



T-SLOT ALUMINUM

THE BASICS OF BUILDING

TABLE OF CONTENTS

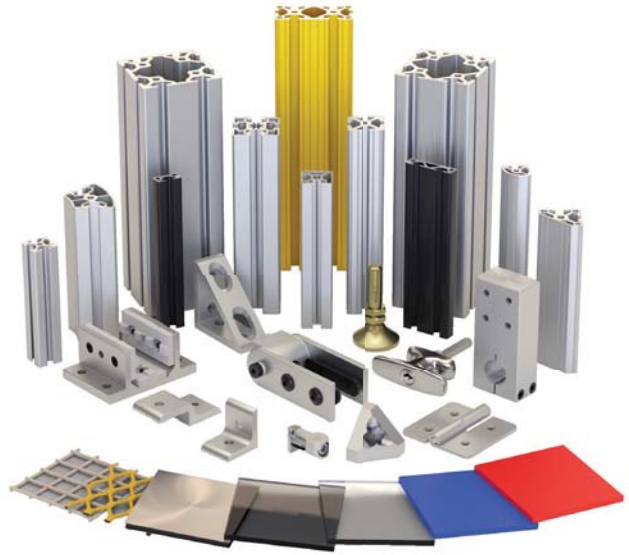
Quick Reference

Getting Started.....	3-4
Profiles.....	5-17
T-slot Profiles	5-13
Ready Tube™	14-15
Quick Frame™	16-17
Fasteners.....	18-24
Introduction	18
Method Types	19
Know Your Hardware	20
T-nut Types	21
Bolt Options	22
Ready Tube™	23
Quick Frame™	24
Panels & Doors.....	25-30
Picking Your Panel	25
Mounting Options	26-27
Ordering Tips	28
Hinges & Handles	29
Bi-fold Door Configuration	30
Floor to Frame.....	31-32
Building the Base	31
Casters & Leveling Feet	32
Add-On Components.....	33-39
Linear Bearings	33
UniBearings™	34
Bearing Pads	35-37
Dynamic Pivots	38
Pressure Manifolds	39
Stanchions.....	40
Finish Your Frame.....	41-42
Structural Shapes.....	43

Where Do I Begin?

You have a project in mind and now just need to narrow down your product options. 80/20 provides a wide range of profiles and parts to accommodate all of your requirements. To help you decide which items work best for your needs, we've broken down products into a few main categories:

- Profiles
- Fasteners
- Panels & Doors
- Floor to Frame
- Add-On Components
- Stanchions
- Finishing Your Frame
- Structural Shapes



Find it fast with our online product selection tools



Resources for Product Selection

If you'd like to see what other 80/20 innovators have created, visit the Xtreme DIY video series or peruse the photo gallery for inspiration. The Profile Selector will help you quickly narrow down your profile choices.



PICK A PROFILE

SCALE ✓

WEIGHT ✓

STRENGTH ✓

SURFACE ✓

COLOR ✓

FINISH ✓

SHAPE ✓

Things to Consider

Typically, it's easiest to start by deciding on your profile series. Think about the end purpose of your application to help you narrow down your search for the profile that fits your needs. 80/20 offers profile series in both the fractional and metric family that accommodate the entire scale of small, medium, and large builds.

A prototype project is an example of a small-scale build while a desk or workstation is an example of a medium-scale project. Profiles used for structural framing would be an instance of a large-scale solution.

Your profile should be determined by deciding on the scale, weight, strength, surface (smooth, grooved), open T-slot requirements, color, finish, and shape that you need.

Keep It Compatible

Throughout planning your project, you'll want to be sure all of the subsequent products, such as your fasteners and accessories, are compatible with the profile series you've chosen. Just look for the appropriate icon, or filter by series when shopping.

COMPATIBILITY KEY



Fractional



Metric



30 Series



10 Series



20 Series



40 Series



15 Series



25 Series



45 Series



Ready Tube™



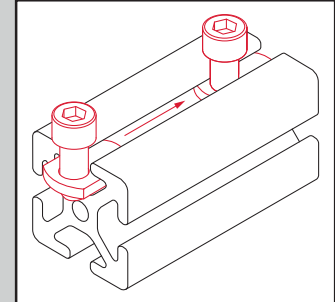
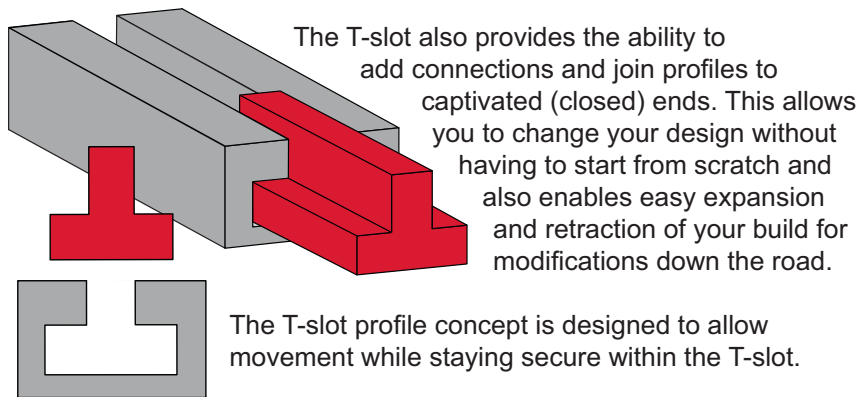
Quick Frame™

Introduction to Aluminum Framing

You have a project or design in mind and now you need to turn that idea into an actual build. Your first step is to choose your profile; T-slot aluminum profiles, Ready Tube, or Quick Frame. If you would like to head directly to information on Ready Tube, flip to page 14, or to page 16 to read about Quick Frame. Let's begin with the T-slot profile.

The T-slot Concept: Built-in Modularity

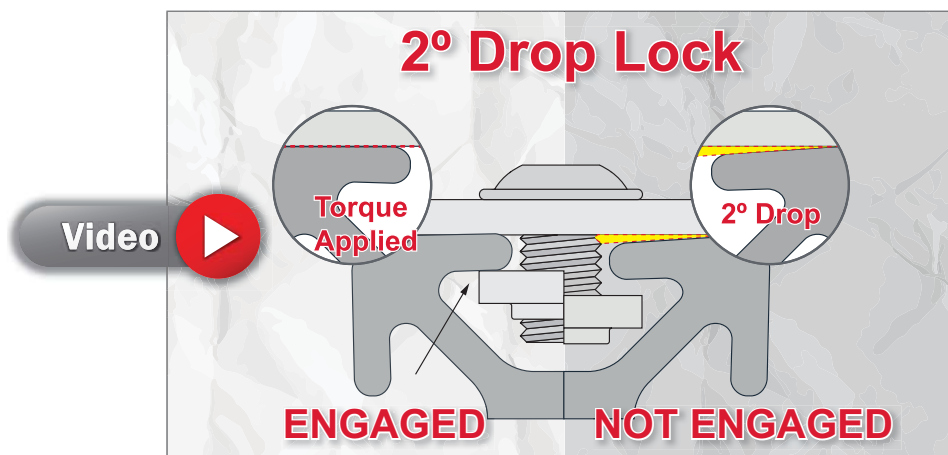
T-slot aluminum profiles offer several benefits. The shape of the profile creates modularity, meaning it is easily assembled and reassembled to conform to evolving needs.



Connections can be made anywhere along the axis of the profile, creating an infinite number of mounting points and eliminating incremental positioning.

80/20's Unique 2° Drop-Lock

Another important attribute of T-slot aluminum profiles is the strong connection made between profiles. 80/20's T-slot aluminum profiles include a 2 degree drop-lock feature for most profiles, which enables connections to remain vibration resistant and strong. 80/20 offers a wide variety of joining options to fit your specific needs (for an overview on fastening products flip to page 18).



PROFILES *Aluminum T-Slot*

Advantages of T-slot Aluminum Profiles

Moving on from the T-slot concept, let's consider the benefits of aluminum. There are several advantages to T-slot aluminum profiles. Take a look at the graphic below to learn how 80/20 profiles stack up against steel. Also keep in mind, all 80/20 profiles come standard with a clear anodize which helps prevent oxidation and corrosion while providing a matte finish.

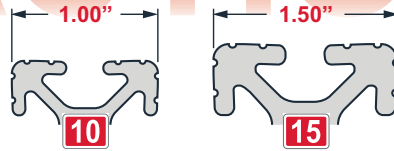
Aluminum vs Steel

Think about the fact that, volume for volume, aluminum is one third the weight of iron, steel, copper or brass. Yet it has yield strength of 35,000 psi, which means it is comparable to A36 steel carbon (frequently used in applications such as equipment and machinery supports as well as building frames). Furthermore, aluminum is resilient and can flex under loads or reshape itself after the shock of impact.

T-SLOT ALUMINUM	VS	WELDED STEEL
MODULAR DESIGN		ONE FIXED DESIGN
WEIGHS LESS THAN STEEL		MORE TIME INVESTED
NO WELDING REQUIRED		WELDING REQUIRED
COSTS LESS THAN STEEL		INCREASED EXPENSES
STRENGTH SIMILAR TO STEEL		REQUIRES SKILLED LABOR
MACHINING NOT REQUIRED		MACHINING REQUIRED
CORROSION RESISTANT		NEEDS PAINT & PRIMER

Profile Family Types

FRACTIONAL

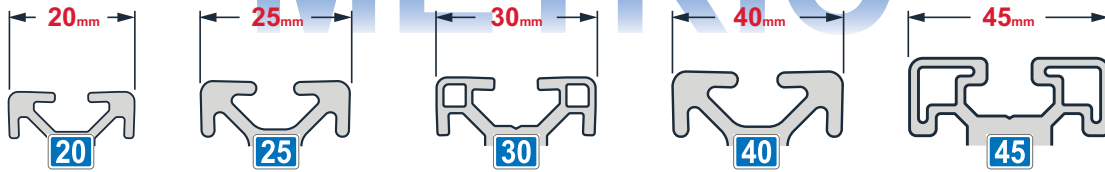


*Profiles are not shown to scale.

The fractional T-slot family uses an inch measurement system (imperial). 80/20 currently offers 57 profiles in fractional units with two standard series: the 10 series and the 15 series. 10 series profiles are based on a 1 inch standard while 15 series profiles are based on a 1.5 inch standard.

Align-a-grooves, featured on some of our 10 series and 15 series T-slot profiles, aid in aligning and squaring corners and joints during assembly. Align-a-grooves are not available in metric profiles.

METRIC



The metric T-slot family is measured in meters or millimeters (mm). 80/20 currently offers 51 profiles in metric units with five series; 20, 25, 30, 40 and 45. The dimensions of the metric profiles each coincide with the series. For instance, 20 series profiles are based on a 20mm standard, 25 series are based on a 25mm standard, 30 series profiles are based on a 30mm standard and so on.

After you have decided which measurement system (fractional or metric), you are going to use, you'll want to decide on a specific profile series. Think about the weight and strength you will need, as well as the shape and open T-slots you want available.



The Shape of a Profile

Once you have determined a series that matches the scale of your build, you are ready to choose the shape of your profile. The shape of the profile affects certain properties such as open T-slots and aesthetics. The available shapes are square, rectangle, angled, and radius.



In both the fractional and metric measurement families, 80/20 offers six different square profile shapes. This variety gives you choices to accommodate appearance, accessories and parts. For medium to large-scale applications consider a square profile with eight T-slot openings to allow a multitude of connection points for the addition of profiles and accessories. Some square profiles also include the capability of a pressurized center cavity.



Between the fractional and metric measurement families there are nine rectangular profile shapes, and all work well for joining other profiles, parts and accessories. Most rectangular profiles have the capacity for a pressurized center cavity. The twelve-slot rectangular profile is perfect for large-scale purposes, such as load-bearing applications, and offers the most mounting and joining options.



