

**Forming  
the future  
of precision  
components.**



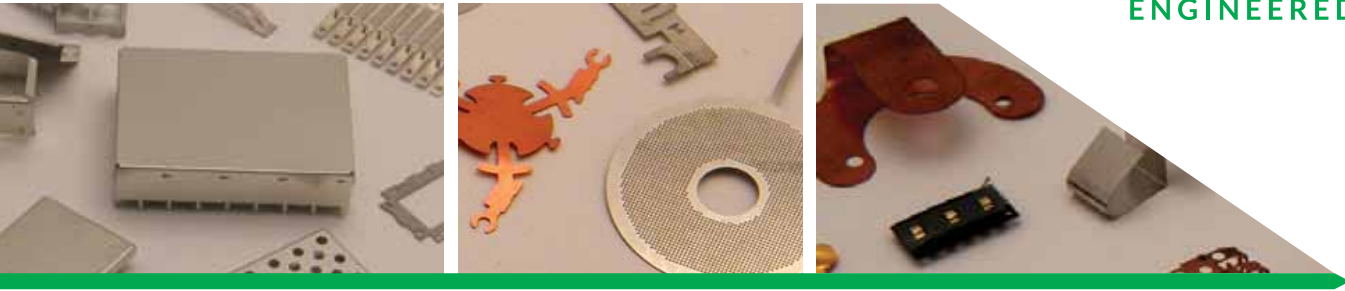


## Meeting your demands. Precisely.

Every day, technology is making our world faster, safer, and more accessible. Technology made possible by Orbel.

Whatever your industry, whatever your application, Orbel's custom design and manufacturing process means engineered solutions designed to your exact needs. Start to finish, from conception through delivery, Orbel offers today's most effective board level shielding, finger-stock gaskets, metalized fabric gaskets, photo-etched precision metal parts, and precision metal stampings.

Areas of specialization include aerospace, defense, telecommunications, electronics, avionics, energy, medical, power storage, instrumentation, manufacturing, automotive, appliances, and scientific controls.



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## The precision behind the solution.

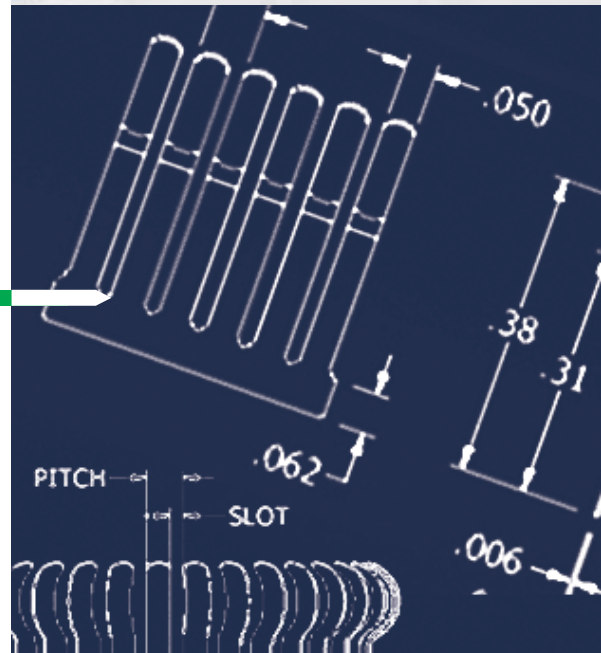
The Orbel difference lies in our ability to transform performance needs into working parts. Whether we're working from a modified standard part, an existing design concept, or design plans engineered in-house, Orbel ensures that your specifications are met and your product is up to every possible standard. It's how we built our reputation, and it's how we meet the needs of the world's largest and most diverse OEMs.

## Complete customer satisfaction.

At every stage in the design and manufacturing process, your needs and your requests are our first priority. Both standard and custom product quotes are delivered within 24 hours of your inquiry, and this same level of responsiveness remains during every phase of your project. For specialized applications, Orbel's experienced team of engineers will work side by side with you to turn your specialized needs into a working reality.

## Engineering your success.

The success of our customers is the direct result of every aspect of our organization. By keeping all operations under one roof, Orbel is able to guarantee exceptional results throughout every step of the production process. We're also dedicated to the industry's fastest turnaround times on samples, prototypes, and production pieces. Orbel can ship product in as little as 24 hours following receipt of your specifications.



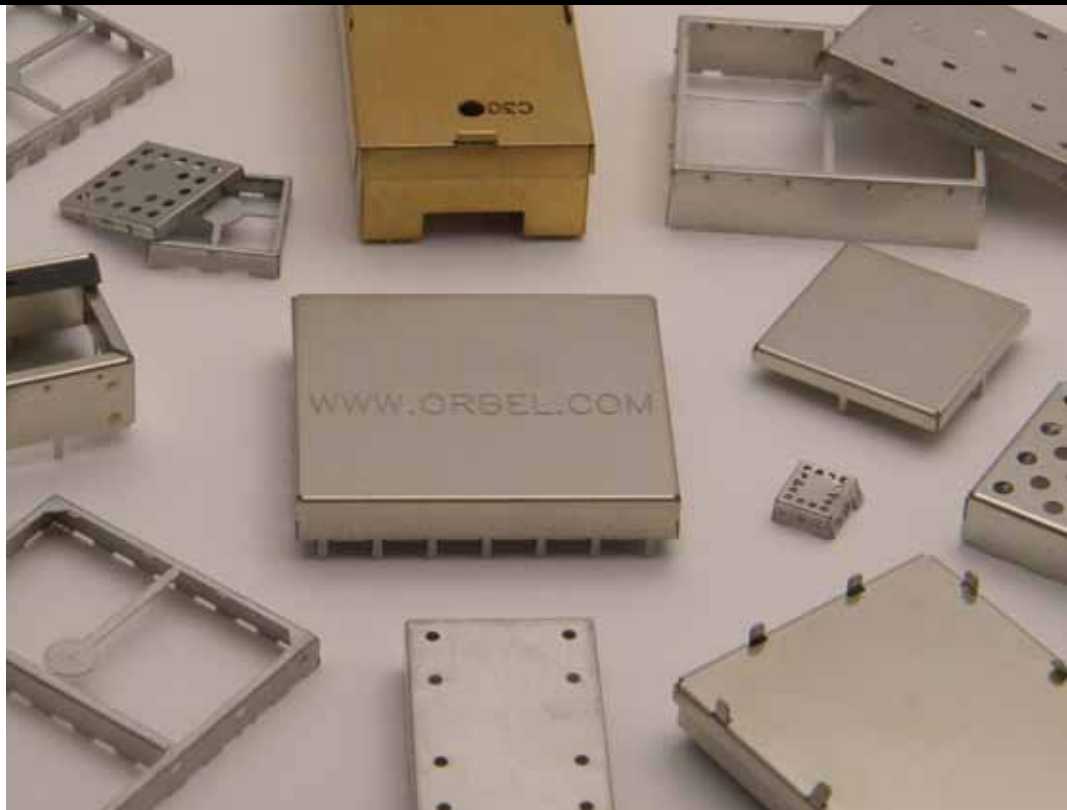


# EMI/RFI SHIELDING

Based on decades of experience and a commitment to the leading edge of fabricating technology, Orbel's EMI/RFI shielding capabilities span from design and engineering to prototyping and testing to production and delivery. Orbel expertly transforms your precise performance needs into a working solution.

Orbel's extensive line of standard EMI/RFI shielding components (board level shielding, finger-stock gaskets, metalized fabric gaskets) offers an excellent starting point for any project. If your needs dictate a start-to-finish custom component, we will be happy to help you design and produce a product that meets your demands.

# BOARD LEVEL SHIELDING



Specified by engineers around the world, Orbel's standard and custom board level shielding (BLS) offers unlimited design flexibility for surface-mount and through-hole configurations. With an array of standard shields that can be customized to any performance or application requirement, Orbel specializes in today's most challenging EMI/RFI shielding applications.

Orbel's extensive family of standard BLS features (pin options, corner options, and more) and material/design options makes it easy for you to configure and create custom board level shields that meet your very precise product requirements. Start to finish, all Orbel board level shielding can be custom-engineered based on your specific needs—if it can be imagined and designed, Orbel can deliver.

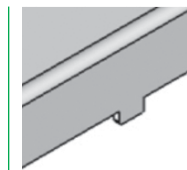
- Unlimited shield sizes
- Variety of material options
- Multiple fence/cover retention methods
- Variety of pin and surface-mount styles
- Custom trace notches at no extra cost
- Standard ventilation holes
- EZ-Marking™ part number and logo identification
- Standard pick target for pick and place
- Available in tape-and-reel or tray packaging
- RoHS-compliant

## Transforming Concept Into Solution

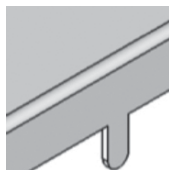
Backed by decades of success, unmatched expertise in EMI/RFI suppression, and a commitment to today's newest manufacturing technology, Orbel's engineering team can transform any board level shielding concept into a high-performance reality. We also offer the industry's fastest turnaround times, minimal startup costs, and unmatched customer service. Whether you're in need of one-piece, two-piece, multi-cavity, or custom-configured board level shielding, Orbel is the one name you need to know.

