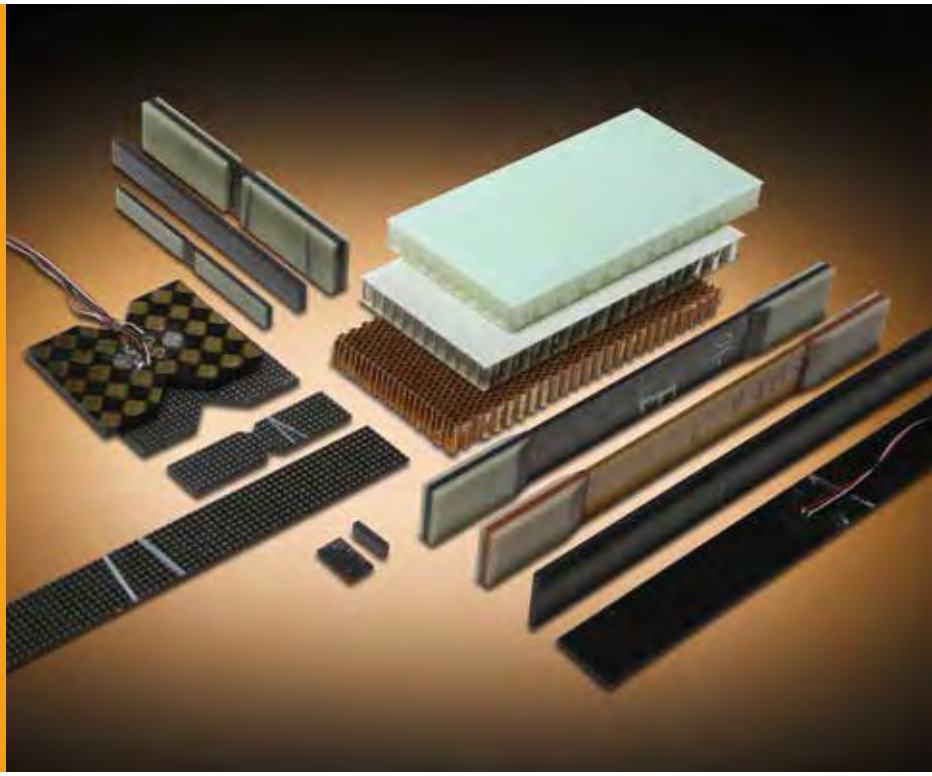
Composites Fixtures

A comprehensive array of polymer matrix composites accessories

be certain.

COMPOSITES FIXTURES

MTS complements its electromechanical and servohydraulic testing lines with a comprehensive array of accessories to fulfill a full spectrum of polymer matrix composites material testing – from basic quality control, to demanding research and development applications.



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A Comprehensive Array of Polymer Matrix Composites / Fibre Reinforced Plastics Accessories

CAN'T FIND WHAT YOU NEED?

We offer many more grips and fixtures. We can offer higher temperature version of many of the fixtures. Contact your local sales representative to find the model that meets your exact needs.

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Model 647 Side-Loading Hydraulic Wedge Grips

The MTS 647 Hydraulic Wedge Grips are versatile, easy-to-load grips for a wide range of tensile and fatigue applications. The symmetrical housing design ensures an even specimen loading across the entire face of the wedge. The lateral movement of the wedges won't change the gripping position on the specimen once the grips are activated.

Features

- These grips clamp onto your specimen in the same position, test after test, to minimize the bending strains that can invalidate your test results
- Tension and fatigue capability
- Adjustable pressure allows these grips to be used for testing a variety of materials
- A wide variety of wedges are available to meet your requirements
- Side loading capability for easy specimen insertion
- All Temperature – These models allow for temperatures to 540°C (1000°F)

  Contact MTS for additional information.

Model 647 Grip Recommended for Polymer Matrix Composites Testing

	Method	Standard
Laminae & Laminate	Tensile	ISO 527-4 & 5, ASTM D3039, EN 2561, EN 2597
	Shear	ISO 14129, ASTM D3518
	Fatigue (tension / tension)	ISO 13003, ASTM D3479
Structural	Tension (open & filled hole)	ASTM D5766, ASTM D6742, ASTM D7615

For use on non-hydraulic load frames or for temperature applications below -7°C (20°F) or above +66°C (+150°F) stand-alone hydraulic grip supply and extension rods are required, refer to SERVICES & ACCESSORIES catalog for details.

All grips are sold as pairs.

All wedges and attachment kits are sold separately.

Model	Dynamic Force	Static Force	Pressure	Temperature Min/Max	Overall Height	Diameter	Weight	Metric/US Customary Stud Size	Part Number
647.10A	100 kN (22 kip)	120 kN (27 kip)	21 MPa (3000 psi)	-40°C/177°C (-40°F/350°F)	188 mm (7.4 in)	203 mm (8.0 in)	30 kg (67 lb)	M27 x 2 (1 - 14 in)	047-080-605
647.25A	250 kN (55 kip)	333 kN (75 kip)	69 MPa (10,000 psi)	-40°C/177°C (-40°F/350°F)	249 mm (9.8 in)	266 mm (10.5 in)	77 kg (170 lb)	M36 x 2 (1 1/2 - 12 in)	047-080-905

Wedges for 647 Wedge Grips Offer a Variety of Surfaces

MTS Wedges Surfaces

» Diamond tip – aggressive surface for gripping soft materials (steel, plastic)

» Surfalloy – grit incorporated onto the wedge surface for testing brittle samples

MTS employs a unique wedge design that significantly reduces the stress concentration on the specimen, enabling even very brittle composites to be gripped securely without grip-induced failure.