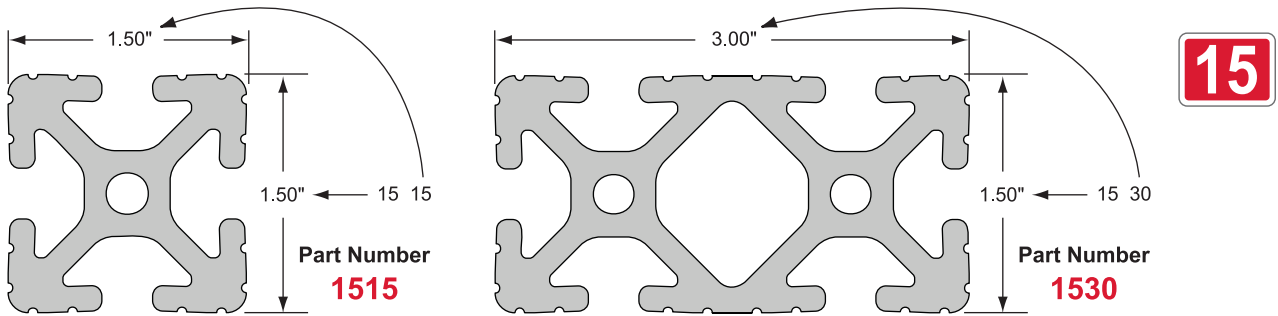
Radius and angled profiles come with two open T-slots and are frequently used for panel mounting and exhibits, due to their versatility and sleek appearance. The rounded shape of radius profiles works well as hand rails.

To recap, T-slot profiles are extremely versatile, modular and strong. You first want to choose either the fractional or metric measurement system, and then decide on the specific profile series. From there, narrow down the shape that works best for your build. If you're still not sure which T-slot aluminum profile is right for your project, use the Profile Selector to help you quickly narrow down your choices, or contact 80/20 at 260.248.8030, or info@8020inc.com.

Part Number Concept & Identification

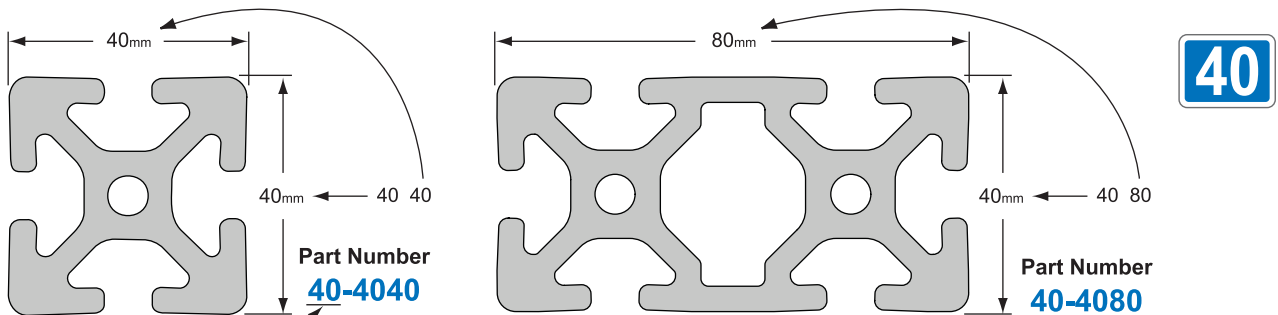
Most fractional and metric T-slot profiles have part numbers that directly coincide with the profile's physical measurements. Fractional profile part numbers contain four characters. Metric profile part numbers contain six characters, which relate to the profile's series and dimensions. This series part-numbering concept is explained in more detail below.

Fractional Profile Naming Standards



Example: 15 series profiles always measure .75" from the outside edge of the profile to the center of the T-slot.

Metric Profile Naming Standards



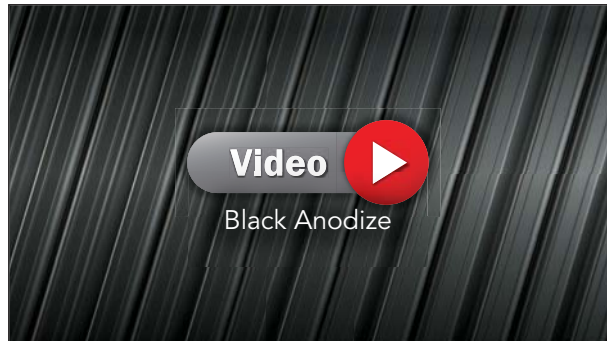
Note: The profile series is listed before the part number.

Note: The profile series is listed before the part number.

Example: 40 series profiles always measure 20.00mm from the outside edge of the profile to the center of the T-slot.

Stocked Profiles with Color

80/20 offers over 1,000 black anodized profiles and parts for your custom designs; these are stocked in-house to provide fast and easy access. We use architectural and organic anodizing processes and both meet Military Spec 8625. There are also yellow powder coat options that are great to denote caution.



You'll find that black anodize makes your projects look sleek while also providing functionality. Black anodize is ideal for low reflective projects, photo booths, military applications, vision systems and anywhere you want to add a polished appearance.



Visit the online photo gallery of solutions to see what others have built using 80/20.



Cut End Profiles

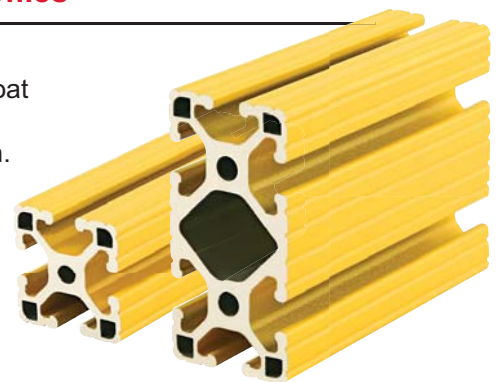
When ordering stock black or yellow profiles and requesting cuts, counterbores, etc. the machined areas will be exposed, meaning not black or yellow. If this is acceptable the order will process normally.

Full Colored Profiles

If you do not want exposed cuts, counterbores, etc., on the profiles and parts you will need to order the part number associated with the fully anodized black or yellow version. This will ensure that the entire bar or part will be colored with no exposed surfaces. Note: This will require the order be sent out, which will delay shipping.

Yellow Safety Profiles

With safety yellow profiles, the powder coat creates a precise and consistent color match. You'll commonly find it in guarding, maintenance, and facilities applications, as it designates caution or a warning.

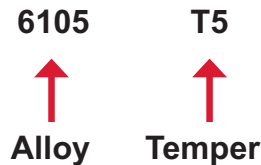


Why 6105-T5* Aluminum Alloy?

All of 80/20's T-slot profiles are made of 6105-T5* alloy, an aluminum extrusion alloy that is a metal mixture that includes other elements such as copper, magnesium, iron, silicon or zinc.

Certain properties such as strength, machinability and corrosion resistance are influenced by the choice of alloy and temper.

Alloy 6105* with a T5 temper has better machinability and strength than 6063-T6.



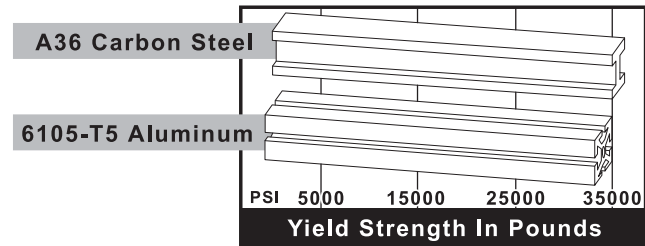
Aluminum Profile Alloys: Number and Characteristics	Tensile Strength - ksi*	
	Ultimate minimum	Yield minimum
6105-T5* (80/20's Alloy)	38.00	35.00
6063-T6	30.00	25.00

Figures based on material thickness of 0.125" to 1.00"
From The Aluminum Extrusion Manual, published by The Aluminum Association and the Aluminum Extruders Council.

Material Strength Specifications

Minimum Yield Strength In Pounds

- 80/20's 6105-T5* alloy yield strength of 35,000 psi compares to A36 carbon steel's yield strength of 36,000 psi.
- Volume for volume, aluminum weighs about 1/3 as much as iron, steel, copper, or brass.



* Or comparable

T-Slot Profile Specifications

FRACTIONAL		METRIC
35,000 p.s.i. (min)	Yield Strength	241.1 N/mm ² (min)
38,000 p.s.i. (min)	Tensile Strength	262.0 N/mm ² (min)
A5 minimum 10%	Elongation	A10 minimum 8%
10,200 k lb/in. ²	Elasticity E	70,326.5 N/mm ²
Rockwell approximately E-88	Hardness	Brinell approximately 75 HB
.004" per 1 inch of width	Flatness	0.1mm per 25.4mm of width
0.0125 inches per 1 foot of length not to exceed 0.118 inches over 20 feet of length	Straightness	0.32mm per 304mm of length, not to exceed 3mm over 6.1 m of length
Per 1 foot of length not to exceed .25 degree and total twist over 20 feet of length not to exceed 1.5 degrees	Twist	Per 304mm of length not to exceed .25 degree and total twist over 6.1m of length not to exceed 1.5 degrees

Note: Extrusion conforming to DIN 17 615 specifications. Unless otherwise specified, all profiles will have etch and clear (MIL-A-8625F) anodizing with depth of .0004 inches (0.010mm) and surface hardness of approximately 250 HV (anodized profiles should not be welded because of toxic fumes).

Technical Information

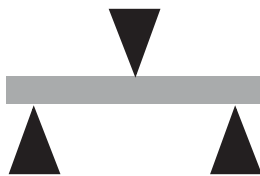
The following information and tables provide technical data as a guide to assist in planning and designing your project. As the builder, you want to make sure that your design meets the structural, functional, and safety requirements of your specific application. For example, typical factors may include maximum weight load, weight distribution, and tipping avoidance.

Simple Beam Deflection Calculations

Deflection is the degree to which a structural element is displaced under a load. Deflection calculations help determine outcomes in different scenarios while planning and designing your project. Keep in mind, you have options depending on the expected configuration of your solution: one fixed end, two fixed ends or supported on both ends.

Formula A

$$\frac{L^3 \cdot W}{48 \cdot E \cdot I} = D$$



This formula will yield worst case deflection for a beam supported at both ends with the load centered over the span.

Formula B

$$\frac{5L^3 \cdot W}{384 \cdot E \cdot I} = D$$



This formula will yield worst case deflection for a beam supported at both ends with the load evenly distributed over the span.

Formula C

$$\frac{L^3 \cdot W}{3 \cdot E \cdot I} = D$$



This formula will yield worst case deflection for a beam fastened at one end and cantilevered horizontally with the load applied at the end of the beam.

Example Using Formula A:

Using the 1515 T-slot profile, a length of 30.00 inches, and an applied force of 50 pounds, you should find the approximate beam deflection to be .011 inches. Using the 40-4040 T-slot profile, a length of 762mm, and an applied force of 222.40 Newtons, you should find the approximate beam deflection to be .21mm.

Visit us online to use the 80/20 deflection calculator.



Formula Reference:

L = Length in Inches

W = Load in Pounds

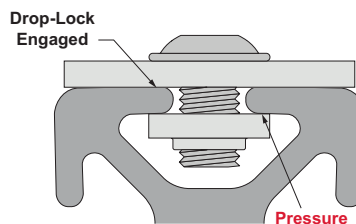
I = Moment of Inertia

E = Modulus of Elasticity

D = Deflection in Inches

Torque Specifications

The tables below show the amount of torque in foot-lbs. and newton meters required to activate the 2 degree drop-lock feature for T-slot profiles. Nut and bolt combination is preloaded when tightened to the minimum torque rating.



