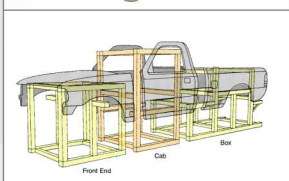
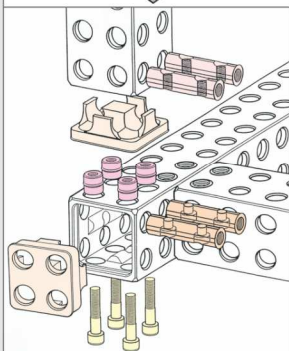
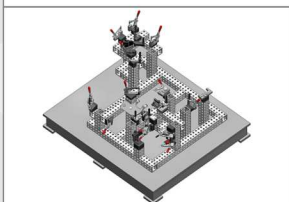
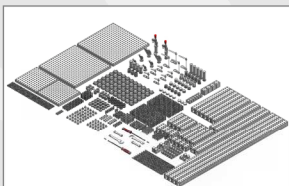


American Modular Tooling

C2
GAUGE & FIXTURE
Precision Modular Measurement & Testing Tools



**DECADES OF
EXPERIENCE**

**PROVEN
FIXTURING
EXCELLENCE**

AMERICAN MADE

C2 **GAUGE & FIXTURE** *American Modular Tooling*

- ⊕ Established in 1991, Paul W. Marino Gages, Inc. is dedicated to providing the finest quality products and professional services to our customers.
- ⊕ In 2018 PWMG created a partnership with C2 Machining in Kentwood Michigan, C2 Gage & Fixture, to sell and manufacture American Modular Tooling as well as design and build fixtures of all types.
- ⊕ Our 5,000 sq. ft. design and 20,000 sq. ft. manufacturing facility, located in Kentwood MI, is home to our sales, design and manufacturing groups and includes a working showroom with demonstration and learning facilities.
- ⊕ Our customer service and sales groups are knowledgeable, professional and ready to assist you.
- ⊕ Our design group are specialists in several fields of design and support all typical file formats.
- ⊕ Our manufacturing and quality groups consist of knee mills, lathes, coordinate measuring systems and all associated equipment required for manufacturing with the future in mind.



C2 Gauge & Fixture, Kentwood Michigan

Widespread Acceptance

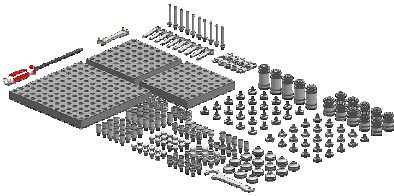
- | | | |
|------------------|-------------------|-----------------|
| ⊕ Aerospace | ⊕ Die Casting | ⊕ Ship Building |
| ⊕ Aircraft | ⊕ Electronics | ⊕ Steel |
| ⊕ Aluminum | ⊕ Instrumentation | ⊕ Tooling |
| ⊕ Automotive | ⊕ Machine Tool | ⊕ And growing |
| ⊕ Communications | ⊕ Medical | |
| ⊕ Defense | ⊕ Plastics | |

American Modular Tooling

The New Manufacturing

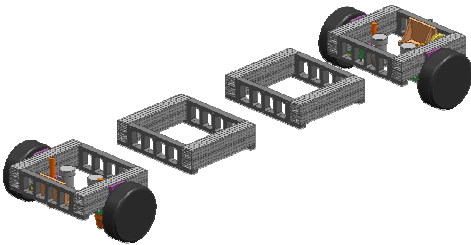
There is a worldwide movement to lean, efficient methods of manufacturing. The U.S. government is currently working with major manufacturers to implement modular, reconfigurable tooling. AMT fulfills the following:

- ⊕ Modular and reconfigurable
- ⊕ Rapid response and deployment
- ⊕ Light weight
- ⊕ Three E's...ecological, ergonomic and economic



AMT Advantages

- ⊕ Fixtures may be built rapidly and modified easily, resulting in immediate savings of time and money.
- ⊕ All components are completely reusable, unlike welded fixtures.
- ⊕ Aluminum is light in weight, resists corrosion and is ecologically sound
- ⊕ Modular elements make it easy to duplicate, or repeat, designs.
- ⊕ Large fixtures, such as body cubes, may be built in sections which can be assembled or dismantled quickly, permitting work at multiple locations.
- ⊕ A fixture may be assembled away from its site of design.



