

# RAILING PRODUCTS



## INTRODUCTION

### History of Excellence

For over 35 years, Morse Industries has partnered with customers to build a company driven by customer needs. We work closely with our customers to fulfill requests in a timely and efficient manner while providing expert advice on our products and applications.

Our goal is simple: To exceed your expectations by providing you the highest quality products available with both convenient and reliable service.

### On-Time Shipping

Morse Industries has three distribution locations placed strategically throughout the United States. Providing products when you expect them is the cornerstone of our business. Orders are tracked by date through all stages of the process and a double-check system is in place to ensure that your order is shipped on the day we promise. Morse also delivers on our own trucks within service areas. That means we take responsibility from our warehouse to your door.

We take great care so you receive your orders in perfect condition. Each item in your order is individually poly-sleeved and packaged with paper interleaving to protect metal finishes. Items are usually boxed in quantities of 50 pieces, shrink-wrapped and placed on pallets to prevent damage.

### Just in Time Inventory

Utilizing our facilities in the Seattle, WA, Los Angeles, CA, and Charlotte, NC metropolitan areas we provide a tailored, ongoing inventory program for your company. We save you inventory holding costs by stocking your custom or standard stock items in one of our warehouses for immediate release as needed. Stocked items are available for same day shipment or may be will-called at our locations.

### Your International Partners

Morse has vendor resources across the globe allowing us to bring you the highest quality products at the best prices. We have staff members employed outside the United States with extensive backgrounds in engineering, quality control, and sourcing. Our employees act as your liaison, overseeing products through all stages of production, quality control, and finally shipment.



#### Seattle Distribution Facility

25811 74th Ave, South Kent, WA 98032  
Phone: 800 325 7513  
Will Call Hours – M-F, 8:00AM – 4:00PM



#### Southern California Distribution Facility

3080 Enterprise St. #A, Brea, CA 92821  
Phone: 800-325-7513  
Will Call hours – M-F, 8:00AM – 4:00PM



#### Charlotte Distribution Facility

2004 Van Buren Ave, Indian Trail, NC 28079  
Phone: 800-325-7513  
Will Call hours – M-F, 8:00AM – 4:00PM



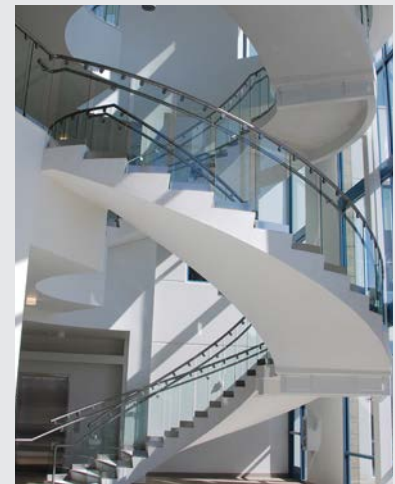
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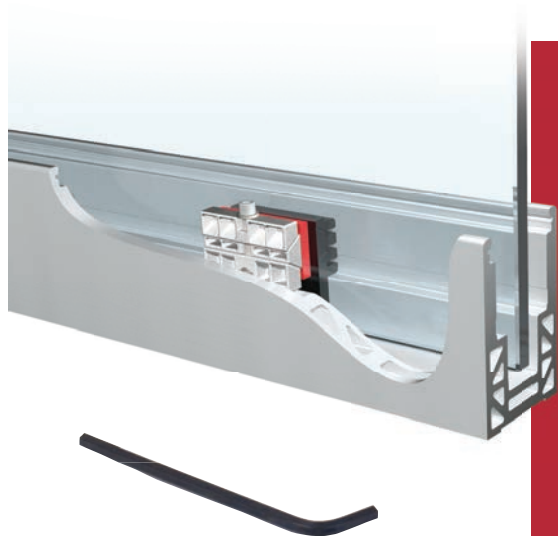


**Front cover photograph  
courtesy of:**

Northwest Precast, LLC  
Boise, ID



# PANELGRIP® DRY GLAZE SYSTEMS



The latest development in Glass Railing technology, PanelGrip® facilitates the quick assembly of structural glass railing without messy fillers or special tools resulting in significant savings in labor and shipping costs.

### **Reduce Labor Costs up to 80%**

No setting blocks, no plumbing of glass, no multiple pours of cement, no waiting for cement to cure, no messy clean-up.

### **Reduce Freight Costs up to 30%**

PanelGrip® base shoe is 30% lighter than standard base shoes yet meets structural load requirements for railings.

### **Broadest Grip Range of Any Dry Glaze System**

Made for range of 1/2" to 13/16" tempered and laminate glass (12.7mm to 21.5mm).

### **No Special Tools required**

All you need is an Allen wrench for installation or removal.

### **No Mess**

No mixing and pouring of expansion cement, no running of cement on incline.

### **Entire System Installed From One Side**

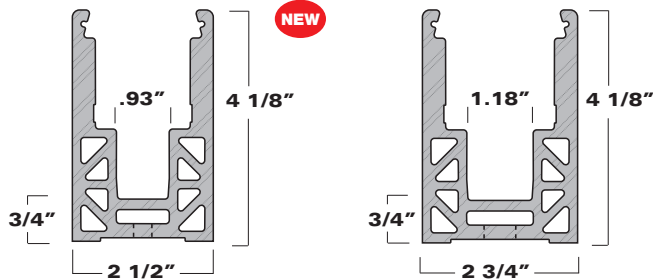
The PanelGrip® System can be installed in locations that only allow access from one side such as balconies, atriums, etc. No need to erect scaffolding or use ladders.

The PanelGrip® base shoe and mechanism are sold as a system and are subject to one or more of the following patents: US7730682, US8181405, NZ581456, CA2697162, EP2171180 and AU 2008282693.



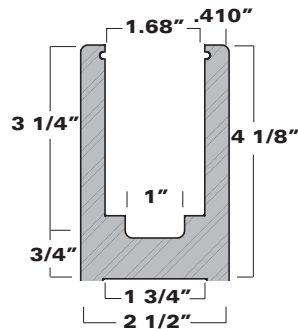
## Aluminum Base Shoe

PanelGrip® Base Shoe is extruded from 6005-T5 in mill finish.



**A42-0072**  
Stocked in:  
10' & 20' lengths

**A42-0073**  
Stocked in:  
10' & 20' lengths -  
CB, SD & Undrilled  
(PanelGrip®2 System)



**A42-0075**  
Stocked in:  
10' & 20' lengths - CB & Undrilled  
(PanelGrip® System)  
For use with 1/2" glass

Ask us for additional details regarding drilling patterns.  
Custom drilling patterns are also available

## Screws & Bolts

Part#	Description	Measurement
F92-0073CH	Zinc Plated Socket Head Cap Screw (10 per pkg)	1/2" - 13 x 3/4"
F92-0073CA	Zinc Plated Concrete Anchor Bolt (10 per pkg)	1/2" x 4 1/2"
F92-0075WB	Zinc Plated Wedge-Bolt® Orange Tip (10 per pkg)	3/8" x 4"



Additional anchors available via special order

## Aluminum Base Drain Block

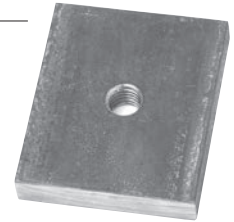
Placed under exterior installed base shoes to provide drainage space for water runoff. Great for balconies and decks. 10 blocks per package.

Part#	Measurement
A42-0023-10	2 1/2" x 2 3/4" x 1/2"



## Steel Weld Block

Part#	Measurement
S42-0023-10	2 1/2" x 2 3/4" x 1/2"



## PanelGrip® Isolators

The patented PanelGrip® System utilizes a unique locking mechanism of high-strength aluminum and PVC isolators combined with a specially designed aluminum shoe moulding. Isolator assembly is adjustable to accommodate a range of 1/2" to 13/16" glass. Glass Deduction = 15/16".

10ft/lbs of torque



## For A42-0073 Shoe

Part #	Color	Glass Size
A42-0028-1B	Black	.500" - .563"
A42-0028-1W	White	.591" - .750"
A42-0028-1R	Red	.846"

## A42-0072 Shoe

Part #	Color	Glass Size
A42-0027-1T	Tempered	.465" - .530"
A42-0027-1L	Laminate	.520" - .570"

## A42-0075 Shoe

Part #	Color	Glass Size
A42-0018-1	Black	.305" - .485"
A42-0018-1W	White	.370" - .550"
A42-0018-1R	Red	.390" - .570"

## Cladding - Standard

### Stainless Steel

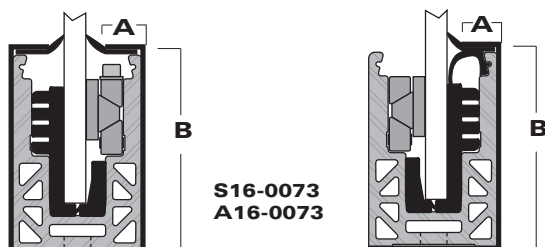
.035 gauge/thickness, #8 polished or #4 brushed finishes are standard.

Part#	A	B	Base Section
S16-0073	13/16"	4 1/8"	A42-0073, A42-0072, A42-0075
S16-0073L	13/16"	4 1/4"	A42-0073, A42-0072, A42-0075

### Aluminum

.050 gauge/thickness, available in clear satin and oil rubbed bronze.

Part#	A	B	Base Section
A16-0073	13/16"	4 1/8"	A42-0073, A42-0072, A42-0075
A16-0073L	13/16"	4 1/4"	A42-0073, A42-0072, A42-0075



## Cladding - Side Drilled

### Stainless Steel

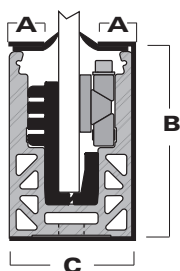
.035 gauge/thickness, #8 polished or #4 brushed finishes are standard.

Part#	A	B	C	Base Section
S16-0073F	13/16"	--	--	A42-0073, A42-0072, A42-0075
S16-0073W	13/16"	4 1/8"	2 3/4"	A42-0073
S16-0075W	13/16"	4 1/8"	2 1/2"	A42-0072, A42-0075

### Aluminum

.050 gauge/thickness, available in clear satin and oil rubbed bronze.

Part#	A	B	C	Base Section
A16-0073F	13/16"	--	--	A42-0073, A42-0072, A42-0075
A16-0073W	13/16"	4 1/8"	2 3/4"	A42-0073
A16-0075W	13/16"	4 1/8"	2 1/2"	A42-0072, A42-0075



### Recommended Attachment Options

Take care to properly align cladding before pressing into place.

1. Apply two rows of tape to the vertical face of the cladding and apply a silicone bead between the rows.
2. Apply three rows of tape to the vertical face of the cladding.
3. Apply silicone to the vertical face of the cladding. Use clamps to hold the cladding in place until the silicone cures.



## End Cap

### Stainless Steel End Cap

.035 gauge/thickness, #8 polished or #4 brushed finishes are standard.

Part#	Base Section	Part #
S17-0073	A42-0073	
S17-0072	A42-0072	
S17-0075	A42-0075	



### Aluminum End Cap

Aluminum end caps are oversized for easy finishing. .050 gauge/thickness, available in mill finish, clear satin and oil rubbed bronze.

Part#	Base Section	Part #
A17-0073	A42-0073	
A17-0072	A42-0072	
A17-0075	A42-0075	

## Spacer Blocks

Die cut, high density foam spacing and sealing pads with adhesive on one side to act as spacers. 1/4" thick x 3 7/16" tall.

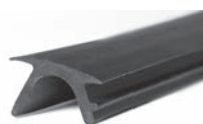
Part#	Description
V50-0010	For 1/2" Glass
V50-0011	For 3/4" Glass



## Rubber Base Shoe Gaskets

For use with or without cladding. Seals the gap at top of base shoe. Sold by the foot.

Part#	Width	Height
V50-0009	1 1/8"	3/4"
V50-0008	3/4"	9/16"



V50-0009



V50-0008

For use with cladding only. Peel back paper to reveal self adhesive strip. Adhere to underside of cladding before applying cladding to base shoe. Sold by the foot.

Part#	Width	Height
V50-0005	1 1/8"	1/4"



## PANELGRIP®2 INSTALLATION:

### 1. PLUMBING PANELGRIP®2 SHOE MOLDING

Before completing attachment of **PanelGrip®2 Base Shoe Molding** to substrate – take all necessary steps to assure that the mounted shoe is adjusted such that the inside channel of the shoe is plumb to +/- 1/8" at an extended height of 42". Spend the time required to plumb the shoe to this tolerance since **the glass will only be as plumb as the shoe**.

### 2. CLEAR THE PANELGRIP®2 BASE SHOE OF ALL DEBRIS

### 3. PLACE ISOLATORS

Place the **PanelGrip®2 Plastic Isolators** into the **Base Shoe Molding**. On inclines, a dab of silicone may be used to keep them in place while placing glass. Space **Plastic Isolators** a maximum of 14" on center with a maximum of 4" in from the left and right edges of each panel – 4 isolators per 4 foot panel.

### 4. PLACE GLASS

Place the glass atop the **Plastic Isolators** in the **Base Shoe Molding**.

**Warning:** With multi-panel railings, do not line up the edge of a panel with the end of the **Base Shoe Molding** – place the panels so that they span **PanelGrip®2 Base Shoe Molding** butt joints to assist in alignment.

### 5. INSERT PANELGRIP

Have someone hold the panel in place while you insert the aluminum **PanelGrip®** mechanism into place on the opposite side of the glass in alignment with the **Plastic Isolators**. Make sure that the plastic pad on the **PanelGrip®** is facing the glass.

### 6. TIGHTEN PANELGRIP

Using a 3/16" hex head wrench, tighten the cap screw on the **PanelGrip®** mechanism. While tightening, the plastic pad will break away from the Aluminum as the unit expands.

### 7. CONFIRM ALIGNMENT AND TIGHTEN

Confirm alignment and make adjustments prior to final tightening which will compress and lock the panel into place.

**Remember, PanelGrip® is self-centering and self-plumbing. Make sure you have properly plumbed the shoe as noted in Step 1.**

Once you have confirmed position, use a 3/16" hex head wrench to make the **PanelGrip® Cap Screw** snug-tight, then continue tightening to **10 ft/lbs of torque**. Repeat on all other **PanelGrip®** mechanisms to secure the panel in position.

**DO NOT OVERTIGHTEN.**

### 8. INSERT SPACING PADS

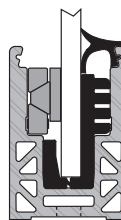
Repeat with other lites of glass. Insert 1/4" **Spacing Pads** between glass panels to prevent glass-to-glass contact. Trim as required.

### 9. SEAL TOP OF SHOE

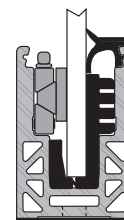
Once glass is properly positioned, seal the top of the shoe using one of three methods. **Note: when installing the gaskets, it's helpful to lubricate the glass with glass cleaner or soapy water.**

*Weep holes should be provided with exterior applications.*

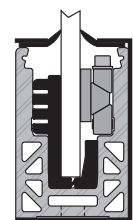
There are three typical methods for sealing the top of the shoe. Please see the following diagrams



No Cladding  
(Use **V50-0009**  
or **V50-0008**)



Cladding Over Gasket  
(Use **V50-0009**  
or **V50-0008** plus  
"L" cladding)

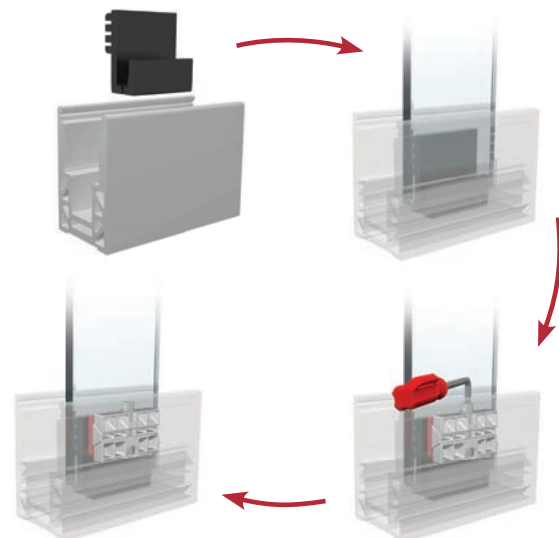


Cladding With  
Self-Adhesive Gasket  
(Use **V50-0005** with  
standard cladding)

### 10. REMOVAL OF GLASS

Should you need to remove a panel, this can be done simply by loosening the **PanelGrip® Cap Screw**.

Visit our website at [www.morseindustries.com](http://www.morseindustries.com) to view our **PanelGrip®2 Assembly Video**







# TRADITIONAL GLASS RAILING

The beauty of glass is timeless. When paired with high quality architectural metals, the end result can be breathtaking. Used in both residential and commercial applications, our glass railing systems allow you to showcase the view, rather than hide it.

Morse Industries offers a full line of glass railing components including base shoe, cladding, top rail, handrail brackets and more.



## System Details

Morse Industries glass and metal handrail system components are designed for use with 1/2" through 3/4" tempered or laminated glass panels. Whether the job specifies a wet or dry system, Morse Industries railing systems deliver the beauty you want for the finishing touch on your commercial and residential installations.

## Superior Top Rail Ensures Smoother Installation

Morse Industries top rails are manufactured one of two ways. Continuous welded top rails are made from two pieces of steel with a continuous weld on the top of the outside diameter and a weld in the middle of the inside channel. The outside weld is ground and polished during finishing so that it is invisible. Bump formed top rails are formed around a radius die to eliminate existing tension within the metal. The inside channel is then spot welded every three inches inside the radius shape for strength and stability. Both continuous weld and bump formed top rails are superior to roll formed top rails which have a tendency to spring back if cut and can develop a twist that makes installation tough. Continuous welded top rails are ideal for applications that require bending or stretch forming as they eliminate the need to re-weld the channel after completion.

## Materials and Finishes

To ensure a superior product, we use only the highest-quality materials. Each component receives multiple runs on state-of-the-art polishing equipment to ensure a consistent, bright finish.

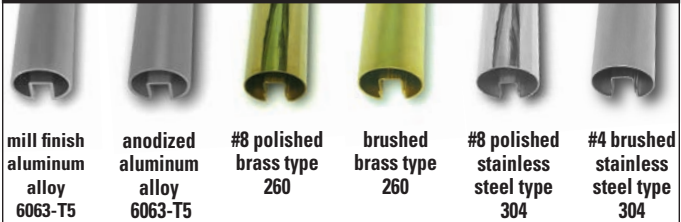
- Aluminum handrail sections are extruded from alloy 6063-T5. Base sections are extruded from alloy 6005-T5 or 6063-T5. Both are standard in mill or clear anodized finish.

**Custom finishes available for aluminum components include anodizing and powder coating. Minimum runs and extended lead times may be required.**

- Brass rail components are made from Type #260 Brass. Our standard finish is #8 polished.
- Stainless steel components are made from Type 304 stainless steel (or Type 316L upon request). Standard finishes are #8 polished and #4 brushed.



### FINISHES



Contact Morse Industries for architect railing specifications and railing quote worksheets, CAD details, and component information.

# TRADITIONAL GLASS RAILING

## GLASS RAILING COMPONENTS

### What Makes Morse Industries Unique

- Offer the patented PanelGrip Dry Glaze System and a full selection of other glass railing options.
- Experienced railing specialists to assist you.
- Special bump-forming process creates precise rail connections.
- Superior finishing process.
- Extensive selections of sizes and materials.
- Custom and standard hole drilling for aluminum base.
- Custom corner components available.
- Top rail protected with removable plastic film.