Model 647 All-Temperature Wedges are available for the all-temperature grips.

Contact MTS for additional information.

Flat Specimen Wedges for Model 647.10 Grips Recommended for Polymer Matrix Composites Testing

Surface	Specimen Thickness	Usable Width	Part Number
Diamond tip	0 - 7.6 mm (0 - 0.30 in)	44 mm (1.75 in)	041-842-101
Diamond tip	7.1 - 14.2 mm (0.28 - 0.56 in)	44 mm (1.75 in)	041-842-102
Diamond tip	11.7 - 19.1 mm (0.46 - 0.75 in)	44 mm (1.75 in)	041-842-109
Wide diamond tip	0 - 7.6 mm (0 - 0.30 in)	76 mm (3 in)	046-198-604
Wide diamond tip	7.1 - 14.2 mm (0.28 - 0.56 in)	76 mm (3 in)	046-198-603
Wide diamond tip	11.4 - 18.9 mm (0.45 - 0.75 in)	76 mm (3 in)	046-198-610
Wide diamond tip	17 - 25.4 mm (0.67 - 1 in)	76 mm (3 in)	046-198-606
Surfalloy	0 - 7.6 mm (0 - 0.30 in)	44 mm (1.75 in)	041-842-108
Surfalloy	7.1 - 14.2 mm (0.28 - 0.56 in)	44 mm (1.75 in)	041-842-111
Surfalloy	11.7 - 19 mm (0.46 - 0.75 in)	44 mm (1.75 in)	041-842-121
Wide surfalloy	0 - 7.6 mm (0 - 0.30 in)	76 mm (3 in)	046-198-602
Wide surfalloy	7.1 - 14.2 mm (0.28 - 0.56 in)	76 mm (3 in)	046-198-601

Insertion depth: 63.5 mm (2.5 in)
Temperature range: -40°C (-40°F) to 177°C (350°F)

Flat Specimen Wedges for Model 647.25 Grips Recommended for Polymer Matrix Composites Testing

Surface	Specimen Thickness	Usable Width	Part Number
Diamond tip	1.0 - 11.9 mm (0.04 - 0.47 in)	50 mm (2 in)	041-842-201
Diamond tip	6.1 - 17.0 mm (0.24 - 0.67 in)	50 mm (2 in)	041-842-202
Diamond tip	15.0 - 25.9 mm (0.59 - 1.02 in)	50 mm (2 in)	041-842-203
Wide diamond tip	1.0 - 11.9 mm (0.04 - 0.47 in)	100 mm (4 in)	046-198-804
Wide diamond tip	6.1 - 17.0 mm (0.24 - 0.67 in)	100 mm (4 in)	046-198-806
Wide diamond tip	15.0 - 25.9 mm (0.59 - 1.02 in)	100 mm (4 in)	046-198-805
Surfalloy	1.0 - 11.9 mm (0.04 - 0.47 in)	50 mm (2 in)	041-842-207
Surfalloy	6.1 - 17.0 mm (0.24 - 0.67 in)	50 mm (2 in)	041-842-208
Surfalloy	15.0 - 25.9 mm (0.59 - 1.02 in)	50 mm (2 in)	041-842-209
Wide surfalloy	0 - 10.6 mm (0 - 0.40 in)	100 mm (4 in)	046-198-801
Wide surfalloy	6.1 - 17.0 mm (0.24 - 0.67 in)	100 mm (4 in)	046-198-802
Wide surfalloy	15.0 - 25.9 mm (0.59 - 1.02 in)	100 mm (4 in)	046-198-803
Wide diamond tip	7.1 - 14.2 mm (0.28 - 0.56 in)	76 mm (3 in)	046-198-603

Insertion depth 89 mm (3.5 in)
Temperature range: -40°C (-40°F) to 177°C (350°F)

Note: Contact your local sales representative or applications engineer for wedges to support specimen thickness range of up to 35 or 40 mm.

MTS Advantage™ Wedge Action Grip

MTS Advantage Wedge Action Grips are versatile general-purpose grips in which the faces remain stationary during loading. This makes it especially useful for applications where screw or pneumatic grips do not provide sufficient clamping force, or where compressive or buckling forces are not desirable during specimen insertion. It works with servohydraulic and electromechanical machines and even accommodates the side insertion of specimens.

Features

- Quick and easy interchangeable faces for round and flat specimens
- Self-tightening during test reduces slipping
- Specimen positioning aids
- Side loading design
- Standard pinned adapter for easy installation and removal
- Suitable for use in environmental chambers
- Improved serrations secure specimen with minimal clamping force

Functions

Wedges

- Spring and mechanical retraction
- Easy access to wedges for quick changeover

Preload

- Uses right-hand/left-hand thread mechanism for reducing effort

Grip Interface

- Type D upper and lower mounting (except for 300 kN).
- 300 kN mounting is M36x2 thread

MTS Advantage Wedge Action Grips Recommended for Polymer Matrix Composites Testing