AMT is ideal for:

- | | | |
|---------------------------------------|---|--------------------------------------|
| ⊕ CMM Holding fixtures | ⊕ Checking fixtures, SPC and indicating | ⊕ Vacuum holding fixtures |
| ⊕ Attribute gages | ⊕ Body stacks, cube ups and bucks | ⊕ Multi-part pallet systems for CMMs |
| ⊕ Holding fixtures | ⊕ Armatures | ⊕ Shuttle systems |
| ⊕ Assembly fixtures | ⊕ Interior and exterior bucks | ⊕ Special machined details |
| ⊕ Welding fixtures | ⊕ Jigs and jiggling base plates | ⊕ Standard details |
| ⊕ Hand apply fixtures or gages | ⊕ Universal, multi-part holding devices | ⊕ Check rails, net pads, locators |
| ⊕ Layout fixtures | | ⊕ Clamping systems |
| ⊕ Checking fixtures, flush and feeler | | |

⊕ We have included several illustrations and photos of production AMT jobs throughout our catalog — refer to the Photo chapter on pages 139-150 for even more.

American Modular Tooling

Fast parts fixturing, rapid tool development, simplified machining and fast assembly make American Modular Tooling an ideal addition to the worldwide movement for lean, efficient methods of manufacturing. Every element has been designed for maximum efficiency and cross-system adaptability. Components are available individually, in kits or as custom fixtures designed and built per your part print.

Material Properties of AMT Components:

AMT "Construction Grade" Extruded Profiles and Locators

- ⊕ 6061-T6, Temper 6
- ⊕ KSI Tensile: 47,000 PSI
- ⊕ KSI Yield: 40,000 PSI
- ⊕ Hard Coat Anodized
- ⊕ Elongation Factor: 8%

AMT "Professional Grade" Extruded Profiles and Top Elements

- ⊕ 7075-T6, Temper 6
- ⊕ KSI Tensile: 78,000 PSI
- ⊕ KSI Yield: 68,000 PSI
- ⊕ Hard Coat Anodized
- ⊕ Elongation Factor: 6%

AMT "Special Duty" Extruded Profiles.

- ⊕ 6082-T6, Temper 6, Special Blend
- ⊕ KSI Tensile: 45,000 PSI
- ⊕ KSI Yield: 30,000 PSI
- ⊕ Hard Coat Anodized
- ⊕ Elongation Factor: 4.5–5.5%

AMT "Special Duty" Cast Products

- ⊕ 319, 0-T5 Sand Cast
- ⊕ KSI Tensile: 30,000 PSI
- ⊕ KSI Yield: 26,000 PSI
- ⊕ Hard Coat Anodized
- ⊕ Elongation Factor: 1.5%

AMT Connection Elements

- ⊕ 2024-T6
- ⊕ KSI Tensile: 69,000 PSI
- ⊕ KSI Yield: 57,000 PSI
- ⊕ Hard Coat Anodized
- ⊕ Elongation Factor: 10%

Benefits of the American Modular Tooling System

Manufacturing and Engineering:

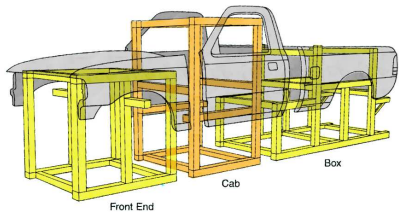
- | | |
|---------------------|--------------|
| ⊕ Facility Usage | 48% Less |
| ⊕ Lead Time | 60% Less |
| ⊕ Tooling Costs | 44% Less |
| ⊕ Tooling Labor | 60% Less |
| ⊕ Tool Design Costs | 50% Less |
| ⊕ Equipment Needs | 70% Less |
| ⊕ Reusable Material | 70% Reusable |

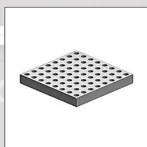
Manufacturing and Assembly:

- | | |
|-----------------------------|-------------|
| ⊕ Assembly Labor | 70% Less |
| ⊕ Through-put Increase | 45% More |
| ⊕ Accuracy of Assemblies | 50% Greater |
| ⊕ Periodic Inspection | 50% Less |
| ⊕ Reconfigurable | Priceless |
| ⊕ Modularity | Priceless |
| ⊕ Rapid Engineering Changes | Priceless |

Other Benefits:

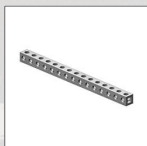
- ⊕ Fewer corrosion problems due to hard coat aluminum
- ⊕ Lower shipping costs due to lighter weight
- ⊕ Faster setup at customers facility
- ⊕ Good ROI on leasing of tool (70% reusable)
- ⊕ Can be used as temporary rate tool
- ⊕ Less space required for storage
- ⊕ Minimal maintenance requirements
- ⊕ Environmentally correct





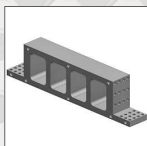
Grid Plates provide the basic structural foundation of almost any fixture.