# STANDARD FEATURES

## PIN OPTIONS



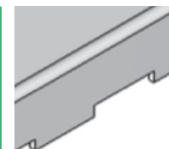
Alignment Pin



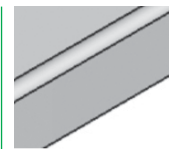
Through-Hole Pin



Through-Hole Pin  
with Standoff

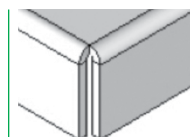


Castellation Edge

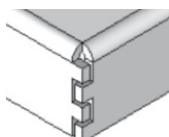


Straight Edge, No Pin

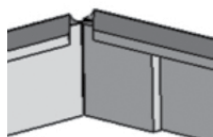
## CORNER OPTIONS



Tight Corner

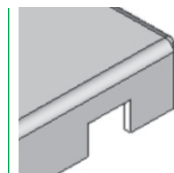


Louvered Corner

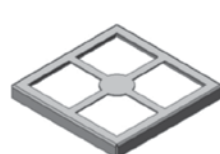


Welded Corner

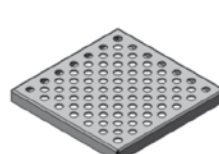
## ADDITIONAL OPTIONS



Trace Notch



Pick Target



Ventilation Holes



Logo or Part Number Marking

# PERFORMANCE SPECS

### Material Options

- Nickel Silver
- TPS: Tin-Plated Steel
- TPB: Tin-Plated Brass
- TPC: Tin-Plated Copper

### Co-Planarity

- Smaller Shields: 0.004"
- Larger Shields: 0.008"

### Material Thicknesses

- 0.010" (Standard)
- 0.008"
- 0.012"
- 0.015"

### RoHS-Compliant

- Yes

### Shielding Effectiveness

- Up to 60dB

*Other material options include beryllium copper, phosphorus bronze, and stainless steel. Additional plating finishes available upon request.*

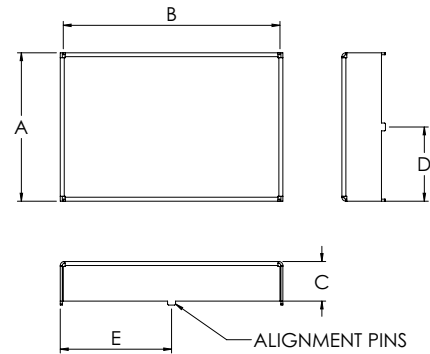
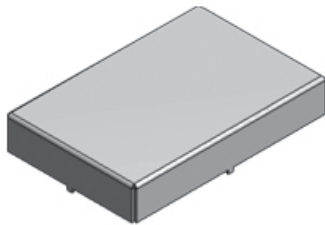
*All technical data presented herein is accurate to the best of our knowledge based on Orbel's most up-to-date testing information and material specs. This information is not presented as a warranty or guarantee and is not intended to be all-inclusive as to conditions of use.*

# EZ-Shield Guardian™ Surface-Mount

The EZ-Shield Guardian™ surface-mount shield is a one-piece circuit board shield with alignment pins to ensure stability during reflow and soldering. Meets one-piece shield requirements in both low- and high-profile applications. Ideal for inaccessibility to components, where cost is highly important.

## FEATURES

- Shield heights ranging from 0.030" to 2.00"
- Alignment pins centrally located on each side
- Standard tight corners
- Can be produced in high volume with progressive die tooling



## Popular Standard Configurations

ORBEL Part Number	A	B	C	Pin Width	Pin Length	D	E
G-0500SA0675-0090XC	0.500"	0.675"	0.090"	0.040"	0.020"	0.250"	0.337"
G-0500SA1000-0150XC	0.500"	1.000"	0.150"	0.040"	0.020"	0.250"	0.500"
G-0600SC0750-0150XC	0.600"	0.750"	0.150"	N/A	N/A	N/A	N/A
G-0750SA1125-0200XC	0.750"	1.125"	0.200"	0.040"	0.020"	0.375"	0.562"
G-1000SA1500-0250XC	1.000"	1.500"	0.250"	0.040"	0.020"	0.500"	0.750"
G-1500SA1750-0400XC	1.500"	1.750"	0.400"	0.040"	0.020"	0.750"	0.875"
G-1750SA2500-0500YC	1.750"	2.500"	0.500"	0.040"	0.020"	0.875"	1.25"

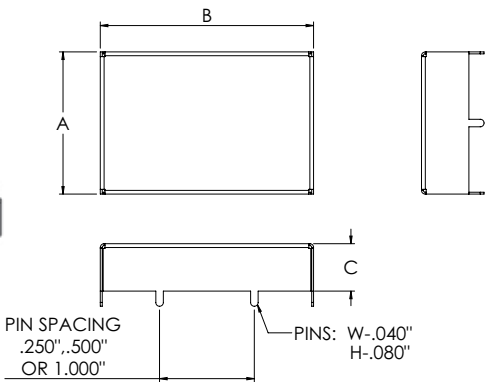
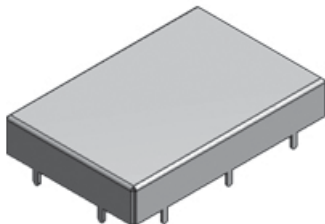
Custom configurations also available.

# EZ-Shield Guardian™ Through-Hole

The EZ-Shield Guardian™ through-hole circuit board shield is a one-piece shield with mounting pins. Meets one-piece shield requirements in both low- and high-profile applications. Ideal for inaccessibility to components, where cost is highly important.

## FEATURES

- Shield heights ranging from 0.030" to 2.00"
- Standard pin spacing is 0.250", 0.500", and 1.00"
- Standard tight corners
- Can be produced in high volume with progressive die tooling



## Popular Standard Configurations

ORBEL Part Number	A	B	C	Pin Width	Pin Length	Pin Spacing
G-0500TB0675-0080XC	0.500"	0.675"	0.080"	0.040"	0.080"	0.500"
G-0500TB1000-0150XC	0.500"	1.000"	0.150"	0.040"	0.080"	0.500"
G-0750TB1125-0250XC	0.750"	1.125"	0.250"	0.040"	0.080"	0.500"
G-1000TB1500-0350XC	1.000"	1.500"	0.350"	0.040"	0.080"	0.500"
G-1500TB1750-0400XC	1.500"	1.750"	0.400"	0.040"	0.080"	0.500"
G-1750TB2500-0500YC	1.750"	2.500"	0.500"	0.040"	0.080"	0.500"

Custom configurations also available.

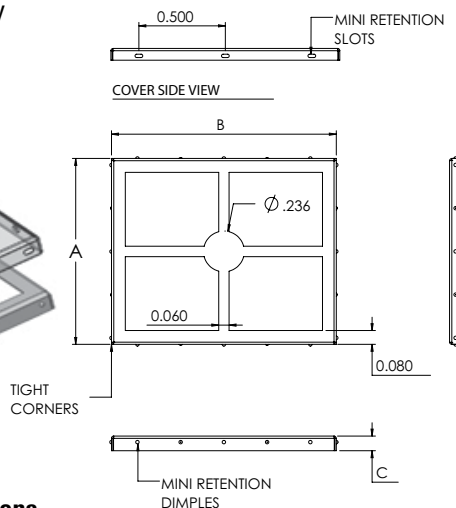
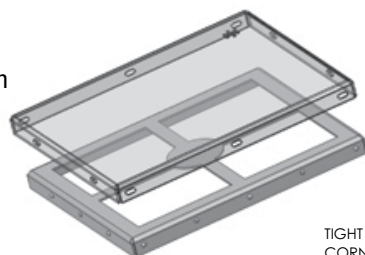


## Snap-Shield Micro™

The Snap-Shield Micro™ offers the lowest two-piece surface-mount shield assembly in the industry. Ideal when space is limited but a two-piece shield is required. Added part stability helps achieve maximum co-planarity.

### FEATURES

- Shield heights ranging from 0.058" to 0.100"
- Standard pick target for pick-and-place automation
- Mini-dimple and slot cover retention method
- Standard tight corners
- Can be produced in high volume with progressive die tooling



### Popular Standard Configurations

ORBEL Part Number	A	B	C	Mating Cover Part #
M-0515SC0560-0050ZF	0.515"	0.560"	0.050"	M-0515CC0560-0050ZC
M-0600SC0950-0060ZF	0.600"	0.950"	0.060"	M-0600CC0950-0060ZC
M-0735SC0865-0070ZF	0.735"	0.865"	0.070"	M-0735CC0865-0070ZC
M-0925SC1100-0080ZF	0.925"	1.100"	0.080"	M-0925CC1100-0080ZC

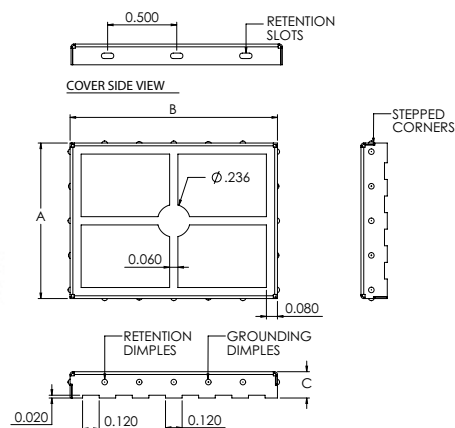
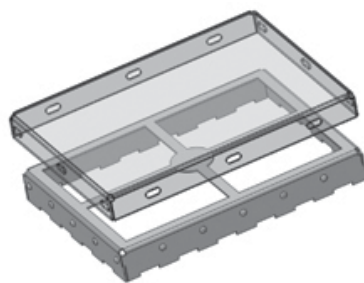
Custom configurations also available.