	Method	Standard
Laminae & Laminate	Tensile	ISO 527-4 (Specimen Type 1B & 2), ASTM D3039, EN 2561(Specimen Type C)
	Shear	ISO 14129, ASTM D3518
Structural	Tension (open & filled hole)	ASTM D5766, ASTM D6742, ASTM D7615

Model	Tensile Capacity	Weight	Temperature Rating	Part Number
Advantage Wedge 50	50 kN (11,000 lbf)	7 kg (15 lb)	-130°C (-200°F) up to 315°C (600°F) at 37 kN (8 kip)	054-951-001
Advantage Wedge 100	100 kN (22,000 lbf)	15 kg (33 lb)	-130°C (-200°F) up to 315°C (600°F) at 75 kN (16 kip)	056-079-801
Advantage Wedge 150	150 kN (33,000 lbf)	19.6 kg (43 lb)	-130°C (-200°F) up to 315°C (600°F) at 112 kN (24 kip)	053-536-901
Advantage Wedge 300	300 kN (67,000 lbf)	54 kg (118 lb)	-130°C (-200°F) up to 315°C (600°F) at 213 kN (48 kip)	056-144-702

Flat Specimen Wedges Recommended for Polymer Matrix Composites Testing

Compatible Grips	ForceCapacity	Profile	Specimen Range	Dimensions	Temperature Rating	Part Number
Advantage 10, 30, 50	50 kN	Serrated Steel	0 - 7.9 mm	50 mm x 25 mm	-130°C (-200°F) to -315°C (600°F)	053-140-801
Advantage 10, 30, 50	50 kN	Serrated Steel	6 - 13.2 mm	50 mm x 25 mm	-130°C (-200°F) to -315°C (600°F)	053-140-802
Advantage 100, 150, 300	300 kN	Serrated Steel	0 - 9 mm	50 mm x 50 mm	-130°C (-200°F) to -315°C (600°F)	053-537-401
Advantage 100, 150, 300	300 kN	Serrated Steel	6.4 - 16 mm	50 mm x 50 mm	-130°C (-200°F) to -315°C (600°F)	053-537-402

Modified Celanese Compression Loading Fixture

- Recommended to test in accordance with ISO 14126 Method 1A
- Constructed out of high quality stainless steel
- Design based on the University of Wyoming Modified Celanese Compression Test Fixture
- Supported specimen dimensions:
  – Maximum width: 12.7 mm (0.5 in)
  – Thickness (with tabs): 3.8 - 6.35 mm (0.15 - 0.25 in)
  – Length: 114.3 mm (4.5 in)
- Includes wedges with flame sprayed high friction surface
- Requires compression platens for mounting (*purchased separately)*

Static Force	Temperature Rating	Weight	Dimensions	Part Number
88 kN (20 kip)	-85 to 122°C (-120 to 250°F)	≈ 7.3 kg (16 lbs)	Ø 89 mm (3.5 in) x 191 mm (7.5 in)	100-351-817

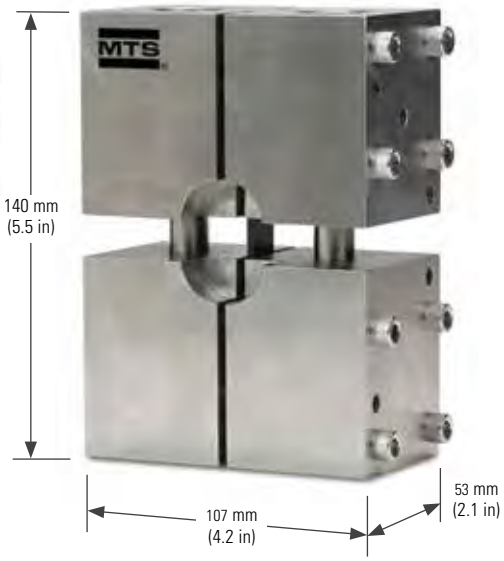
IITRI Compression Loading Fixture

- Recommended to test in accordance with ASTM D3410 and ISO 14126 Method 1B Constructed out of high quality stainless steel
- Supported specimen dimensions:
  – Maximum width: 25.4 mm (1 in)
  – Maximum thickness (with tabs): 15.2 mm (0.6 in)
  – Length: 140 mm (5.5 in)
- Includes sets of wedges to accommodate specimen thicknesses from 5.1 - 10.2 mm (0.2 - 0.4 in)
  Wedges that support other specimen thicknesses are available on request.
- Requires threaded adapters or compression platens for mounting (*purchased separately)*

Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
250 kN (55 kip)	-85 to 122°C (-120 to 250°F)	≈ 36 kg (80 lbs)	178 mm (7 in) x 102 mm (4 in) x 356 mm (14 in)	M30 x 2	100-351-818

Combined Loading Compression (CLC) Fixture

- Recommended to test in accordance with ASTM D6641
- Constructed out of high quality stainless steel
- Supported specimen dimensions:
  - Maximum width: 25.4 mm (1 in)
  - Maximum thickness (with tabs): 12.7 mm (0.5 in)
  - Length: 140 mm (5.5 in)
- Requires compression platens for mounting (*purchased separately)*



Static Force	Temperature Rating	Weight	Dimensions	Part Number
89 kN (20 kip)	-85 to 122°C (-120 to 250°F)	≈ 6.8 kg (15 lbs)	107 mm (4.2 in) x 53 mm (2.1 in) x 140 mm (5.5 in)	100-351-819

