T-Slot Aluminum Framing Solutions

Everything You Need to Build Anything

Parker’s extensive line of structural T-slot aluminum extrusions, fasteners, panels, doors, hardware and accessories can be configured to meet any design challenge with a durable, high performance solution.

Cabinets and Storage

Material Handling Systems

Test Station with Granite Top

Factory Lean Solutions

Machine Bases and Frames

Front Office Reception Desk

Portable Gantry System

Workstations and Tables

NEW!

Factory Lean Solutions

Parker has introduced a series of standard lean factory solutions such as team tracking and communication boards and day by the hour boards using our modular T-slot aluminum framing system. These systems can be ordered as a kit or an assembly.

www.parker.com/FactoryLeanSolutions
Service and Support: When, Where & How You Need It

Customer satisfaction is key to your success, and ours. Our nationwide network of IPS service centers and distributors provide the right level of product and engineering expertise and response to support your needs.

IPS Service Centers
- Plant locations in Wadsworth, OH and Rohnert Park, CA
- Parts, accessories and extrusions in stock
- Engineering capabilities for kits and assemblies
- Machining services: cutting, tapping, drilling and counter boring
- Assembly services
- Factory direct customer service support

Authorized Design Centers
- Locations across the country
- Local inventory of most parts, accessories and extrusions
- Engineering capabilities for kits and assemblies
- Machining services: cutting, tapping, drilling and counter boring
- Assembly services
- Factory trained staff

Authorized Distributors
- Locations across the country
- Local support
- Other value added services
- Factory trained staff

Online Tools
www.parker.com/ips

Parker IPS offers the tools needed to design and develop your assembly solution. Use our website for access to the industry’s most comprehensive resource for:
- Complete selection and specification information on all IPS products available on-line in pdf format
- Native SolidWorks® and Inventor® 3D CAD file libraries available for download or on USB for all IPS products
- Training materials
- Support and downloads
- Rapid quote requests
- Distributor/Design Center Locator

Avoid paying too much for an over-engineered solution, contact our applications team today at 800-358-9068 for quick response and help with designing the best solution.

SolidWorks® is a registered trademark of Dassault Systemes Solidworks Corp. Inventor® is a registered trademark of Autodesk Inc.
Think it. Design it. Build it.

From Concept to Completion.

Turn your brainstorm into an application quote in as little as 24 hours – Parker’s IPS network can help!

Are other structural aluminum providers unable to provide the right solution? Are you considering using aluminum over traditional welded steel? We can convert pen or pencil sketches into final drawings and quotes, often saving you time and money.

Parker can also supply engineered kits or sub-assemblies to make your next project flow smoothly. Most quotes can be turned around quickly.

Call 800-358-9068 to discuss your requirements with an applications engineer.

**Typical Applications**
- Motion systems integration
- Enclosures and guarding
- Machine bases and frames
- Workstations and tables
- Material handling systems
- Lean manufacturing tools
- Clean room applications
- Conveyor frames
- Test equipment
- Tool racks
- Test tables
- Trade show booths
- Store fixtures
- Sound enclosures

**Markets Served**
- Aerospace
- Automotive
- Educational
- Industrial manufacturing
- Medical
- Packaging
- Pharmaceutical
- Plastics
- Semiconductor
- Textiles
- Tires

Turn your brainstorm into an application quote in as little as 24 hours – Parker’s IPS network can help!
Need a Quote in a Hurry?

Parker IPS has the engineering experience to make ground-up system development quick and easy. Let us assist you in designing your next system from concept to completion.

The IPS team of engineers is available to help design systems to ensure perfect field integration. IPS solutions are custom fabricated and shipped installation ready as a kit or complete assembly.

Machine Services
- Cutting
- Tapping
- Drilling
- Counter boring

Value Added Services
- Metric and Imperial design catalog
- Parker's Framing & Aluminum Structures Toolkit
- Motion system integration
- Deflection program
- Engineering quotes and drawings
- Quick quote software
- Assembly manuals
- Assemblies, kits and bundles

Custom services also available by our expert machinists to meet your exact requirements.
Complete Design Solutions

For the factory floor…

IPS Solutions at Work:

Cardboard Storage

Before…

A valve manufacturing plant was looking to update their cardboard storage area. Throughout the day the shippers had to do a lot of bending and other tasks that were not ergonomically friendly.