## Snap-Shield Bullzeye™

The Snap-Shield Bullzeye™ is a two-piece surface-mount shield with castellated edges for easy soldering and trace pass-through. Added part stability helps achieve maximum co-planarity in the reflow process.

### FEATURES

- Shield heights ranging from 0.090" to 2.00"
- Pick target for pick-and-place automation
- Louvered corners for high RFI integrity
- Castellated edge for easy soldering
- Dimple and slot retention method
- Can be produced in high volume with progressive die tooling



### Popular Standard Configurations

ORBEL Part Number	A	B	C	Mating Cover Part #
B-0500SB0750-0090XF	0.500"	0.750"	0.090"	B-0500CC0750-0090XC
B-0625SB1125-0115XF	0.625"	1.125"	0.115"	B-0625CC1125-0115XC
B-0875SB1375-0190XF	0.875"	1.375"	0.190"	B-0875CC1375-0190XC
B-1000SB1000-0140XF	1.000"	1.000"	0.140"	B-1000CC1000-0140XC
B-1125SB1500-0190XF	1.125"	1.500"	0.190"	B-1125CC1500-0190XC
B-1250SB2250-0165XF	1.250"	2.250"	0.165"	B-1250CC2250-0165XC

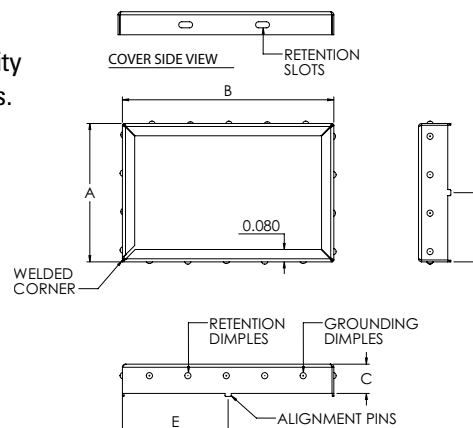
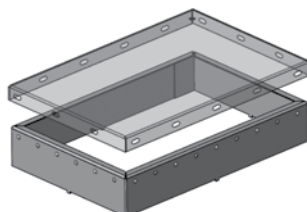
Custom configurations also available.

## Snap-Shield LaZerLoc™ Surface-Mount

The two-piece Snap-Shield LaZerLoc™ surface-mount shield features alignment pins that ensure stability during reflow and soldering. Zero corner slots for high RFI integrity when specifying larger and more complicated shields in hand placement applications.

### FEATURES

- Shield heights ranging from 0.090" to 2.00"
- Fully welded frame, no corner seams
- Alignment pins centrally located on each side
- Standard 0.080" fence flange increases rigidity
- Standard dimple and slot cover retention



### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	E	Mating Cover Part #
L-0700SA0900-0090XF	0.700"	0.900"	0.090"	0.350"	0.450"	L-0700CC0900-0090XC
L-0900SA1375-0190XF	0.900"	1.375"	0.190"	0.450"	0.687"	L-0900CC1375-0190XC
L-1250SA1250-0240XF	1.250"	1.250"	0.240"	0.625"	0.625"	L-1250CC1250-0240XC
L-1300SA1750-0340XF	1.300"	1.750"	0.340"	0.650"	0.875"	L-1300CC1750-0340XC
L-1500SA2250-0390XF	1.500"	2.250"	0.390"	0.750"	1.125"	L-1500CC2250-0390XC
L-2250SA3000-0490YF	2.250"	3.000"	0.490"	1.125"	1.500"	L-2250CC3000-0490YC

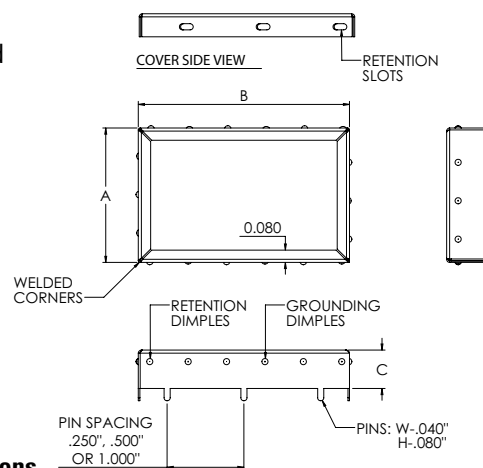
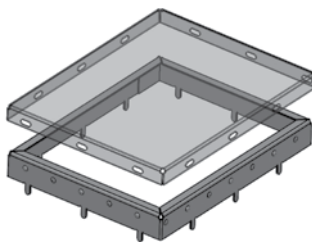
Custom configurations also available.

## Snap-Shield LaZerLoc™ Through-Hole

The two-piece Snap-Shield LaZerLoc™ through-hole shield features mounting pins. Zero corner slots for high RFI integrity when specifying larger and more complicated shields in hand placement applications.

### FEATURES

- Shield heights ranging from 0.090" to 2.00"
- Fully welded frame, no corner seams
- Standard pin spacing is 0.250", 0.500", and 1.00"
- Standard 0.080" fence flange increases rigidity
- Standard dimple and slot cover retention



### Popular Standard Configurations

ORBEL Part Number	A	B	C	Mating Cover Part #
L-0500TB0750-0100XF	0.500"	0.750"	0.100"	L-0500CC0750-0100XC
L-0625TB1125-0125XF	0.625"	1.125"	0.125"	L-0625CC1125-0125XC
L-0875TB1375-0250XF	0.875"	1.375"	0.250"	L-0875CC1375-0250XC
L-1000TB1000-0150XF	1.000"	1.000"	0.150"	L-1000CC1000-0150XC
L-1375TB1750-0200XF	1.375"	1.750"	0.200"	L-1375CC1750-0200XC
L-1750TB2250-0300YF	1.750"	2.250"	0.300"	L-1750CC2250-0300YC

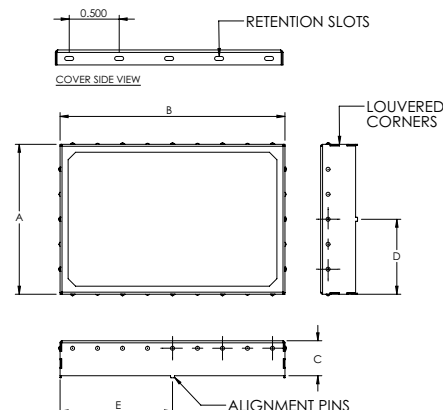
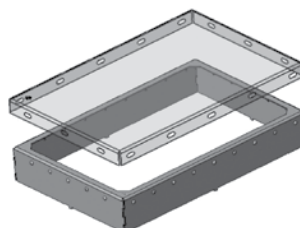
Custom configurations also available.

## Snap-Shield SmartFORM™

The Snap-Shield SmartFORM™ is a two-piece surface-mount shield with alignment pins that ensure stability during solder reflow and soldering. The SmartFORM offers a production-ready design that allows you to go from prototype to progressive die production with no required design changes. The unique forming of this shield enhances co-planarity.

### FEATURES

- Shield heights ranging from 0.090" to 2.00"
- Standard dimple and slot cover retention
- Excellent component accessibility
- Louvered corner construction
- Production-ready design
- Can be produced in high volume with progressive die tooling



### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	E	Mating Cover Part #
S-0700SA0900-0090XF	0.700"	0.900"	0.090"	0.350"	0.450"	S-0700CC0900-0090XC
S-0900SA1375-0190XF	0.900"	1.375"	0.190"	0.450"	0.687"	S-0900CC1375-0190XC
S-1000SA1200-0110XF	1.000"	1.200"	0.110"	0.500"	0.600"	S-1000CC1200-0110XC
S-1250SA1250-0240XF	1.250"	1.250"	0.240"	0.625"	0.625"	S-1250CC1250-0240XC
S-1500SA2250-0350XF	1.500"	2.250"	0.350"	0.750"	1.125"	S-1500CC2250-0350XC
S-2000SA3000-0500XF	2.000"	3.000"	0.500"	1.000"	1.500"	S-2000CC3000-0500XC

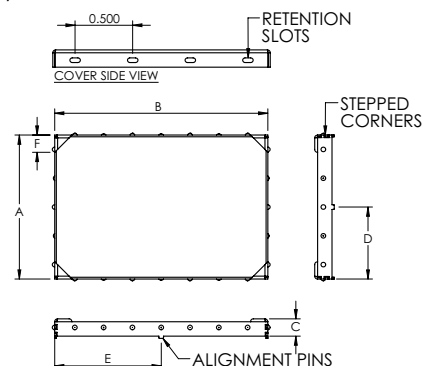
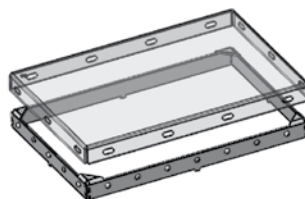
Custom configurations also available.