V-Notched Rail Shear Fixture

- Recommended to test in accordance with ASTM D7078
- Constructed out of high quality stainless steel
- Supported specimen dimensions:
  - Width: 55.6 mm (2.2 in)
  - Maximum thickness: 12.7 mm (0.5 in)
  - Maximum length: 76 mm (3.0 in)
- Requires threaded adapter for top and bottom mounting (*purchased separately)*

Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
44 kN (10 kip)	-152 to 318°C (-240 to 600°F)	≈ 7.7 kg (17 lbs)	102 mm (4 in) x 64 mm (2.5 in) x 165 mm (6.5 in)	1 - 14 in	100-351-820

V-Notched Beam (Iosipescu) Shear Fixture

- Recommended to test in accordance with ASTM D5379
- Constructed out of high quality stainless steel
- Supported Specimen Dimensions:
  - Width: 19 mm (0.75 in)
  - Thickness: 0.76 - 12.7 mm (0.03 -0.5 in)
  - Length: 76 mm (3.0 in)
  - Notch: 90 degree with 1.27 mm (0.05 in) radius minimum
- Includes adjustable wedges
- Requires threaded adapter for top and compression platen for bottom mounting (*purchased separately)*

Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
44 kN (10 kip)	-85 to 122°C (-120 to 250°F)	≈ 6.8 kg (15 lbs)	127 mm (5 in) x 89 mm (3.5 in) x 127 mm (5 in)	0.5 - 20 in	100-087-239

Short Beam Shear and Three-Point Flexure Fixture

- Recommended to test in accordance with ASTM D2344
- Constructed out of high quality stainless steel
- Supported Specimen Dimensions:
  - Maximum Width: 38 mm (1.5 in)
  - Maximum Thickness: 50 mm (2 in)
  - Maximum Length: 152 mm (6 in)
- Adjustable support span
- Requires male clevis adapter for top and threaded adapters for bottom mounting (*purchased separately)*

Lower Fixture Span	Loading Nose Diameter	Supports Diameter	Loading Nose / Supports Width
3.2 - 152 mm (0.125 - 6 in)	6.35 mm (0.25 in)	3.175 mm (0.125 in)	38 mm (1.5 in)

Static Force	Temperature Rating	Weight	Dimensions	Top Mounting Male Clevis	Bottom Mounting Thread Insert Sizes	Part Number
8.9 kN (2 kip)	-85 to 122°C (-120 to 250°F)	≈ 6.8 kg (15 lbs)	178 mm (7 in) x 58 mm (2.3 in) x 287 mm (11.3 in)*	12 mm (Type O)	0.5 - 20 in	100-351-821

** Plus any specimen up to 51 mm (2 in)*

Additional Loading Nose and Supports

Standard	Material	Lower Fixture Span	Loading Nose Diameter	Set of Supports Diameter	Loading Nose / Supports Width	Part Number
ISO 14130	High quality stainless steel	4 - 152 mm (0.157 - 6 in)	10 mm (0.394 in)	–	38 mm (1.5 in)	100-352-347
			–	4 mm (0.157 in)		100-352-348

Bend Fixtures

MTS Model 642 Bend Fixtures are configured to meet a variety of testing requirements. The fixtures have adjustable spans with easy-to-use, permanently attached scales for equal positioning of the rollers. The hardened rollers ensure test result accuracy by reducing undesirable loading and frictional forces on the specimen. All models can be used for both 3- and 4-point tests.

Models 642.01 and 642.10 Recommended for Polymer Matrix Composites

Method		Standard	Fixture Options
Laminae & Laminate	Flexure	ISO 14125	Model 642.01 3- & 4-Point Bend Fixture with Roller Assembly Size 10 mm (diameter) for specimen thickness of 4 mm
		ASTM D7264	Model 642.01 or 642.10 3- & 4-Point Bend Fixture with Roller Assembly Size 10 mm (diameter)
		EN 2562	Model 642.10 3-Point Bend Fixture with Roller Assembly Size 25 mm (diameter - loading) & 10 mm (diameter - support)
		EN 2746	Model 642.01 3- & 4-Point Bend Fixture with Roller Assembly Size 10 mm (loading) & 4 mm (support) Diameter

Model	Description	Upper Fixture Span	Lower Fixture Span	Dynamic Force*	Combined Height**	Part Number
642.01A-01	3-point bend fixture	N/A	24-152 mm (0.94 - 6.0 in)***	10 kN (2.2 kip)	172 mm (6.8 in)	051-427-701
642.01A-02	3- & 4-point bend fixture	24 - 76 mm (0.94 - 3.0 in)***	24-152 mm (0.94 - 6.0 in)***	10 kN (2.2 kip)	243 mm (9.6 in)	051-427-801
642.10B-01	3- point bend fixture	N/A	38-305 mm (1.5 - 12.0 in)****	100 kN (22 kip)	273 mm (10.75 in)	050-032-601
642.10B-02	3- & 4-point bend fixture	38 - 152 mm (1.73 - 6 in)****	38-305 mm (1.5 - 12.0 in)****	100 kN (22 kip)	356 mm (14.00 in)	050-032-701
642.25B-01	3- point bend fixture	N/A	79-610 mm (3.12 - 24.0 in)*****	250 kN (55 kip)	470 mm (18.50 in)	050-876-201
642.25B-02	3- & 4-point bend fixture	50.8 - 203 mm (2 - 8 in)*****	79-610 mm (3.12 - 24.0 in)*****	250 kN (55 kip)	660 mm (26.00 in)	050-876-301