### MORSE PRODUCT CODE

#### PART NUMBER

**S 17-0099 POL**

Finish

Part Number

Metal

#### Metal

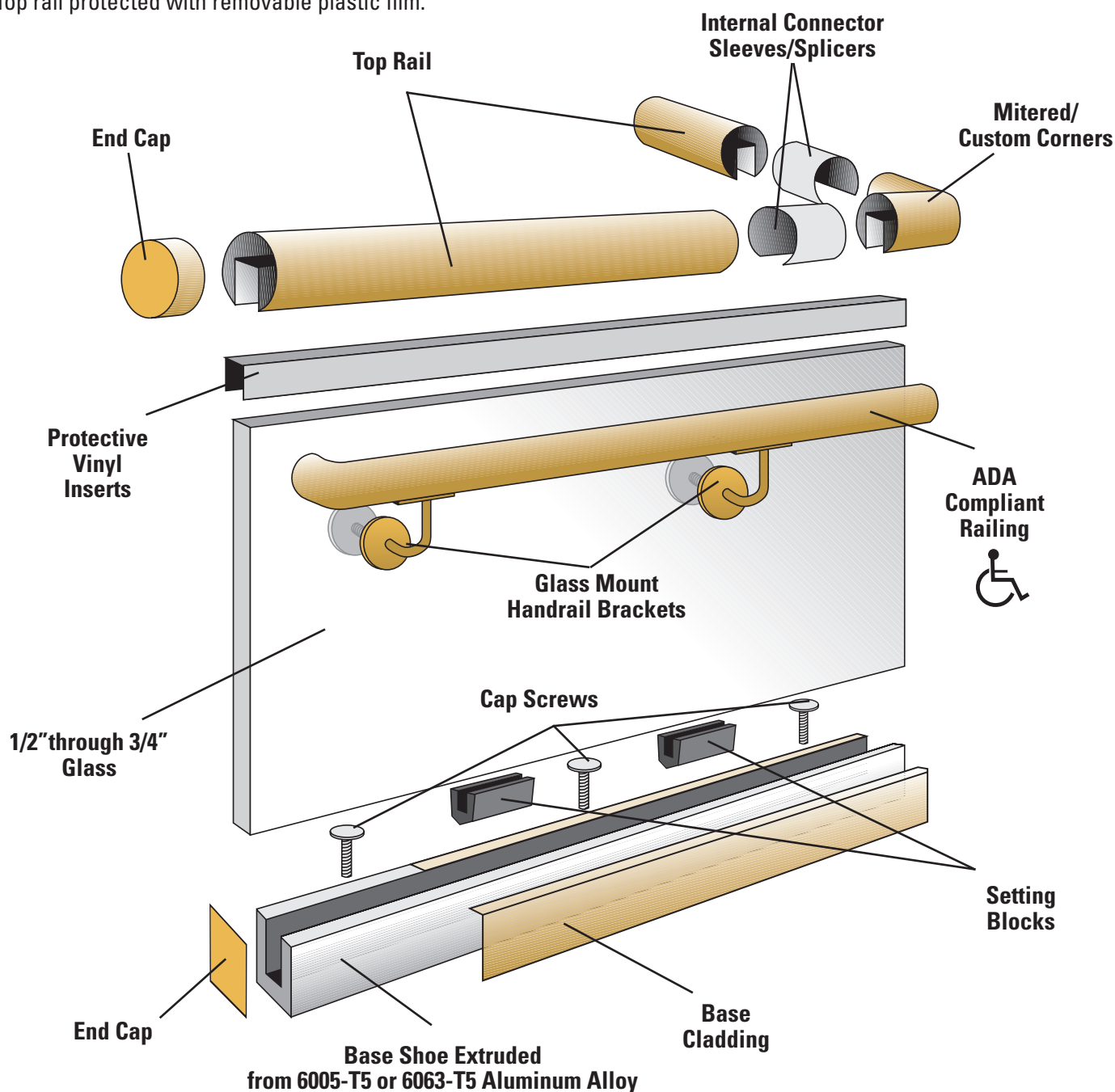
**S = Stainless Steel**

**A = Aluminum**

#### Finish

**POL = Polished**

**VEL = Brushed**

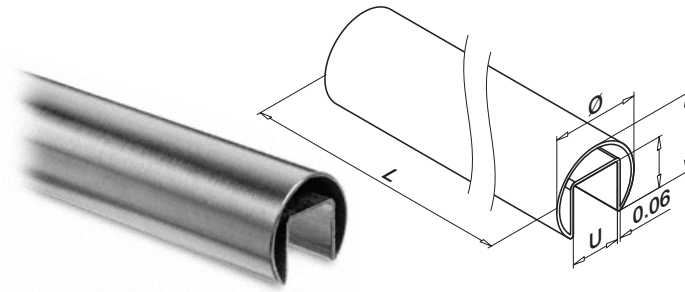




## Stainless Steel Top Rails, Continuous Weld

#4 (brushed) finish, for 1/2" or 3/4" glass.

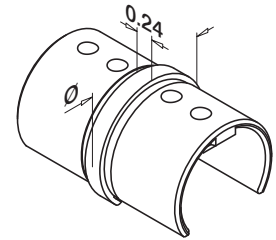
Part #	Ø	U	L
R13-6920-042-12	1.7"	15/16"	16.4'
R13-6925-042-12	1.7"	15/16"	8.2'
R13-6920-048-12	1.9"	1-1/16"	16.4'
R13-6925-048-12	1.9"	1-1/16"	8.2'
R13-6925-060-12	2.37"	1-5/16"	8.2'
R13-6920-060-12	2.37"	1-15/16"	16.4'



## Stainless Steel Connector Sleeves for Continuous Welded Top Rails

Compatible with 1.7" and 1.9" #4 (brushed) Top Rail

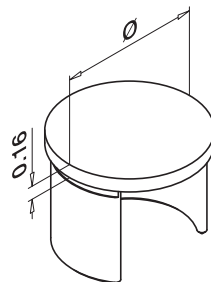
Part #	Ø
R13-6790-042-12	1.7" x 1/16 to the 1/16
R13-6790-048-12	1.9" x 1/16 to the 1/16
M13-6790-060-12	2.37" x 1/16



## SS End Caps for Continuous Weld Top Rail

Compatible with 1.7" and 1.9" #4 (brushed) Top Rail.

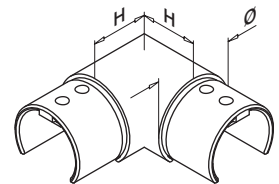
Part #	Ø
R13-6732-042-12	1.7"
R13-6732-048-12	1.9"
M13-6729-060-12	2.37"



## SS Cast Corners for Continuous Weld Top Rail

Compatible with 1.7" and 1.9" #4 (brushed) Top Rail.

Part #	Ø
R13-6313-042-12	1.7"
R13-6313-048-12	1.9"
R13-6313-060-12	2.37"

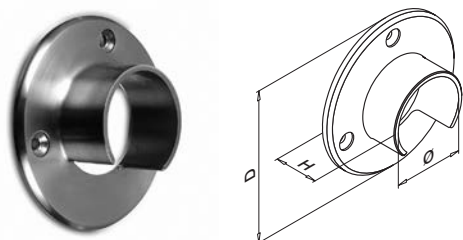


# TRADITIONAL GLASS RAILING

## Wall Flange Support

Compatible with 1.7" and 1.9" Stainless Steel Round Top Rail. Available in 304 and 316.

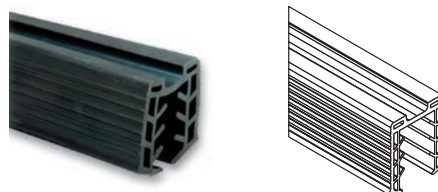
Part #	Ø	D	H
R13-6505-042-12	1.7"	3 35/64"	1 3/16"
R13-6505-048-12	1.9"	3 27/32"	1 3/8"



## Flexible Rubber Inserts

Flexible rubber insert is available for 1/2" and 3/4" glass. Stocked in 16.4' and 8.2' lengths. This insert is compatible with 1.7" and 1.9" Stainless Steel Round Top Rail.

Part#	Description
R19-5042-011-00	For 1.7" Top Rail, 1/2" Glass, 16.4'
R19-5042-211-00	For 1.7" Top Rail, 1/2" Glass, 8.2'
R19-5042-019-00	For 1.7" Top Rail, 3/4" Glass, 16.4'
R19-5042-219-00	For 1.7" Top Rail, 3/4" Glass, 8.2'
R19-5048-011-00	For 1.9" Top Rail, 1/2" Glass, 16.4'
R19-5048-211-00	For 1.9" Top Rail, 1/2" Glass, 8.2'
R19-5048-019-00	For 1.9" Top Rail, 3/4" Glass, 16.4'
R19-5048-219-00	For 1.9" Top Rail, 3/4" Glass, 8.2'
M19-5060-011-00	For 2.37" Top Rail, 1/2" Glass, 16.4'
R19-5060-022-00	For 2.37" Top Rail, 27/32" Glass, 16.4'
R19-5060-024-00	For 2.37" Top Rail, 1" Glass, 16.4'
R19-5060-031-00	For 2.37" Top Rail, 1-1/4" Glass, 16.4'

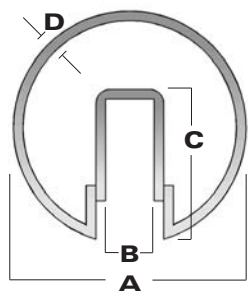


## Stainless Steel Top Rails – Bump Formed

Formed type 304 and 316, spot welded channel, #8 (polished) and #4 (brushed) finishes are standard. Available for 1/2" glass at 10' lengths. Custom sizes also available.

Part #	A	B	C	D
S16-0112*	1 1/2"	5/8"	1"	.050
S16-0200	2"	3/4"	1 1/2"	.050
S16-0212	2 1/2"	3/4"	1 1/2"	.065
S16-0300	3"	3/4"	1 1/2"	.065
S16-0312	3 1/2"	3/4"	1 1/2"	.065
S16-0400	4"	3/4"	1 1/2"	.065

\* ADA Compliant

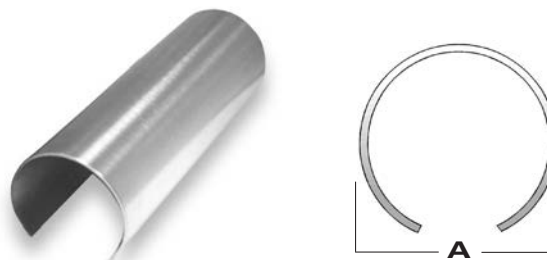


## Stainless Steel Connector Sleeves for Bump Formed Top Rail

Custom sizes also available

Part #	A	Tubing Size
S16-0112CS*	1 3/8"	1 1/2" x .050 wall
S16-0200CS	1 7/8"	2" x .050 wall
S16-0212CS	2 3/8"	2 1/2" x .065 wall
S16-0300CS	2 7/8"	3" x .065 wall
S16-0312CS	3 3/8"	3 1/2" x .065 wall
S16-0400CS	3 7/8"	4" x .065 wall

\* ADA Compliant



## SS End Caps for Bump Formed Top Rail

#8 (polished) and #4 (brushed) finishes are standard.  
Custom sizes also available.

Part #	A	B
S16-0112*	1 1/2"	.050
S16-0200	2"	.050
S16-0212	2 1/2"	.065
S16-0300	3"	.065
S16-0312	3 1/2"	.065
S16-0400	4"	.065

\*  ADA Compliant



## SS Mitered Corners for Bump Formed Top Rail

Fabricated from Morse Industries Top Rail and welded and finished to match. #8 (polished) and #4 (brushed) finishes are standard. All corners are fabricated per order. Please specify degree and location of glass pocket. **Custom corners also available.**

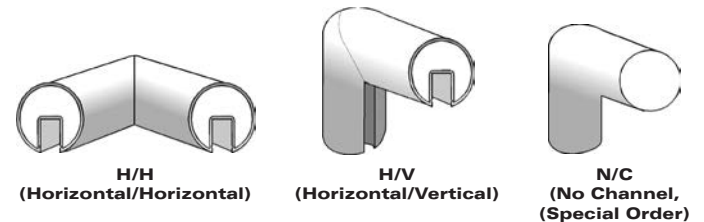
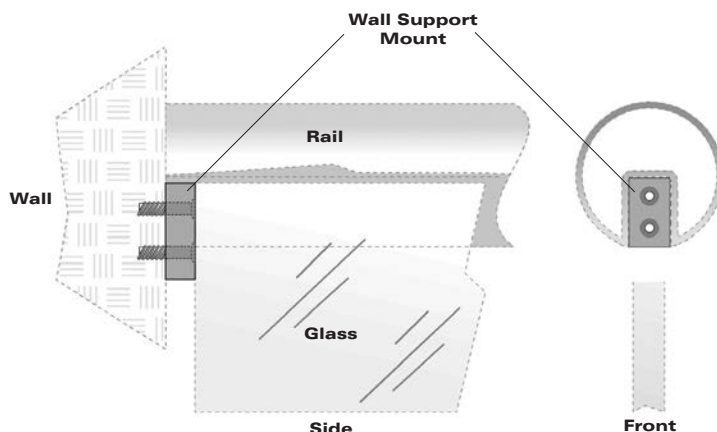
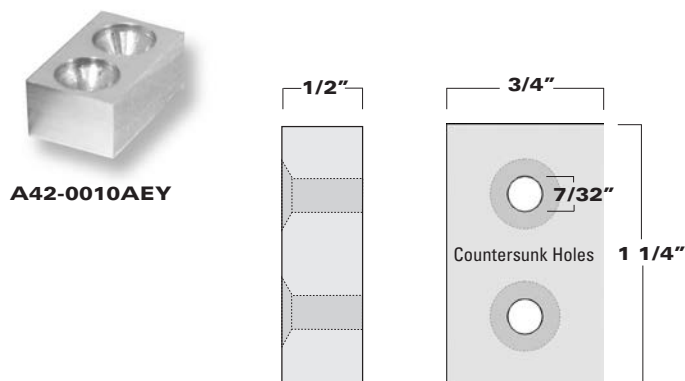
Part #	A	B	C	D
S16-0112*	1 1/2"	5/8"	2 3/8"	3 1/2"
S16-0200	2"	3/4"	2 5/8"	4"
S16-0212	2 1/2"	3/4"	2 7/8"	4 1/2"
S16-0300	3"	3/4"	3 1/8"	5"
S16-0312	3 1/2"	3/4"	3 3/8"	5 1/2"
S16-0400	4"	3/4"	3 5/8"	6"

\*  ADA Compliant



## Top Rail to Wall Support Mount

Morse Industries Wall Support Mount provides lateral support if Top Rail is to be attached to a wall surface. Use #10, 82 degree countersunk fasteners. The Wall Support Mount is not designed for use with the 1 1/2", 1.7" or 1.9" Stainless Steel Top Rail.



## Protective Insert for Top Rails

Rigid vinyl protective insert is available for 1/2" glass. Providing a protective barrier, the insert protects glass panels when fitted inside top rail as well as aiding in alignment during installation. Stocked in 10' lengths. This vinyl insert is not compatible with our 1 1/2", 1.7" and 1.9" Round Stainless Steel Top Rails.

Part#	Description
V50-0001BKA10	Top Rail Insert for 1/2" Glass



**Brass Top Rail with Accessories Available Upon Request**

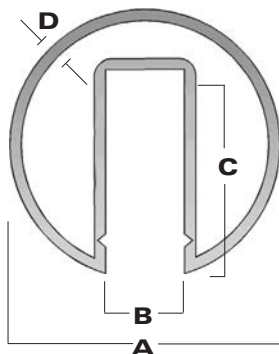


# TRADITIONAL GLASS RAILING

## Aluminum Round Top Rail

Extruded, 6063-T6, mill and clear anodize finishes are standard. Stocked in 20' lengths.

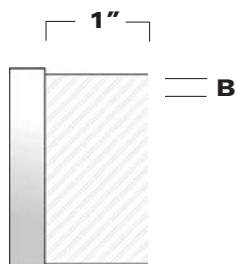
Part #	A	B	C	D
A56-0200	1 29/32"	3/4"	1 1/4"	1/8"



## Aluminum End Cap

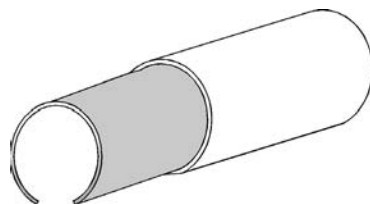
Mill and brushed finishes are standard.

Part #	A	B
A56-0200	1 29/32"	.125



## Aluminum Connector Sleeve

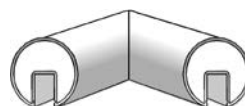
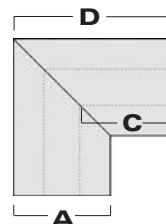
Part #	A	Tubing Size
A56-0200CS	1 5/8"	1 29/32" x .125 wall



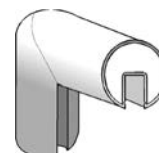
## Aluminum Mitered Corner

Fabricated from Morse Industries Top Rail and welded and finished to match. Mill finish is standard. All corners are fabricated per order. Please specify degree and location of glass pocket. Custom corners also available.

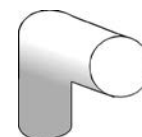
Part #	A	B	C	D
A56-0200	1 29/32"	3/4"	2 5/8"	4"



H/H  
(Horizontal/Horizontal)



H/V  
(Horizontal/Vertical)



N/C  
(No Channel,  
Special Order)

## Protective Insert for Top Rails

Rigid vinyl protective insert is available for 1/2" glass. Providing a protective barrier, the insert protects glass panels when fitted inside top rail as well as aiding in alignment during installation. Stocked in 10' lengths. This vinyl insert is not compatible with our 1 1/2", 1.7" and 1.9" Round Stainless Steel Top Rails.

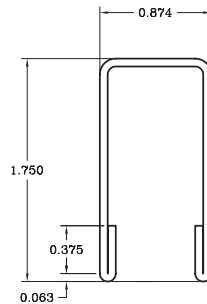
Part#	Description
V50-0001BKA10	Top Rail Insert for 1/2" Glass



## Stainless Steel U-Channel Top Rail

Formed type 304 and 316, #8 (polished) and #4 (brushed) finishes are standard. Available for 1/2" glass at 10' lengths.

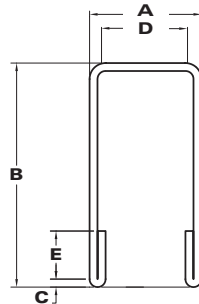
**Part #**  
S16-0134



## Custom Stainless Steel U-Channel Top Rail

Morse Industries can manufacture most customer specified u channel top rails. See diagram below and give us the dimensions you need.

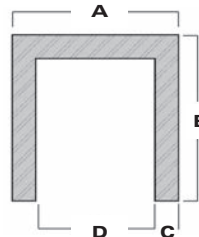
*Note: U-Channel top rails can be made with or without the "hem" at the bottom of the legs. If the hem is not requested, leave dimension "E" blank.*



## Aluminum U-Channel Top Rail

Extruded aluminum channels for 1/2" glass. Standard finishes are brushed stainless steel effect, clear satin, and oil rub bronze in 20' lengths.

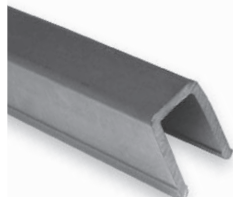
Part #	A	B	C	D
A40-1101	1"	1"	1/8"	3/4"
A40-1306	1"	1 1/2"	1/8"	3/4"
A40-1402	1"	2"	1/8"	3/4"



## Protective Insert for U-Channel Top Rails

Stocked in 10' lengths. This vinyl insert is not compatible with the A40-1101 or A40-1306 U-Channel Top Rails.

**Part#**  
V50-0001BKA10



## Adhesive Tape

Double sided glazing tape to work as a protective barrier when mounting top rails. Stocked in 75' rolls.

**Part #**  
V50-0013

**Dimensions**  
1/8" x 1 1/2" x 75'

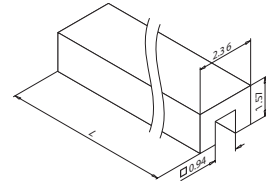


NEW

## Stainless Steel Rectangular Top Rail

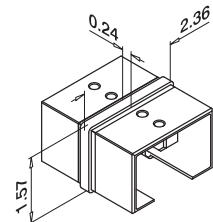
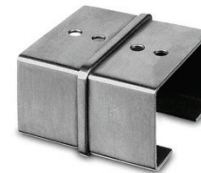
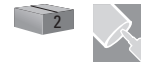
#4 (brushed) finish

Part #	W	H	L
R13-6920-640-12	2.36"	1.57"	16.4'
R13-6925-640-12	2.36"	1.57"	8.2'



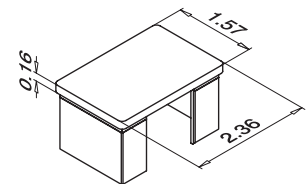
## Stainless Steel Rectangular Connector

**Part #**  
R13-6790-640-12



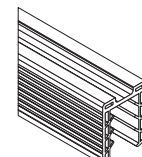
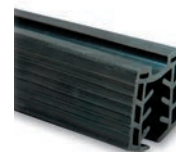
## Stainless Steel Rectangular End Cap

**Part #**  
R13-6732-640-12



## Vinyl Insert for Rectangular Top Rail

Part #	Glass Size	L
R19-5042-011-00	1/2"	16.4'
R19-5042-211-00	1/2"	8.2'
R19-5042-019-00	3/4"	16.4'
R19-5042-219-00	3/4"	8.2'

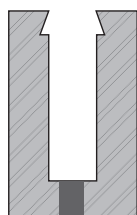


# TRADITIONAL GLASS RAILING

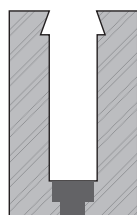
## BASE SHOES

### Base Section Hole Drilling Patterns (Optional)

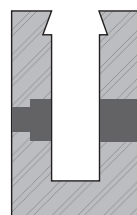
Custom hole drilling for aluminum base is available with four standard drilling patterns for 1/2" cap screws and bolts. For standard drilling patterns, drilling begins 6" from the end and continues every 12" on center.



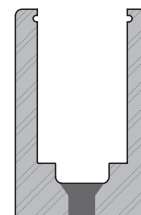
**D =**  
**Drilling**



**CB =**  
**Counter Bore**



**SD =**  
**Side Drill**

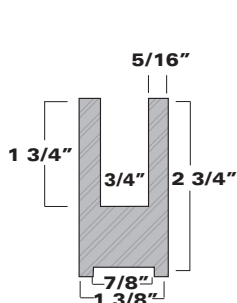


**CS =**  
**82° Counter Sunk**

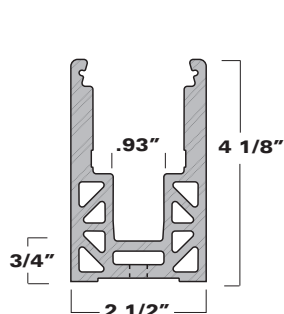
**NOTE: Illustrations are to show the general hole location and shape. Check each base shoe for stock drilling options. Specific drilling specifications are available by request. Custom drilling is also available.**

### Handrail Base Sections

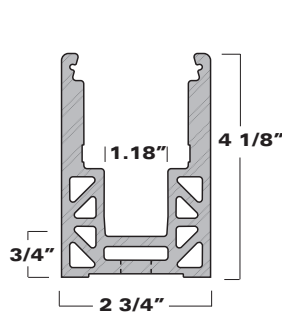
Extruded 6063-T5 or 6005-T5 Aluminum Bottom Rails in mill finish (other lengths available upon request). Codes for stocked drilling patterns can be found in the diagram above.