## Snap-Shield TRU-View™

The Snap-Shield TRU-View™ is a two-piece surface-mount shield with alignment pins that ensure stability during reflow and soldering. The TRU-View's rigid corner design eliminates the need for a perimeter flange, providing full view of components for automated optical inspection (AOI).

### FEATURES

- Shield heights ranging from 0.090" to 2.00"
- Standard dimple and slot cover retention
- No perimeter flange for AOI
- Rigid corner construction
- Can be produced in high volume with progressive die tooling



### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	E	F	Mating Cover Part #
T-0950SA1325-0100YF	0.950"	1.325"	0.100"	0.475"	0.687"	0.125"	T-0950CC1325-0100YC
T-1250SA1850-0150YF	1.250"	1.850"	0.150"	0.650"	0.925"	0.150"	T-0950CC1325-0100YC
T-1600SA2175-0250YF	1.600"	2.175"	0.250"	0.800"	1.087"	0.200"	T-1600CC2175-0250YC
T-1950SA2500-0350YF	1.950"	2.500"	0.350"	0.975"	1.250"	.0200"	T-1950CC2500-0350YC

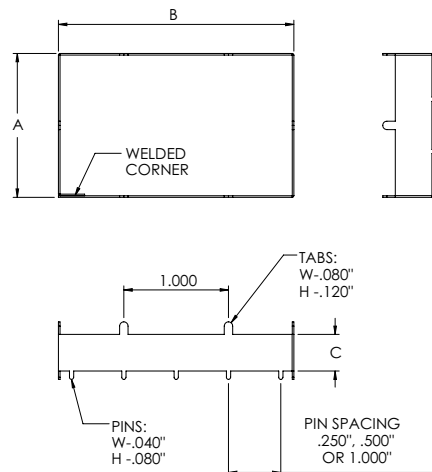
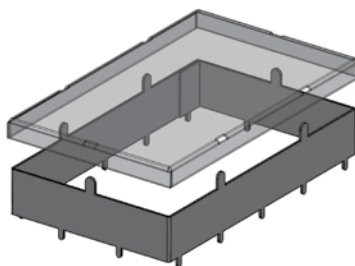
Custom configurations also available.

## Vault-Shield™

The Vault-Shield™ is a two-piece through-hole shield used primarily in extreme shock and vibration applications. The Vault-Shield's tab and slot retention method provides the added security of today's best cover-to-frame retention.

### FEATURES

- Shield heights ranging from 0.030" to 2.00"
- Fully welded frame (no corner seams)
- Standard pin spacing is 0.250", 0.500", and 1.00"
- Secure cover locking tabs



### Popular Standard Configurations

ORBEL Part Number	A	B	C	# Tabs	Locking Tab Spacing	Mating Cover Part #
V-0750TB1500-0200YF	0.750"	1.500"	0.200"	6	1.000"	V-0750CC1500-0200YC
V-1375TB2250-0350YF	1.375"	2.250"	0.350"	6	1.000"	V-1375CC2250-0350YC
V-2000TB3500-0500YF	2.000"	3.500"	0.500"	6	1.000"	V-2000CC3500-0500YC

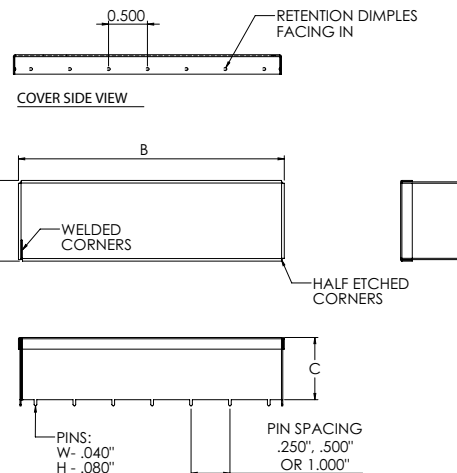
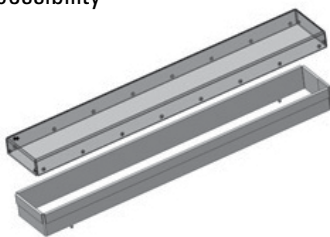
Custom configurations also available.

## Snap-Shield HEMI™

The Snap-Shield HEMI™ is a two-piece through-hole shield offering maximum component accessibility with a unique hemmed frame. Used when specifying larger, more complicated shields in hand placement applications.

### FEATURES

- Shield heights ranging from 0.200" to 2.00"
- Hemmed frame offers maximum component accessibility
- Rigid, fully welded frame, no corner seams
- Revolutionary hem and dimple cover retention



### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Pin Width	Pin Length	Pin Spacing	Mating Cover Part #
H-1750TB2500-0500YF	1.750"	2.500"	0.500"	0.150"	0.040"	0.080"	.0500"	H-1750CC2500-0500YC
H-2600TB3450-0200YF	2.600"	3.450"	0.200"	0.150"	0.040"	0.080"	.0500"	H-2600CC3450-0200YC
H-3500TC5325-0375YF	3.500"	5.325"	0.375"	0.150"	0.040"	0.080"	1.000"	H-3500CC5325-0375YC

Custom configurations also available.



## Snap-Shield Kontour™

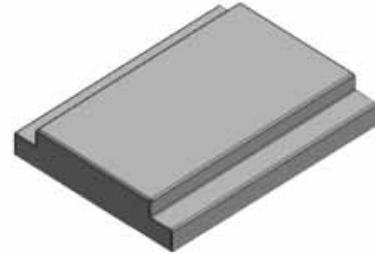
The Snap-Shield Kontour™ is a one-piece shield configuration with a multi-plane cover to conform to irregular height components under one shielded enclosure. Used when space is limited or when product shape dictates design.

### FEATURES

- Shield heights ranging from 0.100" to 2.00"
- Surface-mount or through-hole design
- Multi-plane configurations
- Standard dimple and slot cover retention

### OPTIONS

- Unlimited board shield sizes and configurations
- Notches or entry hole for traces
- Cover ventilation holes for thermal concerns
- Logo or part number identification
- Can be supplied in tape-and-reel or tray packaging



## Snap-Shield Kontour-Pro™

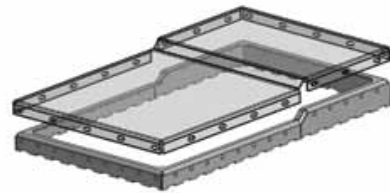
The Snap-Shield Kontour-Pro™ is a two-piece shield configuration with a multi-plane cover to conform to irregular height components under one shielded enclosure. Used when space is limited or when product shape dictates design.

### FEATURES

- Shield heights ranging from 0.100" to 2.00"
- Surface-mount or through-hole design
- Multi-plane configurations
- Standard dimple and slot cover retention

### OPTIONS

- Unlimited board shield sizes and configurations
- Notches or entry hole for traces
- Cover ventilation holes for thermal concerns
- Variety of shield-to-board options
- Logo or part number identification
- Can be supplied in tape-and-reel or tray packaging



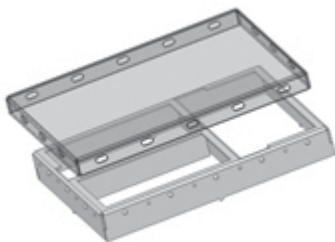
## MultiCAV™

The MultiCAV™ is a compartmentalized shield that combines multiple shields into one, saving valuable board space while reducing shield weight and overall costs. MultiCAV shields typically have two-piece construction with inner walls strategically placed while utilizing one common cover.

Orbel's family of standard MultiCAV shields is available in two distinct styles:

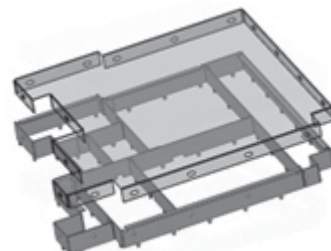
### MultiCAV SmartFORM™

Formed from one sheet of material to create the shield's inner walls. Can be designed with an optional pick target for tape-and-reel automation.