Temperature range: -129°C to 149°C (-200°F to 300°F)
** Static and dynamic force rating depends upon roller diameter.*
*** Dimension depends upon roller diameter. Largest roller diameter shown.*
**** Dimension depends upon roller diameter. 6.35 mm (0.25 in) roller diameter shown.*
***** Dimension depends upon roller diameter. 25.4 mm (1 in) roller diameter shown.*
****** Dimension depends upon roller diameter. 50.8 mm (2 in) roller diameter shown.*

Model 642.01 Roller Assemblies*

Diameter	Part Number
4 mm	051-284-607
5 mm	051-284-601
10 mm	051-284-603
0.25 in	051-284-602
0.50 in	051-284-604

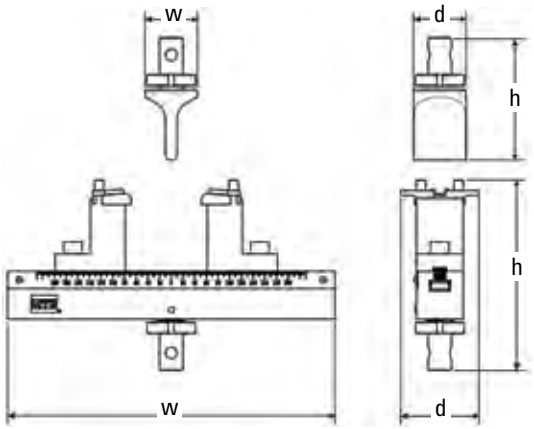
Model 642.10 Roller Assemblies*

Diameter	Part Number	Diameter	Part Number
5 mm	049-578-501	0.25 in	049-578-502
10 mm	049-578-503	0.375 in	049-578-510
15 mm	049-578-505	0.50 in	049-578-504
20 mm	049-578-507	0.75 in	049-578-506
25 mm	049-578-509	1.00 in	049-578-508

**Includes one roller and attachment springs.*
Order quantity 3 for 3-point bend and 4 for 4-point bend configurations.
Roller assemblies listed above are not included with bend fixtures and must be purchased separately.

MTS Exceed® 3-Point Bend Fixtures

- Designed to use with MTS Exceed load frames; can also be used on MTS Criterion® load frames with appropriate conversion adapters
- Loading edge and supports can be changed to optional parts or customized designs
- Fast and accurate specimen positioning with centering device
- Adjustable stepless lower span on the support beam




WA104A


WA204A


ZWA304

Method		Standard	Fixture Options
Laminae & Laminate	Flexure	ISO 14125 (3P)	Model WA104A; WA204A & ZWA304 with Loading Edge R5 Supporting R2 or R5
		ISO 14130	Model WA104A; WA204A & ZWA304 with Loading Edge R5 Supporting R2
		ASTM D7264	Model WA104A; WA204A & ZWA304 with Loading Edge R5 Supporting R5
		EN 2377	Model WA104A with Loading Edge R3 or R5 Supporting R2; WA204A & ZWA304 with Loading Edge R5 Supporting R2
		EN 2746	Model WA104A; WA204A & ZWA304 with Loading Edge R5 Supporting R2

Specifications

Model	WA104A	WA204A	ZWA304
Description	10 kN Bend fixture, plastics	20 kN Bend fixture, plastics	30 kN Bend fixture, SST
Rated Force	10 kN	20 kN	30 kN
Temperature Range	Room temperature	Room temperature	–70°C to 350°C
Weight (upper part)	500 g	670 g	510 g
Weight (lower part)	4.95 kg	9.22 kg	4.7 kg
Dimensions (h*w*d) (upper part)	106 mm × 42 mm × 42 mm	108 mm × 42 mm × 42 mm	108 mm × 42 mm × 42 mm
Dimensions (h*w*d) (lower part)	151 mm × 280 mm × 77 mm	180 mm × 340 mm × 88 mm	180 mm × 190 mm × 88 mm
Loading Edge	R5	R5	R5
Supporting	R2	R2	R2
Maximum Span	160 mm	200 mm	80 mm
Maximum Specimen Width	40 mm	45 mm	45 mm
Part Number	100-302-794	100-302-795	100-302-798

Optional Loading Edge

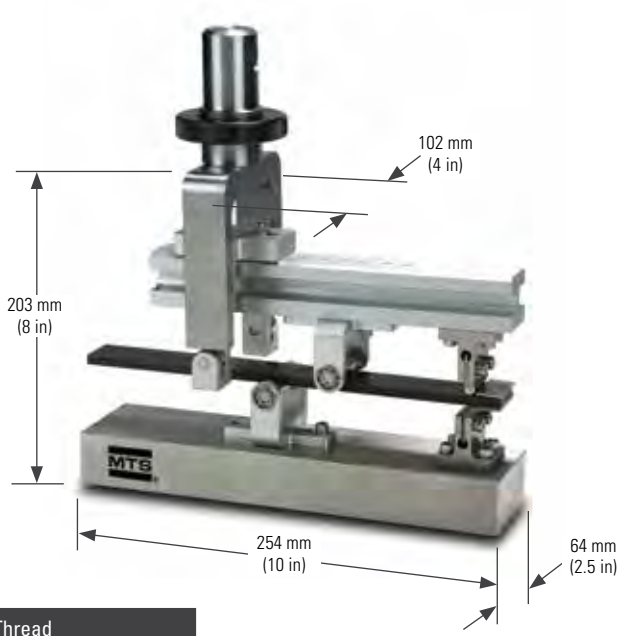
Model	Edge Radius	Width	Compatible Fixture
WA104A-06Ab	R2	40 mm	WA104A
WA104A-06Bb	R3	40 mm	WA104A
WA104A-06Cb	R7.6	40 mm	WA104A
WA204A-10Ac	R2	45 mm	WA204A
WA204A-10Bb	R10	45 mm	WA204A

