, or fibers under SEM observation. Two pieces of a razor blade are mounted side by side, 500 µm (or any longer required distance) apart from each other. A third blade is mounted at the opposite side, so that it can move into the gap between the other two blades. The operator makes the blades touch the specimen very gently. Now the experiment will begin. While the bending experiment is running, load and elongation will be recorded, and visual observation can be done, or movie clips can be taken.

Specifications

	load cell	1 N	200 N	500 N
grippers	bending tests	yes	no	no
	tensile tests	no	no	no
	compression tests	no	no	no
	thread load cell	no		
	maximum load	max 1 N only		
	included in a tensile module	on request		
	purpose	bending experiments in the "Fiber Tensile Module"		
specimen	overall length	longer than 500 µm		
	size	up to 100 µm		
	bending movements	?		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	no		
	optional cooling/heating module usable with gripper	no		

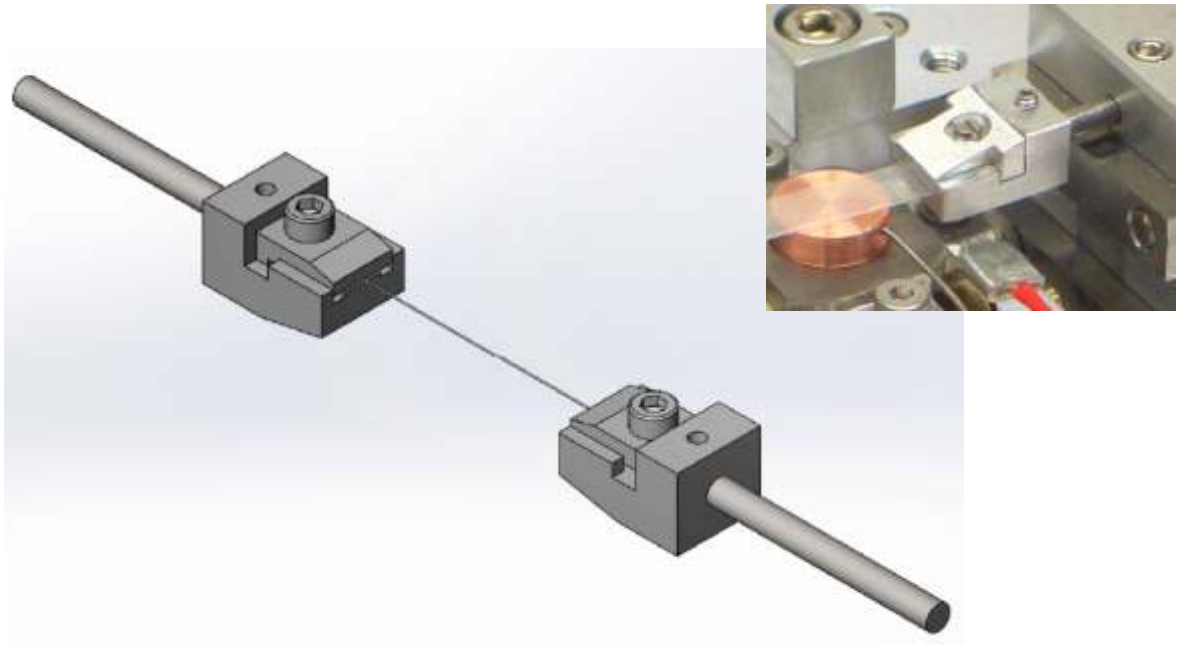
Materials Testing

Kammrath Weiss GmbH

Special Developments for Microscopy

MZ.V41 (only in combination with a K & W Fiber Tensile Module)

for tensile testing and very low forces; for thin wires, foils and similar objects



Clamping device for tensile testing of thin wires, foils and similar objects, being stretched of a millimeter or up to several centimeter long.

Description

Holder to be used in the fiber tensile module as an exchangeable clamping device, instead of the standard fiber clamping. All four clamp surfaces are lined with some “soft” material, to make sure that the specimen will not break at the clamp.
If for instance steel wires will be tested, then this lining can be copper or bronze.
If biological or polymer material will be used, the lining can be carbon foil or blotting paper.
For very long stretching ratio, use short area of interest.