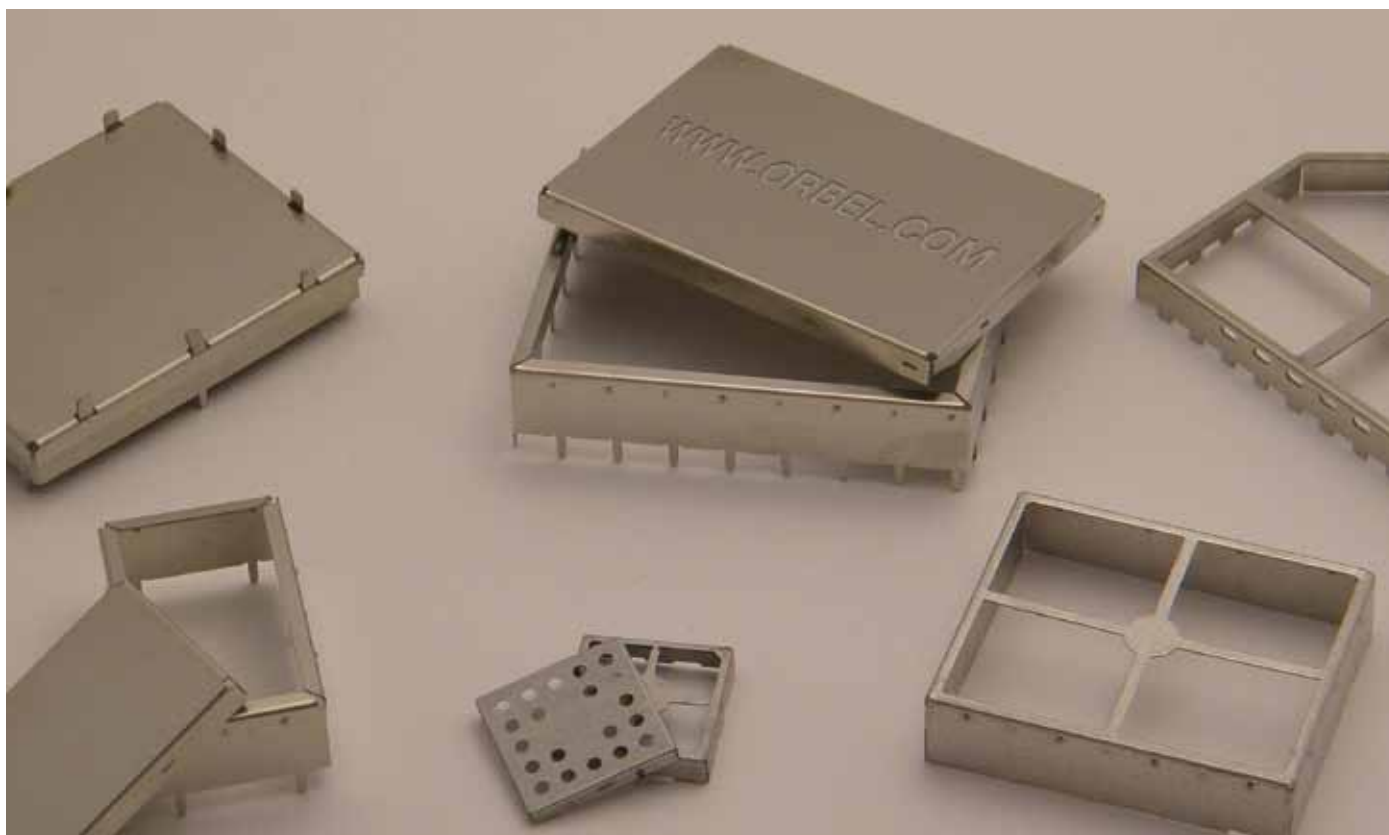
### MultiCAV FASweld™

Used when your design calls for a complicated multi-cavity construction. The shield's inner walls are welded to the perimeter frame to create multi-compartments.



## FEATURES

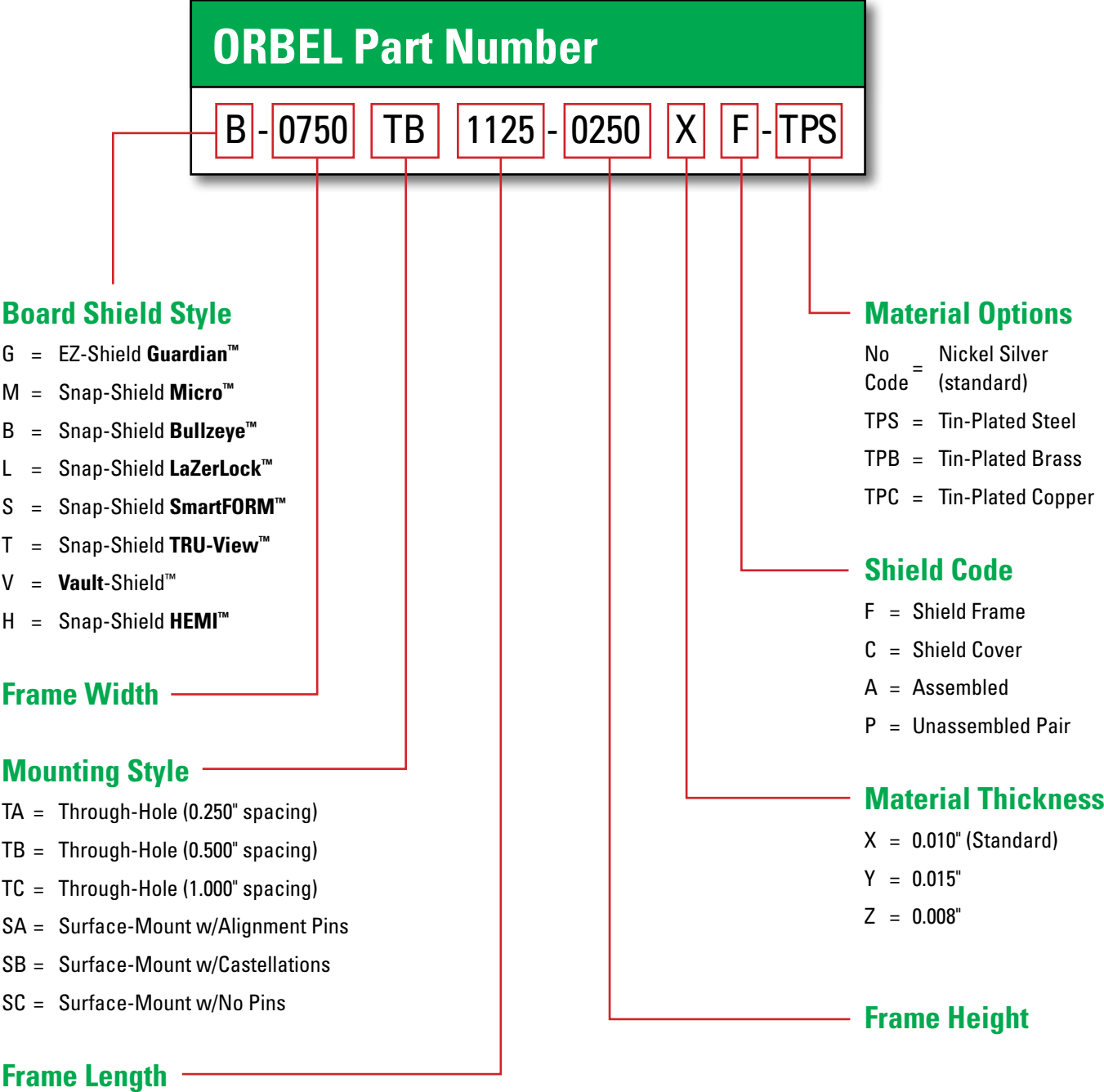
- Shield heights ranging from 0.075" to 2.00"
- Standard dimple-and-slot cover retention
- Customized to board trace specifications
- Locking tabs for inner wall and cover grounding
- SmartFORM can be produced in high volume with progressive die tooling



# HOW TO ORDER BOARD LEVEL SHIELDING

The chart below is an easy-to-use reference on how Orbel BLS part numbers are created and used to order standard and custom board level shielding. Custom configurations that fall outside of our standard shield styles are also available.

**Sample Part Number (Snap-Shield Bullzeye™): B-0750TB1125-0250XF - TPS**



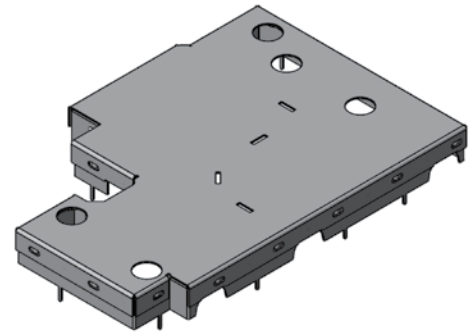
# CUSTOM BOARD LEVEL SHIELDING

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## If you can visualize it, we can make it.

The industry's leading custom board level shielding manufacturer, Orbel utilizes proven engineering expertise and advanced production techniques to deliver unlimited design flexibility for surface-mount and through-hole shield configurations. With a vast array of custom features, Orbel can transform your shield concept into an innovative, cost-effective solution.

- One-piece, two-piece, and multi-cavity
- Unlimited design flexibility
- Any shape or size
- Wide selection of materials
- Variety of plating finishes
- Consultative engineering services



Orbel is today's recognized leader in custom board level shielding technology—our versatile, performance-based approach to precision metal forming allows us to transform any shielding concept into a practical BLS solution. Simply tell us the features you need to incorporate into your shield design, and we can help you create the custom-configured shield that meets your needs, with minimum startup costs.

# PACKAGING

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## Automated Packaging

Orbel's in-house tape-and-reel packaging system provides customers with an automated SMT packaging solution. Tape-and-reel packaging is the preferred method for high-volume board level shielding, battery tab, and electrical contact production.

Other packaging methods include vacuumed-formed trays, tubes, and customer-specified packaging.