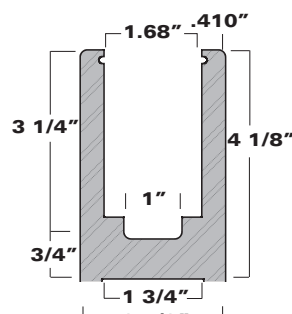
**A42-0064**  
**Stocked in:**  
20' lengths -  
Undrilled



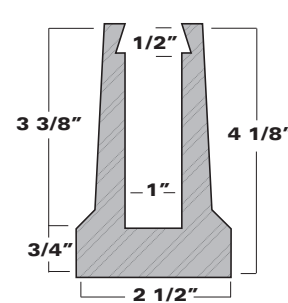
**A42-0072**  
**Stocked in:**  
10' & 20' lengths



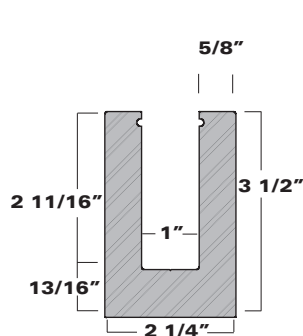
**A42-0073**  
**Stocked in:**  
10' & 20' lengths -  
CB, SD & Undrilled  
(PanelGrip®2 System)



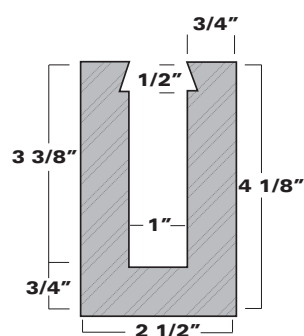
**A42-0075**  
**Stocked in:**  
10' & 20' lengths -  
CB & Undrilled  
(PanelGrip® System)  
For use with 1/2" glass



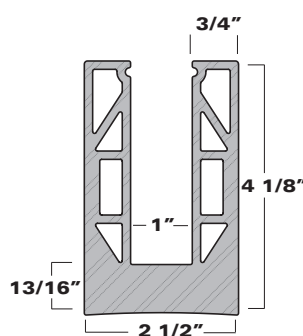
**A42-0076**  
**Stocked in:**  
20' lengths



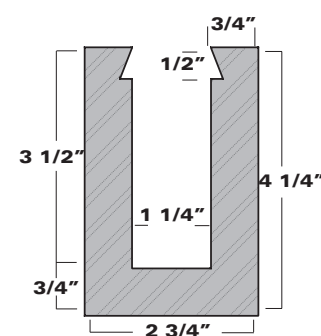
**A42-0088**  
**Stocked in:**  
10' & 20' lengths - CB



**A42-0090**  
**Stocked in:**  
10' & 20' lengths -  
D, CB, SD & Undrilled



**A42-0091**  
**Stocked in:**  
10' & 20' lengths -  
D, CB & Undrilled

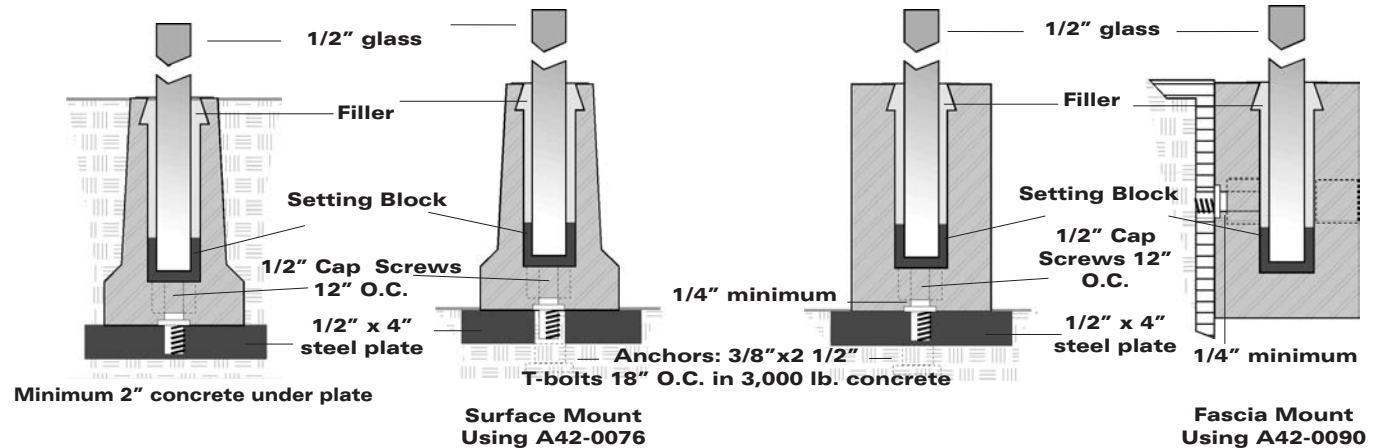


**A42-0099**  
**Stocked in:**  
10' lengths - CB



## Aluminum Handrail Base

Attachment of the base section to substrate is a critical factor in determining the strength of the glass rail system. While there are alternate methods of attachment, the illustrations below demonstrate four methods in which the base sections were independently engineered.



## General Installation Notes

These instructions are general in nature. Please consult local authorities for specification requirements.

1. Attach aluminum shoe molding to substrate with 1/2" stainless steel cap screws or bolts on 12" centers. Note: Aluminum must not be placed in direct contact with concrete or dissimilar metals. Use appropriate paint or primer.
2. Resilient setting blocks of 4" to 6" lengths provide support and cushion for glass panels as the 1/2" tempered float glass is inserted into the base section. Setting blocks should be placed at points 1/4 and 3/4 of the length of the panel from the end. A 1/4" vinyl spacer should be inserted between adjoining glass panels to prevent glass to glass contact. Align and plumb glass panels. Fill base with expansive cement or non-shrinking, non-metallic grout of choice at the discretion of the specifier/fabricator.
3. Rigid protective insert protects the top edge of the glass panel and fits inside the handrail - silicone or clear adhesive can be used to add finishing seal between glass and handrail. Internal splice connectors are designed for end-to-end connection of railing sections and corners. End caps fit securely into top rail for finishing accent, and can be welded or fastened with adhesive or screws.
4. Cover exposed base with cladding material to match top rail. Silicone or two-way tape can be used to adhere cladding.

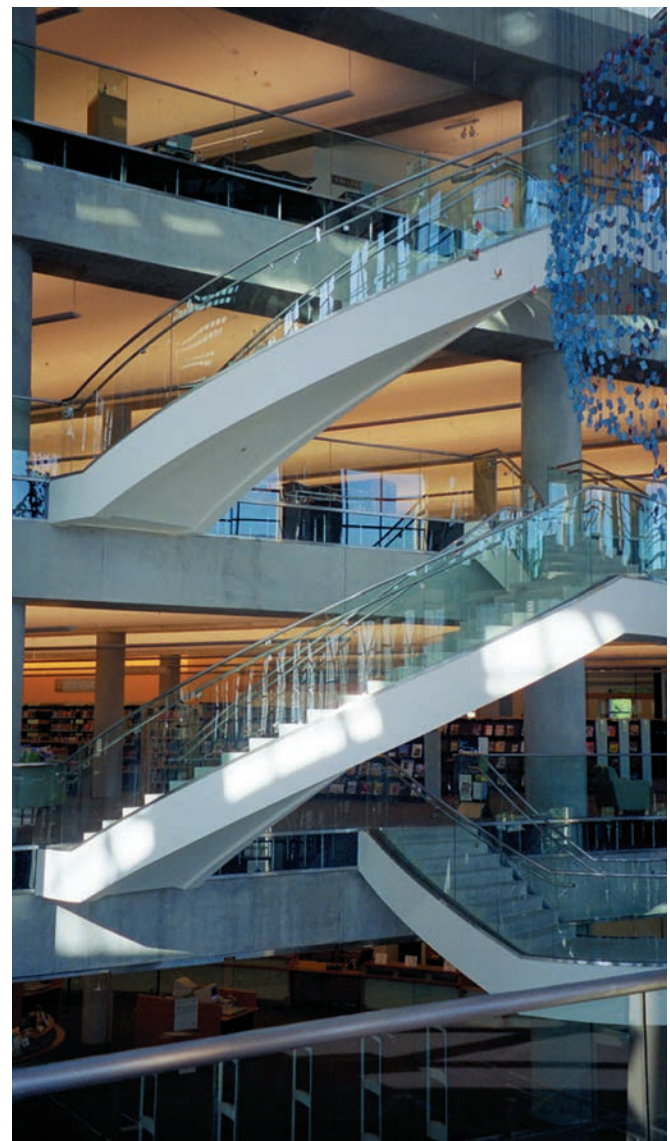
## Code Requirements and Regulations

Model code regulations usually require either a 50 lb/ft uniform loading or a 200 lb concentrated load to the handrail at a distance of 42" above floor level. Most model codes require that handrails be capable of safely resisting these loads.

The designer should consult governing code, local ordinances, project specifications, and regulatory authorities to determine requirements for compliance. It is the responsibility of the building owner, architect, and installation subcontractor to comply with applicable building codes and regulations.

All proposals and data herein are presented in good faith and based upon information Morse Industries believes to be accurate and reliable. As conditions and methods vary widely on the use of these products, Morse Industries does not imply or extend any warranty or guarantee for suggestions contained herein.

**Contact us for Specifications, CAD details, Engineering Reports, and additional information.**



# TRADITIONAL GLASS RAILING

## BASE SECTION CLADDING

Morse Industries stainless and aluminum Cladding is available to match Top Rail. One length covers one side only.

**Custom size Cladding and End Caps are available.** Cladding can be attached with silicone epoxy or two-way tape.

When ordering by part number, use the following formula for part specifications (S= stainless steel, A= aluminum, POL= polished, VEL= brushed):

**Metal (S, A) + Part Number + Finish (POL, VEL)**

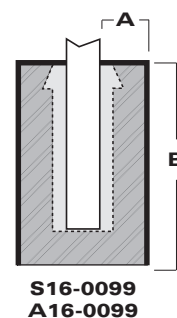
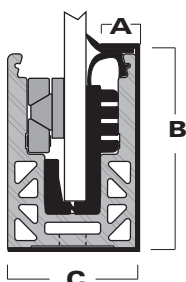
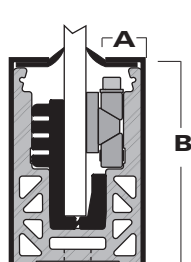
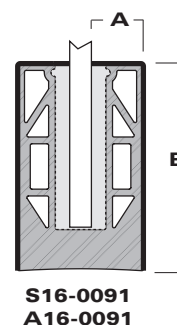
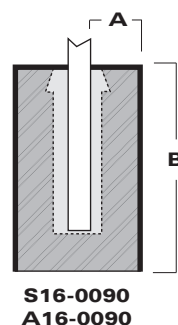
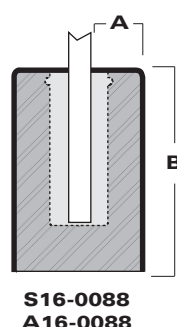
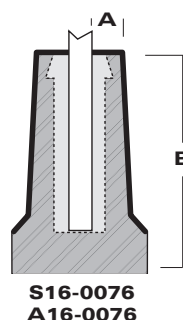
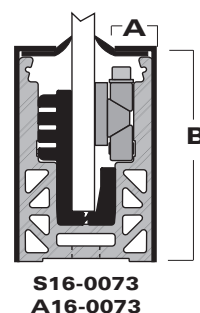
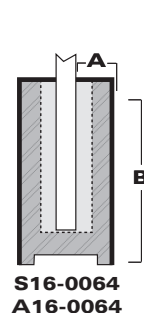
**A 10' length of 4" Polished Stainless Steel Base Section Cladding is written, "S16-0090POL10."**

**Side Drilled Cladding available upon request.**

### Stainless Steel Base Cladding

.035 gauge/thickness, #8 polished or #4 brushed finishes are standard.

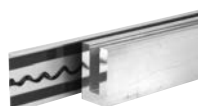
Part#	A	B	Length	Base Section
S16-0064	7/16"	2 3/4"	10', 12'	A42-0064
S16-0073	13/16"	4 1/8"	10', 12'	A42-0073, A42-0072, A42-0075
S16-0073L	13/16"	4 1/4"	10', 12'	A42-0073, A42-0072, A42-0075
S16-0076	1/2"	4 1/8"	10', 12'	A42-0076
S16-0088	.865"	3 1/2"	10', 12'	A42-0088
S16-0090	1"	4 1/8"	10', 12'	A42-0090
S16-0091	1"	4 1/8"	10', 12'	A42-0091
S16-0099	1"	4 1/2"	10', 12'	A42-0099



### Recommended Attachment Options

Take care to properly align cladding before pressing into place.

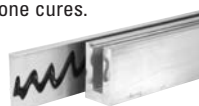
1. Apply two rows of tape to the vertical face of the cladding and apply a silicone bead between the rows.



2. Apply three rows of tape to the vertical face of the cladding.



3. Apply silicone to the vertical face of the cladding. Use clamps to hold the cladding in place until the silicone cures.



## CLADDING END CAPS

Morse Industries stainless and aluminum Cladding End Caps match base section or base cladding. Cladding End Caps can be attached with silicone, epoxy or two-way tape. Aluminum Cladding End Caps are recommended when base sections are anodized or powder-coated.

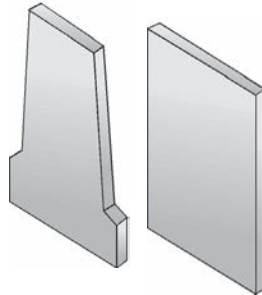
When ordering by part number, use the following formula for part specifications (S= stainless steel, A= aluminum, POL= polished, VEL= brushed):

**Metal (S, A) + Part Number + Finish (POL, VEL)**  
A Polished Stainless Steel End Cap is written, "S17-0090POL."

### Stainless Steel End Caps

.035 gauge/thickness, #8 polished or #4 brushed finishes are standard.

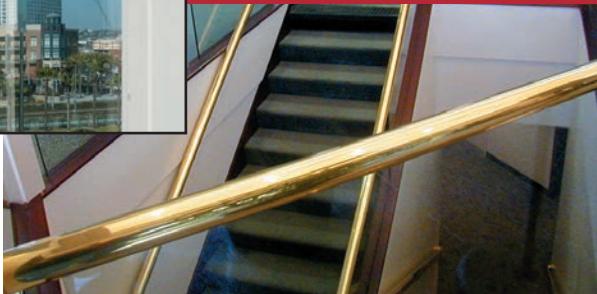
Part#	Base Section Part #
S17-0064	A42-0064
S17-0072	A42-0072
S17-0073	A42-0073
S17-0075	A42-0075
S17-0076	A42-0076
S17-0088	A42-0088
S17-0090	A42-0090
S17-0091	A42-0091
S17-0099	A42-0099



### Aluminum End Caps

Aluminum end caps are oversized for easy finishing. .050 gauge/thickness, available in mill finish, clear satin and oil rubbed bronze.

Part#	Base Section Part #
A17-0064	A42-0064
A17-0072	A42-0072
A17-0073	A42-0073
A17-0075	A42-0075
A17-0076	A42-0076
A17-0088	A42-0088
A17-0090	A42-0090
A17-0091	A42-0091
A17-0099	A42-0099



## DRAIN BLOCKS & SETTING BLOCK

### Aluminum Base Drain Block

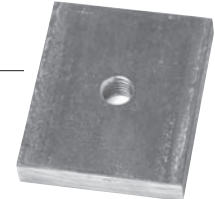
Placed under exterior installed base shoes to provide drainage space for water runoff. Great for balconies and decks. 10 blocks per package.

Part#	Measurement
A42-0023-10	2 1/2" x 2 3/4" x 1/2"



### Steel Weld Block

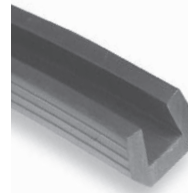
Part#	Measurement
S42-0023-10	2 1/2" x 2 3/4" x 1/2"



### Setting Block for Base Sections

Setting block supports and protects glass when fitted in the base section and is available for 1/2" glass. Easily center glass in base shoe and support panels during expansion cement installations. We recommend two 4" pieces located at quarter points along the bottom of each panel. Resilient EPDM provides durability and longevity, is stocked in 25' coils, and can be cut to any size.

Part#	Description
V50-0002BKA25	Setting Block for 1/2" Glass



### Spacer Blocks

Die cut, high density foam spacing and sealing pads with adhesive on one side to act as spacers. 1/4" thick x 3 7/16" tall.

Part#	Description
V50-0010	For 1/2" Glass
V50-0011	For 3/4" Glass



### Glazing Cement for Wet Glaze Applications

Part#	Description
G42-10402	Kwixset, Interior or Exterior applications. <i>*Not Suitable For Use With Laminated Glass</i>
G42-10051	Rockite, Interior Applications



G42-10402



G42-10051



# LEGENDS & PRODUCT CODE

## STAINLESS STEEL RAILINGS LEGENDS AND PRODUCT CODE



ORDER  
P....

Order information related to  
corresponding products

## INSTALLATION INSTRUCTIONS



Screw-fastened products  
(socket head wrench)



Adjustable wrench



Adapter wrench



Phillips screwdriver



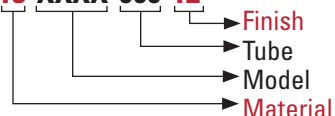
Weldable products



Product to be glued

## PART NUMBER

**R 13-XXXX-000-12**



### Material

13 = Stainless Steel 304 14 = Stainless Steel 316

### Finish

12 = Brushed Stainless Steel

## STANDARD PACKAGING



1 per  
package



2 per  
package



4 per  
package



6 per  
package



8 per  
package



10 per  
package



50 per  
package



The ability to combine components from any of our product lines allows you to create just the look you want. Whether you're designing a public space or a private residence, architectural details have a significant impact on the end result. Bring your vision to life with Morse railing.





# STAINLESS STEEL ROUND RAILING SYSTEM

Our round design is clean, sleek and showcases the beauty of stainless steel. Compatible with our other systems, the round design accommodates glass, cable or rod components providing you with endless design possibilities.



Our system installs on site with no welding required – simply glue, drill and tap the pieces into place. The pre-fabricated, pre-finished tubing is designed to fit perfectly with other components. Available in type 304 and 316 stainless steel for either interior or exterior installation.

Our Railing Systems allow you to install high quality, sleek railing in a fraction of the time traditional systems require. This means quicker installation, less labor and cost savings. With the use of the system's bonding agent, it's no longer necessary to weld connections resulting in a cleaner look. Round system components come in type 304 and 316 stainless steel.

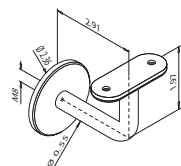
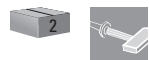
# ROUND RAILING SYSTEM

## HANDRAIL BRACKETS

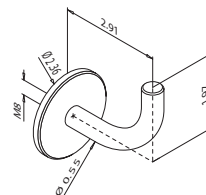
304 Stainless Steel - 316 Stainless Steel Also Available

### Wall Mount with Concealed Fastner

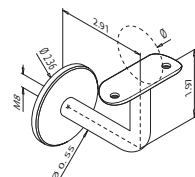
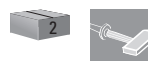
**Part #**  
R13-0111-000-12      **Ø**  
Flat Saddle



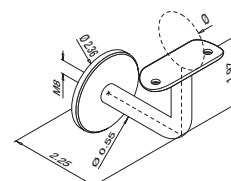
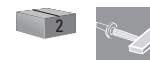
**Part #**  
R13-0114-000-12      **Ø**  
None



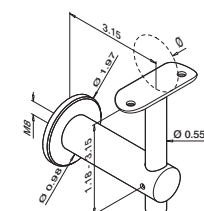
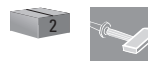
**Part #**  
R13-0111-038-12      **Ø**  
R13-0111-050-12      1 1/2"  
2"



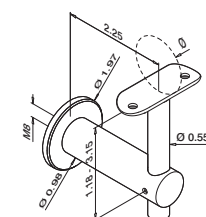
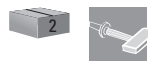
**Part #**  
R13-0121-038-12      **Ø**  
R13-0121-050-12      1 1/2"  
2"



**Part #**  
R13-0140-038-12      **Ø**  
R13-0140-050-12      1 1/2"  
2"

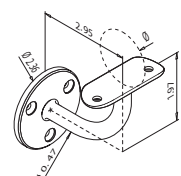


**Part #**  
R13-0141-038-12      **Ø**  
R13-0141-050-12      1 1/2"  
2"

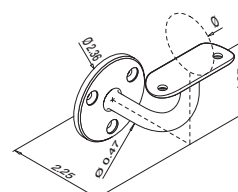


### Wall Mount

**Part #**  
R13-0112-038-12      **Ø**  
R13-0112-050-12      1 1/2"  
2"



**Part #**  
R13-0122-038-12      **Ø**  
R13-0122-050-12      1 1/2"  
2"



Hardware sold separately

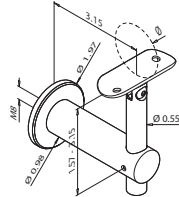
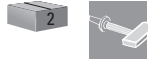
# ROUND RAILING SYSTEM

## HANDRAIL BRACKETS

304 Stainless Steel - 316 Stainless Steel Also Available

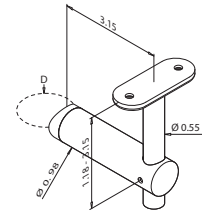
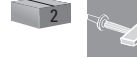
### Adjustable Wall Mount

Part #	Ø
R13-0145-038-12	1 1/2"
R13-0145-050-12	2"

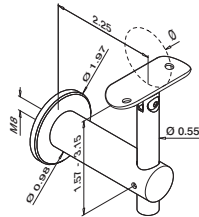


### Tube Mount

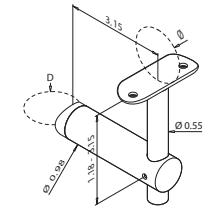
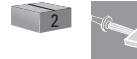
Part #	Ø	D
R13-0130-000-12	Flat Saddle	1 1/2"



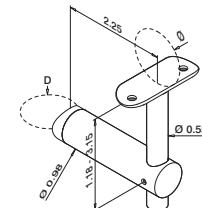
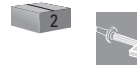
Part #	Ø
R13-0146-038-12	1 1/2"



Part #	Ø	D
R13-0138-038-12	1 1/2"	1 1/2"
R13-0138-050-12	1 1/2"	2"
R13-0139-038-12	2"	1 1/2"



Part #	Ø	D
R13-0168-038-12	1 1/2"	1 1/2"