Fractional T-slot Profiles

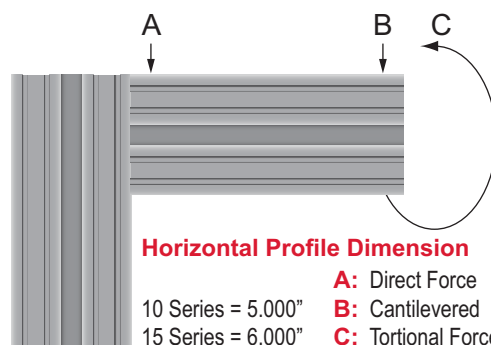
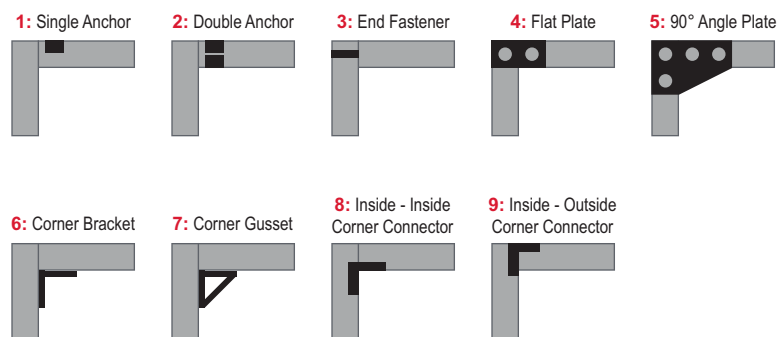
Part Number	Fastener Description	Tested Profile	Minimum Torque Ft.-lbs.	Maximum Torque Ft.-lbs.
3320	5/16-18 x 11/16 Flanged BHSCS & Economy T-Nut	1515	10.00	15.00
3325	5/16-18 x 3/4 Economy T-Slot Stud, Washer & Hex Nut	1515	25.00	30.00
3360	15 Series Anchor Fastener Assembly	1515-Lite	10.00	20.00
3380	15 Series End Fastener Assembly	1515-Lite	10.00	22.00
3321	1/4-20 x 1/2 Flanged BHSCS & Economy T-Nut	1010	4.00	6.00
3395	10 Series Anchor Fastener Assembly	1010	3.00	17.00
3381	10 Series End Fastener Assembly	1010	4.00	17.00

Metric T-slot Profiles

Part Number	Fastener Description	Tested Profile	Minimum Torque Newton Meters	Maximum Torque Newton Meters
75-3422	M8 x 16mm BHSCS & Economy T-Nut	40-4040	13	20
75-3500	M8 x 20mm Economy T-Slot Stud, Washer & Hex Nut	40-4040	40	54
40-3897	40 Series Anchor Fastener Assembly	40-4040-Lite	13	37
40-3891	40 Series End Fastener Assembly	40-4040-Lite	13	29
75-3404	M6 x 10mm BHSCS & Economy T-Nut	25-2525	5	8
25-3896	25 Series Anchor Fastener Assembly	25-2525	4	23
25-3895	25 Series End Fastener Assembly	25-2525	5	23

The estimated torque calculations in this chart are offered as a guide only. Use of this content by anyone is the sole responsibility of that person and they assume all risk. Due to many variables that affect the torque-tension relationship like human error, surface texture, and lubrication the only way to determine the correct torque is through experimentation under actual joint and assembly conditions.

Fastener Application Test



Fastener	1010 Profile			1515-Lite Profile			1515 Profile		
	A (lbs)	B (lbs)	C (Inch-lbs)	A (lbs)	B (lbs)	C (Inch-lbs)	A (lbs)	B (lbs)	C (Inch-lbs)
1	500	250	180	950	625	540	950	1,000	700
2	900	250	260	1,200	700	1,150	1,200	1,200	2,000
3	450	200	325	1,000	500	680	1,000	820	1,150
4	175	50	400	225	200	1,000	225	200	1,100
5	175	50	500	250	200	1,120	250	200	1,260
6	325	75	180	375	225	500	575	225	500
7	325	220	260	375	750	500	575	750	500
8	—	—	—	50	50	50	—	—	—
9	—	—	—	240	220	240	—	—	—

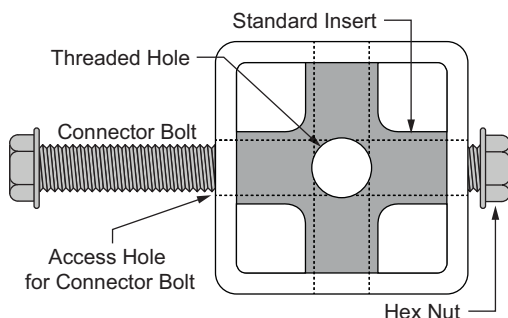
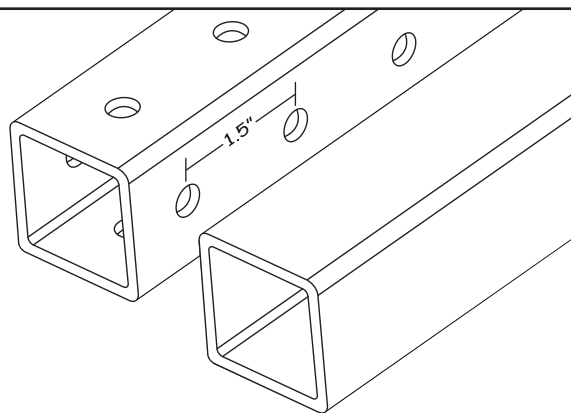
Introduction to Ready Tube™

Ready Tube is an alternative to steel tubular framing; it is lightweight yet strong and durable. Ready Tube is also corrosion resistant, easy to assemble and cost-effective. Ready Tube is appropriately named; it is ready to use without the need for additional machining.

With or Without Pre-Drilled Holes

Ready Tube is available with or without pre-drilled holes. Profiles with pre-drilled holes have 1.50" centerlines between holes, which enables quick and easy connections without the need for machining.

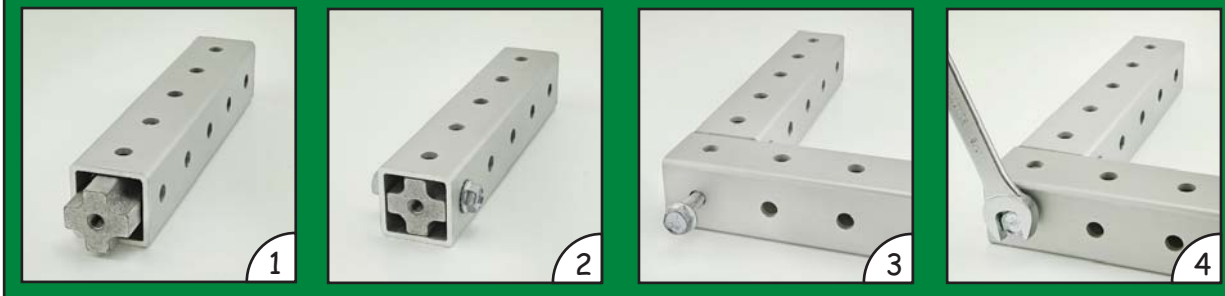
Ready Tube also comes without pre-drilled holes which make it perfect for customized connections and readily attaching to existing builds. In addition, dirt and water have difficulty getting into these profiles and they are easily cleaned, making it a good fit for applications in laboratories and the food industry.



How Ready Tube Works

The most commonly used fastener for Ready Tube is the Standard Tube Insert which requires only a wrench to connect. It includes a connector bolt, hex nut and insert that goes inside the Ready Tube profile and is accessed by the pre-drilled holes. 80/20 does offer additional fasteners for Ready Tube.

Ready Tube Connects in 4 Steps



Advantages of Ready Tube

Ready Tube, similar to the standard 80/20 T-slot profile, is made of an aluminum alloy which offers several advantages:

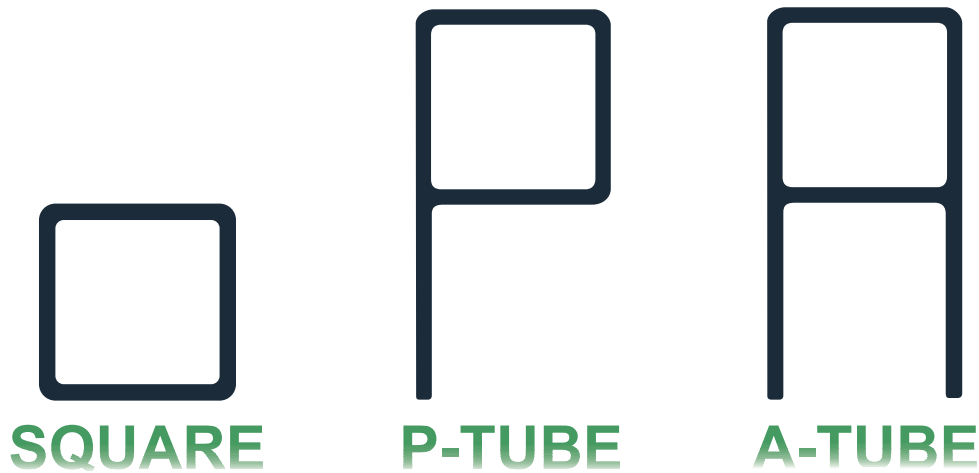
- Strong
- Lightweight
- High strength-to-weight ratio
- Resilient
- Corrosion-resistant



Keep in mind that Ready Tube profiles come standard with a clear anodize finish, which prevents oxidation and corrosion while providing a matte finish.

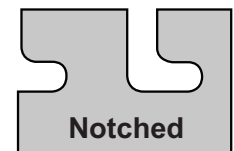
The Shapes of Ready Tube

The properties of Ready Tube make it perfect for evolving and changing applications. It is frequently used in workstations, tables, carts, flow racks, and material handling shelving and racks. When using Ready Tube in your build you have 3 main profile options: square, P-tube, and A-tube.



Look for the green icon for parts compatible with Ready Tube.

Square Ready Tube profiles are easy to clean and aesthetically appealing, while P-tube profiles have flanges that work well for holding panels. A-tubes are available with or without notches and are perfect for applications such as gravity racks or material handling shelves.

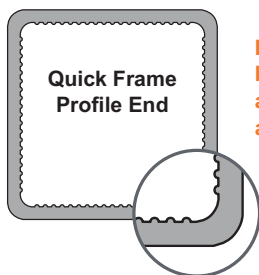


Introduction to **Quick Frame™**

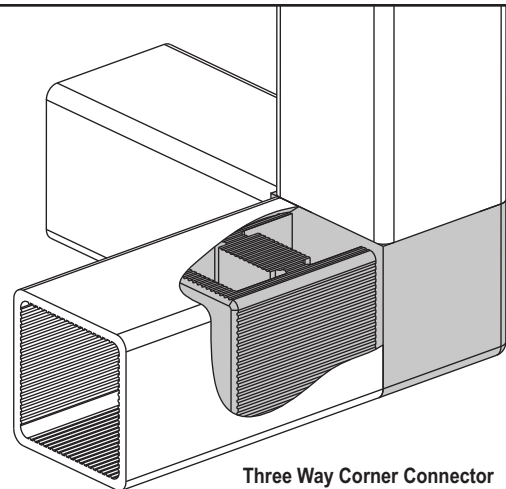
Quick Frame is an alternative to steel tubular framing and wood construction. It is simple to use, lightweight and can help reduce your product costs. Quick Frame requires few parts for assembly and connects with just one tool. It is a boltless method that fastens with nylon tube inserts. This means that Quick Frame does exactly what its name implies - connects quickly to form light yet sturdy builds.

How Quick Frame Works

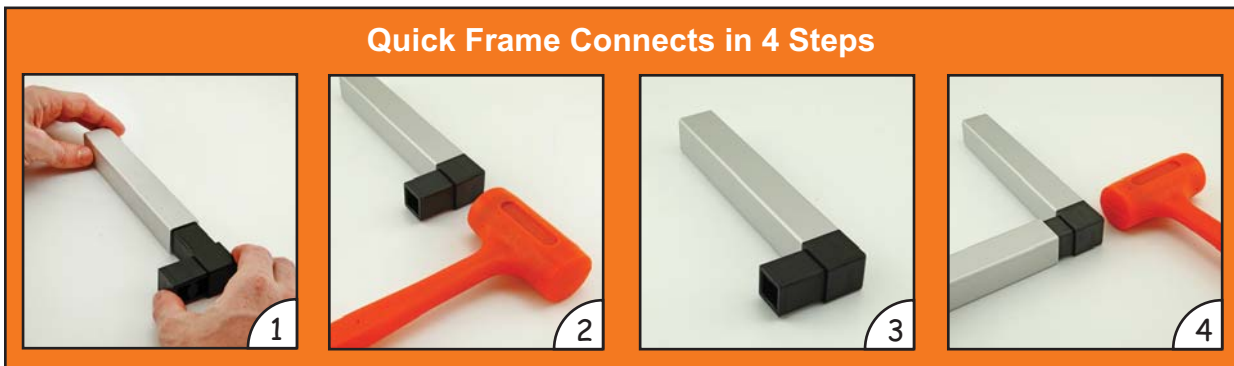
Quick Frame profiles are designed specifically to work with Quick Frame connectors; they have built-in ridges that bite into the connector to create tension without the use of hardware. The profiles connect quickly and easily using only a soft-faced mallet to form light-duty yet sturdy builds.