After…

The valve manufacturer was able to use IPS to make the cardboard storage area more visually aesthetic, modular and ergonomically friendly. This contributed to approximately 125,000 sq. ft. of reclaimed manufacturing floor space!

… and the front office!

Put Our Product, Market, & Application Experience to Work for You
Maintenance Workstations

**Before...**

This maintenance department was in need of a way to organize tools and make them accessible. They also needed a dedicated work area that was clear of clutter in which to work.

**After...**

By using Parker’s T-Slot Aluminum Framing to revamp the maintenance area, the maintenance department was able to have a modular and more organized work space. *This improvement added to the overall plant productivity by roughly 14%.*

Steel Enclosure Replacement

**Before...**

A customer in the paper industry was looking to retrofit the steel enclosures around their machines. Steel has its benefits, but from a weight, modularity, and flexibility standpoint, the customer felt it was time to upgrade and came to Parker IPS for assistance.

**After...**

With the Parker IPS redesign, the customer was able to completely retrofit the heavy steel framing with lightweight but equally strong and durable aluminum. Pneumatic cylinders replaced the hydraulic cylinders to lift the enclosures, resulting in an added cost reduction. The line of sight for the machines was also greatly improved adding to the success of the plant upgrade.
Build Smart...

With T-Slot Aluminum Framing Components

Parker IPS materials can create an unlimited variety of machine bases and frames, linear-slide systems, safety guarding, enclosures, worktables, material handling systems, and other industrial structures. Innovative customers use our IPS technology as the foundation for systems that feature industry-leading Parker motion control solutions.

Think Aluminum

Aluminum framing offers numerous benefits over typical welded steel fabrication.
- Extremely short turnaround time from design to completion
- No welding, grinding, cleaning, painting, or distortions
- Eliminates costly traditional manufacturing processes
- Flexibility to re-configure as requirements change
- Lighter

Profiles

Parker offers a comprehensive offering of metric and inch based profiles:
- 100+ individual high-strength aluminum profiles
- All structural profiles are aircraft grade, high strength, mill-certified with metallurgical properties of 6105-T5
- Aesthetically appealing extrusions offer best-in-class rigidity, durability, and hardness
- Unique T-slot design for reliable connection and easy modification
- Metric sizes range from 20 mm to 160 mm; inch sizes range from 1" to 6"
- Extensive range of smooth, grooveless profiles

Lean Solutions

- Improve your Quality and Lean journey
- Tracking and Communication, Day by the Hour boards, and more!
- Pre-configured, standard part numbers

Fasteners & Accessories

- T-slots, end caps, fasteners, and covers
- Gussets, plates and brackets
- Handles and hinges
- Panels, sliding doors and gate hardware
- Feet and casters
- Work station accessories
- Slide blocks and bushings
- Rollers and slide bearings

Parker offers a comprehensive offering of metric and inch based profiles:
- Polycarbonate
- Trespa®
- Expanded PVC
- PVC coated wire mesh
- Aluminum composite

Specialty panels of any material can be ordered for any project.

Machining Services

Standard machining options include cutting, tapping, drilling, and counter boring. Additional custom machining by our expert machinists ensure that your design is complete and to your exact requirements.

Choose What Suits Your Needs

Choose a level of service to suit your needs from a completely assembled structure to a bundle of uncut profiles:

Assemblies

Parker IPS offers complete assembled solutions that are designed, custom fabricated, and shipped in as little as seven business days. (Lead times may vary and are application dependent.)

Kits

Profiles are cut and machined to order, fasteners and accessories are included based on a parts list, and the entire order is packaged and shipped for final assembly at your location.

Bundles

Our entire product line can be ordered as bundles of uncut or cut-to-length profiles, with packages of fasteners and accessories.
## Introduction

### Catalog 1816-4/US

T-Slot Aluminum Framing    •     Wadsworth, OH     800.333.4932     •     Rohnert Park, CA     800.358.9068

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## Table of Contents

### Profiles & Accessories
- Basic Profiles
- Specialty Profiles
- Profile End Caps
- T-Slot and Profile Covers
- Conduit Profiles
- Conduit End Caps