Optional Supporting

Model	Edge Radius	Width	Compatible Fixture
WA104A-08Ab	R5	40 mm	WA104A
WA204A-06Ab	R5	45 mm	WA204A
ZWA304-04A	R5	45 mm	ZWA304

Mixed Mode Bending Fixture

- Recommended to test in accordance with ASTM D6671
- Constructed out of high quality stainless steel and aluminum
- Supported specimen dimensions:
  – Maximum width: 38 mm (1.5 in)
  – Maximum thickness: 6.35 mm (0.25 in)
  – Maximum length: 228 mm (9.0 in)
- Includes 5 sets of specimen hinges
- Requires threaded adapter for top and compression platen for bottom mounting (*purchased separately)*

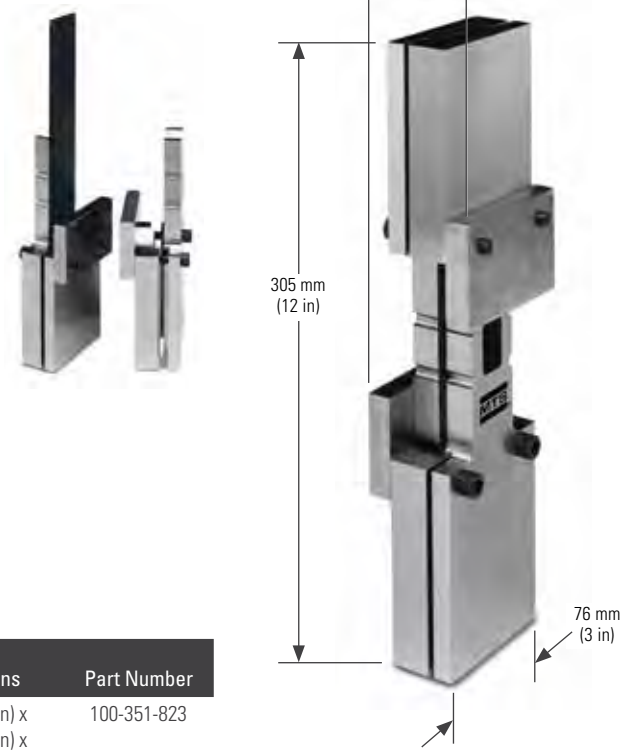


Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
4.4 kN (1 kip)	-85 to 122°C (-121 to 250°F)	≈ 7.3 kg (16 lbs)	254 mm (10 in) x 102 mm (4 in) x 203 mm (8 in)	0.25 - 28 in	100-351-822

Open / Filled Hole Compression Fixture

- Recommended to test in accordance with ASTM D6484, ASTM D6742 and BS 07260
- Constructed out of high quality stainless steel
- Supported specimen dimensions:
  – Width: 38 mm (1.5 in)
  – Maximum thickness: 12.7 mm (0.5 in)
  – Maximum length: 305 mm (12 in)
- Requires compression platens or hydraulic grips for mounting (*purchased separately)*

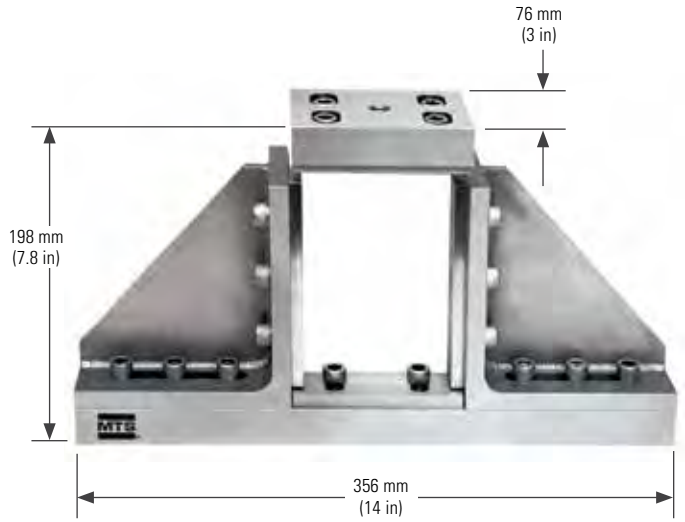
Note: Fixture thickness for gripping = 30 mm (1.18 in) + specimen thickness



Static Force	Temperature Rating	Weight	Dimensions	Part Number
222 kN (50 kip)	-152 to 318°C (-240 to 600°F)	≈ 6.8 kg (15 lbs)	76 mm (3 in) x 51 mm (2 in) x 305 mm (12 in)	100-351-823