Hardware sold separately

All drawings shown in inches



See Metric Converter, page 60

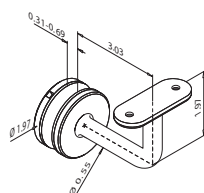
# ROUND RAILING SYSTEM

## HANDRAIL BRACKETS

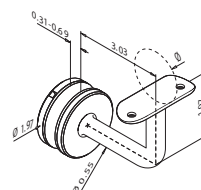
304 Stainless Steel - 316 Stainless Steel Also Available

### Glass Mount

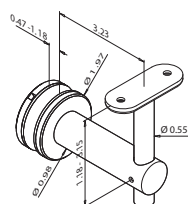
**Part #**  
R13-0117-000-12      **Ø**  
Flat Saddle



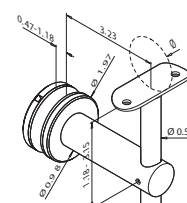
**Part #**  
R13-0117-038-12      **Ø**  
R13-0117-050-12      1 1/2"  
2"



**Part #**  
R13-0150-000-12      **Ø**  
Flat Saddle

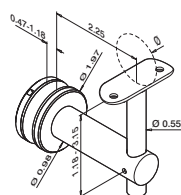


**Part #**  
R13-0150-038-12      **Ø**  
R13-0150-050-12      1 1/2"  
2"

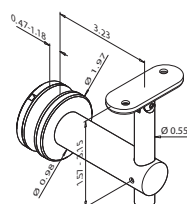


### Adjustable Glass Mount

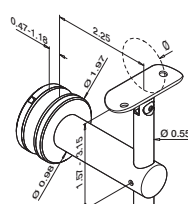
**Part #**  
R13-0151-038-12      **Ø**  
1 1/2"



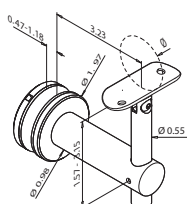
**Part #**  
R13-0155-000-12      **Ø**  
Flat Saddle



**Part #**  
R13-0156-038-12      **Ø**  
1 1/2"



**Part #**  
R13-0155-038-12      **Ø**  
R13-0155-050-12      1 1/2"  
2"



Hardware sold separately



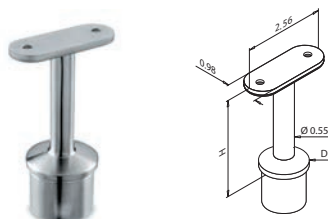
# ROUND RAILING SYSTEM

## HANDRAIL BRACKETS

304 Stainless Steel - 316 Stainless Steel Also Available

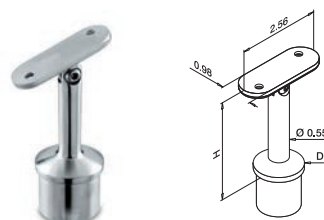
### Fixed Post Mounts

Part #	Ø	D	H
R13-0702-000-12	Flat Saddle	1 1/2"	3 1/4"
R13-0703-000-12	Flat Saddle	2"	3 1/4"

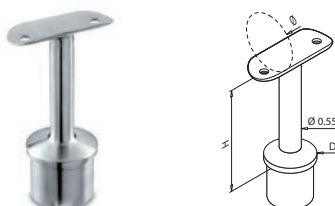


### Adjustable Post Mounts

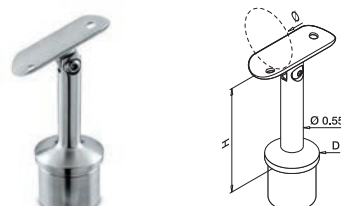
Part #	Ø	D	H
R13-0705-000-12	Flat Saddle	1 1/2"	3 1/4"
R13-0706-000-12	Flat Saddle	2"	3 1/4"



Part #	Ø	D	H
R13-0702-038-12	1 1/2"	1 1/2"	3 1/8"
R13-0702-050-12	2"	1 1/2"	3 1/8"
R13-0703-038-12	1 1/2"	2"	3 1/8"
R13-0703-050-12	2"	2"	3 1/8"

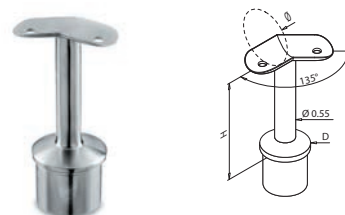


Part #	Ø	D	H
R13-0705-038-12	1 1/2"	1 1/2"	3 1/8"
R13-0705-050-12	2"	1 1/2"	3 1/8"
R13-0706-038-12	1 1/2"	2"	3 1/8"
R13-0706-050-12	2"	2"	3 1/8"



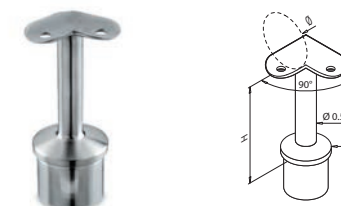
### 135° Corner Post Mounts

Part #	Ø	D	H
R13-0702-338-12	1 1/2"	1 1/2"	3 1/8"
R13-0702-350-12	2"	1 1/2"	3 1/8"
R13-0703-338-12	1 1/2"	2"	3 1/8"
R13-0703-350-12	2"	2"	3 1/8"



### 90° Corner Post Mounts

Part #	Ø	D	H
R13-0702-838-12	1 1/2"	1 1/2"	3 1/8"
R13-0702-850-12	2"	1 1/2"	3 1/8"
R13-0703-838-12	1 1/2"	2"	3 1/8"
R13-0703-850-12	2"	2"	3 1/8"



Hardware sold separately

All drawings shown in inches



See Metric Converter, page 60

# ROUND RAILING SYSTEM

## FLUSH FITTINGS

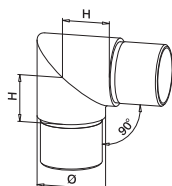
304 Stainless Steel - 316 Stainless Steel Also Available

### 90° Angle

Part #  
M13-0301-038-12

Ø  
1 1/2"

H  
1 3/16"

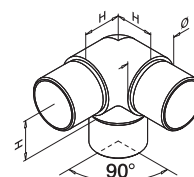


### Side Outlet

Part #  
R13-0304-038-12  
R13-0304-050-12

Ø  
1 1/2"  
2"

H  
1 3/16"  
1 3/8"

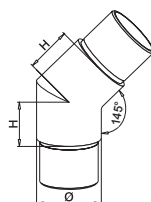


### 145° Angle

Part #  
R13-0308-038-12

Ø  
1 1/2"

H  
1 3/16"

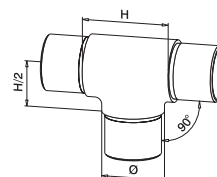


### 90° Tee

Part #  
R13-0307-038-12  
R13-0307-050-12

Ø  
1 1/2"  
2"

H  
2 3/8"  
2 3/4"

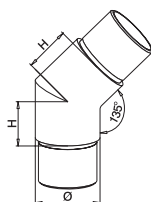


### 135° Angle

Part #  
R13-0300-038-12  
R13-0300-050-12

Ø  
1 1/2"  
2"

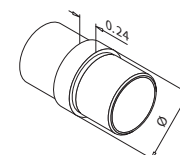
H  
1 3/16"  
1 3/8"



### Connector

Part #  
R13-0790-016-12  
R13-0790-038-12  
R13-0790-050-12

Ø  
5/8"  
1 1/2"  
2"



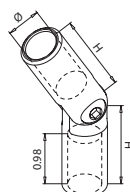
# ROUND RAILING SYSTEM

## FLUSH FITTINGS

304 Stainless Steel - 316 Stainless Steel Also Available

### Adjustable Angle

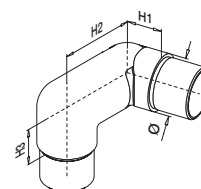
Part #	Ø	H
R13-0302-012-12	.47"	1 27/64"



- 90°  
+ 90°

### Compound Corner Right

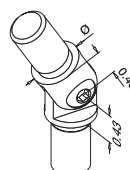
Part #	Ø
R13-0317-038-12	1 1/2"



0-70°

### Adjustable Angle

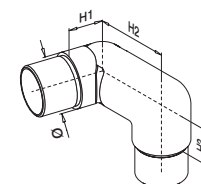
Part #	Ø
R14-0302-016-12	5/8"



- 90°  
+ 90°

### Compound Corner Left

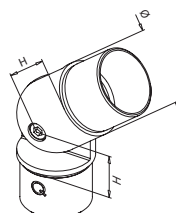
Part #	Ø
R13-0318-038-12	1 1/2"



0-70°

### Adjustable Angle

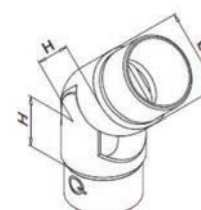
Part #	Ø	H
R13-0302-038-12	1 1/2"	1 1/16"
R13-0302-050-12	2"	1 3/16"



- 90°  
+ 90°

### Adjustable Vertical Angle

Part #	Ø
R13-0312-038-12	1 1/2"



0-70°

### Installation Information



All drawings shown in inches



See Metric Converter, page 60

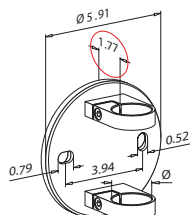
# ROUND RAILING SYSTEM

## FASCIA MOUNT BALUSTER BRACKETS

304 Stainless Steel - 316 Stainless Steel Also Available

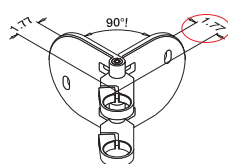
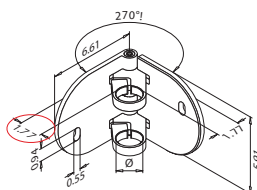
### Round Fascia Mount

Part #	Ø
R13-0551-038-12	1 1/2"
R13-0551-050-12	2"



### Corner Fascia Mount

Part #	Ø
R13-0555-038-12	1 1/2"
R13-0555-050-12	2"

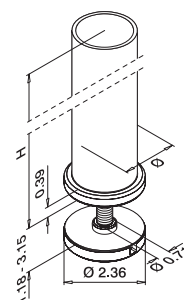


## BALUSTER POSTS

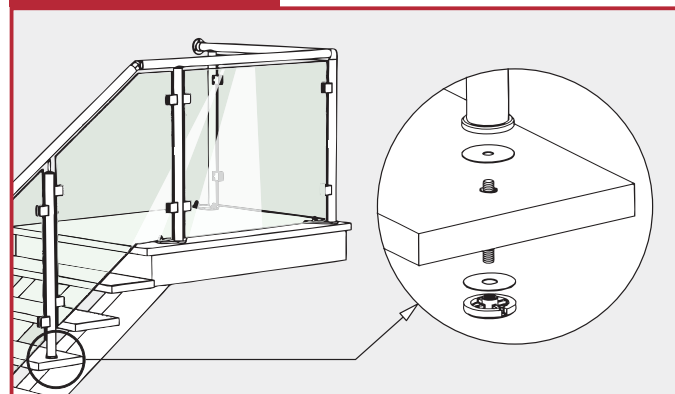
304 Stainless Steel - 316 Stainless Steel Also Available

### Baluster Posts

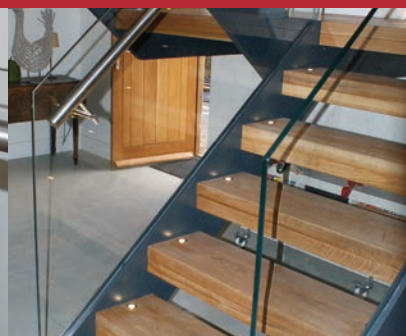
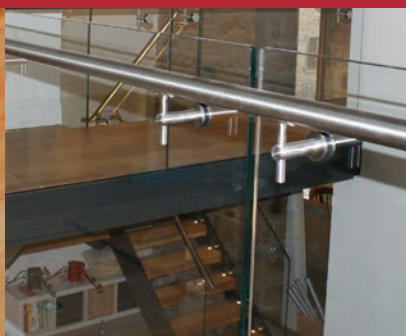
Part #	Description	Ø	H
R13-0544-038-12	5/64" Wall Thickness	1 1/2"	38"



### Installation Information

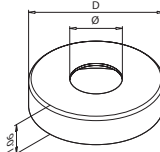
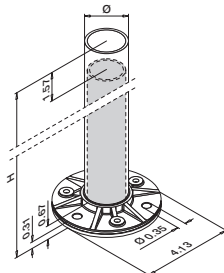
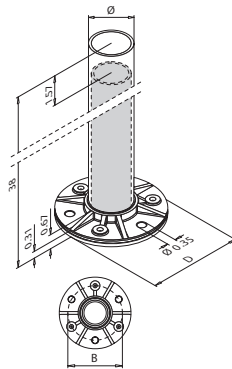


Hardware sold separately





*304 Stainless Steel - 316 Stainless Steel Also Available*



Nationwide Supplier of Railing Systems & Components 27

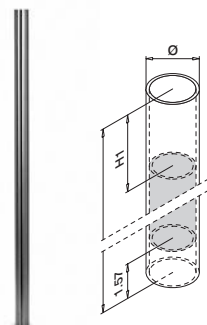
# ROUND RAILING SYSTEM

## BALUSTER POST TUBES & FLOOR FLANGES

304 Stainless Steel - 316 Stainless Steel Also Available

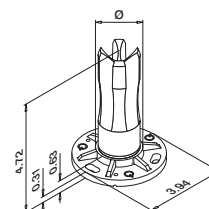
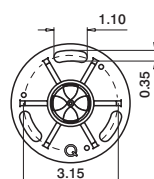
### Baluster Post Tubes—Double Wall

Part#	Description	H1	Ø
R13-0951-438-12	.156" Wall Thickness, 49" tall	10.95"	1 1/2"
R13-0951-450-12	.156" Wall Thickness, 49" tall	10.95"	2"
R13-0952-438-12	.156" Wall Thickness, 53" tall	14.95"	1 1/2"
R13-0952-450-12	.156" Wall Thickness, 53" tall	14.95"	2"



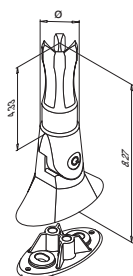
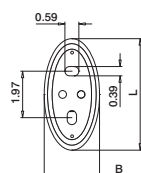
### Floor Flanges

Part #	Description (D)	Ø
R14-0942-038-00	Floor Flange, glued connection	1 1/2"



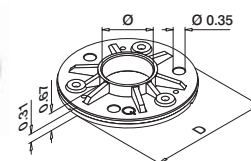
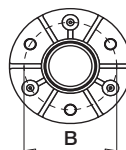
### Floor Flanges

Part #	Description (D)	Ø	L	B
R13-0945-038-12	Adjustable Angle Floor Flange, glued connection	1 1/2"	4 3/16"	2 1/8"



### Floor Flanges

Part #	Description (D)	Ø	D	B
R14-3502-038-00	Floor Flange, welded connection	1 1/2"	4 1/8"	3 1/8"
R14-3502-050-00	Floor Flange, welded connection	2"	4 1/2"	3 35/64"



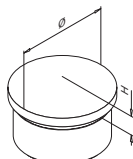
Hardware sold separately

## END CAPS, FLANGES & WALL RETURNS

304 Stainless Steel - 316 Stainless Steel Also Available

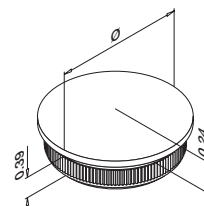
### Arched End Cap

Part #	Ø	H
R13-0729-038-12	1 1/2"	5/32"



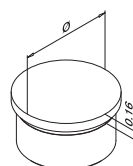
### Easy Hit End Cap

Part #	Ø
R13-5729-038-12	1 1/2"
R13-5729-050-12	2"



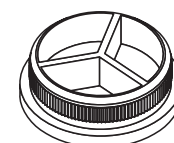
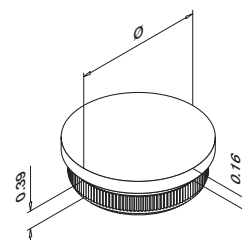
### Flat End Cap

Part #	Ø
R13-0732-038-12	1 1/2"
R13-0732-050-12	2"



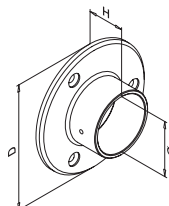
### Easy Hit End Cap

Part #	Ø
R13-5732-038-12	1 1/2"
R13-5732-050-12	2"



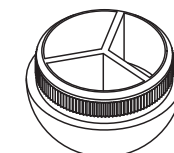
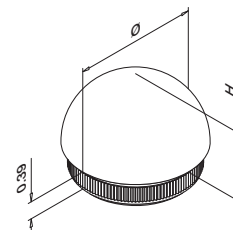
### Wall Flange

Part #	Ø	D	H
R13-0505-038-12	1 1/2"	3 27/32"	1 3/16"
R13-0505-050-12	2"	4"	1 3/8"



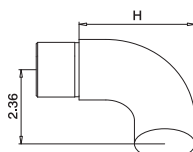
### Easy Hit End Cap

Part #	Ø	H
R13-5730-038-12	1 1/2"	2"
R13-5730-050-12	2"	2"



### Wall Return

Part #	Ø	H
R13-0739-038-12	1 1/2"	3 1/4"
R13-0739-050-12	2"	3 5/16"



Hardware sold separately

All drawings shown in inches

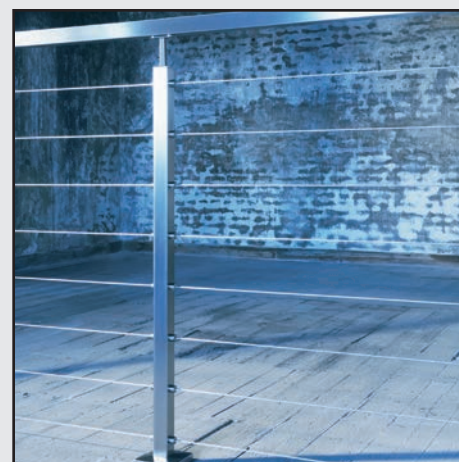


See Metric Converter, page 60

# STAINLESS STEEL SQUARE & RECTANGULAR RAILINGS

Edgy and sleek, our square and rectangular designs are the answer to demand for contemporary and stylish design. Unique to the industry, our square line delivers a look unlike any other. This unique concept uses a square tube for both baluster and railing. The square line accommodates glass, cable or rod components so you can mix and match for a completely unique design.

Our system installs on site with no welding required – simply glue or drill/tap/screw the pieces into place. The pre-fabricated, pre-finished tubing is designed to fit perfectly with other components. Available in type 304 and 316 stainless steel for either interior or exterior installation.





304 Stainless Steel - 316 Stainless Steel Also Available



Technical drawing of a mechanical assembly with dimensions:

- Top horizontal dimension: 0.47 - 0.58
- Top right horizontal dimension: 3.7
- Top middle horizontal dimension: 0.2
- Top right vertical dimension: 2.36
- Left vertical dimension: 1.57
- Bottom left horizontal dimension: 0.29
- Bottom middle horizontal dimension: 1.57
- Bottom right horizontal dimension: 0.5

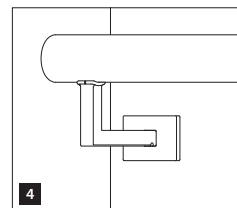
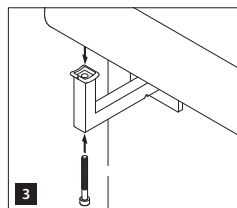
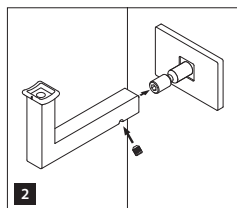


Technical drawing of a mechanical part with the following dimensions:

- Overall length: 3.62
- Top flange width: 0.2
- Flange thickness: 1.56
- Internal slot width: 0.5
- Slot depth: 1.57
- Bottom flange width: 1.57
- Bottom flange thickness: 1.57
- Angle: 45°
- Inner diameter:  $\varnothing 0.9$



Technical drawing of a mechanical part with dimensions: 4.60, 3.62, 2.96, 1.57, 0.2, 1.97, and a hole of diameter 0.55.