Pages 7—16



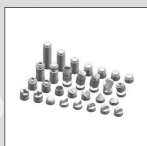
Light weight Hollows feature a channelled interior for high accuracy.

Pages 17—34



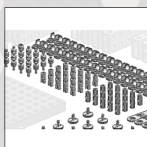
Special duty supports, gussets and foot plates provide added strength.

Pages 35—42



Locating and Clamping Elements hold and locate parts of many shapes and sizes.

Pages 43—72



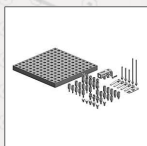
Connection Elements permit rapid assembly of fixtures.

Pages 73—86



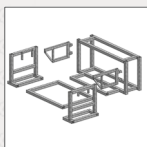
Tools and Storage Cabinets

Pages 87—92



Kits are designed to accommodate all varieties of fixturing requirements.

Pages 93—124



Studio Tools

Pages 125—138



Photos

Pages 139—150

American Modular Tooling

Testimonial of the Year:

Modular Tooling Reduces Fixturing Costs, Allows Conversion From One Make to Another.

"It's easy to learn, but there is so much there that you have to sort through it. Once you know what everything does, it's like working with one of those Erector® sets you had when you were a kid. It's very, very user friendly."

Bill Ralph, Quality Metalcraft, Inc.



"I would recommend it to anybody. You are better off sticking with the people who know what to do with it."

Two sided modular tool converted for reuse after its initial run for a different manufacturer.

"If it's going to cost us a measly \$3,000.00 to build a, say, \$100,000.00 fixture...we want to do it."

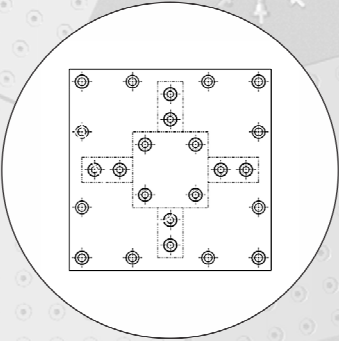
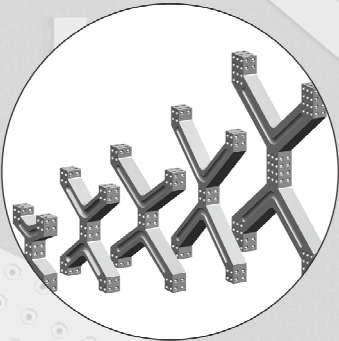
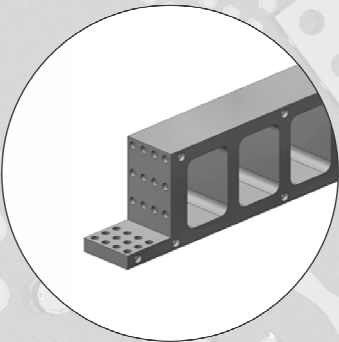


A close-up view showing a three-axis adjustable locating element holding a door in body position.

"It's part of our system now, they are definitely going to use it on the next big project. It should last for years."

Read the entire article in Quality Magazine, 2008 or online at www.qualitymag.com.

See more on our website, pmargage.com



Grid Plates

Hollows

Special Duty

Locating & Clamping

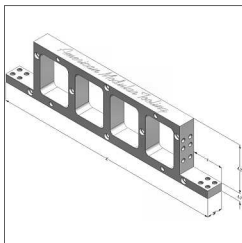
Connection Elements

Tools & Storage

Fixturing Kits

Studio Tools

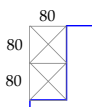
Photos



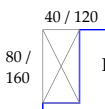
Support, Type B.
Custom, box type,
special duty support
made of aluminum,
available by special
order only.