Compression After Impact Test Fixture

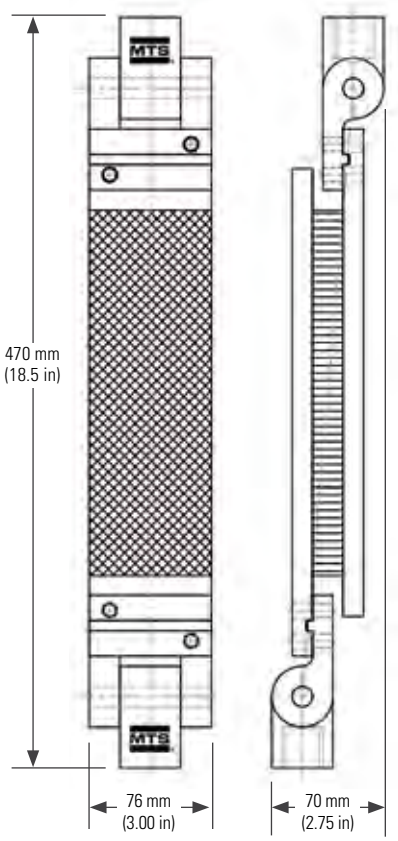
- Recommended to test in accordance with ASTM D7137
- Constructed out of high quality stainless steel
- Supported specimen dimensions:
  – Width: 102 mm (4 in)
  – Thickness: 3.175 - 12.7 mm (0.125 - 0.500 in)
  – Length: 152 mm (6 in)
- Requires threaded adapter for top and compression platen for bottom mounting (*purchased separately)*



Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
222 kN (50,000 lbs)	-152 to 318°C (-240 to 600°F)	≈ 16 kg (35 lbs)	356 mm (14 in) x 76 mm (3 in) x 198 mm (7.8 in)	0.5 - 13 in	100-351-824

Flatwise Plane Shear Fixture, Tensile Mode

- Recommended to test in accordance with ASTM C273 and ASTM C394 (Fatigue)
- Constructed out of high quality stainless steel
- Includes three sets of aluminum bonding plates
- Supported specimen dimensions:
  – Maximum width: 76 mm (3 in)
  – Thickness: 6.3 - 19.1 mm (0.25 - 0.75 in) (*optional plates for thicker samples on request*)
  – Maximum length: 229 mm (9 in)
- Includes 5 sets of specimen hinges
- Requires threaded adapter for top and bottom mounting (*purchased separately)*

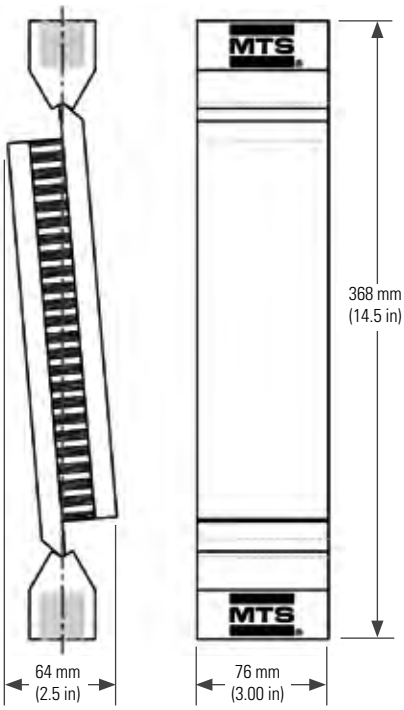


Static Force	Temperature Rating*	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
89 kN (20 kip)	-152 to 318°C (-152 to 600°F)	≈ 14.5 kg (32 lbs)	76 mm (3 in) x 70 mm (2.75 in) x 470 mm (18.5 in)	1 - 14 in	100-204-294

** Temperature Range of Aluminum Bonding Plates -29 to 49°C (-20 to 120°F)*

Flatwise Plane Shear Fixture, Compression Mode

- Recommended to test in accordance with ASTM C273 and ASTM C394 (Fatigue)
- Constructed out of high quality stainless steel
- Includes three sets of aluminum bonding plates
- Supported specimen dimensions:
  – Maximum width: 76 mm (3 in)
  – Thickness: 6.3 - 19.1 mm (0.25 - 0.75 in) (*optional plates for thicker samples on request*)
  – Maximum length: 229 mm (9 in)
- Requires threaded adapter for top and bottom mounting (*purchased separately)*



Static Force	Temperature Rating*	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
89 kN (20 kip)	-152 to 318°C (-152 to 600°F)	≈ 14.5 kg (32 lbs)	76 mm (3 in) x 64 mm (2.5 in) x 368 mm (14.5 in)	1 - 14 in	100-056-205