Nationwide Supplier of Railing Systems & Components 31

# SQUARE & RECTANGULAR RAILING SYSTEM

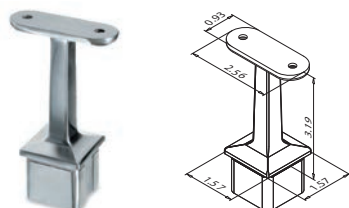
## HANDRAIL BRACKETS

304 Stainless Steel - 316 Stainless Steel Also Available

### Fixed Post Mounts

**Part #**  
R13-4710-000-12

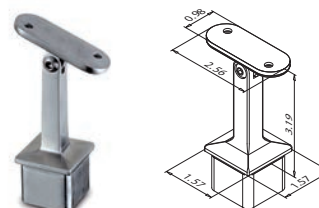
**Ø**  
Flat Saddle



### Adjustable Post Mounts

**Part #**  
R13-4718-000-12

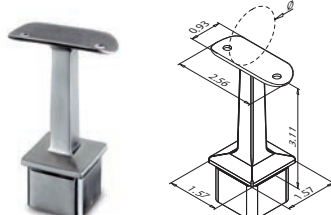
**Ø**  
Flat Saddle



### Fixed Post Mounts

**Part #**  
R13-4710-038-12

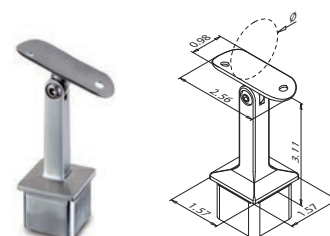
**Ø**  
1 1/2"



### Adjustable Post Mounts

**Part #**  
R13-4718-038-12

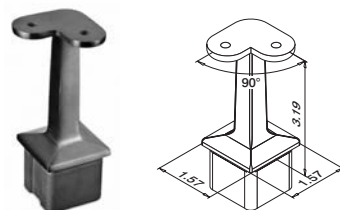
**Ø**  
1 1/2"



### 90° Fixed Corner Post Mounts

**Part #**  
R13-4710-800-12

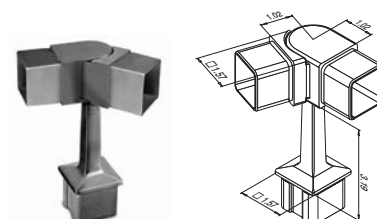
**Ø**  
Flat Saddle



### Adjustable Corner Post Mounts

**Part #**  
R13-4736-040-12

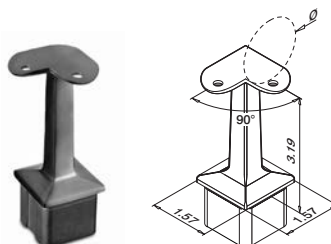
**Description**  
0-70° Adjustment



### 90° Fixed Corner Post Mounts

**Part #**  
R13-4710-838-12

**Ø**  
1-1/2"



Hardware sold separately

# SQUARE & RECTANGULAR RAILING SYSTEM

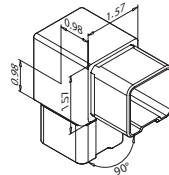
## FLUSH FITTINGS & BALUSTER BRACKETS

304 Stainless Steel - 316 Stainless Steel Also Available

### 90° Angle

**Part #**  
R13-4301-040-12

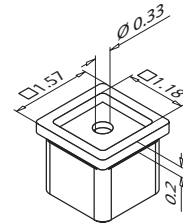
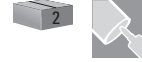
**Description**  
90° Angle



### Handrail Adaptor

**Part #**  
R13-4727-000-12

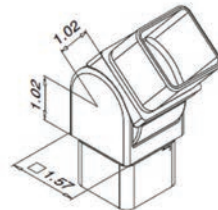
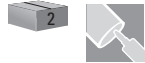
**Description**  
Flush Angle



### Adjustable Angle

**Part #**  
R13-4312-040-12

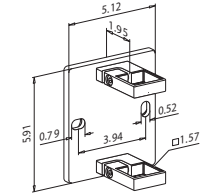
**Description**  
Adjustable Angle 0-70°



### Fascia Mount Baluster Bracket

**Part #**  
R13-4551-040-12

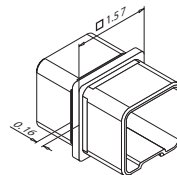
**Description**  
Baluster Bracket



### Connector

**Part #**  
R13-4790-040-12

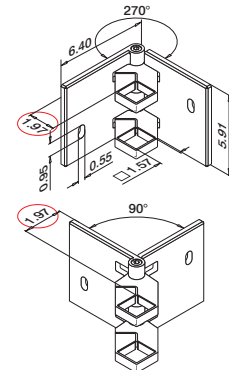
**Description**  
Connector



### Corner Fascia Mount Bracket

**Part #**  
R13-4555-040-12

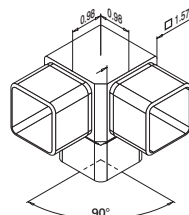
**Description**  
Corner Baluster Bracket



### Three Way Fitting

**Part #**  
R13-4304-040-12

**Description**  
Baluster Bracket



Hardware sold separately

All drawings shown in inches



See Metric Converter, page 60

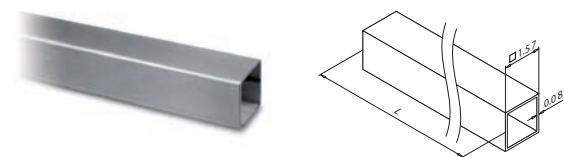
# SQUARE & RECTANGULAR RAILING SYSTEM

## TUBING, BALUSTER POSTS & ACCESSORIES

304 Stainless Steel - 316 Stainless Steel Also Available

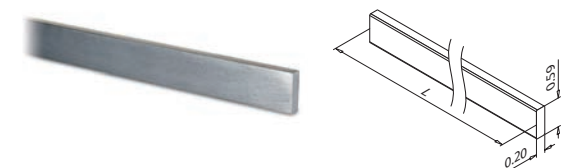
### Square Handrail Tubing

Part #	Description
R13-4900-040-12	1.57" SS Square Tube, 16.4'
R13-4925-040-12	1.57" SS Square Tube, 8.2'



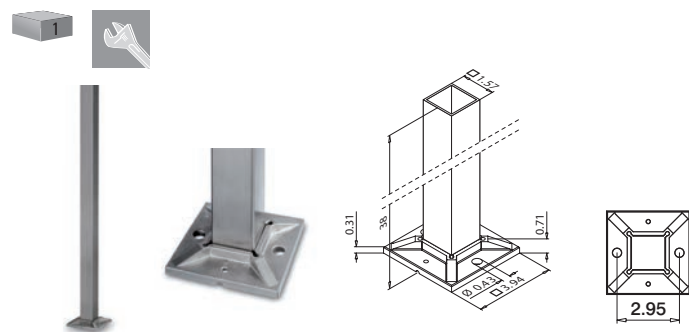
### Stainless Bar

Part #	Description
R13-4900-015-12	Stainless Bar, 16.4'
R13-4925-015-12	Stainless Bar, 8.2'



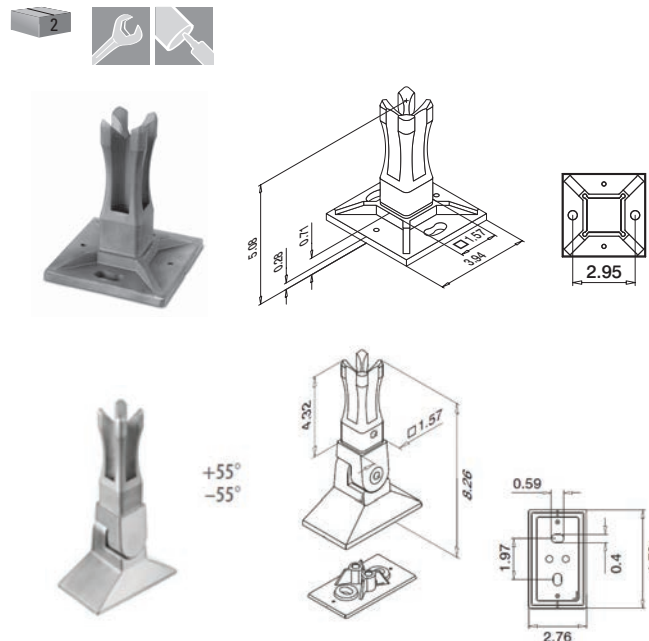
### Baluster Post

Part #	Description
R13-4913-040-12	38" Tall



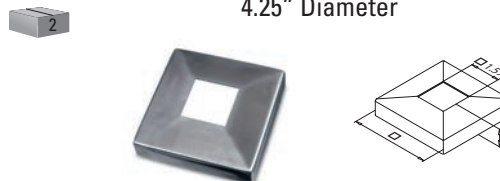
### Floor Flanges

Part #	Description
R13-4942-040-00	Floor Flange
R14-4943-040-12	Floor Flange



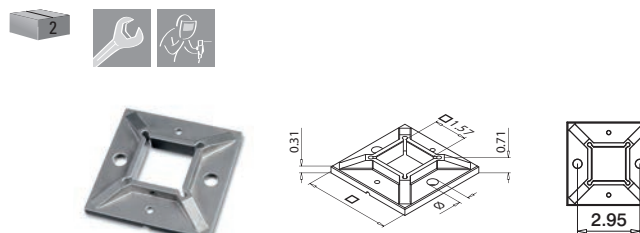
### Flange Cover Plate

Part #	Description	H
R13-4511-040-12	Baluster Post Flange Cover Plate, 4.25" Diameter	1"



### Floor Flanges

Part #	Description	Ø
R13-4940-040-00	4" Floor Flange	.43"



Hardware sold separately



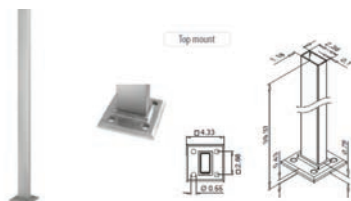




# SQUARE & RECTANGULAR RAILING SYSTEM

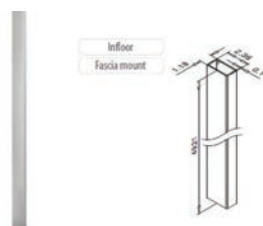
## Floor Mount Rectangular Baluster Post

Part #	Description
R14-4901-063-12	2.36" x 1.18" x 39.37"



## Fascia Mount Rectangular Baluster Post

Part #	Description
R14-4902-063-12	2.36" x 1.18" x 49.21"



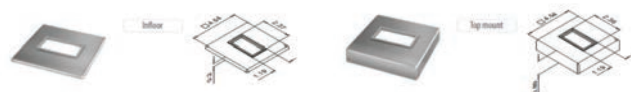
## Floor Flange Fascia Mount Rectangular Baluster Post

Part #	Description
R14-3503-063-00	Weld Mount Floor Flange



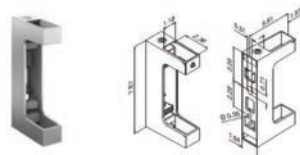
## Flange Cover Plates

Part #	Description
R14-4513-063-12	Top Mount Cover Plate
R14-4512-063-12	Flush Mount Cover Plate



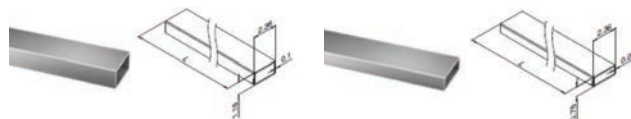
## Fascia Mount Bracket

Part #	Description
R14-4558-063-12	Fascia Mount Bracket



## Rectangular Tubing

Part #	Description
R14-4900-063-12	2.36" x 1.18" Rectangular Tube, 16.4'
R14-4900-262-12	2.36" x 0.78" Rectangular Tube 16.4'
R14-4925-262-12	2.36" x 0.78" Rectangular Tube 8.2'



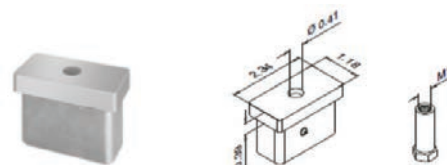
## Post Mounts

Part #	Description
R14-4711-000-12	Ø: Flat Saddle
R14-4711-042-12	Ø: 1-1/2"
R14-4711-048-12	Ø: 1.9"



## Handrail Adapter

Part #	Description
R14-4725-063-12	Handrail adapter



## End Caps

Part #	Description
R14-5728-063-12	2.36" x 1.18" End Cap, Press Mount
R14-5727-262-12	2.36" x 0.78" End Cap, Press Mount



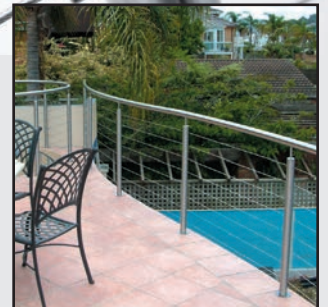
## Connector Sleeve

Part #	Description
R14-5792-262-00	2.36" x 0.78" 0°-70°



# QUICK CONNECTING STAINLESS STEEL CABLE SYSTEM

Modern, minimalistic and sleek...that's our quick connecting stainless steel cable railing system. Our system features complete cable sets that allow you to mount, tension, and finish each run without keeping track of a complicated list of components.



Primarily used as infill, complete cable sets are available in sets are available in 1/8" or 5/32" diameter. Our quick connecting cable sets can be used with a wide variety of balusters, including round and square stainless steel, wood, and more.

For balusters and handrails, please consult the round or square railing sections.

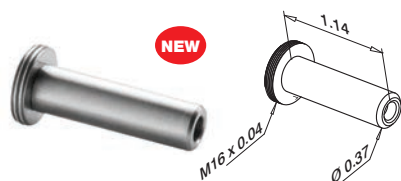
# STAINLESS STEEL CABLE SYSTEM

## CABLE, TOOLS & ACCESSORIES

316 Stainless Steel Also Available

### Receivers

**Part #**  
R14-7240-003-12  
R14-7240-004-12



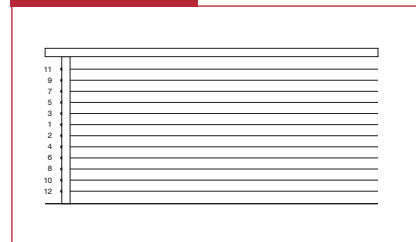
### Cable Sets

Part #	Ø	L
R14-7901-013-12	1/8"	3.3'
R14-7901-023-12	1/8"	8'
R14-7901-053-12	1/8"	16.4'
R14-7901-073-12	1/8"	24.5'
R14-7901-103-12	1/8"	32.8'
R14-7901-123-12	1/8"	41'
R14-7901-203-12	1/8"	65.5'
R14-7901-014-12	5/32"	3.3'
R14-7901-024-12	5/32"	8'
R14-7901-054-12	5/32"	16.4'
R14-7901-074-12	5/32"	24.5'
R14-7901-104-12	5/32"	32.8'

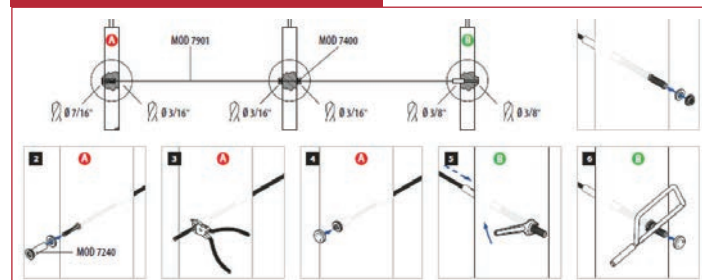
Ø 1/8" (3.2 mm) = (1 x 19)    Ø 5/32" (4.0 mm) = (7 x 19)



### Installation Order

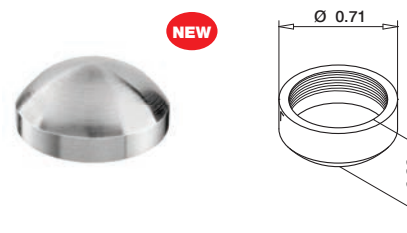


### Installation Instructions – 1/8" Cable



### Cover Cap

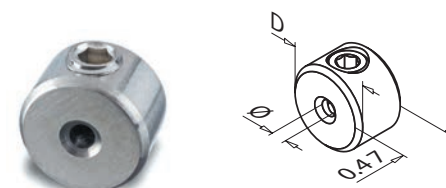
**Part #**  
R14-5010-000-12



### Cable Adapter

**Part #**  
R14-7400-003-12

**Ø** 9/64"    **D** 23/32"



### Release Tool

**Part #**  
R14-7802-003-00  
R14-7802-004-00

**Ø** 1/8"  
5/32"



### Cable Cutter

**Part #**  
R14-7800-000-00

**Description**  
Cable Cutter



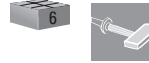


## STAIR WASHERS

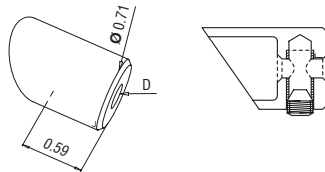
316 Stainless Steel Also Available

### Flat Washer - Downwards

**Part #**  
R14-7401-300-12 **Angle**  
+/- 35°

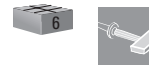


NEW

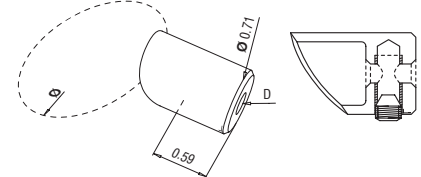


### Concave Washers - Downwards

**Part #**  
R14-7401-342-12 **Ø** 1 1/2" **Angle** +/- 35°  
R14-7401-338-12 **Ø** 2" +/- 35°

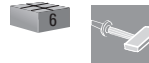


NEW

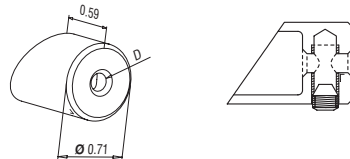
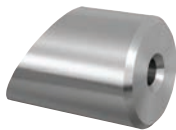


### Flat Washer - Upwards

**Part #**  
R14-7402-300-12 **Angle**  
+/- 35°

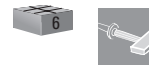


NEW

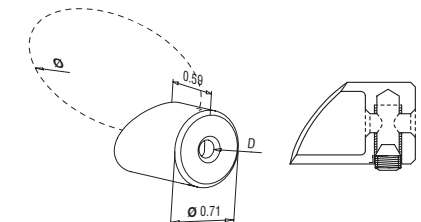
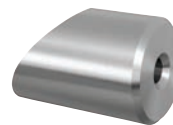


### Concave Washers - Upwards

**Part #**  
R14-7402-342-12 **Ø** 1 1/2" **Angle** +/- 35°  
R14-7402-338-12 **Ø** 2" +/- 35°



NEW



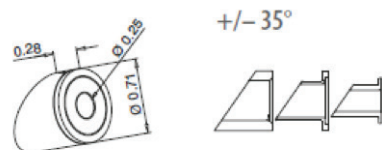
### Flat Washer - End

**Part #**  
R14-7403-300-12 **Angle**  
+/- 35°



Flat - cable

NEW



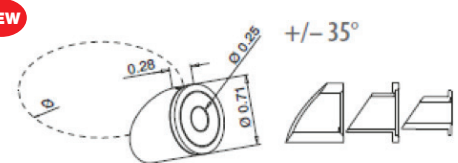
### Concave Washers - End

**Part #**  
R14-7403-342-12 **Ø** 1 1/2" **Angle** +/- 35°

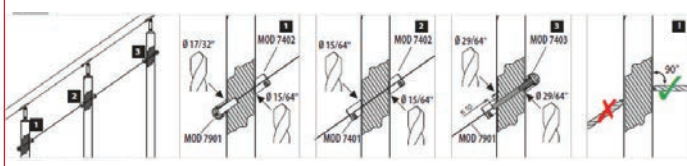


Tube - cable

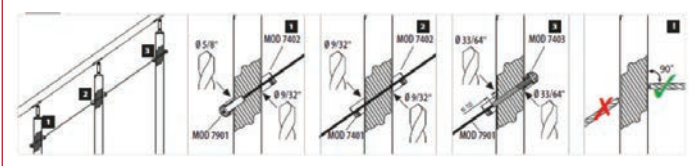
NEW



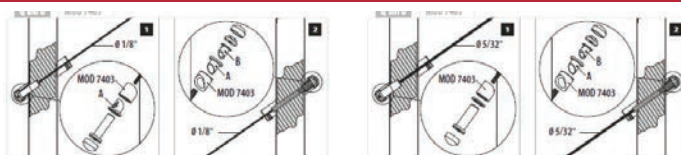
### Installation Instructions – Mod 7401, 7402, 7403 – 1/8" Cable



### Installation Instructions – Mod 7401, 7402, 7403 – 5/32" Cable



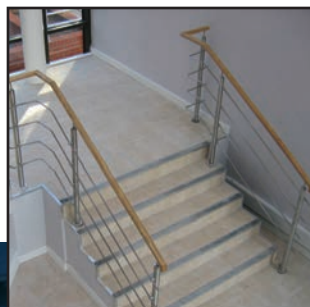
### Installation Instructions – Mod 7403



All drawings shown in inches



See Metric Converter, page 60



# STAINLESS STEEL ROD SYSTEM

Sleek, modern and clean...that's our stainless steel rod railing system. Our rod components are designed to be compatible with other systems allowing you versatility and the ability to create a myriad of designs.

Primarily used as infill, rod is available with a .47" diameter in two lengths. A variety of crossbar holders and fittings allow you to customize the system for use with our round or square design balusters to meet your specific design needs.

For balusters and handrails, please consult the round or square railing sections.



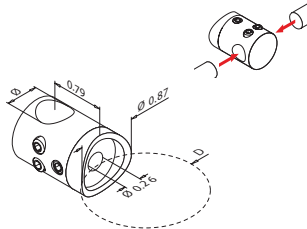
# STAINLESS STEEL ROD SYSTEM

## CROSSBAR HOLDERS

304 Stainless Steel - 316 Stainless Steel Also Available

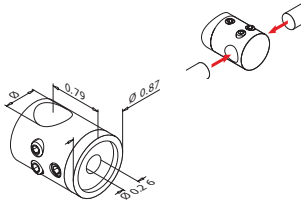
### Crossbar Holder - Center

Part #	Ø	D
R13-0831-038-12	.47"	1 1/2"
R13-0831-050-12	.47"	2"



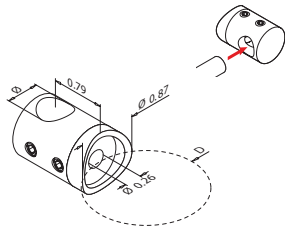
### Crossbar Holder - Center

Part #	Ø
R13-0831-000-12	.47"



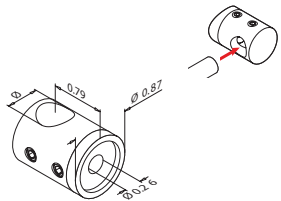
### Crossbar Holder - End

Part #	Ø	D
R13-0832-038-12	.47"	1 1/2"
R13-0832-050-12	.47"	2"



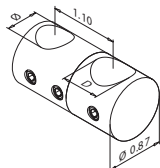
### Crossbar Holder - Left

Part #	Ø
R13-0832-000-12	.47"



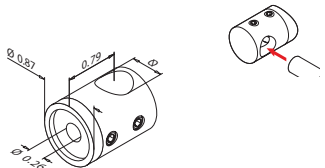
### Crossbar Holder

Part #	Ø	D
R13-0830-012-12	.47"	.47"



### Crossbar Holder - Right

Part #	Ø
R13-0833-000-12	.47"



Hardware sold separately

All drawings shown in inches



See Metric Converter, page 60

# STAINLESS STEEL ROD SYSTEM

## BAR STANDARDS

304 Stainless Steel - 316 Stainless Steel Also Available

### Bar Standards

Part #	Ø
R13-0850-038-12	1 1/2"
R13-0850-050-12	2"

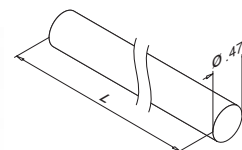


## ROD

304 Stainless Steel - 316 Stainless Steel Also Available

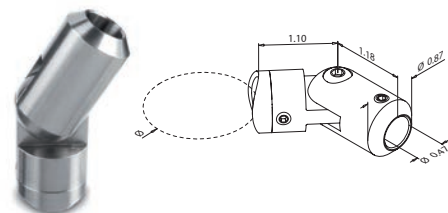
### .47" Rod

Part #	L
R13-0900-012-12	16.4'
R13-8925-012-12	8.2'

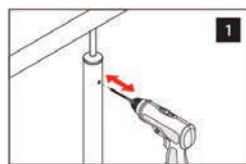


### Bar Standards

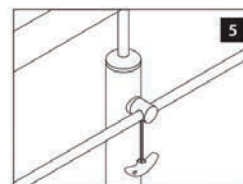
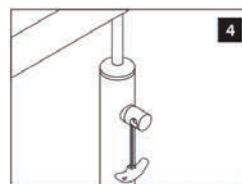
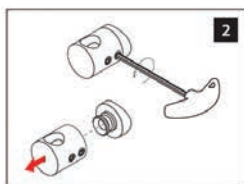
Part #	Ø
R13-0855-038-12	1 1/2"
R13-0855-050-12	2"



### Installation Information



Drill size: #20  
Tap size: 3/16-24



Hardware sold separately



# TUBING

Our tube has a far lower tolerance than any standard commercial tube. Even the welding seam of the tube has been specially adapted to our fittings.