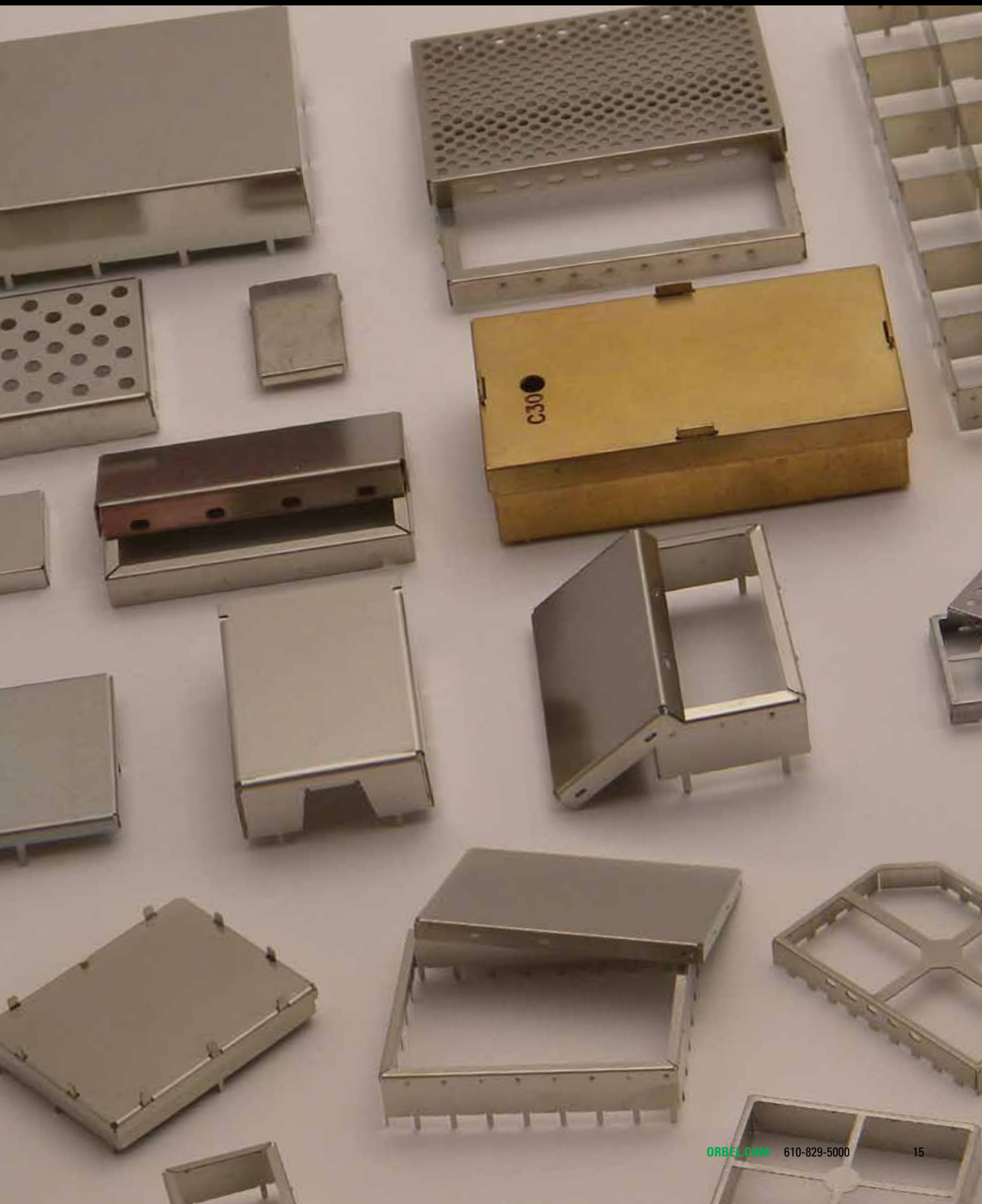


## Standard Packaging

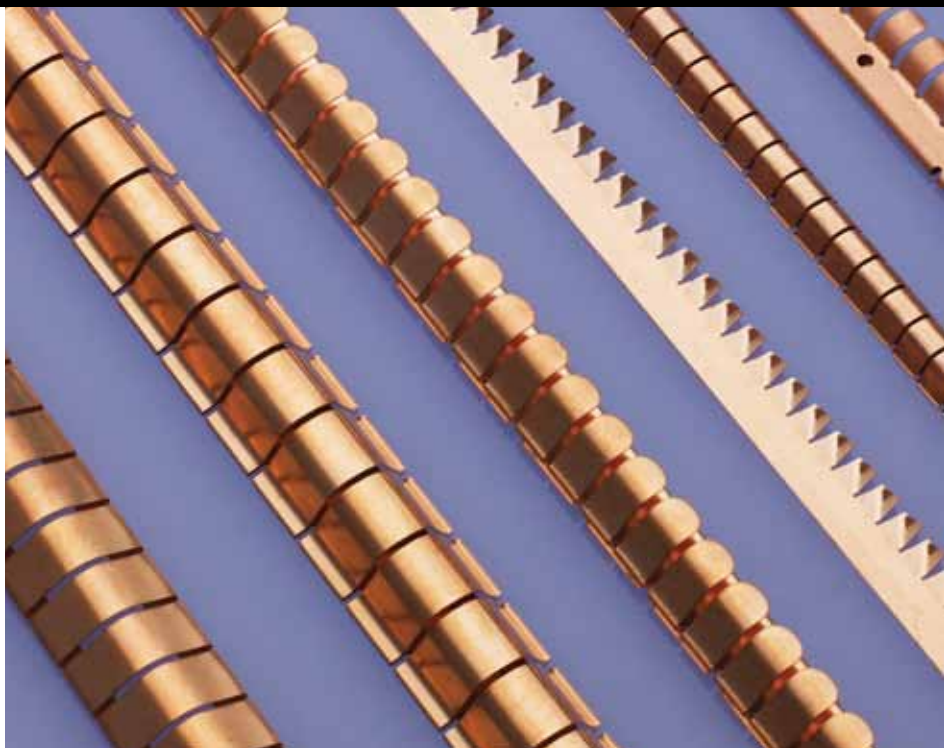
Every board level shield Orbel manufactures goes through a rigorous inspection process and is hand-packed using layered foam and cardboard packaging. This standard packaging method is cost-effective and ensures the highest product quality.







# FINGER-STOCK GASKETS



Beryllium copper finger-stock gaskets deliver the best electrical spring contact in the industry. With this in mind, Orbel offers a diverse variety of BeCu finger-stock profiles, modified finger stock, contact strips, contact rings, and metal connector gaskets. All standard strips can be cut to length, pierced, or have fingers removed to fit your exact needs. Orbel handles all secondary operations in-house including plating and finishing.

Today's leading manufacturer of BeCu finger-stock gaskets, Orbel delivers a low-resistance product with excellent anti-corrosion properties, ideal for low- or high-temperature high-cycle EMI/RFI applications that require regular access.

## Custom Engineering & Production

A true engineering and production partner, Orbel specializes in fully customizable BeCu gaskets. Whether you have a working design concept or need us to help you develop a custom gasket, Orbel will ensure that your end product is your ideal solution. Orbel finger-stock gaskets offer the industry's highest EMI/RFI shielding effectiveness and are ideal for repeated opening and closing applications where high attenuation performance and mechanical strength is required.

## The Worldwide Industry Standard

Used to avoid radiating EMI/RFI and prevent outside sources of EMI/RFI, BeCu finger-stock gaskets from Orbel represent the worldwide industry standard:

- Over 100 standard configurations
- Gaskets supplied in standard strip lengths or 25' coils
- Mounting methods include pressure-sensitive adhesive tape, clip-on, slot-mount, riveted, or soldered
- MegaSoft™ reduces compression forces and increases cycle life
- In-house electroplating in a variety of finishes:
  - **Bright Finish** (no plating)
  - **Nickel:** Dull, Bright, Electroless
  - **Zinc:** No Chromate, Clear Chromate, Yellow Chromate
  - **Tin:** Bright, Matte
  - **Gold:** Hard
  - **Silver:** Semi-Bright

# ADVANTAGES OF BERYLLIUM COPPER

- Maximum spring properties
- High cycle life
- Excellent conductivity
- Conforms to large gap variations
- Easy to plate and solder
- Dimensional stability
- Low compression force
- Variety of sizes and configurations
- Various mounting methods
- Excellent for bi-directional applications
- Nonflammable
- Resistance to stress relaxation
- Easy installation
- Wide temperature variation
- Cost-effective
- Non-magnetic
- RoHS-compliant

## MATERIAL SPECS

Orbel uses only the highest-quality maximum-strength beryllium copper alloys for our standard and custom finger-stock gaskets.

Alloy 25 (C17200) strip material provides the highest strength of any copper alloy, with electrical conductivity considerably greater than other high-strength copper alloys. Heat-treated after forming, it delivers excellent formability and ductility, stress relaxation resistance, and fatigue strength. This material is commonly used for electromagnetic shielding gaskets, connectors, and contacts.

### Chemical Composition (Weight Percent)

Alloy	Beryllium	Nickel + Cobalt	Nickel + Cobalt + Iron	Copper
C17200	1.8-2.00	0.2 min.	0.6 max.	Balance

### Physical Properties

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density	Thermal Expansion Coefficient	Thermal Conductivity (25°C)
19,000 ksi 131 Gpa	1600°F 870°C	22-28% IACS 6.2-7.8 $\mu\Omega$ -cm	0.302 lb./in. <sup>3</sup> 8.36g/cm <sup>3</sup>	9.7x10 <sup>-6</sup> in./in. °F 17.0x10 <sup>-6</sup> m/m °C	0.60 BTU/ft. hr. °F 105 W/m K

### Mechanical Properties

Temper	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness
	ksi	Mpa	ksi	Mpa	Percent	DPH
1/4 H (TD01)	60-80	410-560	75-88	510-660	20-45	121-185
1/2 H (TD02)	75-95	510-660	85-100	580-690	12-30	176-216
1/4 H (TH01)	150-185	1030-1300	175-205	1190-1420	3-10	353-424
1/2 H (TH02)	160-195	1100-1350	185-215	1270-1490	1-8	373-435

All technical data presented herein is accurate to the best of our knowledge based on Orbel's most up-to-date testing information and material specs. This information is not presented as a warranty or guarantee and is not intended to be all-inclusive as to conditions of use.