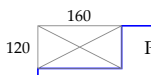
Profile A



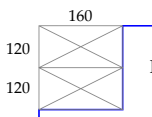
Profile B



Profile C & E



Profile D



Profile F

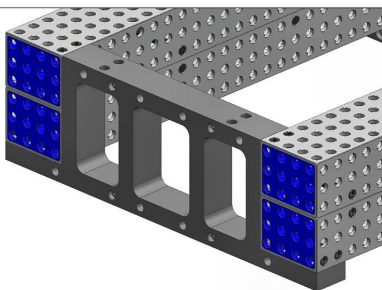
Part No.	Dimensions	Profile
AMT-28101	80 x 120 x 600	A
AMT-28102	80 x 120 x 720	A
AMT-28103	80 x 120 x 760	A
AMT-28104	80 x 120 x 880	A
AMT-28105	80 x 200 x 600	B
AMT-28106	80 x 200 x 720	B
AMT-28107	80 x 200 x 760	B
AMT-28108	80 x 200 x 880	B
AMT-28109	80 x 120 x 520	C
AMT-28110	80 x 120 x 640	C
AMT-28111	80 x 120 x 680	C
AMT-28112	80 x 120 x 800	C
AMT-28113	80 x 160 x 720	D
AMT-28114	80 x 160 x 760	D
AMT-28115	80 x 160 x 880	D
AMT-28116	80 x 160 x 1000	D
AMT-28117	80 x 200 x 720	E
AMT-28118	80 x 200 x 760	E
AMT-28119	80 x 200 x 880	E
AMT-28120	80 x 200 x 1000	E
AMT-28121	80 x 280 x 880	F
AMT-28122	80 x 280 x 1000	F
AMT-28123	80 x 280 x 1160	F

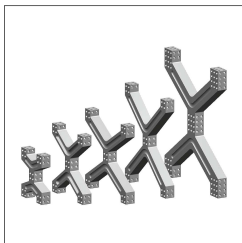
SOLUTIONS®

How it works

Cast Parts feature:

- j 319, 0—T5 Sand Cast
- j KSI Tensile: 30,000 PSI
- j KSI Yield: 57,000 PSI
- j Hard Coat Anodize
- j Elongation Factor: 10%

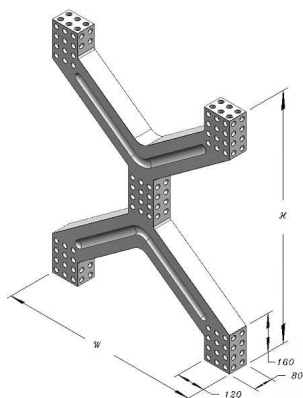
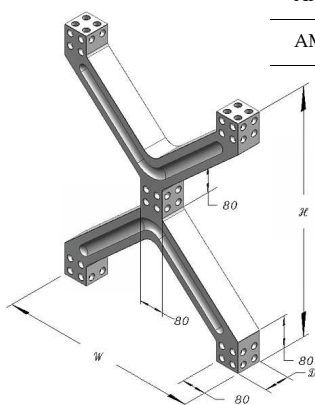




AMT "X" Supports for extra strength. Available by special order only, contact us for details.

Part No.	Dimensions	System
AMT-28301	25 x 150 x 200	25
AMT-28302	25 x 300 x 400	25
AMT-28303	25 x 450 x 600	25
AMT-28304	50 x 450 x 600	25
AMT-28305	25 x 600 x 800	25
AMT-28306	50 x 600 x 800	25
AMT-28307	50 x 750 x 1000	25
AMT-28308	40 x 320 x 400	40
AMT-28309	40 x 480 x 560	40
AMT-28311	40 x 640 x 640	40
AMT-28312	80 x 640 x 640	40
AMT-28310	40 x 640 x 800	40
AMT-28320	80 x 640 x 800	40
AMT-28321	80 x 840 x 1040	40

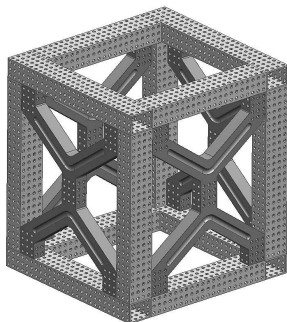
Special Duty



"Maximum Strength"

Cast Parts feature:

- j 319, 0—T5 Sand Cast
- j KSI Tensile: 30,000 PSI
- j KSI Yield: 57,000 PSI
- j Hard Coat Anodize
- j Elongation Factor: 10%



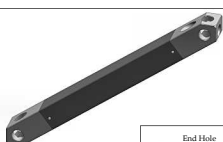


Struts can be mounted at two different angles and will span two different lengths.