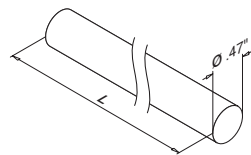
# TUBING

## TUBES & RODS

304 Stainless Steel - 316 Stainless Steel Also Available

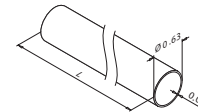
### .47" Rod

Part #	L
R13-0900-012-12	16.4'
R13-8925-012-12	8.2'



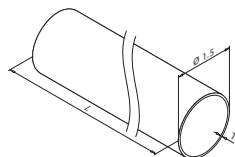
### 5/8" Tube

Part #	L
R13-0900-016-12	16.4'
R13-8925-016-12	8.2'



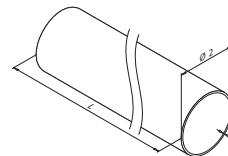
### 1 1/2" Tube

Part #	T	L
R13-0900-038-12	5/64"	16.4'
R13-8925-038-12	5/64"	8.2'



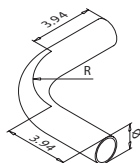
### 2" Tube

Part #	T	L
R13-0900-050-12	5/64"	16.4'
R13-8925-050-12	5/64"	8.2'



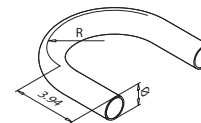
### 90° Angle Tube

Part #	Ø	R
R13-0903-038-12	1 1/2" x 5/64"	3 11/32"
R13-0903-050-12	2" x 5/64"	3 27/32"



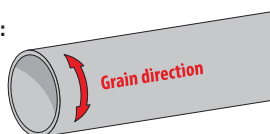
### 180° Angle Tube

Part #	Ø	R
R13-0906-038-12	1 1/2" x 5/64"	3 11/32"
R13-0906-050-12	2" x 5/64"	3 27/32"



### Information

Tube grain direction:  
it just looks better!



# GLASS CLAMPS

Our glass clamps are a very versatile part of our railing systems. Available in both flat and concave back, they can be used with either round or square balusters to mount glass or other architectural panels.



## Safety First!

When it comes to our glass solutions, one thing is perfectly clear: style and safety go hand in hand. All glass clamps are certified and grip the glass with immense strength.

Our glass clamps have been successfully tested with both tempered and laminated glass, and can be used with glass up to a width of 5.3 feet.



# GLASS CLAMPS

## ROUND GLASS CLAMPS

304 Stainless Steel - 316 Stainless Steel Also Available

### Round Glass Clamps (Model 22)



Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2206-000-12	Flat	--	1/4"
R13-2208-000-12	Flat	--	5/16"
R13-2210-000-12	Flat	--	3/8"
R13-2206-038-12	Tube	1 1/2"	1/4"
R13-2208-038-12	Tube	1 1/2"	5/16"
R13-2210-038-12	Tube	1 1/2"	3/8"
R13-2206-050-12	Tube	2"	1/4"
R13-2208-050-12	Tube	2"	5/16"
R13-2210-050-12	Tube	2"	3/8"



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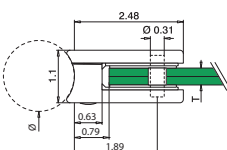
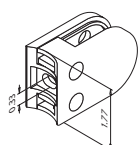
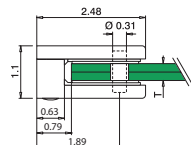
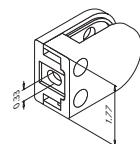
### Round Glass Clamps (Model 22)



Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2207-000-12	Flat	--	1/4"
R13-2209-000-12	Flat	--	5/16"
R13-2207-038-12	Tube	1 1/2"	1/4"
R13-2209-038-12	Tube	1 1/2"	5/16"
R13-2207-050-12	Tube	2"	1/4"
R13-2209-050-12	Tube	2"	5/16"



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"Why should I use a security plate or pin and when do I use them?"

In case of a fire, the clamping rubbers will melt down. There is no clamping pressure on the glass.

Situation A

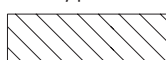
**No use for security plate or pin.**

The glass panel will drop on the floor, but stays in the glass clamps.



Situation B

The glass will fall down and can cause damage. Use a security plate or pin for safety. Never use a plastic pin, always use metal security pins.



### Round Glass Clamps (Model 25)



Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2512-000-12	Flat	--	1/2"
R13-2512-038-12	Tube	1 1/2"	1/2"
R13-2512-050-12	Tube	2"	1/2"



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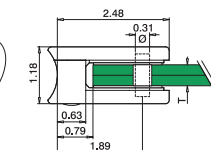
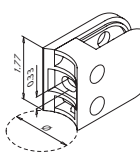
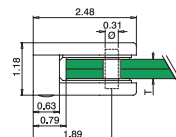
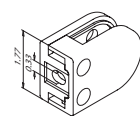
### Round Glass Clamps (Model 25)



Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2511-000-12	Flat	--	3/8"
R13-2513-000-12	Flat	--	1/2"
R13-2511-038-12	Tube	1 1/2"	3/8"
R13-2513-038-12	Tube	1 1/2"	1/2"
R13-2511-050-12	Tube	2"	3/8"
R13-2513-050-12	Tube	2"	1/2"

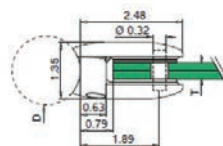
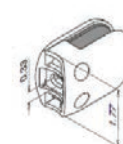
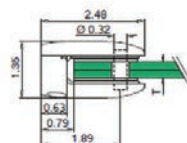
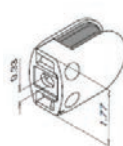


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### Round Glass Clamp (Model 28 Tempered)

Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2808-000-12	Flat	--	5/16"
R13-2810-000-12	Flat	--	3/8"
R13-2812-000-12	Flat	--	1/2"
R13-2808-048-12	Tube	1.9"	5/16"
R13-2810-048-12	Tube	1.9"	3/8"
R13-2812-048-12	Tube	1.9"	1/2"



Hardware sold separately



# GLASS CLAMPS

## SQUARE GLASS CLAMPS

304 Stainless Steel - 316 Stainless Steel Also Available

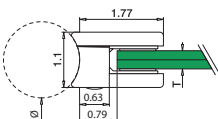
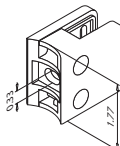
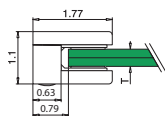
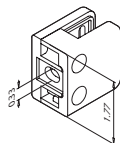
### Square Glass Clamps (Model 21)

Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2106-000-12	Flat	--	1/4"
R13-2108-000-12	Flat	--	5/16"
R13-2106-038-12	Tube	1 1/2"	1/4"
R13-2108-038-12	Tube	1 1/2"	5/16"



### Square Glass Clamps (Model 21)

Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2107-000-12	Flat	--	1/4"
R13-2109-000-12	Flat	--	5/16"
R13-2107-038-12	Tube	1 1/2"	1/4"
R13-2109-038-12	Tube	1 1/2"	5/16"



### Square Glass Clamps (Model 26)

Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2608-000-12	Flat	--	5/16"
R13-2610-000-12	Flat	--	3/8"
R13-2612-000-12	Flat	--	1/2"

R13-2608-038-12*	Tube	1 1/2"	5/16"
R13-2610-038-12*	Tube	1 1/2"	3/8"
R13-2612-038-12*	Tube	1 1/2"	1/2"
R13-2608-050-12	Tube	2"	5/16"
R13-2610-050-12	Tube	2"	3/8"
R13-2612-050-12	Tube	2"	1/2"



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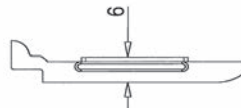
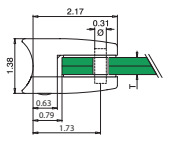
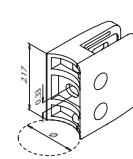
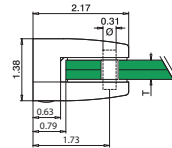
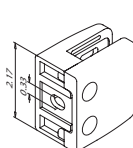
### Square Glass Clamps (Model 26)

Part #	Mount Type	Tube (Ø)	Glass (T)
R13-2609-000-12	Flat	--	5/16"
R13-2611-000-12	Flat	--	3/8"
R13-2613-000-12	Flat	--	1/2"

R13-2609-038-12*	Tube	1 1/2"	5/16"
R13-2611-038-12*	Tube	1 1/2"	3/8"
R13-2613-038-12*	Tube	1 1/2"	1/2"
R13-2609-050-12	Tube	2"	5/16"
R13-2611-050-12	Tube	2"	3/8"
R13-2613-050-12	Tube	2"	1/2"



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Removable plate can be used to meet code requirements when glass overhangs an occupied area

Hardware sold separately



All drawings shown in inches



See Metric Converter, page 60

# GLASS CLAMPS

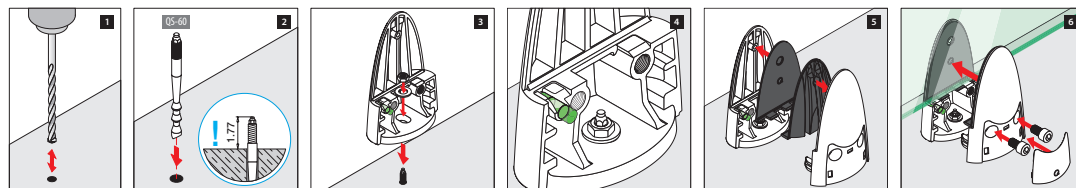
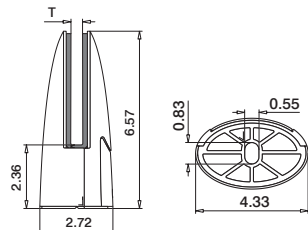
## FLOOR GLASS CLAMPS

316 Stainless Steel

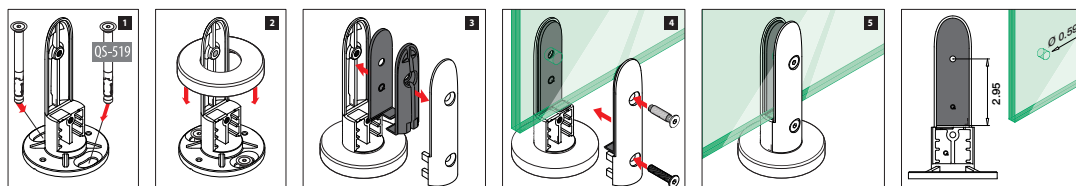
### Floor Glass Clamp

Part #  
R14-6012-000-12

Glass (T)  
1/2"



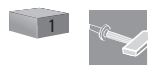
Security pin is optional.



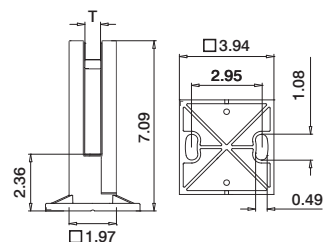
### Floor Glass Clamp

Part #  
R14-6212-000-12

Glass (T)  
1/2"

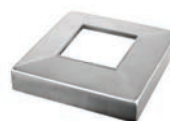


NEW

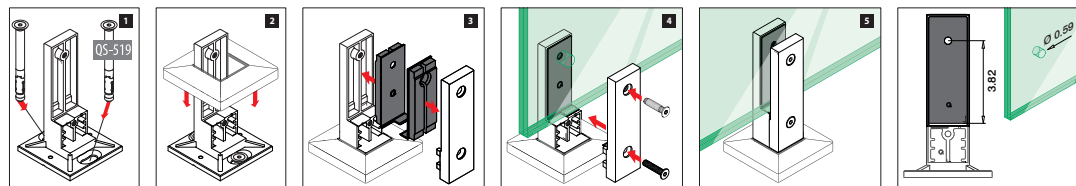
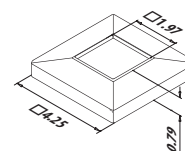


Part #  
R14-4511-050-12

H  
7.9"



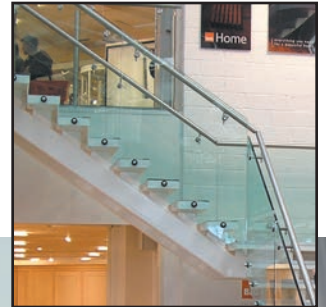
NEW



Hardware sold separately

# FASCIA MOUNTS & FLOATING EFFECTS

The look of floating glass is the ultimate in minimalist design. Create glass railing that appears to float above the ground or in front of the base. Our full line of fascia mount adapters allow you to do just that, showcasing the beauty of the glass and the view.



All drawings shown in inches



See Metric Converter, page 60

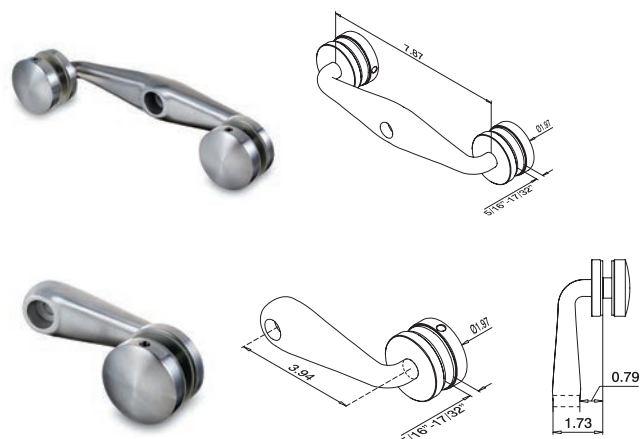
# FASCIA MOUNTS & FLOATING EFFECTS

## GLASS ADAPTERS & COMPONENTS

304 Stainless Steel - 316 Stainless Steel Also Available

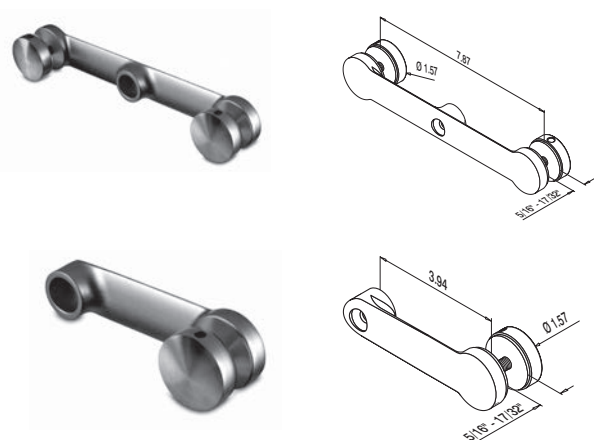
### Round Glass Spider Adapters

Part #	Description
R13-0750-000-12	Spider Connector - Double
R13-0751-000-12	Spider Connector - Single



### Round Glass Spider Adapters

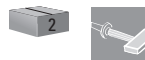
Part #	Description
R13-0752-000-12	Spider Connector - Double
R13-0753-000-12	Spider Connector - Single



### Tube Mount Fitting

For use with round glass spider adapters.

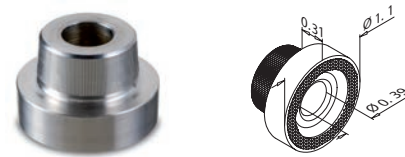
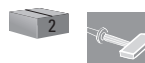
Part #	Mount Type	Tube (Ø)
R13-0724-038-12	Tube	1 1/2"
R13-0724-050-12	Tube	2"



### Flat Mount Fitting

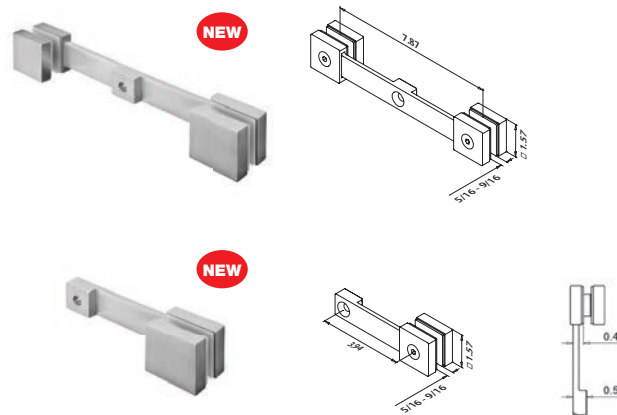
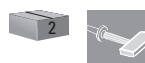
For use with round glass spider adapters.

Part #	Mount Type
R13-0724-000-12	Flat



### Square Glass Spider Adapters

Part #	Description
R13-4752-000-12	Spider Connector - Double
R13-4753-000-12	Spider Connector - Single



Hardware sold separately



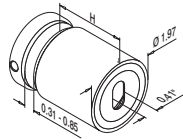
# FASCIA MOUNTS & FLOATING EFFECTS

## STAND OFFS

304 Stainless Steel - 316 Stainless Steel Also Available

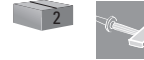
### Stand Offs

Part #	H
R13-0749-300-12	1 3/16"
R13-0749-400-12	1 9/16"

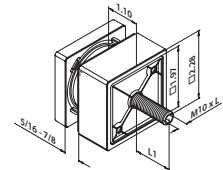


### Square Stand Offs

Part #	L	L1
R14-4747-300-12	3 1/8"	3/4"

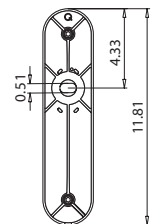
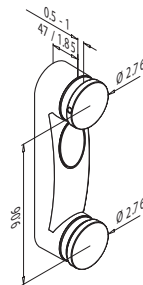


NEW



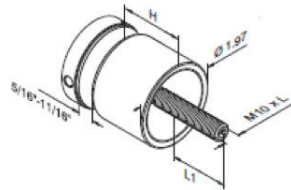
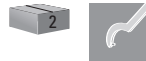
### Dual Stand Offs

Part #	Description
R13-0760-000-12	Round Fascia Mount Adapter, Large
R13-0762-000-12	Round Fascia Mount Adapter, Small
R14-4762-000-12	Square Fascia Mount Adapter



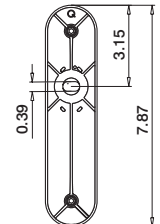
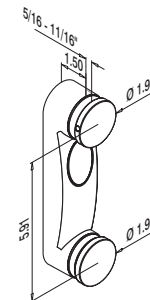
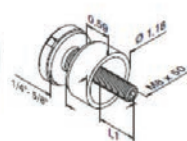
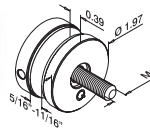
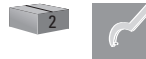
### Stand Offs

Part #	H
M13-0747-500-12	1-15/16"



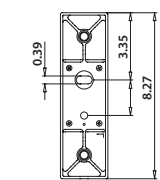
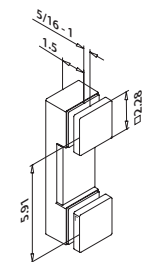
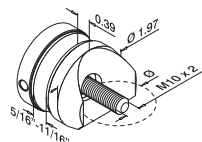
### Flat Fittings

Part #	Mount Type
R13-0747-000-12	Flat
R14-0746-000-12	Flat

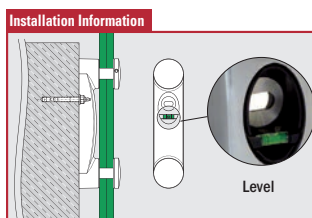


### Tube Fitting

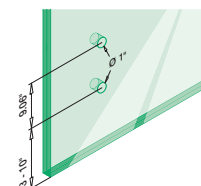
Part #	Mount Type	Tube (Ø)
R13-0747-038-12	Tube	1 1/2"
R13-0747-050-12	Tube	2"



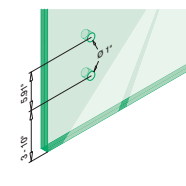
Hardware sold separately



MOD 0760



MOD 4762



All drawings shown in inches



See Metric Converter, page 60

# QUICKRAIL

When your project calls for a symmetrical, industrial look with lots of sharp corners and visible parts, Quickrail delivers. Made from the perfect balance of anodized aluminum and satined stainless steel, Quickrail easily accommodates either glass or rod infill.



Like all of our product lines, Quickrail is designed for both indoor and outdoor uses. From office buildings to apartment complexes, balconies to separations, architects worldwide are incorporating this industrial look into their designs.

Why is it called “Quickrail”? The reason is concealed beneath the clean, seamless connection to the top rail. Inside each

baluster post is a hidden track. For installation, the components that attach the infill to the posts simply slide onto the posts and lock in place. No drilling, screwing, or welding required.