### Fasteners
- Fasteners
- T-Nuts
- Miter Connectors
- Screws, Bolts, Nuts & Washers
- T-Clips & Cable Holders

### Brackets, Gussets, & Plates
- Brackets
- Gussets
- Corner Elements
- Joining Plates

### Panels & Doors
- Panels & Wire Mesh
- Panel Mounting/Mesh Retainers
- Door Guides & Rollers
- Rail Carts

### Handles, Hinges, & Latches
- Handles
- Door Catches
- Latches & Locks
- Hinges
- Pivot Joint

### Feet & Casters
- Feet
- Casters
- Base/Corner Mounting Plates

### Special Applications
- Pneumatic Components
- Workstation Accessories

### Linear Applications
- Slide Blocks
- Linear Roller Systems

### Lean, Services, Tips, & Tools
- Machining Services
- Assembly Tips
- Tools
- Lean Communication Boards

### Index / Offer of Sale
- Part Number Index
- Catalog Index by Topic
- Offer of Sale
Introduction

Section 1 – Profiles & Accessories

40 Series
Pages 26-39

30 Series
Pages 40-43

28 Series
Page 44-48

20 Series
Page 49-51

1.5” Series
Page 52-58

1” Series
Page 59-60

18x32 Frame Profile
Page 61

Door Guide Profiles
Page 62

Panel Profiles
Page 63

Clamp Profiles
Page 64

Rack Angle Profiles
Page 65

UHMW Profiles
Page 66

Gaskets, Profile Covers
Pages 67-68

End Caps
Pages 69-71

Conduit Profiles
Pages 72-77

Section 2 – Fasteners

Fasteners
Pages 81-85

Miter Connectors
Page 86

T-Nuts
Pages 87-92

T-Slot Bars
Page 90

Anodize Breaker
Page 93

Bolts, Nuts, Washers
Pages 93-94

Screws
Pages 95-99

Clips
Page 99

T-Clips/Cable Holders
Page 100-101
Section 3 – Brackets, Gussets, & Plates

- Corner Brackets, Page 103
- Corner Connectors, Page 104
- Profile Connectors, Page 105
- Mounting Plate, Page 106
- Clamp Block, Page 106
- Joining Plates, Pages 107-108
- Angle Brackets, Pages 109-110
- Gussets, Pages 111-112
- Corner Elements, Pages 113-114

Section 4 – Panels & Doors

- Panels & Wire Mesh, Pages 116-118
- Panel Mounting Blocks, Pages 119-122
- Mesh Retainers, Pages 123-124
- Bifold Door Glides, Pages 125-126
- Sliding Doors, Pages 127-130
- Rollers, Page 131-133
- Rail Carts, Page 134
- Roller Carts, Page 134
Section 5 – Handles, Hinges, & Latches

- Handles Pages 136-138
- Tube Handle Supports Page 139
- Hinges Pages 140-153
- Pivot Joints Page 154
- Quarter Turn Latches Pages 156-158
- Deadbolt Page 159
- Slam Latch Page 160
- Door Catches Pages 162-164
- Ball Plungers Page 165
- Door Stops Page 161

Section 6 – Feet & Casters

- Leveling Feet Pages 167-169
- Knuckle Feet Pages 170-171
- Foot Accessories Page 172
- Corner Mounting Plate Page 172
- L-Base Leveler/Anchor Page 173
- Floor Brackets Pages 174-175
- Flange Feet Page 176
- Casters Pages 177-181
- Floor Lock Page 185
- Base Plates Pages 182-185
Section 7 – Special Applications

- Pneumatic Plates: Pages 188-189
- Pneumatic Fasteners: Page 189
- Pneumatic Seals: Page 190
- Workstations: Pages 191-193
- Tool Runners: Page 193

Lift Systems: Pages 194-195

Section 8 – Linear Applications

- Slide Blocks: Pages 200-207
- Block Accessories: Pages 208-211
- Roller Track: Page 212
- Linear Roller System: Page 213-229

Section 9 – Lean, Services, Tips, & Tools

- Lean Boards: Page 242-245

Section 10 – Index and Offer of Sale
Each product page in the catalog includes:

- Application information and examples
- Technical information
- Dimensions
- How to assemble
- Recommended fasteners, if applicable
- Ordering information (part #, unit and weight)

**Profile Compatibility**

As a quick reference for product compatibility, the Ordering Information section groups product by profile series. Additional information can be found in the applications drawings associated. Where available, the Recommended Hardware section will highlight the necessary hardware components based on the profile series application.

Contact your Parker IPS Service Center or Customer Service to discuss specials or applications not found in this catalog.

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**Application**

Door Stops provide a positive stop to keep the door lined up with a frame. An optional Velcro® plate can be added to create a light-duty catch.