AMT Strut, 25 x 25

Part No.	Dimensions mm	Short Span	Long Span
AMT-27506	25 x 25	175	225
AMT-27508	25 x 25	250	325
AMT-27512	25 x 25	400	525
AMT-27514	25 x 25	475	625
AMT-27516	25 x 25	550	725

Note: Short Span x Long Span = Window as illustrated below.



Struts have two differently angled holes on each end and a hole going through the side

AMT Strut, 40 x 40

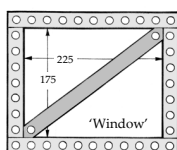
Part No.	Dimensions mm	Short Span	Long Span
AMT-27546	40 x 40	160	200
AMT-27547	40 x 40	280	360
AMT-27548	40 x 40	400	520
AMT-27549	40 x 40	640	840
AMT-27550	40 x 40	760	1000

Note: Short Span x Long Span = Window as illustrated below.

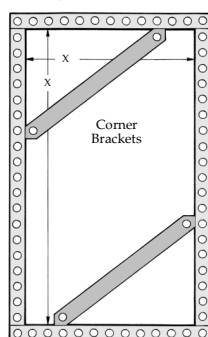
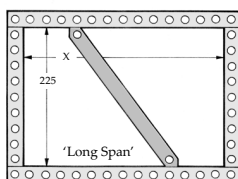
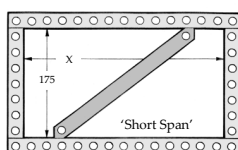
SOLUTIONS®

How it works

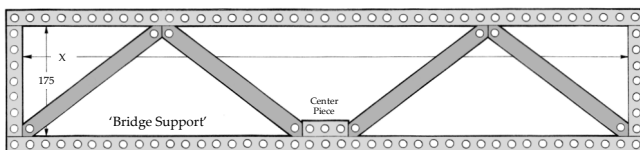
(Strut 27506 shown as an example)



Each strut can span only two different lengths. In this case a 'window' of 175 x 225 mm is the smallest area into which the strut can be fitted. When struts cannot span an area they should be used as corner brackets.



The strut setup shown below is used for a long bridge-type support. A short center piece is added for extra strength.





AMT Strut, 40 x 80

Part No.	Dimensions mm	Short Span	Long Span
AMT-27552	40 x 80	160	200
AMT-27553	40 x 80	280	360
AMT-27554	40 x 80	400	520
AMT-27555	40 x 80	520	680
AMT-27556	40 x 80	640	840

Note: Short Span x Long Span = Window as illustrated on previous page.

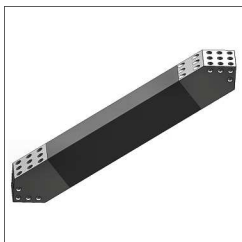
Special Duty



AMT Strut, 80 x 80

Part No.	Dimensions mm	Short Span	Long Span
AMT-27558	80 x 80	760	1000
AMT-27559	80 x 80	880	1160
AMT-27560	80 x 80	1000	1320

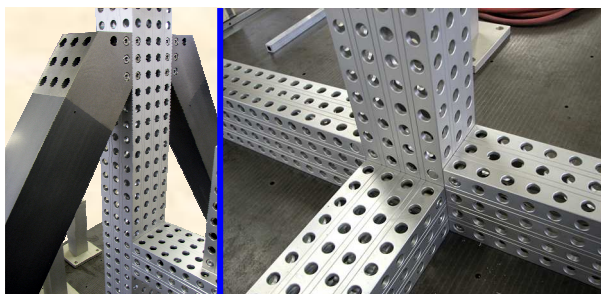
Note: Short Span x Long Span = Window as illustrated on previous page.



AMT Strut, 120 x 160

Part No.	Dimensions mm	Short Span	Long Span
AMT-27563	120 x 160	880	1160
AMT-27564	120 x 160	1000	1320
AMT-27565	120 x 160	1120	1480
AMT-27566	120 x 160	1240	1600

Note: Short Span x Long Span = Window as illustrated on previous page.

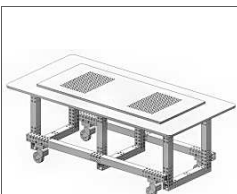


Larger sizes are available on request.