Specifications

	load cell	1 N	10 N	500 N
grippers	bending tests	no	no	no
	tensile tests	yes	no	no
	compression tests	no	no	no
	thread load cell	no		
	maximum load	1 N		
	included in a tensile module	on request		
	purpose	tensile testing of thin wires, foils and similar objects		
specimen	overall length	20 mm		
	size	to be determined		
	Maximum specimen length	50 mm		
	Maximum specimen width	6 mm (if using foils)		
	Maximum wire diameter			
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, any angle		
	optional cooling/heating module usable with gripper	yes		

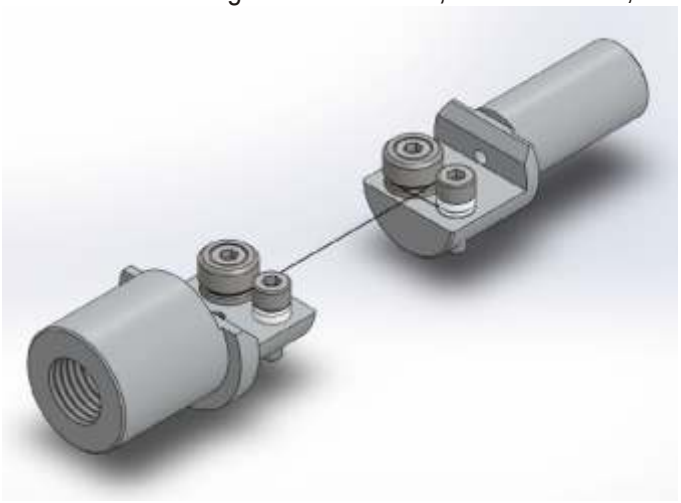
Kammrath Weiss GmbH

Special Developments for Microscopy

Materials Testing

MZ.V44 (only in combination with a K & W Tensile Module)

for tensile testing and low forces; for thin wires, threads, filaments and similar objects



To be used for wine wires or other filamentous material. Fiber specimen holder with ball bearing slide.

Description

To be used in the tensile module as an exchangeable clamping device, instead of the standard fiber clamping. Two screws with a cylindrical portion near their heads are mounted on each half of the device. One of these screws has a Teflon washer. The wire or thread is wound around the cylindrical end of the larger screw, and then laid down under the Teflon washer. Now the smaller screw will be tightened carefully. The Teflon surface will not break the wire, because it is a fairly soft material. The larger screw will not be tightened, so that only the small screw will do the clamping. Winding the wire around the cylindrical portion of the large screw will prevent the wire from breaking at the clamping. With this clamp L0 easily can determined.

Specifications

	load cell	10 N	100 N	500 N
grippers	bending tests	no	no	no
	tensile tests	yes	yes	yes
	compression tests	no	no	no
	thread load cell	M5		
	maximum load	10 N to usually < 500 N; depends upon installed load gauge		
	included in a tensile module	on request		
	purpose	thin wires, threads, filaments and similar objects		
specimen	overall length			
	maximum clamping width	2 mm		
	maximum free specimen length	as much as yoke separation will allow; usually 60mm		
	minimum free specimen length	10 mm or as short as operator can handle, using tweezers		
	size of clamping heads	12 mm diameter, 20 mm overall length		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, any angle		
	optional cooling/heating module usable with gripper	yes		

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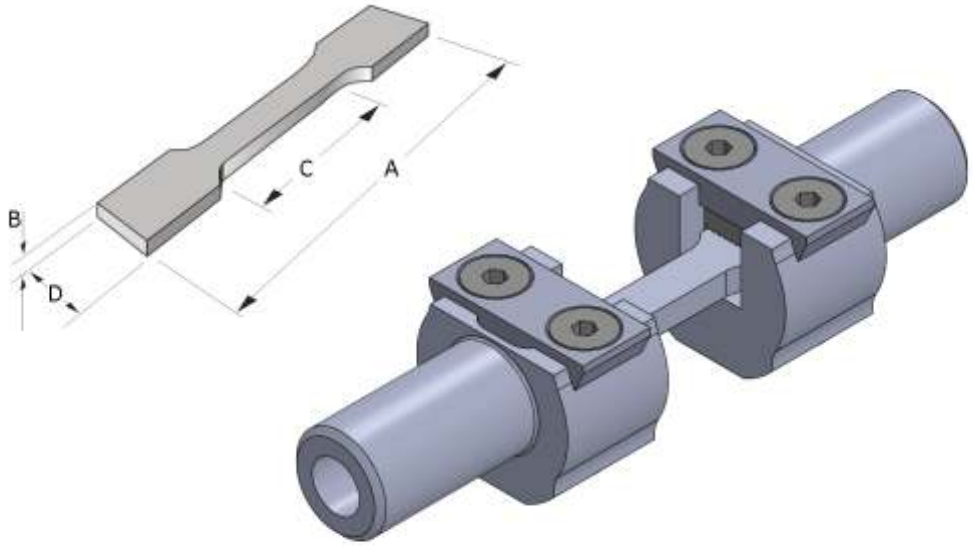
Special Developments for Microscopy

Materials Testing

MZ.V45 (for use in selected AFM's and light microscopes and for low working distances)

for tensile/compression tests and high forces; for flat specimen without reamed holes



The dimensions shown here are examples only, some of them may vary individually; see list.