Internal grooves in the Quick Frame profile hold connector in place without the use of additional hardware. A soft-faced mallet is all that is required for assembly.



Quick Frame Connects in 4 Steps



Quick Frame: Strong, Light-Duty Solution

Quick Frame is made of aluminum but is even lighter than most other framing materials such as wood and PVC. This means that Quick Frame retains structural rigidity making it perfect for light-duty applications such as shelving and storage solutions, barrier and splash guards, enclosures, and retail displays.

Added Benefits of Quick Frame

Quick Frame is easily incorporated into preexisting projects and frames already built with T-slot aluminum profiles. Keep in mind, too, that Quick Frame is anodized which means that it is corrosion resistant and aesthetically appealing. The nylon connectors do not degrade and can even be submerged in water without rusting.

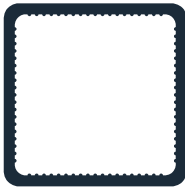


The Shapes of Quick Frame

There are 3 main shapes when it comes to Quick Frame; square, flanged, and twin flanged. Square profiles hinder dirt and debris buildup and are easy to clean while single flanged profiles are perfect for building doors or adding panels. Twin flanged profiles hold panels in place for vertical applications such as enclosures.

Within both the flanged and twin flanged shapes you can choose from either a single flange, a right angle flange or a double flange, allowing you to find the specific Quick Frame profile perfect for your build.

SQUARE



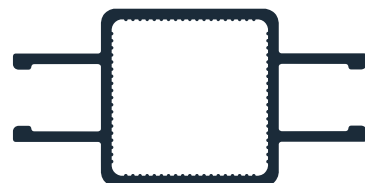
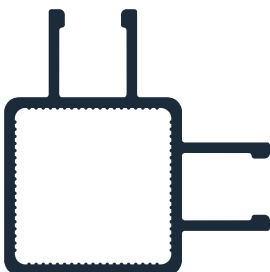
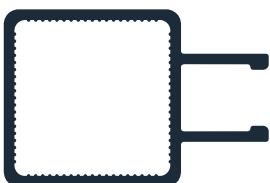
Look for the orange icon for parts compatible with Quick Frame.



FLANGED



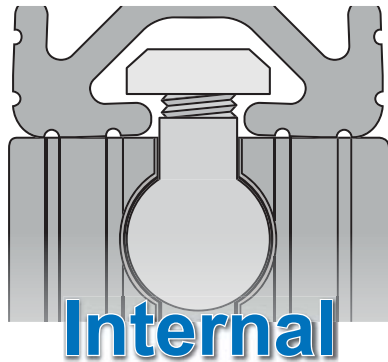
TWIN FLANGED



Introduction to Fastening Methods

There are several options when choosing your fastening method. The intent of this section is to give an overview of points to consider as well as a brief summary of fastening options. While the variety may seem overwhelming, you can narrow down your selection based on properties of your desired fastener.

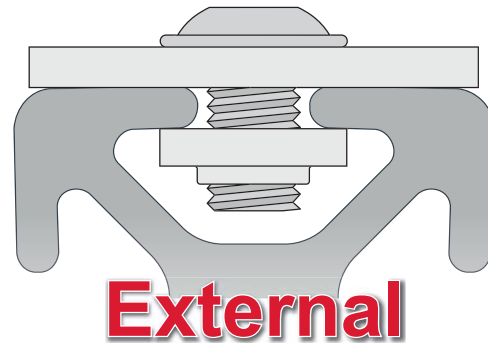
As a way to simplify your decision-making process, it's easiest to categorize fasteners into two main groups: internal fasteners and external fasteners. Most of the fastening connections offered by 80/20 fall into one of these two groups and each group has unique attributes and properties.



Internal connections create strong bonds between profiles because, in most cases, the fastener is machined into the profile. They are easy to assemble, require few parts, and are simple to work into your design.

INTERNAL BENEFITS

- Fastener recessed in T-slot
- Fewer parts
- Easy to assemble
- Easy to incorporate
- Hardware typically included
- Hidden connections available
- Options for infinite positioning
- Typically will not affect design area



External connections mount to the outside of the T-slot, strengthen connection points, and are easy to implement into the application. Most external connections are reconfigurable and can be mounted anywhere along the T-slot.

EXTERNAL BENEFITS

- Mount to T-slot
- Usually no machining required
- Options for infinite positioning
- Easy to implement
- Reconfigurable connections
- Ability for variable angles
- Strengthen connection points
- Assemble with simple hardware
- Options for connecting more than two profiles



Variety of Options Available

Keep in mind that in most instances, there is no “one right way” or “one right answer” when choosing your method. It will depend on personal preference, circumstance, application, design and purpose. Be sure to look for your series compatibility icon when choosing a fastener.

Internal Fasteners

Anchor Fastener	End Fastener	Central Connector	Hidden Corner Connector		
					
					
					
					
					
45 Degree Supports	Structural Pivots	Flat Plates	Brackets & Gussets		

External Fasteners

Get to Know Your Hardware								
Part	Part Image	No Machining	Hardware Included	Reconfigurable	Flush	More Than 2-Way Hub	Hidden	Infinite Positioning
<i>Internal</i>								
Anchor Fastener			✓	✓	✓			✓
End Fastener			✓		✓	✓	✓	
Inside Corner Connector		✓	✓					✓
Hidden Corner Connector		✓	✓		✓		✓	✓
Butt Fastener			✓		✓			
Central Connector			✓		✓			✓
Miter Connector			✓		✓			
<i>External</i>								
Flat Plates		✓		✓		✓		✓
Brackets and Gussets		✓		✓		✓		✓
3-Way Corner Connectors					✓	✓		
45 Degree Supports		✓	✓		✓			
Pivot Hinge Assemblies		✓		✓				✓

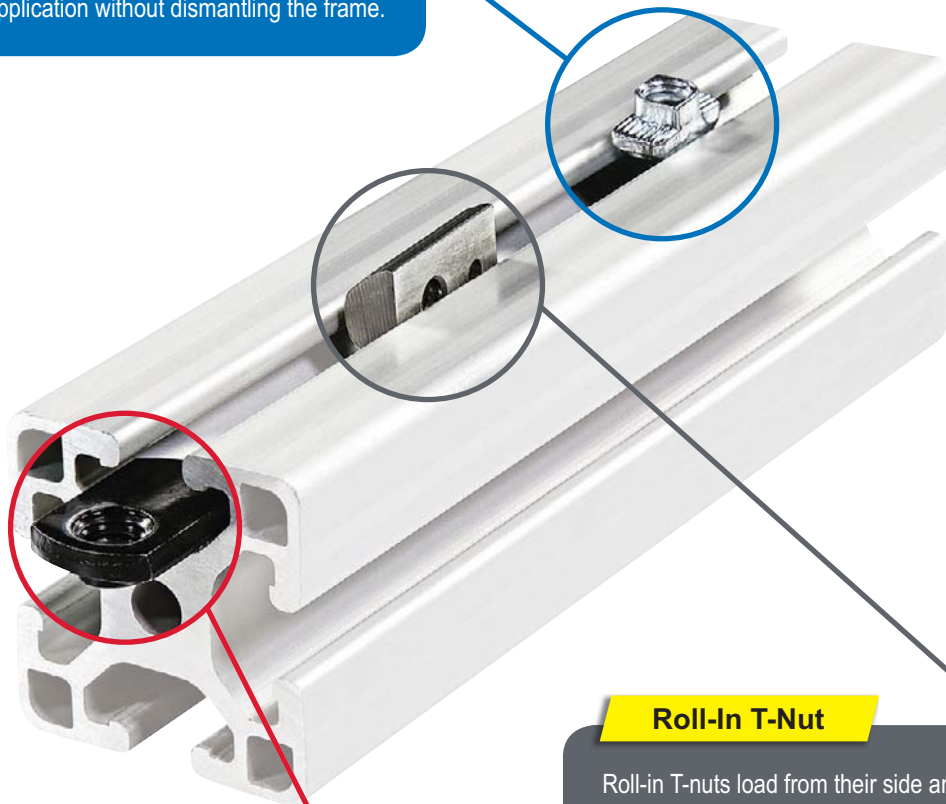
T-Nut Types

80/20 offers a wide variety of hardware with options in size, material, shape, thread alignment, and installation method. Three popular types of T-nuts are slide-in, drop-in, and roll-in.



Drop-In T-Nut

Drop-in T-nuts load from anywhere on the profile, making them perfect in instances where the ends of the profiles are captivated and you want to add to your application without dismantling the frame.



Slide-In T-Nut

Slide-in T-nuts load from the end of the profile and are available in several configurations including a centered or offset thread, and material and finish options.

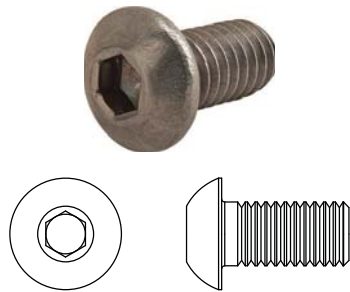
Roll-In T-Nut

Roll-in T-nuts load from their side and spin into place, which allows for infinite positioning along the T-slot. They can be used even when profiles are captivated. Roll-in T-nuts come in several variations, including self-aligning options as well as features to hold the T-nut in place for easy positioning.

Bolt Options

80/20 offers a wide variety of bolt fastening options. Some of the most frequently used are Button Head, Socket Head, Flanged Button Head, Flat Head and Low Head.

Button Head (BHSCS)



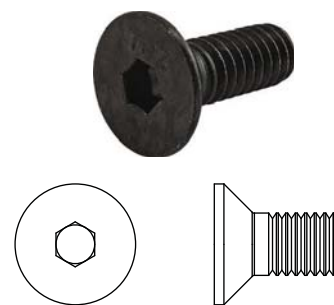
Socket Head (SHCS)



Flanged Button Head (FBHSCS)



Flat Head (FHSCS)



Low Head (LHSCS)



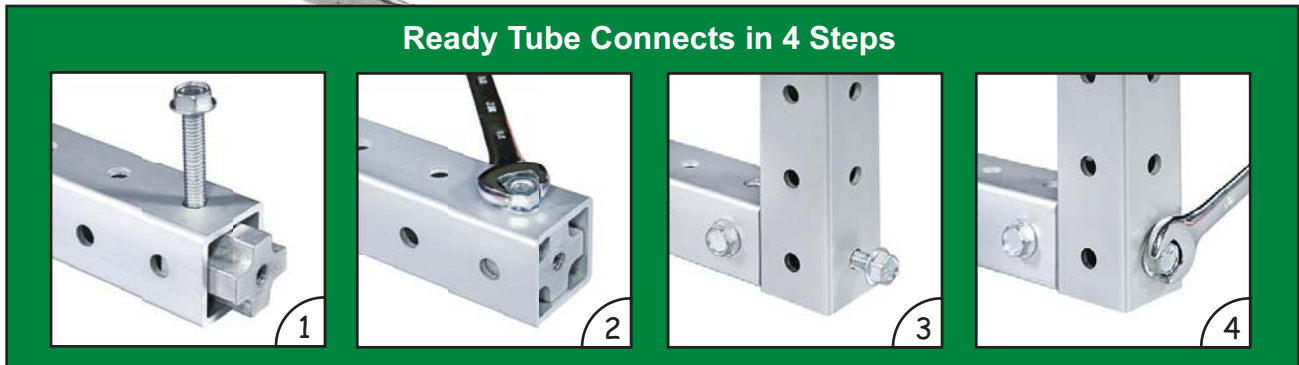
Ready Tube™ Fasteners 101

80/20 offers several fastening options for Ready Tube profiles. While the most common is the Ready Connector Kit, there are also additional internal and external connection methods. Because Ready Tube profiles have pre-drilled holes, the connection methods do not require machining.



Only need a wrench!

Ready Tube Connects in 4 Steps



Standard Insert Kit

The Standard Tube Insert Kit includes all of the hardware you will need to easily assemble your project. This method is used for 90 degree connections when the end of the mounting profile **is** exactly .750" of an inch from the first hole centerline.



Extended Insert Kit

The Extended Tube Insert Kit also includes all of the hardware you will need to easily assemble your project. This kit is used in instances when the end of the mounting profile **is not** exactly .750" of an inch from the first hole centerline.