Part No.	Dimensions
AMT-14523	650 x 1500 x 1000

AMT Universal Jig Table features all edges parallel and perpendicular to bars. Remove the wheels and sit on surface plate for prototype milling applications.



Part No.	Dimensions
AMT-14575	1200 x 2000 x 1000

AMT Jig Table features all edges parallel and perpendicular to bars. Great as jig table or rolling workstation. Remove the wheels and sit on surface plate for prototype milling applications.

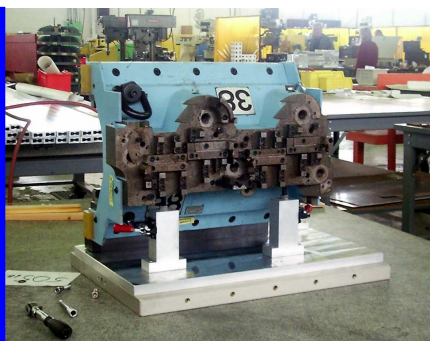


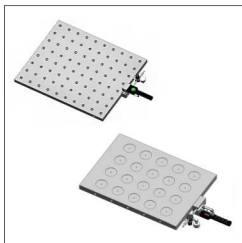
Part No.	Dimensions
X-Table	800 x 1800 x 785

AMT Jig Table. Add casters and make this universal table portable. X-support available by special order only, see our modular alternative above, part number AMT-15423

SOLUTIONS®

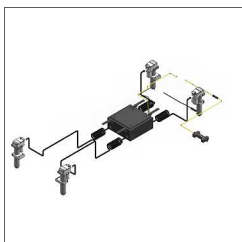
Ideas: Jig Tables and Air Pallets





Part No.	Dimensions	System
AMT-11705	25 x 500 x 500	25
AMT-11707	25 x 600 x 800	25
AMT-11723	40 x 600 x 800	40

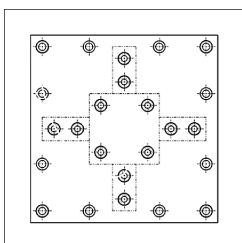
AMT Air Pallets provide easy movement of heavy parts. May also be used with our transport carts.



Part No.	Dimensions	System
AMT-14690	—	25 / 40

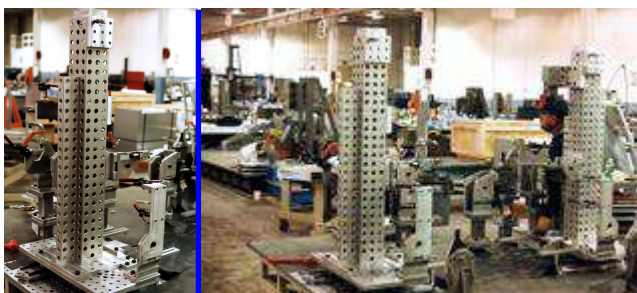


Leveling System: Hand Pendant / Controller / 4 Actuators with cables.



Part No.	Dimensions	System
AMT-14309	40 x 80 mm	40
AMT-14310	80 x 80 mm	40
AMT-14311	120 x 160 mm	40

Standard and custom Foot Plates for our hole pattern or yours.



Custom Foot Plates for Special Duty Stanchions can be made to customer supplied specifications.



Part No.	Dimensions	System
Special	Square profile x length	25 or 40
Special	Rectangular profile x length	25 or 40

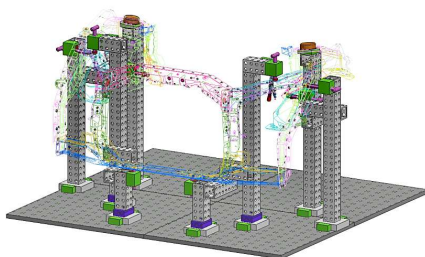
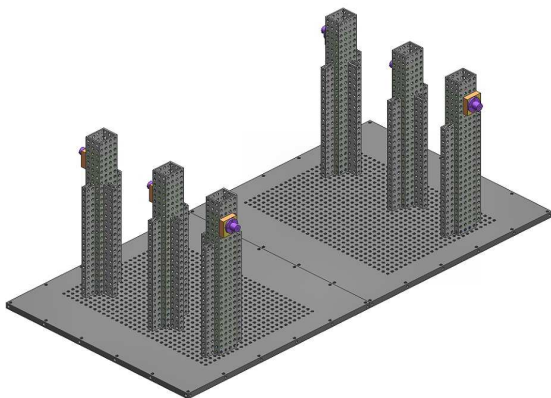
Standard Hollow profiles available in all profiles, lengths and hole patterns. Adds strength, costs less.