Description

Holder to be used in the tensile module as an exchangeable clamping device. The specimens can be clamped horizontal or under several ten degrees of tilt. The length of the area of interest (narrow portion) may be varied within the range of the tensile testing module. Typical overall length range is 30 to 50 mm (up to 60mm; depends on specimen). See sketch above. For very long elongation ratio, use short area of interest (narrow portion). It can be used in both tensile tester designs; the 38 mm and the 58 mm leadscrew distance. This clamping set allows a smaller working distance and can be used in conjunction with selected AFM's or light microscopes.

Specifications

	load cell	1000 N	5000 N	10000 N
grippers	tensile tests	yes	yes	no
	compression tests	yes	yes	no
	thread load cell	M10	M10	M10
	maximum load	1000 N to 5000 N		
	included in a tensile module	on request for tensile/compression module MZ.Ms		
	purpose	for flat specimens in tensile/compression tests in conjunction with EBSD or some AFM		
specimen	A-overall length	30 to 50 mm (up to 60mm; depends on specimen)		
	B-thickness	0.5 to 4 mm		
	C-length of narrow area	10 to 30 mm		
	D-width at clamping ends	10 mm		
	diameter of pivot holes	no pivot holes		
	distance of pivot holes	no pivot holes		
	specimen can be mounted with some tilt	yes, +/- 20°		
	optional cooling/heating module usable with gripper	yes		

Materials Testing

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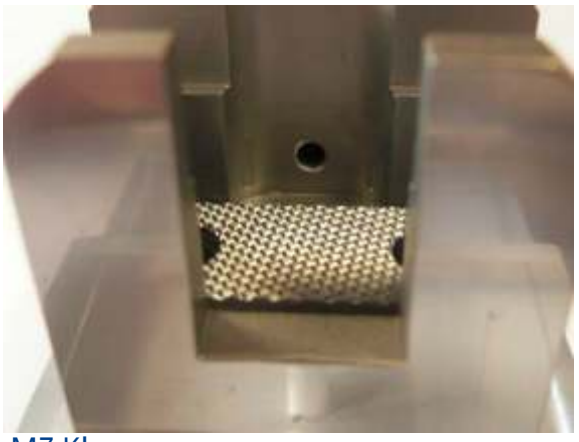
Special Developments for Microscopy

Accessories for tensile / compression experiments

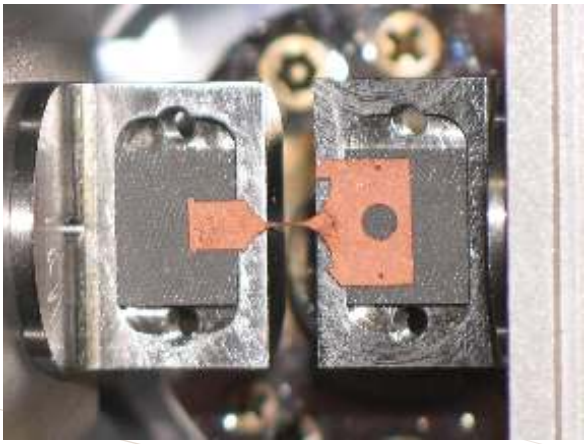
MZ.KI-gr Set of rough “bite plates” (spare part) 4 pcs. (up to 10 kN)

MZ.KI-kl Set of fine “bite plates” (spare part) 4 pcs. (up to 500 N)

MZ.KI-gr



MZ.KI-gr



MZ.KI-kl

MZ.KI-kl

Materials Testing

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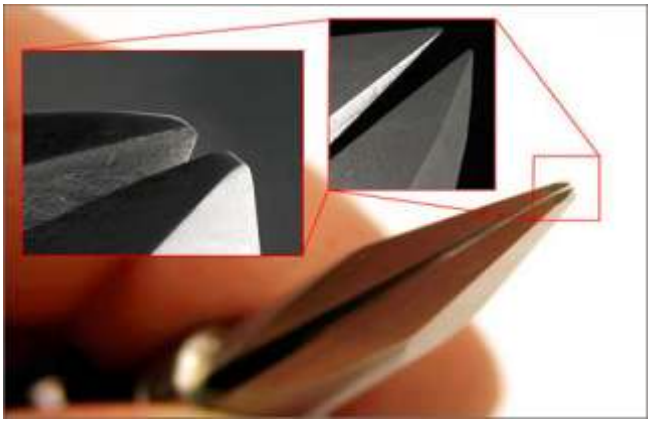
Special Developments for Microscopy

Accessories for tensile / compression experiments

S.TWG Specialty gripper



Piezo actuated Micro Tweezer
Designed for use with our Micro Tensile Module

Kammrath Weiss GmbH

Special Developments for Microscopy

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