Roll Pin

The roll pin is commonly used with the standard tube insert and is an internal connection method for Ready Tube. It provides a smooth, clean finish and eliminates the need for protruding hardware when used with Ready Tube connector kits.

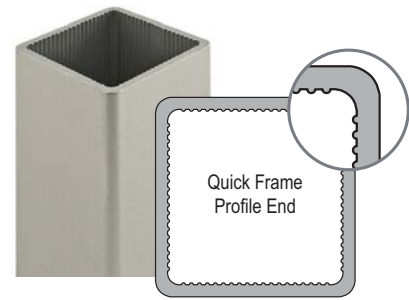
Compatible with Additional 15 Series Fasteners

80/20 corner brackets, gussets, and flat plates can also be used to make connections between Ready Tube profiles. All of these connection methods are external, meaning that they are easy to use, reconfigurable, and mount directly to the profile.

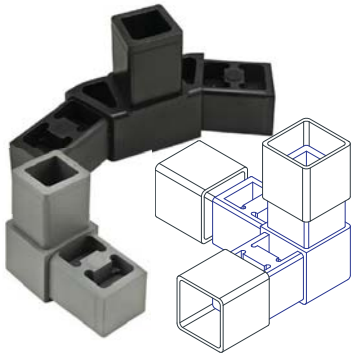
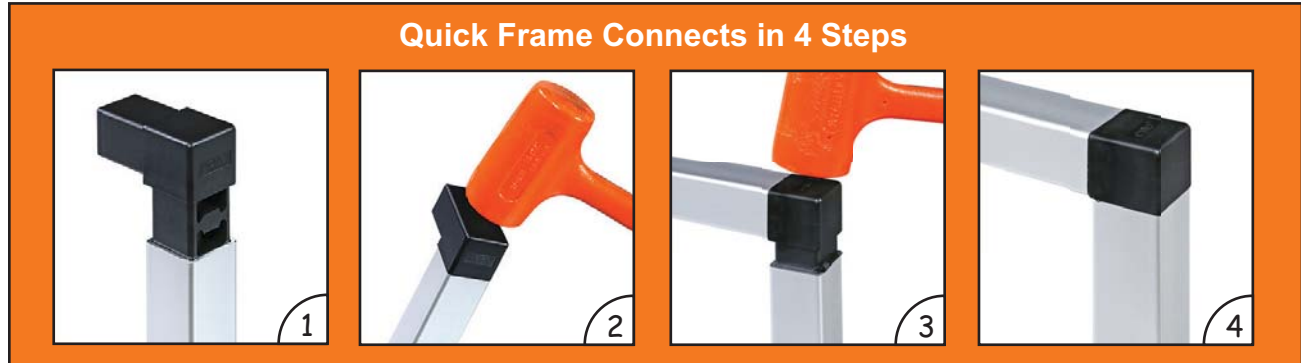


Quick Frame™ Fasteners 101

80/20 Quick Frame connectors are made of black or gray nylon and used with a Quick Frame Profile which has built-in ridges that bite into the fastener. This creates tension without the use of additional hardware. The profiles connect quickly and easily using only a soft-faced mallet to form light-duty yet sturdy builds.



Quick Frame Connects in 4 Steps



No Machining, No Additional Hardware



80/20 Quick Frame connectors require no machining or additional hardware for assembly. This fast and efficient method is perfect for lightweight and cost-effective applications that still require a sturdy and secure connection. Quick Frame connectors also do not degrade and can even be submerged in water without deteriorating.

Helpful Tip: Use a soft faced mallet to install Quick Frame connectors.

Variety of Fastening Options

80/20 has a variety of Quick Frame fastening options that enable connections between multiple profiles (up to eight using just one connector) as well as options to join profiles at varying angles. 80/20 also offers base connectors for projects that will be attached or mounted to any flat surface or T-slot profile.

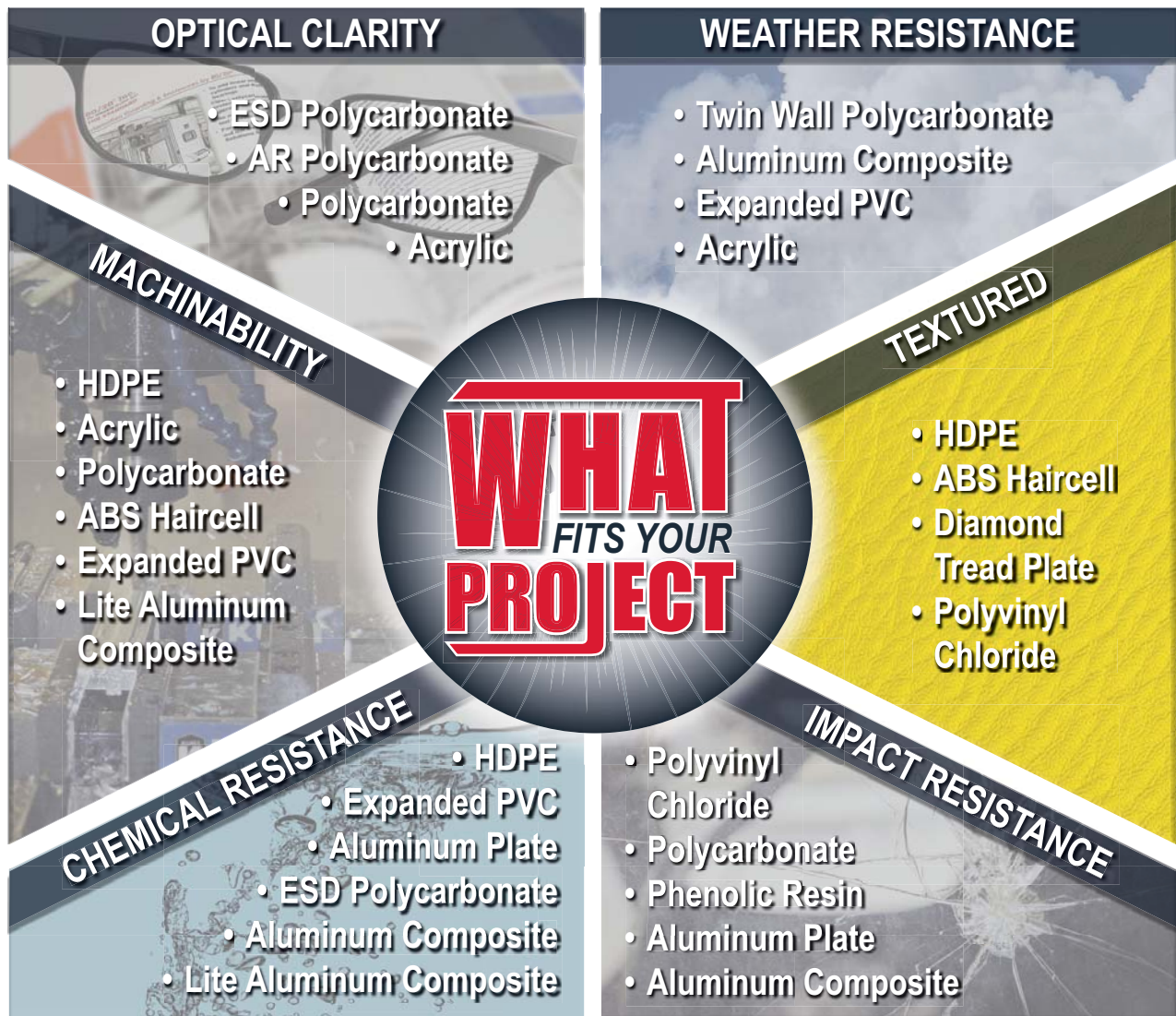


Introduction to Panels & Doors

80/20 has an extensive in-house panel shop with a wide variety of wire, mesh and plastic panels. Our panels are frequently integrated into design plans and builds. They are great for guarding, enclosures, tabletops and shelves, among other applications. 80/20 carries an impressive stock of over 100 panels in different sizes, shapes, thicknesses, colors, and materials. Keep in mind that 80/20 mesh, plastic panels, and aluminum plates are ordered by the square foot or square meter.



When deciding on your panel you'll want to make a thorough assessment of your needs. You will find that you have several choices to consider when incorporating paneling into your projects.



Expanded Metal & Wire Mesh

Expanded metal and wire mesh panels work well for guarding and enclosure applications where air flow is required. They provide a barrier and can be used to block off a machine, supplies, inventory, or equipment while still providing visual access. They are strong yet lightweight and are available in a range of materials and colors.



Visit us online and use the 80/20 Panel Selector.



How Panels Are Used with T-Slot

80/20 panels and mesh retainers can be used a few different ways with T-slot profiles. You can either rest the panel in the T-slot or mount it flush with the T-slot profile. Guarding, enclosures, and access points lend themselves well to panels that rest within the profile while desks and furniture applications commonly have flush panels.

Tip: When sizing a panel that will be inserted into the T-slot, be sure to add extra material to your visible panel size.

Quick Frame: For flanged Quick Frame subtract 0.14" of the visible panel size.

Series	Add
10	.500"
15	.750"
20	10mm
25	14mm
30	15mm
40	22mm
45	24mm

Panel & Mesh Mounting Options

You have several options when it comes to mounting your panels and mesh. Consider your application. Is it being used to keep things in or out or both? Are you using a mesh panel? Will you be changing out the panel often? Will the project be used inside or outside?

The answer to these questions will help determine the type of mounting option you will want to use.



Retainers



Blocks



Gasket

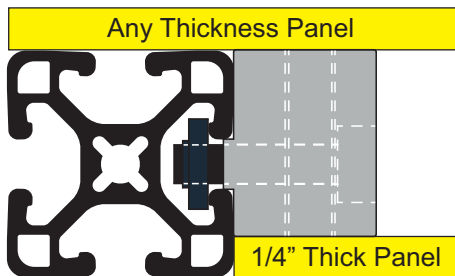
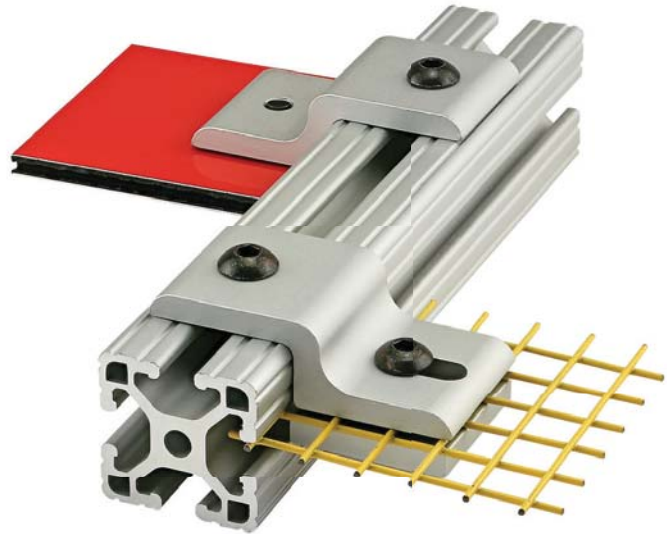
Retainers are easy to use and available in several sizes and shapes to fit your needs.

Panel Retainers:

- Strong
- Cost-effective
- Corrosion-resistant
- Indoor or outdoor use
- Requires drill-through hole in panel

Mesh Retainers:

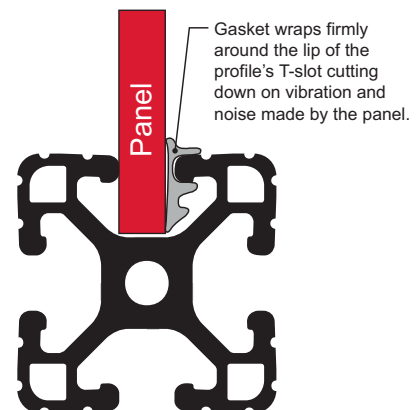
- Strong
- Cost-effective
- Corrosion-resistant
- Indoor or outdoor use
- Includes a backing plate
- No machining required
- Slotted holes for adjustability



Panel Mount Blocks are a great way to mount your panel either flush with the profile or on the profile surface. They provide stability while reducing vibration and there are options available in aluminum or nylon.