** Temperature Range of Aluminum Bonding Plates -29 to 49°C (-20 to 120°F)*

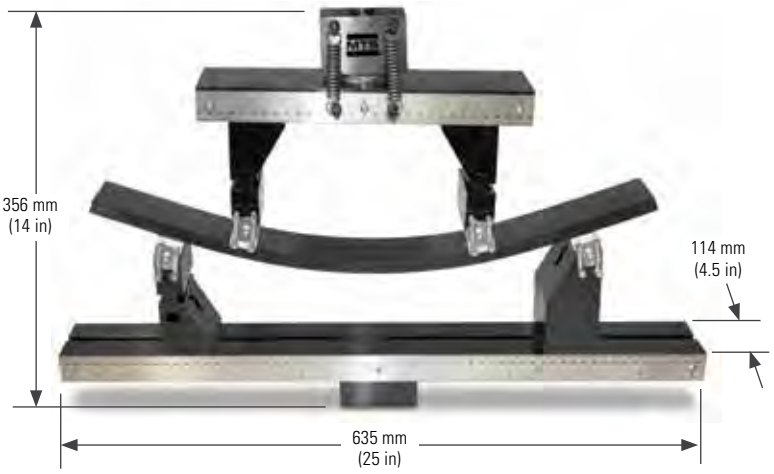
Adjustable Edgewise Compression Fixture

- Recommended to test in accordance with ASTM C364
- Supported specimen dimensions:
  – Maximum width: 65 mm (2.5 in)
  – Maximum thickness: 22 mm (0.86 in)
- Faces:
  – Maximum opening: 22 mm (0.86 mm)
  – Width: 65 mm (2.5 in)
  – Material: Rubber
- Minimize system errors with self-aligning mechanism that secures the specimen
- Male Clevis Adapters (40 mm) for top and bottom mounting (included)

Static Force	Temperature Rating	Weight	Dimensions (w*d*h)	Mounting Male Clevis	Model Number	Part Number
50 kN (11.2 kip)	Room Temperature	≈ 6.8 kg (15 lbs)	118 mm (4.6 in) x 100 mm (3.9 in) x 286 mm (11.3 in)	(Upper part) 40 mm/ (Lower part) 40 mm	DKF1005089.03	100-302-784

Three & Four Point Sandwich Beam Flexure / Shear Fixture

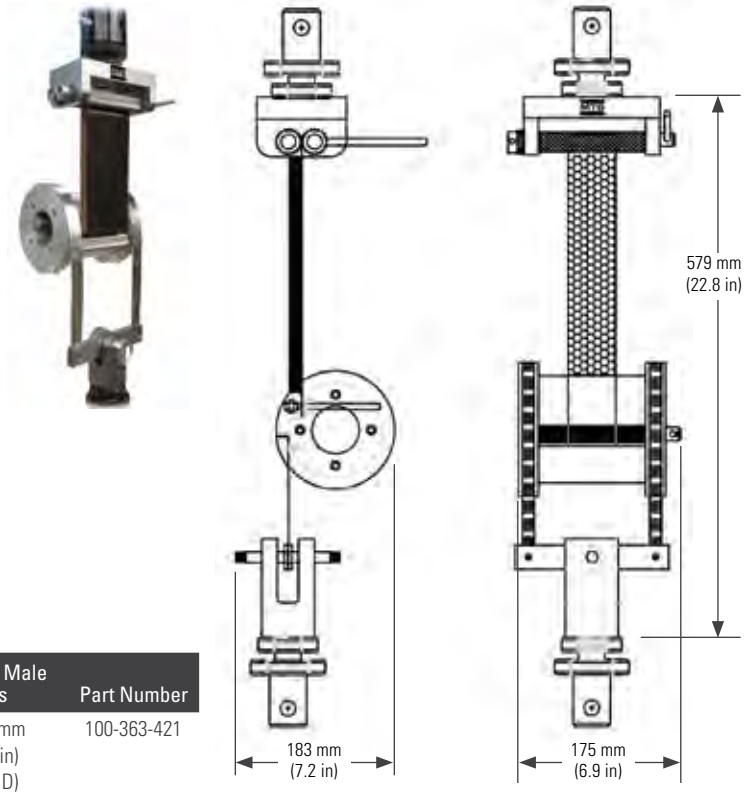
- Recommended to test in accordance with ASTM C393, ASTM D5467, ASTM D7249 and ASTM D7250
- Constructed out of high strength steel with a durable black oxide finish (except for rollers and pads)
- Supported specimen dimensions:
  – Maximum width: 100 mm (4 in)
  – Maximum length: 610 mm (24 in)
- Adjustable loading and support spans
- Loading and support bars are supplied with loading pins and flat steel loading blocks held in alignment with springs (rubber pads not included)
- Requires threaded adapter for top and bottom mounting (*purchased separately)*



Upper Fixture Span	Lower Fixture Span	Loading Pins Diameter	Support Pins Diameter	Loading & Support Pins Width
51- 305 mm (2 - 12 in))	152 - 610 mm (6 - 24 in)	25.4 mm (1 in)	25.4 mm (1 in)	100 mm (4 in)

Static Force	Temperature Rating	Weight	Dimensions	Mounting Thread Insert Sizes	Part Number
11 kN (2.5 kip)	-85 to 122°C (-120 to 250°F)	≈ 52 kg (114 lbs)	635 mm (25 in) x 114 mm (4.5 in) x 356 mm (14 in)	1 - 14 in	100-351-826

Climbing Drum Peel Fixture with Roller Type Grips



- Recommended to test in accordance with ASTM D1781
- Constructed out of high quality stainless steel with an aluminum drum
- Supported specimen dimensions:
  – Width: 25.4 - 102 mm (1 - 4 in)
  – Thickness: 0.762 - 25.4 mm (0.03 - 1 in)
  – Length: 254 mm (10 in)
- Includes Type D Male Clevis Adapters for top and bottom mounting

Static Force	Temperature Rating	Weight	Dimensions	Mounting Male Clevis	Part Number
2.2 kN (0.5 kip)	-29 to 49°C (-20 to 120°F)	≈ 18 kg (40 lbs)	183 mm (7.2 in) x 175 mm (6.9 in) x 579 mm (22.8 in)	31.75 mm (1.25 in) (Type D)	100-363-421

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