Special Duty

SOLUTIONS®

Ideas: **Special Systems**

AMT Special Duty Aluminum Hollows combined with Foot Plates and Grid Plates can be used to make extra strong, extra large tools, fixtures and gages. Ideal for assembly work, weld tools and other large workholding jobs.



American Modular Tooling

SYMBOL FOR:	ASME Y14.5M 1994	ISO
STRAIGHTNESS		
FLATNESS		
CIRCULARITY		
CYLINDRICITY		
PROFILE OF A LINE		
PROFILE OF A SURFACE		
ALL AROUND		(projected)
ANGULARITY		
PERPENDICULARITY		
PARALLELISM		
POSITION		
CONCENTRICITY (concentricity and coaxiality in ISO)		
SYMMETRY		
CIRCULAR RUNOUT		
TOTAL RUNOUT		
AT MAXIMUM MATERIAL CONDITION		
AT LEAST MATERIAL CONDITION		
REGARDLESS OF FEATURE SIZE	NONE	NONE
PROJECTED TOLERANCE ZONE		
TANGENT PLANE		(projected)
FREE STATE		
DIAMETER		
BASIC DIMENSION (theoretically exact dimension in ISO)		
REFERENCE DIMENSION (auxiliary dimension in ISO)	(50)	(50)
DATUM FEATURE		
DIMENSION ORIGIN		
FEATURE CONTROL FRAME		
CONICAL TAPER		
SLOPE		
COUNTERBORE/SPOTFACE		(projected)
COUNTERSINK		(projected)
DEPTH/DEEP		(projected)
SQUARE		
DIMENSION NOT TO SCALE	15	15
NUMBER OF PLACES	8A	8A
ARC LENGTH		
RADIUS	R	R
SPHERICAL RADIUS	SR	SR
SPHERICAL DIAMETER	SØ	SØ
CONTROLLED RADIUS	CR	NONE
BETWEEN		NONE
STATISTICAL TOLERANCE		NONE
DATUM TARGET		
TARGET POINT		

* May be filled or not filled

About Us

We are dedicated to presenting the finest quality products to industry while providing reliability and service. Our mission is to supply the technological advances that enable the manufacturing process to work faster, with higher precision, than past practices. We utilize methods that recognize global economic, ergonomic and ecological considerations.

Over the years our highly skilled personnel, consistency in service, quality and innovative ideas have proven to be our greatest assets.

Distributor Network

American Modular Tooling® products are sold through our highly valued distributor network, world-wide. We make all efforts to protect those relationships and are looking for additional qualified distribution networks in many areas of the world.

If you are unable to locate a distributor in your area, or are interested in becoming a distributor, please contact us at the numbers below.

Contact Us

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 United States

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 Web: pmargage.com
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⊕ Technical Sales & Consultation

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⊕ Sales ⊕ Design & Build
 ⊕ Manufacturing ⊕ Logistics

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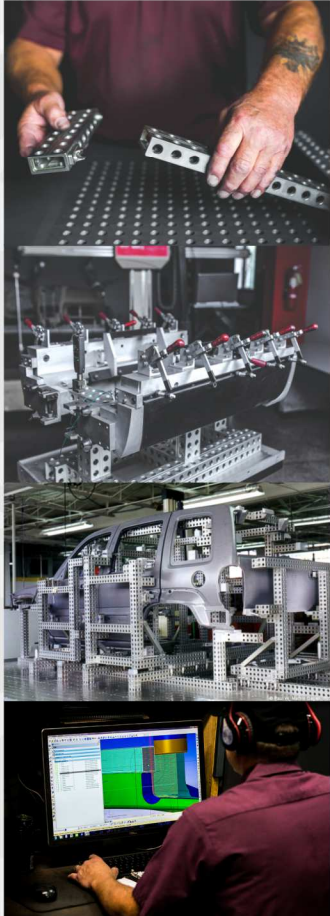
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American Modular Tooling

C2
GAUGE & FIXTURE
Precision Modular Measurement & Testing Tools



**DECADES OF
EXPERIENCE**

**PROVEN
FIXTURING
EXCELLENCE**

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