Panel Gasket is a great finishing touch for your project. Use it to help secure your panel and prevent it from rattling within the frame. Keep in mind that you only need to put panel gasket on one side of the panel. Here are a few other tips when using panel gasket:

- If you are having trouble installing the gasket, use a little bit of automotive vinyl protectant.
- Cut your panel gasket 2-3 inches (50-76mm) longer than the opening to make the corners stay tight.
- When installing panel gasket, begin in the middle of your panel and work your way out.

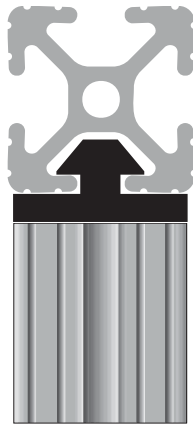


Motion within the T-slot

Door glides and roller wheels slide within the T-slot channel to enable movement of a door, panel, frame or other component. Create accessible displays or an entrance with a bi-fold door.

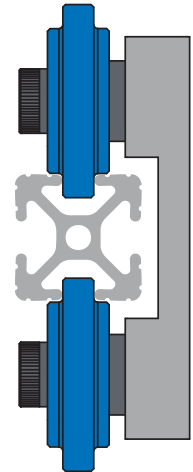
GLIDES

Glides are simple to use and bolt directly to a profile end to freely rotate as the door or application pivots. There is an option available that creates a bi-fold door without the use of a bottom rail.



ROLLERS

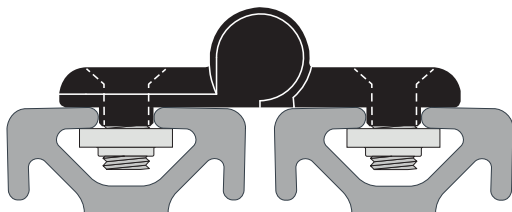
Roller wheels mount directly to a T-slot or profile end and are ideal for guided linear motion. They are made of self-lubricating nylon with a permanent lubricated bushing available which reduces maintenance time and cost.



Variety of Hinge Options

80/20 offers a wide assortment of hinges in a variety of styles, materials, and sizes that can be mounted to a panel or profile to fit your requirements. From light to heavy-duty projects, there are a range of options available; choose from different materials such as plastic, zinc, or aluminum.

- Plastic hinges are typically used for lightweight doors and to connect plastic panels while aluminum hinges are a heavier-duty option.
- Lift-off hinges are popular, as they can create a door that lifts off by using all right or all left lift-off hinges, or confine a door or access point by using a combination of left and right hinges.



Tip: To increase its load-bearing capacity and prevent it from rotating, choose hinges with slot tabs or slot pins. If needed, the tabs and pins can be removed when, for example, a panel is being mounted.



Finishing Touches, Handles & More

80/20 has a wide range of handles, locks, catches, and door stops for your door or access point. Start off by deciding how frequently the door will be in use and whether you will want it to be locked.



Unlocked



Locked

If people will be using it often, consider ergonomic handles or offset handles that hinder finger-pinching injuries. There are also flush handles to prevent snags or heavy-duty latches for larger doors or magnetic catches to help ensure a connection.



Tips for Ordering Panels

PLEASE NOTE A DRAWING IS REQUIRED

Panel Orientation:

When ordering panels it is important to indicate orientation:



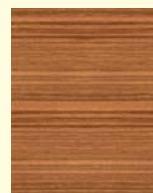
Expanded Metal:

Specify horizontal or vertical diamond orientation.



Twin Wall Polycarbonate:

Specify horizontal or vertical channel orientation.

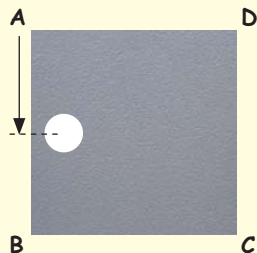


Phenolic Resin:

Specify horizontal or vertical woodgrain orientation.

Textured Side:

Panels like Polyvinyl Chloride and ABS Haircell have a textured and smooth side. When machining is needed it's important to indicate which is outward with "T" for textured or "S" for smooth.



Machining Reference:

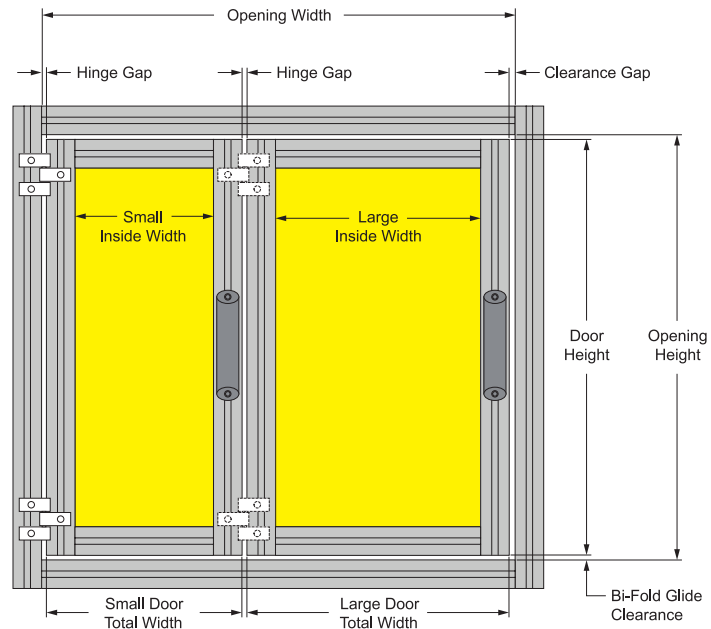
Beginning with the upper left corner, call outs are designated A, B, C, and D in a counterclockwise direction on panels. Referencing these call outs when ordering machining allows for proper measuring of the service position.

In this example, the service center line is measured down from A.

Bi-Fold Door Application Example

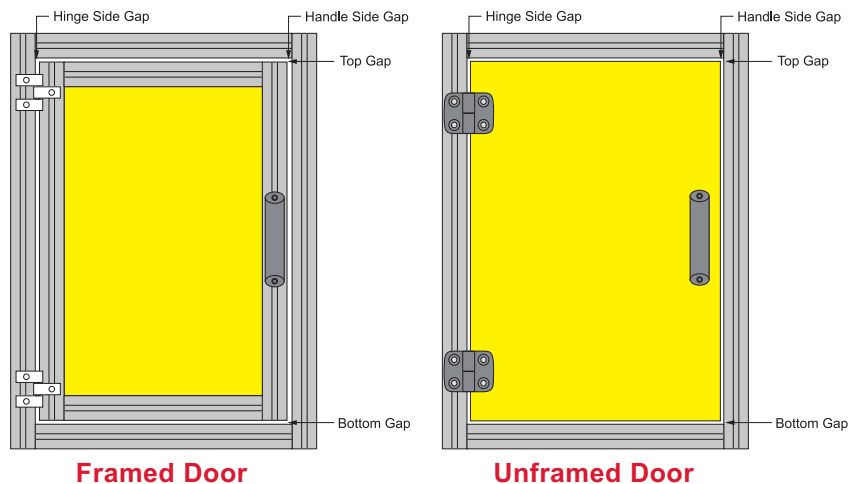
Designing a bi-fold door using 80/20® products is a straight-forward process. Simply remember to include the hinge and opening gaps when sizing the inside dimension of your door, while taking into account the profile size. Follow the steps listed and reference the drawing for the standard method of designing a bi-fold door.

- Step 1:** Select the profile you will use for building your bi-fold door. Typically this is the same as the frame.
- Step 2:** Determine the opening width of your door.
- Step 3:** Choose your hinge type and find the standard gap between profiles when using that hinge.
- Step 4:** Choose the total width for each inside door, remembering to subtract the hinge and clearance gaps.



Framed & Unframed Doors

- For both framed and unframed doors the hinge side gap depends on hinge.
- Framed Doors: There is a 1/4" (6.35mm) top, bottom and handle gap. When using door gasket subtract 1/8" (3.175mm).
- Unframed Doors: There is a 1/8" (3.175mm) top, bottom and handle gap.



Building the Base

Once you've got your design narrowed down it's time to start thinking about your base. There are several varieties available, from casters to furniture glides, leveling feet, or anchors. Some add movement and provide a swivel or a pivot, while others lock or reduce vibration. There are also feet that do just what their name implies; level or anchor your project. You can also choose from options that provide combinations of these features.



You'll want to consider how often your application will need to be in motion or relocated. For example, work carts are constantly moving and turning while furniture only occasionally needs repositioned. In contrast, a guard or larger machine may never need moved or only very infrequently. There may also be a need to immobilize equipment. Determining the frequency of movement will help you decide if you need a caster, a leveling foot, a glide or perhaps a floor lock or anchor.

Consider the Capacity

After you've decided on the type of foot that works best for your project, you'll want to begin narrowing down your product choices. One of the main factors will be the required load capacity.



Keep in mind that the ratings are per foot; if you're using multiple bases the weight will be distributed and provide a higher overall capacity.

Find Your Footing

Casters, glides, bases, leveling feet and anchors are a great way to customize your application and design it to fit your specific space and purpose. There are several added features to choose from.

Caster Options

When using a caster, there are options available that swivel or remain rigid. Some of the casters also include locking mechanisms. The leveling caster is a great combination foot that incorporates both mobility and leveling features with one component.

The threaded stem swivel caster is one of many casters with or without brakes that 80/20 offers.



Feet and Glide Options

Glides, leveling feet and bases come in a wide range of varieties. There are choices suitable for different surfaces, such as concrete or carpet, or that provide leveling and shock-resistance. Select from options with a pad that help reduce and absorb vibration. There are also heavier and lighter-duty bases to pick from.

Options include feet that are both resistant to vibration and pivot up to 20 degrees to accommodate uneven floors.



Add Stability with a Base Plate

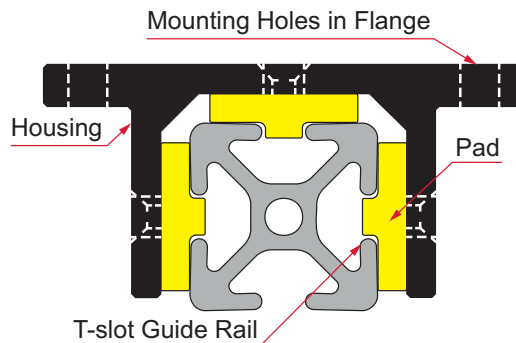
Many feet mount to the profile using a base plate. There are several plates available; this allows you to mount your foot anywhere along the profile T-slot or end, increasing options as to where you can position the foot.

There are also alternatives that let you attach a foot directly to the profile end without the need for a base plate. You'll want to keep in mind that the profile will require an end tap.

Linear Bearing Concept

Linear bearings enable you to add repeated motion and movement to your project. As an example, linear bearings are commonly found in material transportation applications such as picking tools.

The core concept is that profiles act as guiderails and pads are inserted into the T-slot to enable movement. Pads are available in two options: standard or high-cycle.



Standard Pad

Perfect for solutions such as drawer glides, table saw fences, ergonomic workstations or adjustable stands. All pads are available in white and black styles.



High-Cycle Pad

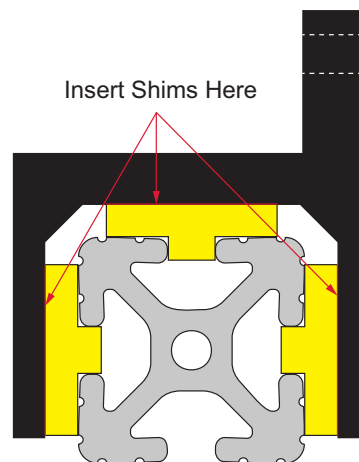
These bearings have a special threaded insert designed for sudden acceleration and deceleration without deteriorating. This durable pad lends itself to actuators and parts-transfer equipment.

Linear Bearing Shims

Linear bearing shim stock is used to create a precise fit. Each shim is .005 inches (.127mm) thick and has a slotted design that enables easy installation without having to dismantle the bearing; simply loosen the bearing pad and slide the shim(s) between the pad and housing while the bearing is still in place. Shims are sold in packs of 10 and are compatible with all 80/20 bearings.



See how easy it is to install a shim insert into a linear bearing.