**Recommended Fastening Hardware (Order Separately)**

<table>
<thead>
<tr>
<th>Profile Series</th>
<th>Screws</th>
<th>T-Nuts</th>
<th>Screws</th>
<th>T-Nuts</th>
<th>Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Series</td>
<td>24-120</td>
<td>24-210</td>
<td>24-120</td>
<td>24-210</td>
<td>24-120</td>
</tr>
<tr>
<td>28 Series</td>
<td>20-125</td>
<td>20-035</td>
<td>20-125</td>
<td>20-035</td>
<td>20-125</td>
</tr>
<tr>
<td>1.5”</td>
<td>25-114</td>
<td>25-020</td>
<td>25-114</td>
<td>25-020</td>
<td>25-114</td>
</tr>
</tbody>
</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Weight</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Stop - Straight</td>
<td>Each</td>
<td>91 g</td>
<td>23-124</td>
</tr>
<tr>
<td>Door Stop - 40, 30 - Angle</td>
<td>Each</td>
<td>91 g</td>
<td>23-125</td>
</tr>
<tr>
<td>Velcro® Plate</td>
<td>Each</td>
<td>9 g</td>
<td>23-158</td>
</tr>
</tbody>
</table>

* For wider surfaces, use 23-145 and apply velcro strip. Order M6 hardware separately.

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Throughout this catalog you may notice our ACE designator. This symbol will highlight our high-volume components and parts that will have reduced lead time when compared to items without the ACE designator. We encourage the use of these items to ensure the fastest service from our team.
Parker offers several ways to order metric and Inch product so that you can choose a level of service to suit your needs. You can order everything from a bundle of uncut profiles to a completely assembled structure.

- **Bulk** – IPS product line can be ordered as bundles of profiles and packages of fasteners and accessories to machine and assemble at your location.

- **UPS Shipping Requirements** – IPS profiles can be shipped via UPS Air if they are cut to 8’ (2.4m) length max and each package does not exceed 70 lbs (31kg). Cut charges will apply.

- **Kits** – IPS product line can be ordered in a kit form where the profiles are cut and machined to order and fasteners and accessories are included based on a parts list. This kit can be assembled at your location.

- **Complete Assembly** – IPS product line can be ordered completely assembled and shipped as an assembled unit. Shipping costs should be a consideration when using this method.

- **Order cut to size** – specify the length in millimeters or decimal meter dimensions. Example: 1500mm or 1.5 meters. See the conversion chart on page 19 for fraction to decimal conversions. A cut charge will be included with cut to size lengths.

- **Additional machining** should also be specified along with the profile if it is required for fasteners or accessories. Standard machining options include tapping, drilling, and counter boring. See machining services pages in this catalog for correct part numbers. Any additional custom machining can be done by our expert machinists to ensure that your design is complete and to your requirements.

- **Cut to length tolerance** is +/-0.40mm [+-0.015”].
Choosing a Fastener/Accessory

What aspect is critical for fastening?
• Aesthetics/hidden (standard fastener, universal)
• Strength (universal fastener, standard)
• Ease-of-assembly
• Gussets and joining plates can be used instead of machining to assemble
• Adjustability (gussets, angle bracket, universal)

When ordering universal fasteners or standard fasteners, machining operations are required for the fastener to work in a profile. Part numbers and descriptions for machining operations are found in the machining services section of the catalog.

Choices of Accessories

A full range of accessories are available to complete an assembly:
• T-Slot Covers
• End Caps
• Brackets and Gussets
• Joining and Base Plates
• Casters
• Hinges
• Handles

What aspect is critical for accessories?

Parker offers a wide range of accessories to provide the right part for the special considerations of your application.
• Aesthetics
• Ease-of-assembly
• Load on structure
• Functionality

Panels & Wire Mesh

Panels and wire mesh can be ordered as a full sheet or cut to a specified dimension in square meters. When ordering full sheets, please add a P to the end of the part number that you are ordering (e.g. 26-790-6P)

Standard panel choices include:
• Polycarbonate
• TRESPA®
• Expanded PVC
• PVC Coated Wire Mesh
• Aluminum Composite

Specialty panels of any material can be ordered for any project. Additional time may be required to expedite any specials.
Introduction