## HANDRAIL BRACKETS, BALUSTER POSTS & TUBES

304 Stainless Steel - 316 Stainless Steel Also Available

### Handrail Bracket, adjustable

**Part #**  
R13-9310-042-12

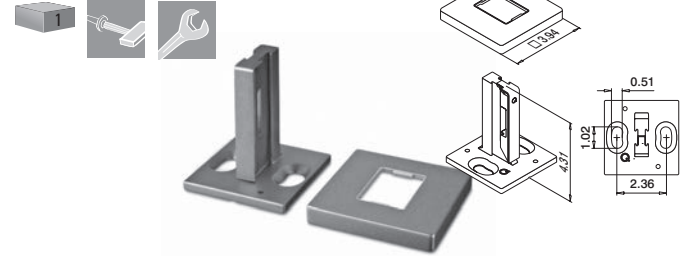
**Ø**  
1 1/2"

**H**  
2 15/16"



### Baluster Bracket-Top Mount

**Part #**  
R14-9011-050-12



### Handrail Bracket – Offset

**Part #**  
R13-9300-042-12

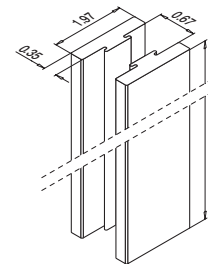
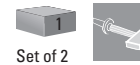
**Ø**  
1-1/2"



### Baluster Posts

**Part #**  
R16-0545-050-18  
R16-0546-050-18

**H**  
39 3/8"  
47 1/4"



### Baluster Bracket-Core Drill

**Part #**  
R14-9012-050-12

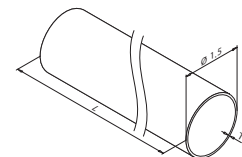


### 1 1/2" Tube

**Part #**  
R13-0900-038-12  
R13-8925-038-12

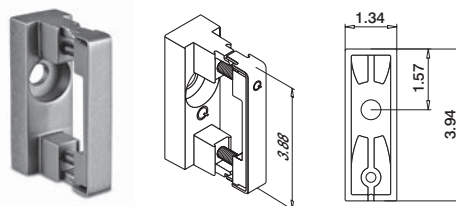
**T**  
5/64"  
5/64"

**L**  
16.4'  
8.2'



### Baluster Bracket-Fascia Mount

**Part #**  
R14-9021-050-12

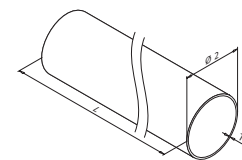


### 2" Tube

**Part #**  
R13-0900-050-12  
R13-8925-050-12

**T**  
5/64"  
5/64"

**L**  
16.4'  
8.2'



Hardware sold separately

All drawings shown in inches



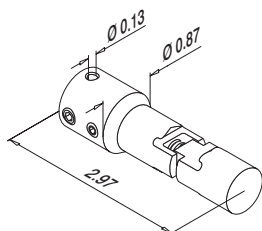
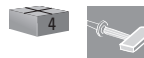
See Metric Converter, page 60

## CABLE SYSTEMS

304 Stainless Steel - 316 Stainless Steel Also Available

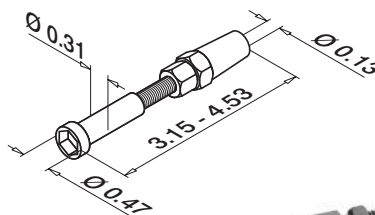
### Cable System - Center

**Part #**  
R14-9450-050-12



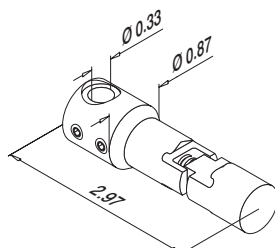
### Cable System - End

**Part #**  
R14-7500-003-12



### Cable System - Right

**Part #**  
R14-9453-050-12



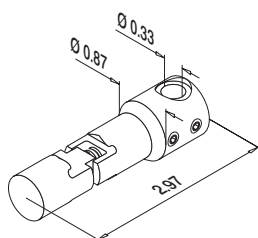
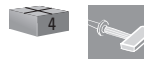
### Cable

Part #	Ø	L
R14-7900-003-12	1/8"	33'
R14-7900-053-12	1/8"	66'
R14-7900-103-12	1/8"	333'



### Cable System - Left

**Part #**  
R14-9452-050-12



### Cable Cutter

**Part #**  
R14-7800-000-00

**Description**  
Cable Cutter

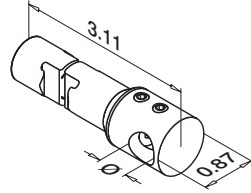
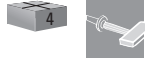


## CROSSBAR HOLDERS, RODS & GLASS ADAPTERS

304 Stainless Steel - 316 Stainless Steel Also Available

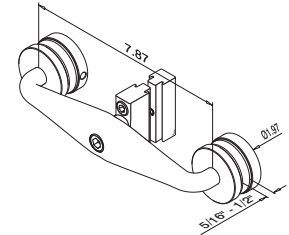
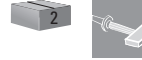
### Crossbar Holder

Part #	Description	Ø
R14-9100-050-12	1 set screw	.47"



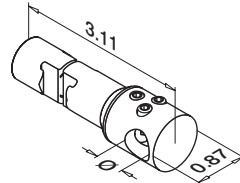
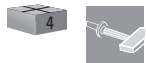
### Glass Adapters - Double Spider

Part #
R13-9110-050-12



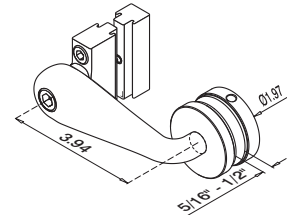
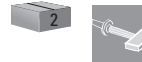
### Crossbar Holder

Part #	Description	Ø
R14-9101-050-12	2 set screw	.47"



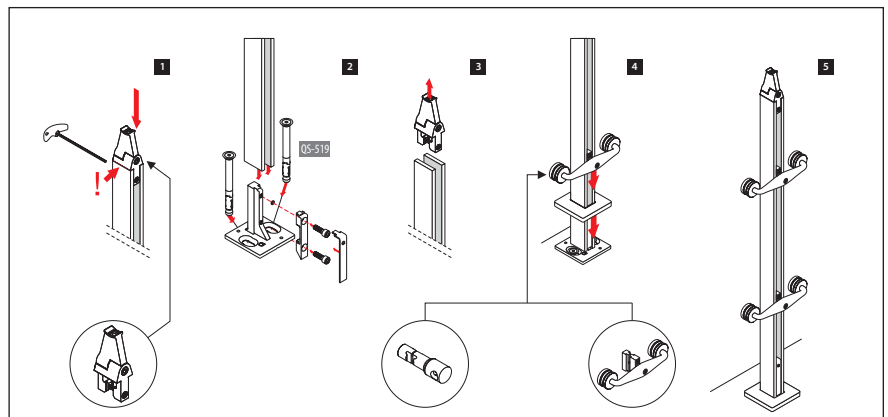
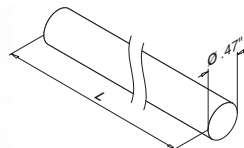
### Glass Adapters - Single Spider

Part #
R13-9111-050-12



### .47" Rod

Part #	L
R13-0900-012-12	16.4'
R13-8925-012-12	8.2'



All drawings shown in inches



See Metric Converter, page 60



ACCESSORIES

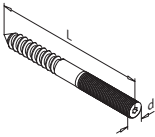
SCREWS

ACCESSORIES



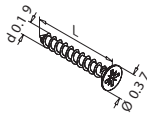
Hanger Bolt

Part #	d	L
R93-0100-850-14	M8 x 1/2"	2"
R93-0100-890-14	M8 x 1/2"	3.15"



Screw

Part #	L
R93-0220-525-14	1"



## SCREWS

### Screw - coarse thread

Part #	d	D	L
R94-0511-516-14	3/16"	3/8"	5/8"

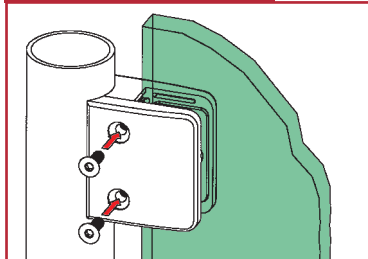


### Screw

Part #	Ø	D	L	Model
R93-0670-616-14	1/2"	M6	5/8"	20, 21, 22, 25
R93-0670-620-14	1/2"	M6	13/16"	26



### Installation Information



### Screw - coarse thread

Part #	Ø	D	L
R94-0670-520-14	3/8"	NR.10-	3/4"
R94-0670-625-14	1/2"	NR.10-	1"
R94-0670-630-14	1/2"	NR.10-	1 1/4"
R94-0670-825-14	5/8"	5/16"	1"
R94-0670-840-14	5/8"	5/16"	1 1/2"



### Screw - coarse thread

Part #	Ø	D	H	L
R94-0680-620-13	1/2"	1/4"	1/4"	3/4"
R94-0680-660-13	1/2"	1/4"	1/4"	2 1/4"
R94-0681-045-13	5/8"	3/8"	3/8"	1 3/4"

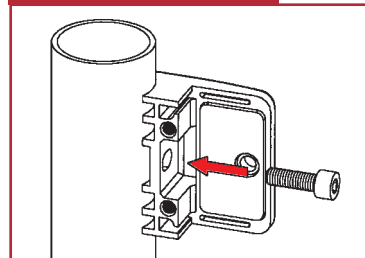


### Screw - coarse thread

Part #	Ø	D	H	L
R94-0680-820-14	15/32"	5/16"	5/16"	3/4"



### Installation Information



# ACCESSORIES

## MISCELLANEOUS

### Stainless Steel Glue

Part #	Description
R19-1331-000-00	SS High Strength Fixative, 1.69 fl. oz.



Connections per bottle		
5/8"	1 1/2"	2"
150	60	50

### Glass Silicone

Part #	Description
R19-1340-310-00	Glass silicone, black with nozzle included, 10.5 fl. oz.



### Stainless Steel Cleaner

Part #	Description
R19-0601-000-00	SS Protecting Spray, 13.5 fl. oz.



### Stainless Steel Ultra Clean

Part #	Description
R19-0610-000-00	SS Cleaner, 16.9 fl. oz.



#### Installation Information



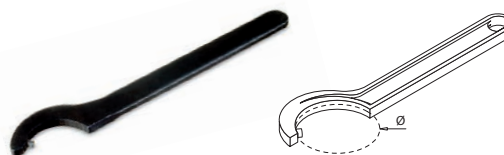
### Hex Drive Wrench Set

Part #	Description
R19-1701-000-00	Wrench Set



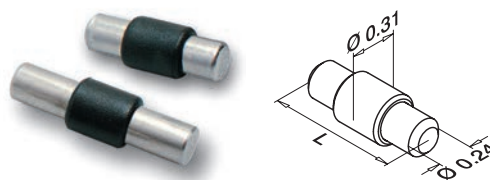
### Spanner Wrench

Part #	Ø
R19-0702-030-00	63/64" - 1 1/10"
R19-0702-050-00	1 3/4" - 2"
R19-0702-060-00	2 1/4" - 2 1/2"



### Glass Clamp Security Pins

Part #	For Glass Clamp Model	L
R19-5015-022-00	22	7/8"
R19-5015-025-00	25, 26	63/64"
R19-5015-030-00	Floor Clamp	1 3/16"



### Adhesive Tape

Double sided glazing tape to work as a protective barrier when mounting top rails. Stocked in 75' rolls.

Part #	Dimensions
V50-0013	1/8" x 1 1/2" x 75'

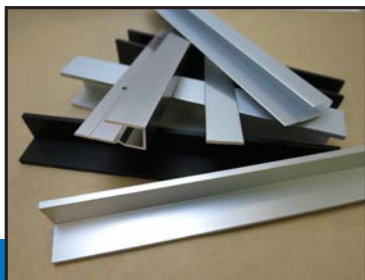


# US STANDARD & METRIC EQUIVALENTS

## METRIC CONVERSION CHART

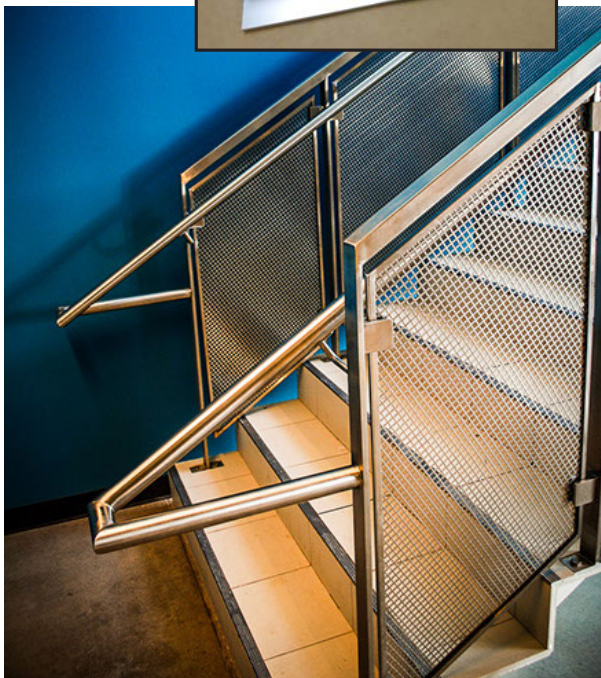
For your convenience, please find below a metric converter chart to assist you with the measurements of all items in the catalog.

Fraction (inches)	Decimal (inches)	Millimeters (mm)	Fraction (inches)	Decimal (inches)	Millimeters (mm)	Foot	Meter
1/64	.015625	0.39687	33/64	.515625	13.09671	2	.60960
1/32	.03125	0.79374	17/32	.53123	13.49362	4	1.21920
3/64	.046875	1.19061	35/64	.546875	13.89045	6	1.82880
1/16	.0625	1.58748	9/16	.5625	14.28737	8	2.43840
5/64	.078125	1.98435	37/64	.578125	14.68419	10	3.04800
3/32	.09375	2.38123	19/32	.59375	15.08111	12	3.65760
7/64	.109375	2.77809	39/64	.609375	15.47793	14	4.26720
1/8	.125	3.17497	5/8	.625	15.87485	16	4.87680
9/64	.140625	3.57183	41/64	.640625	16.27167	18	5.48640
5/32	.15625	3.96871	21/32	.65625	16.66859	20	6.09600
11/64	.171875	4.36557	43/64	.671875	17.06541		
3/16	.1875	4.76245	11/16	.6875	17.46234		
13/64	.203125	5.15931	45/64	.703125	17.85915		
7/32	.21875	5.55620	23/32	.71875	18.25608		
15/64	.234375	5.95305	47/64	.734375	18.65289		
1/4	.25	6.34994	3/4	.750	19.04982		
17/64	.265625	6.74679	49/64	.765645	19.44663		
9/32	.28125	7.14368	25/32	.78125	19.84356		
19/64	.296875	7.54053	51/64	.796875	20.24037		
5/16	.3125	7.93743	13/16	.8125	20.63731		
21/64	.328125	8.33427	53/64	.828125	21.03411		
11/32	.34375	8.73117	27/32	.84375	21.43105		
23/64	.359375	9.12801	55/64	.859375	21.82785		
3/8	.375	9.52491	7/8	.875	22.22479		
25/64	.390625	9.92175	57/64	.890625	22.62159		
13/32	.40625	10.31865	29/32	.90625	23.01853		
27/64	.421895	10.71549	59/64	.921875	23.41533		
7/16	.4375	11.11240	15/16	.9375	23.81228		
29/64	.453125	11.50923	61/64	.953125	24.20907		
15/32	.46875	11.90614	31/32	.96875	24.60602		
31/64	.484375	12.30297	63/64	.984375	25.00281		
1/2	.5	12.69988	1	1.0	25.39977		



## CUSTOM CAPABILITIES

Morse Industries provides a total solution for your extrusion, Railing Components, Shower Hardware, and/or Cast Stainless needs. Morse makes thousands of special order items available to you through our worldwide network. If we can't special order the product you are looking for, we help you take advantage of the global marketplace by facilitating the design, engineering, and manufacturing of your custom product.





## Railing Components & Hardware

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You've come to rely on Morse Industries to supply the best Glass Railing Systems and Stainless Steel Railing components in the industry. We pride ourselves in offering great prices without sacrificing the high quality of our products. If you are looking for railing components that Morse Industries doesn't stock, ask us about our special order and custom manufacturing capabilities. We can offer you a tremendous selection of items beyond those which we typically stock.

## Aluminum Extrusions

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Our goal is to give our customers a feel for what is required to have a custom profile produced. Lead times must be calculated after all factors are considered.

**Alloys** - The most common alloys are in the 6000 series. Common tempers include T1, T4, T5, T6, and T832.

**Finishes** - We offer a variety of finishes including Anodized, Anodized and bright dip, Two Step hard coat anodized, Color Tinting, Electro-Static Wet Paint, Powder Coat, Mill Finish (as extruded), Buffing, Brushing, Texturing. Many of these finishes are available in stock colors or can be custom matched to the color of your choice. Anodized clear and bright dip.

**Fabrication** - Cutting to length, Drill and Countersink, Punch and slot, drill and tap, notching, mitered cuts, stamping, etc.

## Cast Stainless Steel

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**Alloys** - The most common alloys are type 304 and type 316. Low carbon versions are also available to reduce slag when welding.

**Dies Creation/Casting** - Most stainless steel cast items are made using the "lost wax" process. A mold is created to form a wax replica of your item. That wax is then encased in sand. When molten stainless steel is poured in, the wax is melted and your stainless steel item remains.

**Finishing** - Cast stainless steel items are typically polished to a mirror finish. Other finishes, including paint or powder coating may also be available upon request

**Fabrication/Assembly** - If your cast item requires further fabrication or assembly, Morse Industries can provide you solutions for that as well.

## Shower Hardware

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If you have an existing piece of shower hardware or an idea for a new piece, we can help you obtain it at an excellent cost while insuring top quality standards are met. Morse Industries can source or manufacture hinges, clamps, pulls, towel bars, etc. Ask us how we can provide a solution for your individual needs.

## Packaging

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We will work with you to insure that your custom item is packaged to your specifications and to avoid the vast majority of possible shipping damage. Common packaging options include: cardboard cartons or tubes, individual poly sleeves, paper interleaves, spiral wrap (carton or pallet), heat-shrink wrap and more.

## Lead Times

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As can be expected of any custom or special order item, lead times may be significant. It's important to consider that your item may require significant time for design/engineering, die or mold creation, production, fabrication, and transportation. Our sales and customer service staff will always be up front about the time your project is expected to take. We will also update you frequently so you are aware of any updated timelines or challenges.

# REFERENCE MATERIALS

Morse Industries

## TERMS, CONDITIONS OF SALE AND LIMITED WARRANTY

1. **This Is Entire Agreement.** This Invoice constitutes the entire agreement between Morse Industries ("Morse") and the Buyer, and it is a complete merger of all prior negotiations and agreements as to the products sold to Buyer by Morse listed on this Invoice. This Invoice supersedes any prior or contemporaneous oral, written or implied agreements about the products listed on this Invoice.
2. **Buyer's Acceptance of Terms.** Buyer's acceptance of these Terms, Conditions of Sale and Limited Warranty (collectively, the "Terms") will be indicated by: (1) Accepting the products delivered, or (2) failing to notify Morse within three days of delivery of any objection to the Terms. Unless buyer explicitly rejects all Terms or explicitly objects to specific terms, any contrary term contained in any document submitted by Buyer shall not be construed as a rejection; and Buyer's acceptance of products or failure to notify Morse explicitly of such a rejection or objection shall constitute acceptance of the Terms by Buyer.
3. **Warranty Covers Only Specified Intended Uses.** Morse standard products are warranted for the intended uses specified in current Morse product descriptions, brochures and catalogs (including, but not limited to, catalogs for marine products and architectural products). Regularly stocked standard products not included in Morse product descriptions, brochures or catalogs are warranted only for normal uses of such products in the ordinary course. Morse products that are custom-made to Buyer's specifications are warranted only for the intended uses as specified in writing in the specification included with this Invoice. There is no warranty for unintended uses, or for products damaged by misuse, unreasonable or improper use, accident, improper installation or fabrication, unauthorized modifications or repairs, lack of proper cleaning or maintenance, normal wear and tear, or other causes not due solely to defects in materials or workmanship. Buyer warrants that it alone has selected the products to be furnished by Morse hereunder and stipulates that it is not relying on Morse's skill or judgment to select such products. Buyers of custom-made products additionally warrant that they alone have selected the products to be furnished by Morse hereunder and stipulate that they are not relying on Morse's skill or judgment to select such products.
4. **Morse Limited Warranty.**
  - a. **Conformity with Specifications.** Morse warrants that its standard products conform to the specifications included in current Morse product descriptions, brochures and catalogs (dimensions, materials and tested capacities) within industry-standard tolerances. As to custom-made products and standard or regularly stocked products altered by Morse at Buyer's direction, Morse warrants that such products also conform (within industry-standard tolerances) to the written specifications included with this Invoice.
  - b. **Freedom from Defects.** Further, Morse warrants that its products will be free from defects in materials and workmanship, under normal use and service, for a period of one year from the invoice date.
  - c. **Warranty Applies Only to Buyer.** This limited warranty applies only to the Buyer, not to any remote consumers or any other persons or entities other than the Buyer.
  - d. **Sole Remedy is Replacement of Defective Product.** Buyer's sole remedy under the limited warranty is replacement without charge of the defective product, as more fully detailed below. When the return of defective products is authorized by Morse, it will reimburse Buyer for the cost of standard shipping to return defective products to Morse, and it will ship replacement products to Buyer at Morse's expense. Any expenses involved in the removal or reinstallation of defective products are not covered by this warranty.
  - e. **"Morse Limited Warranty" Defined.** The above provisions (sub-paragraphs a-d) are referred to hereafter as the "Morse Limited Warranty."