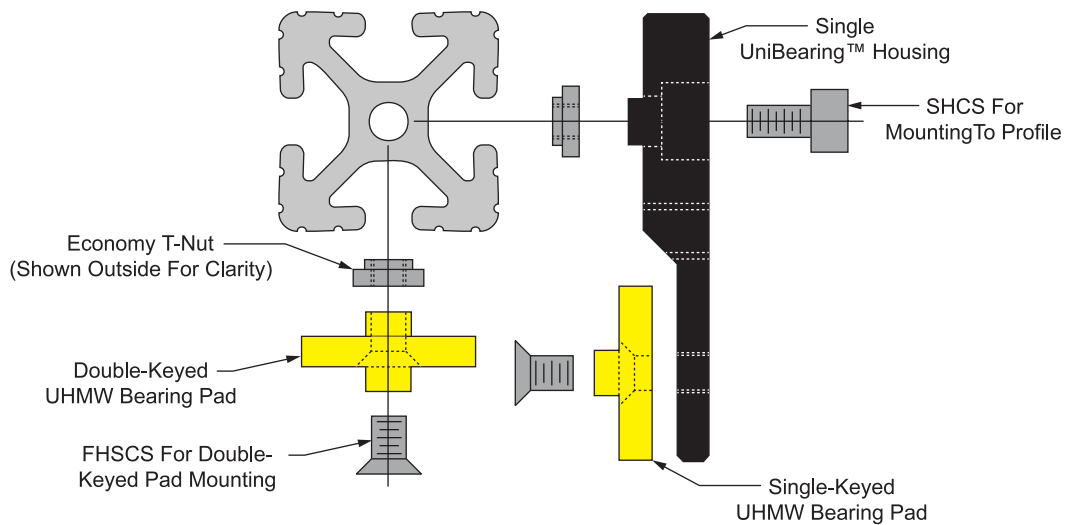
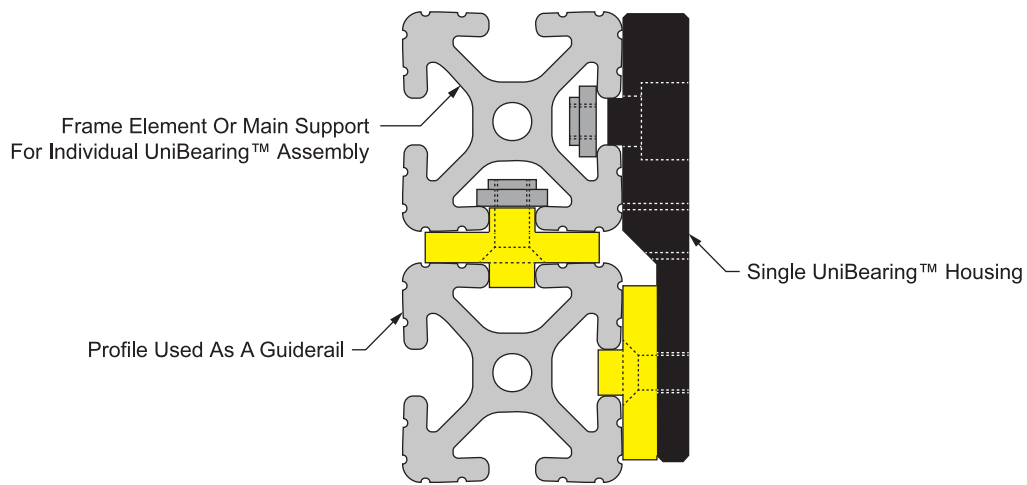
Video

UniBearing™ Concept

80/20 offers a custom UniBearing™. It differs from the traditional linear bearing in that it is adjustable for a range of profiles and can be installed even when a T-slot profile is captivated.



These are easily integrated into existing structures and are commonly used in applications such as automation equipment or guards that require frequent movement.



Engineering Specifications on UHMW-PE Bearing Pads

Property	Test Method	Unit	Typical Value
Specific Gravity	ASTM D-792	g/cm3	0.94
Yield Strength @ 73°F	ASTM D-638	p.s.i.	3400
Ultimate Tensile Strength @ 73°F	ASTM D-638	p.s.i.	6800
Break Elongation @ 73°F	ASTM D-638	%	450
Yield Strength @ 250°F	Stress Strain Diagram	p.s.i.	700
Ultimate Tensile Strength @ 250°F	Stress Strain Diagram	p.s.i.	3300
Break Elongation @ 250°F	Stress Strain Diagram	%	900
Hardness - Rockwell "R" Scale	ASTM D-785	-	64
- Shore "D" Scale	ASTM D-2240	-	67
Flexural Modulus of Elasticity	Bend Creep/1 min. value	p.s.i.	110,000
Shear Strength	ASTM D-732	p.s.i.	3500
Izod Impact @ + 23°C	ASTM D-256A	ft-lbs/in. notch	No break
@ - 140° C	ASTM D-256A	ft-lbs/in. notch	No break
Environmental Stress Cracking @ F50	ASTM D-1693 Mod	hrs.	6000
Water Absorption	ASTM D-570	-	NIL

Abrasive Resistance - Sand Slurry Test

- Each material listed below was rotated 24 hours @ 1750 r.p.m.
- Carbon steel = abrasive rating of 100.
- The weight loss for each material is relative to 100.
- The lower the figure, the better the abrasive resistance.
- 50-50 sand/water slurry.

Material	Rating	Material	Rating	Material	Rating
UHMW-PE	15	Polypropylene.....	87	Normal MW polyethylene	125
Nylon	31	Polycarbonate.....	96	Phosphor bronze	193
High MW polyethylene.....	44	Hi carbon steel.....	100	Yellow brass	409
TFE.....	72	Polyacetal.....	110	Phenolic laminate.....	571
Stainless steel	84	TFE/glass fiber	113	Hickory wood	967

Coefficient of Friction

UHMW-PE polymer has a lower coefficient of friction than glass. Its self-lubricating characteristics make it an ideal material for bearings, bushings, valves, wear strips, or any application where sliding contact is encountered.

Materials	Static	Kinetic	Test Method
Aluminum* vs. UHMW-PE	0.12	0.016	ASTM D-1894
Mild Steel vs. Mild Steel	0.30 - 0.40	0.25 - 0.35	
Mild Steel vs. UHMW-PE	0.15 - 0.20	0.12 - 0.20	
UHMW-PE vs. UHMW-PE	0.20 - 0.30	0.20 - 0.30	

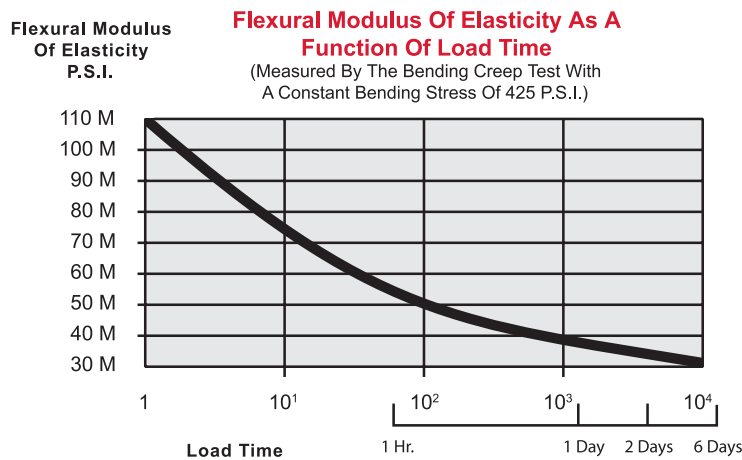
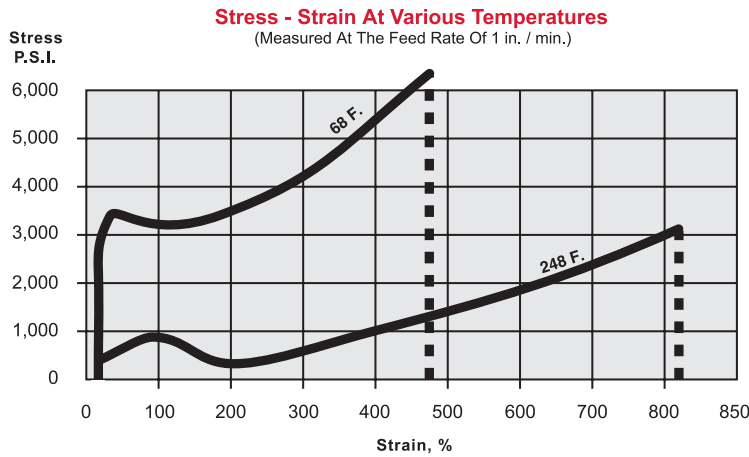
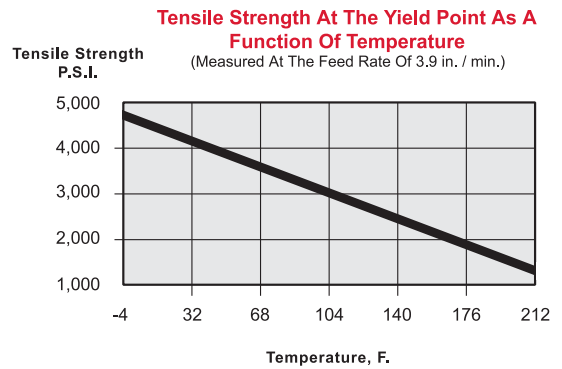
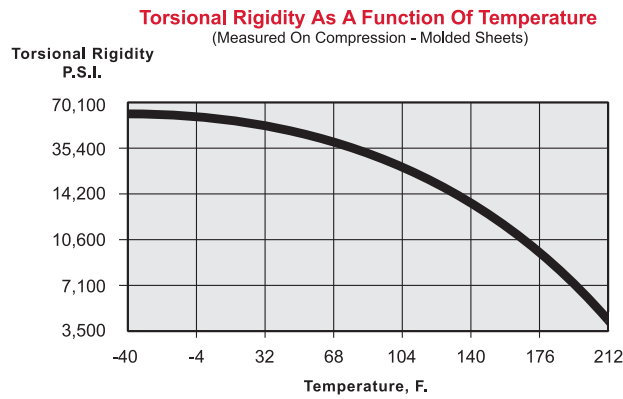
*Anodized 204 R1 Spec on extruded aluminum

Comparison of Dynamic Coefficient of Friction on Polished Steel

Property	UHMW-PE
Dry	0.10 - 0.22
Water	0.05 - 0.10
Oil	0.05 - 0.08

**FDA and USDA
Approved**

Load Bearing Properties of UHMW-PE



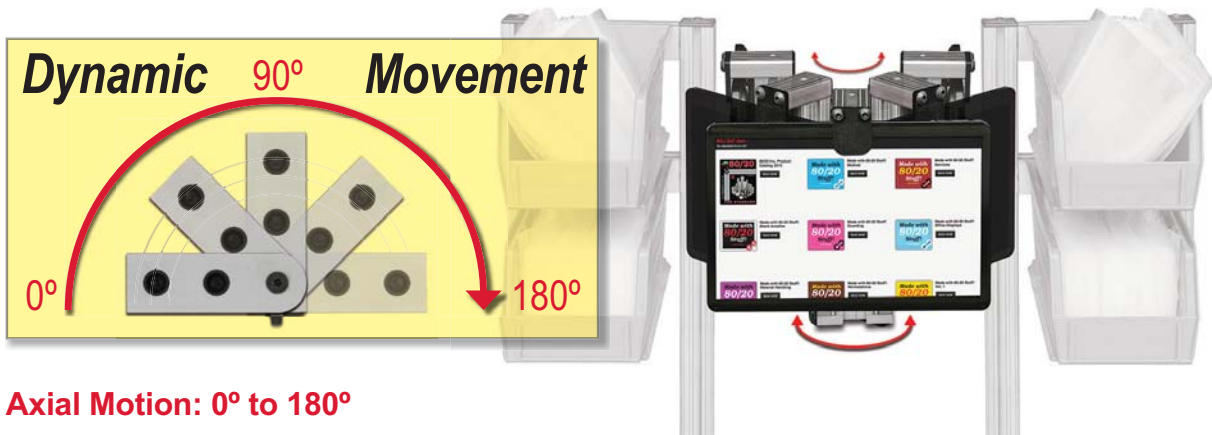
Chemical Resistance of UHMW-PE

TEST SPECIMENS	Dumb-bell type
DURATION OF TEST	30 Days
+ = RESISTANT	Mechanical properties not appreciably affected
/ = LIMITED RESISTANT	Decreases in yield stress and ultimate tensile strength less than 20%
- = NOT RESISTANT	Decreases in yield stress and ultimate tensile strength greater than 20%