Catalog 1816-4/US

Technical Data

- All structural IPS profiles are prime aluminum, mill-certified with metallurgical properties equivalent to 6105-T5/6005-T5/6063-T66. Accessory products are 6061-T6 or 6063-T6.
- Yield (0.2 limit) Rm min. 240 N/mm² (33-35 ksi)
- Tensile strength Rm min. 260 N/mm² (37-42 ksi)
  Note: Cross sectional thickness variations of the profiles may influence yield and tensile strength.
- Elongation for 2 in. long specimens:
  6005-T5 (thickness up thru 0.124 in), 6061-T6 (up thru 0.249 in), 6105-T5 (up thru 0.5 in) – 8% min
  6005-T5 (thickness 0.125-1 in.), 6061-T6 (0.25 in. and over) – 10% min
- Modulus of Elasticity "E" approximately 70,000 N/mm² (10,150 kpsi)
- Brinell Hardness approximately 75 HB 2.5/187.5
- The molecular structure of the 6005-T5 alloy is generally stable in an ambient temperature range of:
  -40°C to +200°C (-40°F to +392°F)
  Extreme temperature fluctuations may change the mechanical properties.

Profile Finish

- Clear anodizing: AA M10, C22, A31, Clear
- Black anodizing: AA M10, C22, A34, Black
- Minimum depth: 0.010mm (0.0004 in.)
- Surface hardness: approximately 250 HV, outer surface exposed
- Custom anodizing and protective finishes available

Tolerances

- Extrusions conforming to DIN 17 615 specifications and to IPS blueprints.
- Twist per 300mm (1 ft) length not to exceed 0.25° and total twist over 6m (20 ft) length not to exceed 1.5°.
- Flatness 0.10mm (0.004 in) per 25mm (1 in) of width.
- Straightness 0.32mm (0.0125 in) per 300mm (1 ft) of length and not exceeding 3mm (0.12 in) over 6m (20 ft) of extrusion.
  Maximum bow 3mm (0.12 in) over 6m (20 ft).
- Cut to length tolerance +/-0.40mm [+-0.015”].

Defined Rest Points

All 40, 30, 28, 20, 1.5" and 1" series profiles have a taper built-in to the T-slot. Preload in the material elastic range results in a vibration safe connection because the profile is pulled flush with the connecting surface during fastener tightening. The high-quality material ensures that the profile T-slot will remember its original shape if disassembly is required, making all IPS profiles completely reusable.

<table>
<thead>
<tr>
<th>Profile Series</th>
<th>Preload Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5&quot;, 40, 30, 28</td>
<td>0.2mm</td>
</tr>
<tr>
<td>20, 1&quot;</td>
<td>0.1mm</td>
</tr>
</tbody>
</table>

See Chart

T-Slot Aluminum Framing • Wadsworth, OH 800.333.4932 • Rohnert Park, CA 800.358.9068
Deflection Calculation

Application
Standalone program able to calculate deflection and stress of IPS aluminum profiles based on profile selection, length and load (evenly distributed and/or concentrated at the critical point). Three cases for the profile attachment are calculated: supported at both ends, fixed at one end, fixed at both ends. Metric or inch units of measure can be used to enter profile length and load. Calculated deflection given in both millimeters and inches. Stress values are given in both N/mm² and psi.

Download at www.parker.com/IPS

Formulas for calculating deflection at critical points

Supported at both ends

\[ f = \frac{F \cdot L^3}{48 \cdot E \cdot I \cdot 10^4} \]

Fixed at one end

\[ f = \frac{F \cdot L^3}{3 \cdot E \cdot I \cdot 10^4} \]

Fixed at both ends

\[ f = \frac{F \cdot L^3}{192 \cdot E \cdot I \cdot 10^4} \]

Example
Find the deflection for the following conditions:
80x40 Standard Profile (10-080), upright
\[ I_x = 71.97 \text{ cm}^4 \]
\[ m = 3.18 \text{ kg/m} \]
\[ L = 1000 \text{ mm} \]
\[ F = 50 \text{ N} - \text{concentrated load} \]
No additional load other than profile weight

Calculate Profile weight (uniform load)
\[ F_u = m \cdot L \cdot g = (3.18 \cdot 10^{-3}) \cdot 1000 \cdot 9.81 = 31.2 \text{ N} \]

Total deflection \[ f_{TOTAL} = f_{CONCENTRATED} + f_{UNIFORM} \]