EXCEPT FOR THE MORSE LIMITED WARRANTY STATED ABOVE, MORSE MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS. THE MORSE LIMITED WARRANTY DOES NOT INCLUDE A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND THE DURATION OF ANY SUCH WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE THAT MAY BE IMPOSED BY LAW SHALL BE THE SAME AS THE MORSE LIMITED WARRANTY AND TOTALLY EXCLUDED THEREAFTER. Some states in the United States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary from state to state.
5. **Morse Limited Warranty Excludes Consequential Damages.** THE REPLACEMENT OF DEFECTIVE PRODUCTS, AS DETAILED BELOW, SHALL BE THE SOLE REMEDY FOR THE BUYER AND THE SOLE LIABILITY OF MORSE FOR ANY BREACH OF WARRANTY. UNDER ALL CIRCUMSTANCES, MORSE SHALL NOT BE LIABLE FOR THE LOSS OF TIME, LOSS OF USE, COSTS TO REMOVE OR REPLACE PRODUCTS, EXPEDITED SHIPPING COSTS, INCONVENIENCE OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OR DAMAGE TO OTHER PERSONAL PROPERTY OR LOSS OF REVENUE, ALLEGEDLY CAUSED BY A DEFECTIVE MORSE PRODUCT. Some states in the United States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. The Morse Limited Warranty gives you specific legal rights, and you may also have other rights that vary from state to state.
6. **Replacement Products Covered for Balance of One-Year Warranty Period.** If allegedly defective products are returned to Morse and replaced under the Morse Limited Warranty, they shall become the property of Morse. The replacement of products will not extend the term of the warranty, but the replaced product will be covered for the balance of the original warranty period.
7. **Any Product Return Must Have Prior Return Authorization.**
  - a. **Non-Defective Products:** Morse will accept returns of standard, non-defective products only in "as-originally-shipped" condition. Morse will not accept returns of non-defective products that are custom-made, altered by Morse to Buyer's specifications, altered by Buyer, or not currently stocked by Morse. Such returns require a return merchandise authorization and are subject to a 20% re-stocking charge; otherwise, the returned products will be re-shipped to the Buyer at the Buyer's expense.
  - b. **Defective Products:** Credit for defective products will not be issued without Morse's return authorization. To obtain authorization, return requests must be mailed, faxed or e-mailed to our offices, and they must include an itemized list of products to be returned, the reasons for return, and the date and number of the Morse invoice.
8. **No Duty to Upgrade.** Morse reserves the right to improve its products through changes in design, materials or manufacturing processes, without being obligated to incorporate such changes in products previously manufactured by it, or to notify Buyers or subsequent users of its previously manufactured products of such later changes.
9. **Warranty Dispute Procedures.** Any court action concerning the Terms, including, but not limited to, the Morse Limited Warranty, must be filed in the courts located in King County, Washington, the laws of which (excluding its choice of law rules) shall be applied to any claim arising under the Terms, including, but not limited to, the Morse Limited Warranty. Should the court determine that Morse was the substantially prevailing party, Buyer agrees to reimburse Morse for its reasonable expenses, including attorneys' and experts' fees, incurred in defending against Buyer's claims.

## CARE AND CLEANING OF STAINLESS STEEL

### Introduction

Cleanliness and stainless steel are closely related and, in many applications, each is dependent upon the other. In the handling of food, chemicals, pharmaceuticals and in the use of stainless steel as a construction material (roofs, wall panels, entry ways, signs, etc. ), stainless steel provides the degree of corrosion resistance that is necessary to prevent product contamination or surface rusting. However, stainless steel performs best when clean - cleanliness is essential for maximum resistance to corrosion.

This handbook describes various practices for cleaning stainless steel during manufacture and in use. This includes methods for removing free-iron contamination on stainless steel surfaces that may have been picked up from metalworking tools; and for removing general accumulation of dirt, grime and surface stains that occur during normal handling and exposure to the elements.

The reader should keep in mind that there are few specific rules for a cleaning procedure. Accordingly, the methods discussed in this handbook are suggestions. Each manufacturer or user, after obtaining competent advice with respect to their individual requirements, should select methods appropriate to those requirements.

### What is Stainless Steel?

Stainless steel is not a single alloy, but rather the name applies to a group of iron-based alloys containing a minimum 10.5% chromium. Other elements are added and the chromium content increased to improve the corrosion resistance and heat resisting properties, enhance mechanical properties, and/or improve fabricating characteristics. There are over 50 stainless steel grades that were originally recognized by the American Iron and Steel Institute (AISI). Three general classifications are used to identify stainless steel. They are:

1. Metallurgical structure.
2. The AISI numbering system (200, 300 and 400 series numbers).
3. The Unified Numbering System, which was developed by the American Society for Testing Materials (ASTM) and the Society of Automotive Engineers (SAE) to apply to all commercial metals and alloys.

The various types of stainless steel are detailed in a designer handbook, "Design Guidelines for the Selection and Use of Stainless Steel," available from the Specialty Steel Industry of North America (SSINA). Several other publications are also available, including: "Stainless Steel Fabrication", "Stainless Steel Fasteners", "Stainless Steel Finishes", "Stainless Steel Specifications", and "Stainless Steel Architectural Facts", to mention a few.

### Alloy Types

304 is the basic chromium-nickel austenitic stainless steel and has been found suitable for a wide range of applications. It is the most readily available in a variety of product forms. This grade is easy to form and fabricate with excellent resistance to corrosion.

304L is the low carbon version of 304. It is sometimes specified where extensive welding will be done.

316 offers more corrosion-resistance through the addition of molybdenum. This grade is desirable where the possibility of severe corrosion exists, such as heavy industrial atmospheres and marine environments.

316L is the low carbon version of 316.

430 is a straight chromium ferritic stainless steel with lower corrosion resistance than the 300 series, It is principally employed for interior use.

## CARE AND CLEANING OF STAINLESS STEEL

### Forms and Finishes

Sheet, strip, plate and bar forms are shown in Table 1. Sheet finishes are shown in Table 2. Bar product conditions and finishes are shown in Table 3. Plate is shown in Table 4. In addition to the common mill and polished finishes, there are numerous special finishes used for architectural applications. Some of the more delicate finishes require special precautions when cleaning and the advice of the supplier should be obtained. The most common special finishes are shown in Table 5.

### Cleaning of Stainless Steel

Stainless steels need to be cleaned for aesthetic considerations and to preserve corrosion resistance. Stainless steel is protected from corrosion by a thin layer of chromium oxide. Oxygen from the atmosphere combines with the chromium in the stainless steel to form this passive chromium oxide film that protects from further corrosion. Any contamination of the surface by dirt, or other material, hinders this passivation process and traps corrosive agents, reducing corrosion protection. Thus, some form of routine cleaning is necessary to preserve the appearance and integrity of the surface. Stainless steels are easily cleaned by many different methods. They actually thrive with frequent cleanings, and, unlike some other materials, it is impossible to "wear out" stainless steel by excessive cleaning. The effect of surface/pattern roughness, grain/pattern orientation, and designs that allow for maximum rain cleaning (exterior applications) should be considered.

### Types of Surface Contaminants

**DIRT:** Like any surface that is exposed to the environment, stainless steel can get dirty. Dirt and soil can consist of accumulated dust and a variety of contaminants that come from many sources, ranging from the wind to everyday use. These contaminants will vary greatly in their effect on appearance and corrosivity and ease of removal. While some may be easily removed, others may require specific cleaners for effective removal. It may be necessary to identify the contaminate or experiment with various cleaners. Frequently, warm water with or without a gentle detergent is sufficient. Next in order are mild non-scratching abrasive powders such as typical household cleaners. These can be

**Table 1 Classification of Stainless Steel Product Forms**

Item	Description	Dimensions Thickness	Width	Diameter or Size
<b>Sheet</b>	Coil and cut lengths: Mill finishes Nos. 1, 2D, & 2B Pol. finishes Nos. 3, 4, 6, 7 & 8	under 3/16" (4.76mm) under 3/16" (4.76mm)	24" (609.6mm) & over all widths	_____
<b>Strip</b>	Cold finished, coils or cut lengths Pol. finishes Nos. 3, 4, 6, 7 & 8	under 3/16" (4.76mm) under 3/16" (4.76mm)	under 24" (609.6mm) all widths	_____
<b>Plate</b>	Flat rolled or forged	3/16" (4.76mm) & over	over 10" (254mm)	_____
<b>Bar</b>	Hot finished rounds, squares, octagons and hexagons	_____	_____	1/4" (6.35mm) & over
	Hot finished flats	1/8" (3.18mm) to 8" (203mm) incl.	1/4" (6.35mm) to 10" (254mm) incl.	_____
	Cold finished rounds, squares, octagons and hexagons	_____	_____	over 1/8" (3.18mm)
	Cold finished flats	1/8" (3.18mm) to 4 1/2" (114mm)	3/8" (9.53mm) to 4 1/2" (114mm)	_____
<b>Wire</b>	Cold finishes only: (in coil) Round, square, octagon, hexagon, and flat wire	under 3/16" (4.76mm)	under 3/8" (9.53mm)	_____
<b>Pipe &amp; Tubing</b>	Several different classifications, with differing specifications, are available. For information on standard sizes, consult your local Steel Service Center or the SSINA.			
<b>Extrusions</b>	Not considered "standard" shapes, but of potentially wide interest. Currently limited in size to approximately 6 1/2" (135.1mm) diameter, or structurals.			

**Table 2 Standard Mechanical Sheet Finishes**

Unpolished or Rolled Finishes:	
<b>No. 1</b>	A rough, dull surface which results from hot rolling to the specified thickness followed by annealing and descaling.
<b>No. 2D</b>	A dull finish which results from cold rolling followed by annealing and descaling, and may perhaps get a light roll pass through unpolished rolls. A 2D finish is used where appearance is not of primary concern.
<b>No. 2B</b>	A bright, cold-rolled finish resulting in the same manner as No. 2D finish, except that the annealed and descaled sheet receives a final light roll pass through polished rolls. This is the general-purpose cold-rolled finish that can be used as is or as a preliminary step to polishing.
Polished Finishes:	
<b>No. 3</b>	An intermediate polish surface obtained by finishing with a 100-grit abrasive. Generally used where a semifinished polished surface is required. A No. 3 usually receives additional polishing during fabrication.
<b>No. 4</b>	A polished surface obtained by finishing with a 120-150 mesh abrasive, following initial grinding with coarser abrasives. This is a general-purpose bright finish with a visible "grain" which prevents mirror reflection.
<b>No. 6</b>	A dull satin finish having lower reflectivity than No. 4 finish in a medium of abrasive and oil. It is used for architectural applications and ornamentation where a higher luster is undesirable, and to contrast with brighter finishes.
<b>No. 7</b>	A highly reflective finish that is obtained by buffing finely ground surfaces but not to the extent of completely removing the "grit" lines. It is chiefly for architectural and ornamental purposes.
<b>No. 8</b>	The most reflective surface obtained by polishing with successively finer abrasives and buffing extensively until all grit lines from preliminary grinding operations are removed. It is used for applications such as mirrors and reflectors.

CARE AND CLEANING OF STAINLESS STEEL

used with warm water, bristle brushes, sponges or clean cloths. Ordinary carbon steel brushes or steel wool should be avoided as they may leave particles embedded on the surface which can lead to RUSTING. For more aggressive cleaning, a small amount of vinegar can be added to the scouring powder. Cleaning should always be followed by rinsing in hot water. When water contains mineral solids, which leave water spots, it is advisable to wipe the surface completely with dry towels.

**FINGERPRINTS AND STAINS:** Fingerprints and mild stains resulting from normal use in consumer and architectural applications are the most common surface contaminants. Fortunately, these usually affect only appearance and seldom have an effect on corrosion resistance. They are easy to remove by a variety of simple cleaning methods. Fingerprints are probably the most troublesome marks to remove from the surface of smooth polished or bright finished stainless steel. Fortunately, they can be removed with glass cleaner or by gentle rubbing with a paste of soda ash (sodium carbonate) and water applied with a soft rag. Once again, this should be followed by a thorough warm water rinse. There are several special surface finishes where fingerprints present special problems: polished No. 6, etched, some abrasive blasted finishes, and light electrochemical colors applied over satin or brushed finishes. (NOTE: there are several finishes designed to withstand fingerprints: embossed, swirl patterns, lined patterns, etc.).

**SHOP OIL AND GREASE:** Shop oils, which may carry grease, grit and metal chips, commonly produce surface soiling after many shop operations. Greases and other contaminants may also soil surfaces in food preparation and many other household and commercial situations. These soils may be corrosive in themselves or may not allow the surface to maintain passivity, and so periodic removal is a necessity. Initially, soap or detergent and water may be tried or a combination of detergent and water plus a solvent. The removal of oil and grease from stainless steel parts by immersion in chemical solvents is frequently used with cold-formed or machined

Table 3 Conditions and Finishes for Bar

Conditions	Surface Finishes*
Hot worked only	(a) Scale not removed (excluding spot conditioning) (b) Rough turned** (c) Pickled or blast cleaned and pickled
Annealed or otherwise heat treated	(a) Scale not removed (excluding spot conditioning) (b) Rough turned (c) Pickled or blast cleaned and pickled (d) Cold drawn or cold rolled (e) Centerless ground (f) polished
Annealed or cold worked to high tensile strength***	(d) Cold drawn or cold rolled (e) Centerless ground (f) polished

\* Surface finishes (b), (e), and (f) are applicable to round bars only.

\*\* Bars of the 4xx series stainless steels which are highly hardenable, such as Types 414, 420, 420F, 431, 440A, 440B and 440C, are annealed before rough turning. Other hardenable grades such as Types 403, 410, 416 and 416Se, may also require annealing depending on their composition and size.

\*\*\* Produced in Types 302, 303Se, 304 and 316.

Table 5 Special Stainless Steel Finishes

Finish	Description
Selective Polishing	Selective polishing of unprotected areas to produce patterns
Swirl	Swirl patterns obtained with grinding wheels or stainless steel wire brushes
Engine Turn	Rings, circles or overlapping circles created with a CNC-operated machine
Distressed	Random scratch pattern covering entire surface
Angel Hair	Finer random scratch pattern
Abrasive Blast	Matte, uniform, blast media choice determines appearance
Selective Etching	Etching of selective surface areas to obtain pattern
Embossing	Raised patterns pressed into the stainless by rolling
Electrochemical	Applied to cut sheets, numerous colors (also called INCO or light interference coloring)
Epoxy Paint	Applied to coils, full range of colors
Sputtering	Thin layer of colored material applied to surface
Plating	Electroplating with colored and/or precious metals
Perforated Designs	Simple or elaborate patterns



## CARE AND CLEANING OF STAINLESS STEEL

parts that are laden with lubricants. This process, in its simplest form, consists of bringing liquid solvent into contact with the surface to be cleaned and allowing dissolution to take place; for example, trichloroethylene or similar liquid or stirring a batch of small parts in a container of solvent. Non-halogenated solvents, such as acetone, methyl alcohol, ethyl alcohol, methyl ethyl ketone, benzene, isopropyl alcohol, toluene, mineral spirits, and turpentine work well. Many of these solvents are widely used as individual cleaners, but there are thousands of blended or compound cleaners on the market. Users are advised to contact suppliers of solvents for information on their applications on stainless steel.

### Types of Cleaners and Methods: General Precautions

In selecting cleaning practices, consider the possibility of scratching and the potential for post-cleaning corrosion caused by incompletely removed cleaners. Scratching can occur on a bright mirror finish by cleaners that contain hard abrasives, or even by "grit" in wash water. This is usually not a problem on dull finishes, or those surfaces with a coarse polishing grit. The best preventative measure is to avoid using abrasive cleaners unless absolutely necessary. When abrasives are needed, first experiment on an inconspicuous area. A "soft abrasive," such as pumice, should be used. Abrasives can permanently damage some colored and highly polished finishes. Advice should be obtained from the finish supplier when cleaning special finishes. Many cleaners contain corrosive ingredients which require thorough post-clean rinsing with clean water; however, thorough rinsing is recommended for all cleaning procedures.

**CLEAN WATER AND WIPE:** The simplest, safest, and least costly method that will adequately do the job is always the best method. Stainless surfaces thrive with frequent cleaning because there is no surface coating to wear off stainless steels. A soft cloth and clean warm water should always be the first choice for mild stains and loose dirt and soils. A final rinse with clean water and a dry wipe will complete the process and eliminate the possibility of water stains.

**SOLVENT CLEANING:** Organic solvents can be used to remove fresh fingerprints and oils and greases that have not had time to oxidize or decompose. The preferred solvent is one that does not contain chlorine, such as acetone, methyl alcohol and mineral spirits. There are many compounded or blended organic cleaners that are commercially available and attempt to optimize both cleanability and safety attributes. Cleaning can be accomplished by immersing smaller articles directly into the solvent, wiping with solvent-impregnated cloths, or by sophisticated vapor or spray methods. The wiping technique sometimes leaves a streaked surface.

**HOUSEHOLD CLEANERS:** Household cleaners fall into two categories: detergent (non-abrasive) and abrasive cleaners. Both are effective for many mild dirt, stain and soil deposits, as well as light oils such as fingerprints. The abrasive cleaners are more effective but introduce the possibility of scratching the surface. However, the degree of abrasiveness will vary greatly with the particular product, and some brands will produce noticeable scratching on only the most highly polished and some colored surface. All these cleaners vary widely with respect to their acidity and the amount of chloride they contain. A neutral cleaner low in chloride is preferred unless the user is assured that the surface can be thoroughly rinsed after cleaning. The fact that the label states "for stainless steel" is no guarantee that the product is not abrasive, not acidic or low in chloride. The cleaning method generally employed with these cleaners is to apply them to the stainless surface and follow by cloth wiping, or to wipe directly with a cleaner-

**Table 6 Effective Cleaning Methods**

Job	Cleaning Agents*	Comments
Routine Cleaning	Warm water, Soap, Ammonia, Detergent	Apply with sponge or soft cloth. Can be used on all finishes.
Fingerprints and Smears	3M Stainless Steel Cleaner and Polish, Arcal 20, Lac-O-Nu, Lumin Wash, O'Cedar Cream Polish, Stainless Shine	Provides barrier film to minimize fingerprints. Can be used on all finishes.
Stubborn Stains and Discoloration	3M Stainless Steel Cleaner and Polish, Allchem Concentrated Cleaner, Samae, Twinkle, Cameo Copper Cleaner, Grade FFF or Grade F Italian Pumice, Whiting or talc, Liquid Nu Steel, Copper's or Revere Stainless Steel Cleaner, Household Cleaners, Lumin Cleaner, Zud Restoro, Sta-Clean, Highlite, Allen Polish, Penny-Brite, Copper-Brite	Rub lightly, using dry damp cloth, in the direction of polish lines on the stainless steel.
Grease and Blood Burnt-on or Baked-on Foods	Scotch-Brite Power Pad 2001, Easy-Off De-Grease-It, 4% to 6% hot solution of such agents as tri-sodium polyphosphate, 5% to 15% caustic soda solution	Excellent removal on acids, all finishes. Particularly useful where rubbing is not practical.
Grease and Oil	Any good commercial detergent or caustic cleanser.	Apply with sponge or soft cloth in direction of polish lines.

\* NOTE: Use of proprietary names is intended only to indicate a type of cleaner and does not constitute an endorsement. Omission of any proprietary cleanser does not imply its inadequacy. All products should be used in strict accordance with instructions on package.

## CARE AND CLEANING OF STAINLESS STEEL

impregnated soft cloth. In all cases, the cleaned surface should be thoroughly rinsed with clean water and wiped dry with a soft cloth if water streaking is a consideration.

**COMMERCIAL CLEANERS:** Many commercial cleaners compounded from phosphates, synthetic detergents, and alkalis are available for the cleaning of severely soiled or stained stainless surfaces. When used with a variety of cleaning methods, these cleaners can safely provide effective cleaning. Manufacturers should be consulted and their recommendations followed whenever using cleaners of this kind. The general precautions stated above also pertain to these cleaners.

### Care of Stainless Steel

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The cleaner stainless steel can be kept while in storage, being processed or during use, the greater the assurance of optimum corrosion resistance. Some tips on the care of stainless steel are listed below:

1. Use paper or other protective wrapping on the surface of the stainless steel until processing is complete.\*
2. Handle stainless steel with clean gloves or cloths to guard against stains or finger marks.
3. Avoid the use of oily rags or greasy cloths when wiping the surface.
4. Do routine cleaning of exposed surfaces. Buildings with window washing systems can utilize this method to clean exterior panels.
5. Where possible, after cleaning, rinse thoroughly with water.
6. Cleaning with chloride-containing detergents must be avoided.
7. Even the finest cleaning powders can scratch or burnish a mill-rolled finish. On polished finishes, rubbing or wiping should be done in the direction of the polish lines, NOT across them.
8. DO NOT USE SOLVENTS in closed spaces or while smoking.

**\* Many adhesive-backed papers and plastic sheets or tape applied to stainless steel for protection "age" in fairly short periods of time and become extremely difficult to remove. Manufacturers should be contacted regarding information as to how long protective films or paper can be left in place.**

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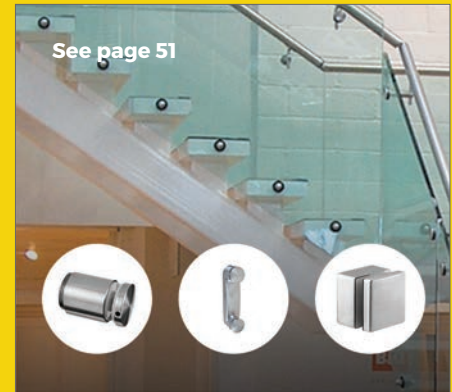
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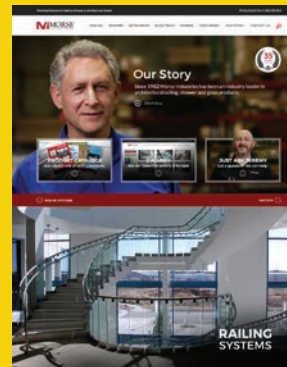
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