Reagent	Temperatures		
	20°C	50°C	80°C
I. Inorganic acids			
Chromic acid (80%)	+	+	/
Hydrochloric acid (conc.)	+	+	+
Hydrocyanic acid	+	+	
Hydrofluoric acid	-	-	-
Nitric acid (conc.)	/	-	
Nitric acid (50%)	+	+	/
Nitric acid (20%)	+	+	+
Phosphoric acid (85%)	+	-	-
Sulphuric acid (conc.)	+	-	-
Sulphuric acid (50%)	+	+	+
II. Alkalis			
Aqueous ammonia	+	+	
Potassium hydroxide solution	+	+	+
Sodium hydroxide solution	+	+	+
III. Aqueous solutions of inorganic salts			
Aluminum chloride	+	+	+
Ammonium nitrate	+	+	+
Bleaching powder	+	+	+
Calcium chloride	+	+	+
Sodium carbonate	+	+	+
Sodium chloride	+	+	+
Sodium hypochlorite	+	+	+
Zinc chloride	+	+	+
IV. Organic acids			
Acetic acid (99%)	+	+	/
Acetic acid (10%)	+	+	+
Butyric acid	+	+	
Citric acid	+	+	+
Formic acid	+	+	
Oleic acid	+	+	/

Reagent	Temperatures		
	20°C	50°C	80°C
V. Hydrocarbons and halogenated hydrocarbons			
Benzene	/	/	
Carbon tetrachloride	/		
Cyclohexane	+	+	
Dichloroethylene	-	-	
Diesel oil	+	+	/
n-Heptane	+	+	
Petroleum ether	+		
Trichloroethylene	/	-	
Toluene	/	-	
White spirit	+	/	
Xylene	/	/	-
VI. Alcohols, Ketones, Ester, and Amines			
Acetone	+	+	
Aniline	+	+	/
Benzyl alcohol	+	+	+
Butyl alcohol	+	+	+
Cyclohexanol	+	+	+
Ethanol	+	+	
Ethyl acetate	+	+	
Ethylene glycol	+	+	+
Glycerine	+	+	+
Lauryl alcohol	+	+	+
Propyl alcohol	+	+	+
VII. Miscellaneous			
Beer	+	+	+
Detergents in aqueous solution	+	+	+
Distilled water	+	+	+
Hydrogen peroxide 30% (perhydrol)	+	+	
Linseed oil	+	+	+
Milk	+	+	+
Olive oil	+	+	+
Sea water	+	+	+
Wine	+	+	+

Because we cannot anticipate or control the many different conditions under which our products may be used, the product information contained in this catalog should be viewed as general guidelines only and not as a recommendation to use our products in any particular situation. Although we believe that all information contained herein is reliable, certain information in this catalog may have been obtained from test results published by other parties, and consequently, we cannot guarantee the accuracy of all information contained in this catalog. In addition, particular conditions of use and reasonable lot-to-lot variations can affect performance. Users of our products should perform their own tests to determine the suitability of any product for their particular purposes.



Axial Motion: 0° to 180°

Dynamic pivots are typically used to create axial motion ranging from 0-180 degrees. There are also assemblies available to limit the range of motion from 0-90 degrees. You'll commonly find dynamic pivots in tooling arms, displays and computer stands.



All dynamic arms and brackets come with permanently lubricated bronze bushings for long-lasting and repeated movement.

Dynamic Pivot Components

Dynamic pivot assemblies include a pivot nub and connect to the profile using either "L" arms, straight arms, or brackets. These arms have permanently lubricated bronze bushings that act as a high-strength pivot point and reduce maintenance time and cost.

Repositioning Your Pivot

If you will be repositioning your dynamic pivot frequently, consider adding a handle to help simplify and speed up the process. Dynamic pivots are long-lasting and there are a variety of assembly combinations available that allow you to fold or rotate the profiles to fit your specific needs.



Video

Introduction to Pressure Manifolds

Manifolds are used to add a pressurized substance, such as liquids or air, into the center cavity of a T-slot profile. You'll commonly find this in material handling processes, such as work and assembly stations, because the pressurized profile allows you to incorporate pneumatic tools directly into the work area.

There are a range of access, feed, and stopper plates available to fit your structure.

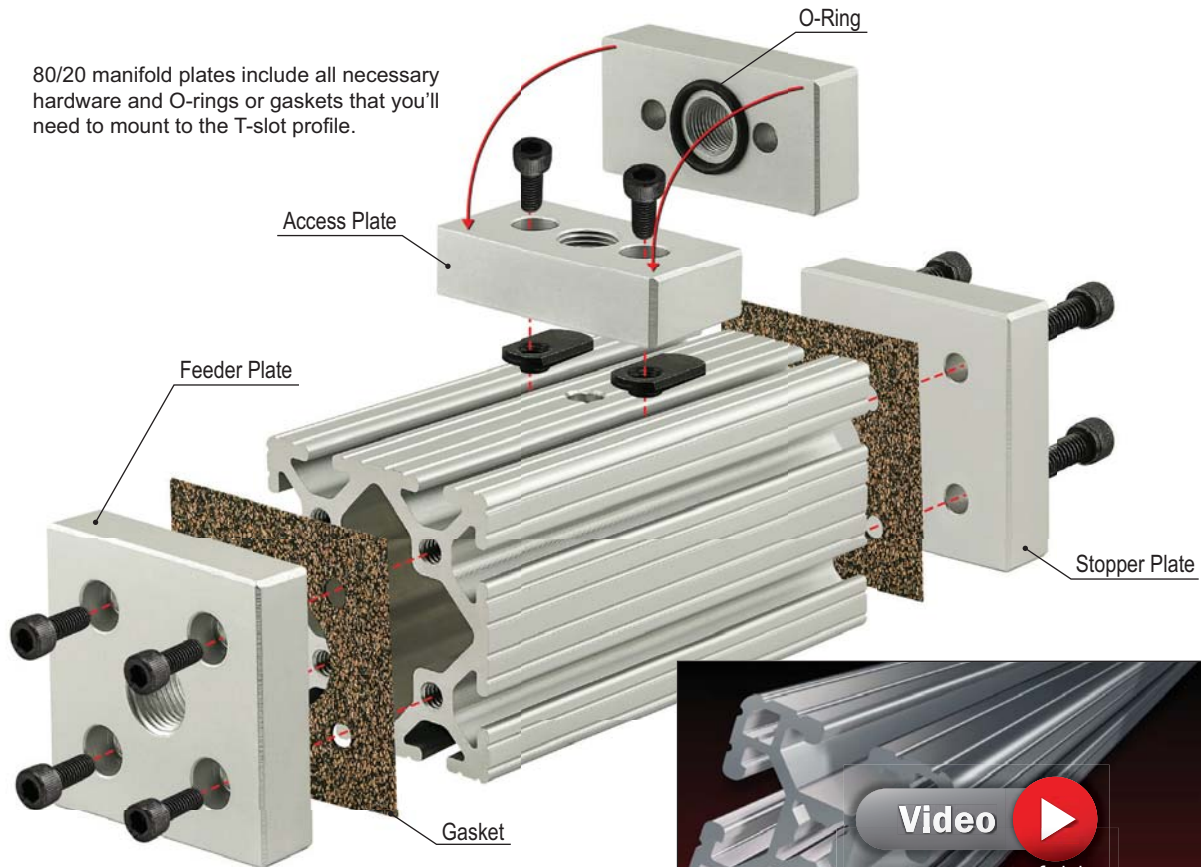
As an example, a manifold configuration could include an access plate attached to the supply line and feed plate mounted where the pressurized substance is released. The stopper plate secures to the profile end to form a tight seal.



Did You Know?

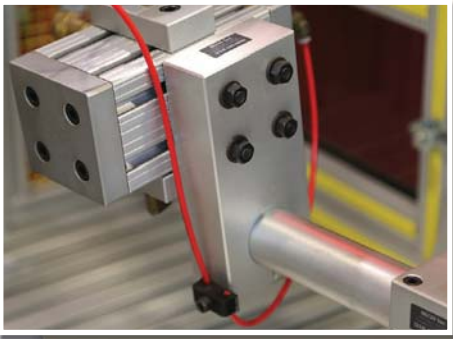
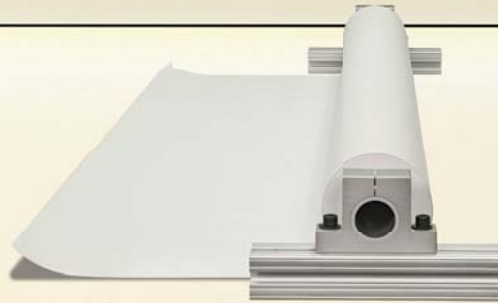
80/20 carries a wide range of structural shapes that allow you to design a custom manifold.

80/20 manifold plates include all necessary hardware and O-rings or gaskets that you'll need to mount to the T-slot profile.



Introduction to Stanchions

Stanchions are typically used with 80/20 aluminum tubes to create an additional axis. Stanchions are a more permanent, precise, and stable base than alternatives, such as clamps.



Variety of Bases

There are different bases to choose from that allow you to add vertical or horizontal axes or a combination of the two. You also have options that support two axes using just one base or even the ability to create an off-set axis.

Incorporate Tubes, Wires & Cables

You will also want to consider adding a handle to your stanchion block; they enable flexibility in positioning and easy repositioning if you will be moving the tube frequently.



YouTube™

[▶ Subscribe](#)

and catch all new
80/20 videos



Finishing Touches

80/20 accessories pull together your project and give it the finishing touches to make it fit your exact specifications. There are a wide variety of options; from storage and organization to wire and tube management, you'll find what you need to enhance and personalize your project.

When adding accessories consider a few categories:

- Protection
- Wire & Cable Management
- Storage and Organization



Protection

Accessories in this category are used for a range of purposes from protecting people and equipment from sharp edges and damage to keeping dust out of T-slots. Some of the products, such as T-slot covers and end caps, also add a finishing look to your project.

- End caps
- T-slot covers
- Tread strip
- Anodize breaker
- Grounding terminal
- Rubber bumper



Tip: Try aluminum T-slot covers to blend in with your profile or use colors to stand out and denote caution or warning.

Wire and Cable Management

Wire and cable management products improve safety by keeping your application clean, protected and organized. These products decrease the possibility of damage to wires, cables and tubes and can be quickly and easily installed into any project. The variety of options available provides flexibility in design and implementation.

- Wire housing
- Cable tie mounting pad
- Cable and tube clip
- Cable tie mounting block
- Single and double tube clamps



Tip: Wiring duct has interlocking ends so you can make the duct any customized length.

Storage and Organization

Storage and organization accessories come in a range of colors and sizes to accommodate your processes. Keep clutter at bay and streamline operations by incorporating these products into your application.

- Storage bins
- Tool hangers & holders
- Monitor mounts
- Light-duty adhesive clamp
- Label holder

Important Note: Storage bins are mounted to a T-slot profile using storage bin hangers.



**LEARN
MORE**

See more of what others have built with 80/20 with the online photo gallery of solutions.

Structural Shapes for Custom Solutions

Structural shapes are commonly used for custom projects; if there's a unique flat plate, manifold, bearing, or bracket you need, we have the material in stock to make it for you.

From solid aluminum plates, deadbolt latches, angle profiles, or panel mount blocks, this wide selection of in-house shapes provides a quick turn time for your design.



In-House Machining Capabilities

80/20 also provides an in-house Custom Machining service to modify any of our structural shapes to fit your requirements. This gives you access to a high-precision, large capacity machine shop to customize your parts quickly and accurately.



Visit us online to request a Custom Machining quote.



Selection of Finishes

All of the structural shapes are available with either a mill or anodize finish. We also offer black anodize to create an aesthetic look.

Mill Finish



Clear Anodize



Black Anodize



Want to Know More?

Request a FREE solutions booklet from the following categories:

ORDER NOW



- Automation
- Guarding & Safety
- Lean Solutions
- Material Handling
- Machine Framing
- Research & Development
- What is 80/20?
- Workstations