Supported at both ends:
\[ f = 0.021 + 0.008 \approx 0.03 \text{mm} \]
Fixed at one end:
\[ f = 0.331 + 0.077 \approx 0.41 \text{mm} \]
Fixed at both ends:
\[ f = 0.005 + 0.002 \approx 0.01 \text{mm} \]
Introduction

Catalog 1816-4/US

T-Slot Aluminum Framing • Wadsworth, OH 800.333.4932 • Rohnert Park, CA 800.358.9068

Conversion Charts

Fractions to Decimals

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16</td>
<td>0.063</td>
</tr>
<tr>
<td>1/8</td>
<td>0.125</td>
</tr>
<tr>
<td>3/16</td>
<td>0.188</td>
</tr>
<tr>
<td>1/4</td>
<td>0.25</td>
</tr>
<tr>
<td>5/16</td>
<td>0.313</td>
</tr>
<tr>
<td>3/8</td>
<td>0.375</td>
</tr>
<tr>
<td>7/16</td>
<td>0.438</td>
</tr>
<tr>
<td>1/2</td>
<td>0.50</td>
</tr>
<tr>
<td>9/16</td>
<td>0.563</td>
</tr>
<tr>
<td>5/8</td>
<td>0.625</td>
</tr>
<tr>
<td>11/16</td>
<td>0.688</td>
</tr>
<tr>
<td>3/4</td>
<td>0.75</td>
</tr>
<tr>
<td>13/16</td>
<td>0.813</td>
</tr>
<tr>
<td>7/8</td>
<td>0.875</td>
</tr>
<tr>
<td>15/16</td>
<td>0.938</td>
</tr>
</tbody>
</table>

Metric/English Conversions
Below is a conversion chart for converting metric and inch units of measure for applicable physical conditions with this product line.

<table>
<thead>
<tr>
<th>Multiply</th>
<th>by</th>
<th>To Get</th>
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</thead>
<tbody>
<tr>
<td>Linear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>0.03937</td>
<td>Inches</td>
</tr>
<tr>
<td>inches</td>
<td>25.4</td>
<td>mm</td>
</tr>
<tr>
<td>cm</td>
<td>0.3937</td>
<td>inches</td>
</tr>
<tr>
<td>m (meters)</td>
<td>3.2808</td>
<td>Feet</td>
</tr>
<tr>
<td>Feet</td>
<td>0.3048</td>
<td>m (meters)</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm²</td>
<td>0.00155</td>
<td>Inches²</td>
</tr>
<tr>
<td>inches²</td>
<td>645.16</td>
<td>mm²</td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cm³</td>
<td>0.06102</td>
<td>inches³</td>
</tr>
<tr>
<td>inches³</td>
<td>16.387</td>
<td>cm³</td>
</tr>
<tr>
<td>inches³</td>
<td>0.0165</td>
<td>liters</td>
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<tr>
<td>liters</td>
<td>61.024</td>
<td>inches³</td>
</tr>
<tr>
<td>Mass</td>
<td></td>
<td></td>
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<tr>
<td>Gram (g)</td>
<td>0.0353</td>
<td>Ounce (oz)</td>
</tr>
<tr>
<td>Ounce (oz)</td>
<td>28.329</td>
<td>Gram (g)</td>
</tr>
<tr>
<td>Kilogram (kg)</td>
<td>2.2046</td>
<td>Pounds (lb)</td>
</tr>
<tr>
<td>Pounds</td>
<td>0.4536</td>
<td>Kilograms (kg)</td>
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<tr>
<td>Velocity</td>
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<tr>
<td>Meters/Minute</td>
<td>3.281</td>
<td>Feet/Minute</td>
</tr>
<tr>
<td>Feet/Minute</td>
<td>0.3048</td>
<td>Meters/Minute</td>
</tr>
<tr>
<td>Force</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kilograms-f (kgf)</td>
<td>9.807</td>
<td>Newtons (N)</td>
</tr>
<tr>
<td>Newtons (N)</td>
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<td>Kilograms-f (kgf)</td>
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<td>Pounds-f (lbf)</td>
<td>4.448</td>
<td>Newtons (N)</td>
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<tr>
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<td>Newton-Meters (Nm)</td>
<td>8.851</td>
<td>Pound-_inches (lb-in)</td>
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<td>Moment of Inertia</td>
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</tr>
<tr>
<td>cm⁴</td>
<td>0.02403</td>
<td>inch⁴</td>
</tr>
<tr>
<td>inch⁴</td>
<td>41.623</td>
<td>cm⁴</td>
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