# DEFLECTION/COMPRESSION FORCE DATA

When designing electronic enclosures, it's important to consider recommended gasket deflection and compression forces required to close gasketed seams. Orbel has established the following chart with loads for each gasket and the recommended compressed height to achieve maximum shielding performance. If you have a compression-force-sensitive application, our MegaSoft™ finger-stock products can greatly reduce compression forces while broadening the elastic range of the gasket.

ORBEL Part Number	Gasket Style	Recommended Compressed Height	Load (lbs./ft.)	Maximum Compression Height
21B03-BFA016000N	Slot-Mount	0.045"	21	0.015"
21B41-BFA016000N	Slot-Mount	0.095"	29	0.020"
30B03-BFA024000T	Twist: Strip	0.022"	18	0.010"
30B09-BFA024000T	Twist: Strip	0.056"	22	0.025"
30B05-BFA024000T	Twist: Right-Angle	0.022"	18	0.010"
30B09-BFA024000T	Twist: Right-Angle	0.056"	22	0.025"
24B13-BFA024000T	Adhesive-Mount	0.155"	26	0.040"
24B19-BFA024000T	Adhesive-Mount	0.180"	27	0.080"
26B01-BFA018000T	No-Snag	0.085"	13	0.050"
26B03-BFA018000T	No-Snag	0.170"	17	0.090"
32B05-BFA016000N	Clip-On	0.084"	17	0.060"
32B25-BFA016000N	Clip-On	0.180"	25	0.060"
33B01-BFA300000N	Large-Enclosure	0.180"	22	0.075"
33B03-BFA300000N	Large-Enclosure	0.290"	31	0.100"
36B11-BFA016000N	Contact Strip	0.064"	31	0.055"
36B30-BFA016000N	Contact Strip	0.094"	19	0.070"

Please consult Orbel's engineering team for sizes not shown.

# EMI SHIELDING PERFORMANCE

Shielding effectiveness is based on the recommended 25% gasket deflection and tested in accordance with MIL-STD-285 test procedure. MegaSoft™ finger stock offers comparable shielding effectiveness to standard product.

Gasketing Material	H-Field (100 kHz)	E-Field (10 MHz)	Plane Wave (1 GHz)
Standard Finger Stock	110 dB	100 dB	95 dB
MegaSoft™ Finger Stock	105 dB	95 dB	90 dB

All technical data presented herein is accurate to the best of our knowledge based on Orbel's most up-to-date testing information and material specs. This information is not presented as a warranty or guarantee and is not intended to be all-inclusive as to conditions of use.




# GALVANIC COMPATIBILITY

All dissimilar materials have the potential to react with each other in the presence of a catalyst such as humidity. For applications where humidity is low, the likelihood of galvanic corrosion will be low as well. If however you are working on a design for use in damp conditions or outdoors, the possible effects of galvanic corrosion can be significant.

Project designs often require dissimilar metals to come in contact during application. To prevent galvanic corrosion in these instances, plating is often used to protect the base materials from corrosion. Galvanic corrosion is a complex problem with many variables that are difficult to predict.

It is recommended that metals used together are located as close together as possible on the table below, as utilization of similar metals listed within a group will help to eliminate the possibility of galvanic corrosion. For additional guidance in solving potential issues regarding galvanic corrosion, please contact Orbel's technical sales or engineering department.

Group I	Group II	Group III	Group IV
Magnesium and Magnesium Alloys	Zinc and Zinc Plating	Cadmium Plating	Brass
Zinc and Zinc Plating	Galvanized Steel	Mild Steel and Wrought Iron	Stainless Steels
Galvanized Steel	Aluminum and Aluminum Alloys	Nickel and Nickel Plating	Copper and Copper Alloys • Beryllium Copper • Phosphorus Bronze • Nickel Silver • Monel
Aluminum and Aluminum Alloys	Chromium	Tin and Tin Plating	Silver
Chromium	Cadmium Plating	Tin/Lead Alloys – Solder and Plating	Graphite
	Mild Steel and Wrought Iron	Brass	Rhodium
	Nickel and Nickel Plating	Stainless Steels	Titanium
	Tin and Tin Plating	Copper and Copper Alloys	Platinum
	Tin/Lead Alloys—Solder and Plating	• Beryllium Copper • Phosphorus Bronze • Nickel Silver • Monel	Gold
<b>ANODIC</b>  <b>CATHODIC</b>			

# TAPE SPECS

Orbel's tape-mounted beryllium copper finger-stock gaskets utilize a non-conductive double-sided pressure-sensitive adhesive to ensure a strong bond to a wide variety of surfaces. This adhesive features very high holding power and its bond strength increases substantially with natural aging, making it ideal for electronic enclosures.

Material	Specification	Thickness	Color	Temperature Range	Shelf Life
Non-Conductive Acrylic Pressure-Sensitive Adhesive	3M 9469PC or Equivalent	0.005"	Clear	-40°F to + 250°F (-40°C to + 121°C)	12 Months*

\*Gaskets should be stored in original packaging in an atmosphere-controlled environment at 70°F (21°C) and 50% relative humidity.

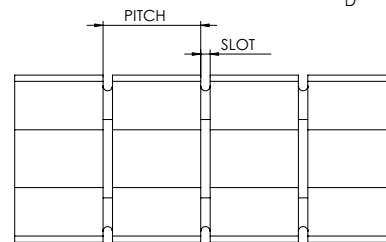
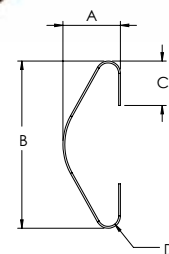
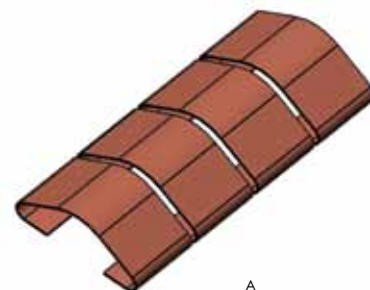
## Slot-Mount Series

Slot-mount series gaskets are typically used for bi-directional wiping or grounding applications. These parts are supplied in full-length strips or small segments where they can be mounted individually into two parallel slots or on a metal track for slide applications.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Thickness	Pitch	Slot	Length	# Fingers
21B03-BFA016000N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	16"	86
21M03-BFA016000N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	16"	86
21B03-BFA300000N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	300"	Coil
21M03-BFA300000N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	300"	Coil
21B03-BFA000169N	0.110"	0.320"	0.085"	0.020"	0.004"	-	-	0.169"	1
21M03-BFA000169N	0.110"	0.320"	0.085"	0.020"	0.002"	-	-	0.169"	1
21B03-BFA000356N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	0.356"	2
21M03-BFA000356N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	0.356"	2
21B03-BFA000543N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	0.543"	3
21M03-BFA000543N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	0.543"	3
21B03-BFA000730N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	0.730"	4
21M03-BFA000730N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	0.730"	4
21B03-BFA000917N	0.110"	0.320"	0.085"	0.020"	0.004"	0.187"	0.018"	0.917"	5
21M03-BFA000917N	0.110"	0.320"	0.085"	0.020"	0.002"	0.187"	0.018"	0.917"	5
21B41-BFA016000N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	16"	57
21M41-BFA016000N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	16"	57
21B41-BFA300000N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	300"	Coil
21M41-BFA300000N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	300"	Coil
21B41-BFA000250N	0.220"	0.600"	0.140"	0.040"	0.005"	-	-	0.250"	1
21M41-BFA000250N	0.220"	0.600"	0.140"	0.040"	0.003"	-	-	0.250"	1
21B41-BFA000532N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	0.532"	2
21M41-BFA000532N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	0.532"	2
21B41-BFA000814N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	0.814"	3
21M41-BFA000814N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	0.814"	3
21B41-BFA001096N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	1.096"	4
21M41-BFA001096N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	1.096"	4
21B41-BFA001378N	0.220"	0.600"	0.140"	0.040"	0.005"	0.282"	0.032"	1.378"	5
21M41-BFA001378N	0.220"	0.600"	0.140"	0.040"	0.003"	0.282"	0.032"	1.378"	5

Custom configurations also available.



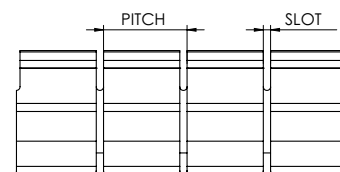
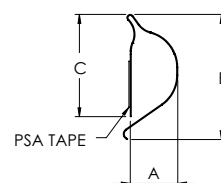
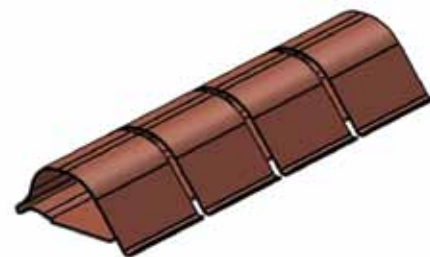
## Adhesive-Mount

Adhesive-mount gaskets are the most widely used finger-stock gaskets for metal cabinets and electronic enclosures. These all-purpose gaskets offer a high dynamic range of deflection while offering very low compression forces.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	Thickness	Pitch	Slot	Length	# Fingers
24B09-BFA016000T	0.140"	0.370"	0.310"	0.003"	0.250"	0.022"	16"	64
24M09-BFA016000T	0.140"	0.370"	0.310"	0.002"	0.250"	0.022"	16"	64
24B09-BFA300000T	0.140"	0.370"	0.310"	0.003"	0.250"	0.022"	300"	Coil
24M09-BFA300000T	0.140"	0.370"	0.310"	0.002"	0.250"	0.022"	300"	Coil
24B13-BFA024000T	0.230"	0.600"	0.500"	0.004"	0.375"	0.032"	24"	64
24M13-BFA024000T	0.230"	0.600"	0.500"	0.002"	0.375"	0.032"	24"	64
24B13-BFA300000T	0.230"	0.600"	0.500"	0.004"	0.375"	0.032"	300"	Coil
24M13-BFA300000T	0.230"	0.600"	0.500"	0.002"	0.375"	0.032"	300"	Coil
24B19-BFA024000T	0.250"	0.780"	0.530"	0.005"	0.375"	0.040"	24"	64
24M19-BFA024000T	0.250"	0.780"	0.530"	0.003"	0.375"	0.040"	24"	64
24B19-BFA300000T	0.250"	0.780"	0.530"	0.005"	0.375"	0.040"	300"	Coil
24M19-BFA300000T	0.250"	0.780"	0.530"	0.003"	0.375"	0.040"	300"	Coil

Custom configurations also available.



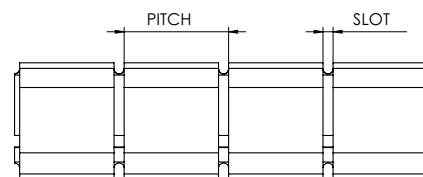
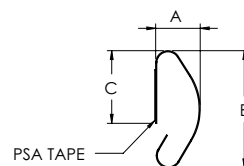
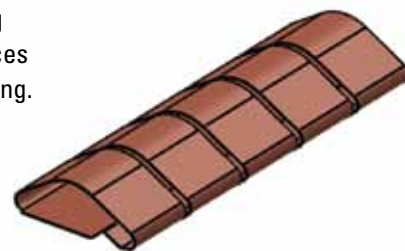
## No-Snag

No-snag gaskets are specifically designed to reduce compression friction while eliminating accidental snagging in high-traffic areas. Pyramid geometry provides low compression forces with a no-snag design. Parts are supplied with pressure-sensitive adhesive for easy mounting.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	Thickness	Pitch	Slot	Length	# Fingers
26B07-BFA018000T	0.080"	0.210"	0.130"	0.002"	0.187"	0.018"	18"	96
26B01-BFA018000T	0.110"	0.320"	0.210"	0.002"	0.187"	0.018"	18"	96
26B06-BFA018000T	0.120"	0.275"	0.175"	0.003"	0.187"	0.018"	18"	96
26M06-BFA018000T	0.120"	0.275"	0.175"	0.002"	0.187"	0.018"	18"	96
26B02-BFA018000T	0.130"	0.370"	0.210"	0.003"	0.250"	0.025"	18"	72
26M02-BFA018000T	0.130"	0.370"	0.210"	0.002"	0.250"	0.025"	18"	72
26B03-BFA018000T	0.220"	0.600"	0.280"	0.004"	0.375"	0.032"	18"	48
26M03-BFA018000T	0.220"	0.600"	0.280"	0.002"	0.375"	0.032"	18"	48
26B05-BFA018000T	0.320"	0.800"	0.440"	0.004"	0.375"	0.032"	18"	48
26M05-BFA018000T	0.320"	0.800"	0.440"	0.002"	0.375"	0.032"	18"	48
26B08-BFA018000T	0.320"	0.600"	0.340"	0.004"	0.375"	0.032"	18"	48
26M08-BFA018000T	0.320"	0.600"	0.340"	0.002"	0.375"	0.032"	18"	48
26B09-BFA018000T	0.405"	1.100"	0.780"	0.005"	0.480"	0.020"	18"	39
26M09-BFA018000T	0.405"	1.100"	0.780"	0.003"	0.480"	0.020"	18"	39

Custom configurations also available.



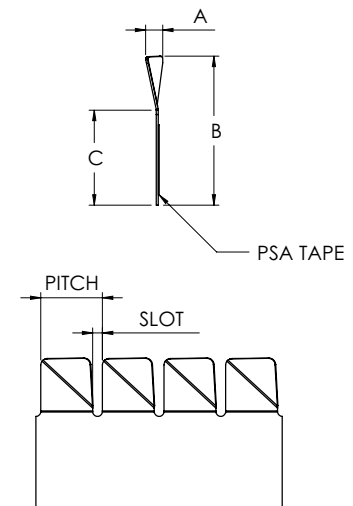
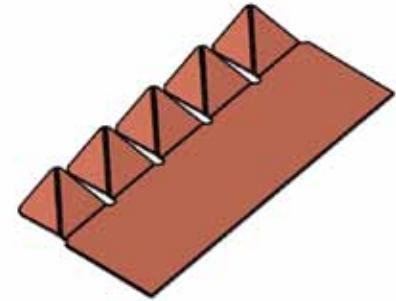
## Twist Series: Strip

Twist series strip gaskets are designed for straight compression or static load applications where gaskets can be compressed to material thickness. These gaskets offer exceptional EMI/RFI shielding performance as result of biting action of the twist contact finger design.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	Thickness	Pitch	Slot	Length	# Fingers
30B03-BFA024000T	0.030"	0.230"	0.140"	0.003"	0.095"	0.015"	24"	253
30M03-BFA024000T	0.030"	0.230"	0.140"	0.002"	0.095"	0.015"	24"	253
30B03-BFA300000T	0.030"	0.230"	0.140"	0.003"	0.095"	0.015"	300"	Coil
30M03-BFA300000T	0.030"	0.230"	0.140"	0.002"	0.095"	0.015"	300"	Coil
30B09-BFA024000T	0.070"	0.340"	0.180"	0.003"	0.165"	0.015"	24"	146
30M09-BFA024000T	0.070"	0.340"	0.180"	0.002"	0.165"	0.015"	24"	146
30B09-BFA300000T	0.070"	0.340"	0.180"	0.003"	0.165"	0.015"	300"	Coil
30M09-BFA300000T	0.070"	0.340"	0.180"	0.002"	0.165"	0.015"	300"	Coil
30B19-BFA024000T	0.070"	0.300"	0.140"	0.003"	0.165"	0.015"	24"	146
30M19-BFA024000T	0.070"	0.300"	0.140"	0.002"	0.165"	0.015"	24"	146
30B19-BFA300000T	0.070"	0.300"	0.140"	0.003"	0.165"	0.015"	300"	Coil
30M19-BFA300000T	0.070"	0.300"	0.140"	0.002"	0.165"	0.015"	300"	Coil
30B22-BFA024000T	0.030"	0.200"	0.110"	0.003"	0.165"	0.015"	24"	253
30M22-BFA024000T	0.030"	0.200"	0.110"	0.002"	0.165"	0.015"	24"	253
30B22-BFA300000T	0.030"	0.200"	0.110"	0.003"	0.165"	0.015"	300"	Coil
30M22-BFA300000T	0.030"	0.200"	0.110"	0.002"	0.165"	0.015"	300"	Coil

Custom configurations also available.



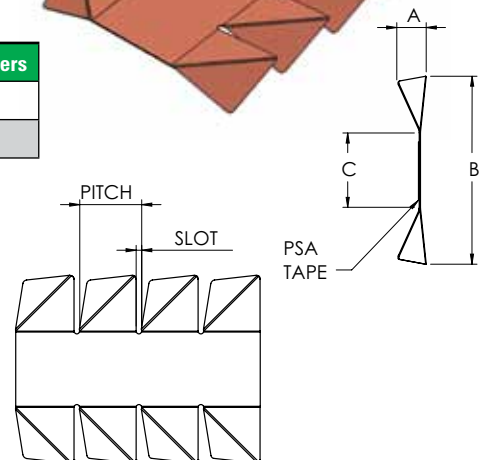
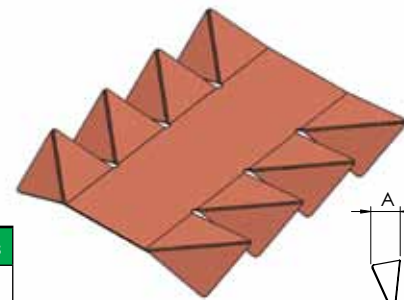
## Twist Series: Double-Strip

Twist series double-strip gaskets are designed for straight compression or static load applications where gaskets can be compressed to material thickness. These gaskets offer exceptional EMI/RFI shielding performance as a result of the biting action of the twist contact finger design.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	Thickness	Pitch	Slot	Length	# Fingers
30B15-BFA024000T	0.070"	0.500"	0.190"	0.003"	0.165"	0.015"	24"	146
30M15-BFA024000T	0.070"	0.500"	0.190"	0.002"	0.165"	0.015"	24"	146

Custom configurations also available.



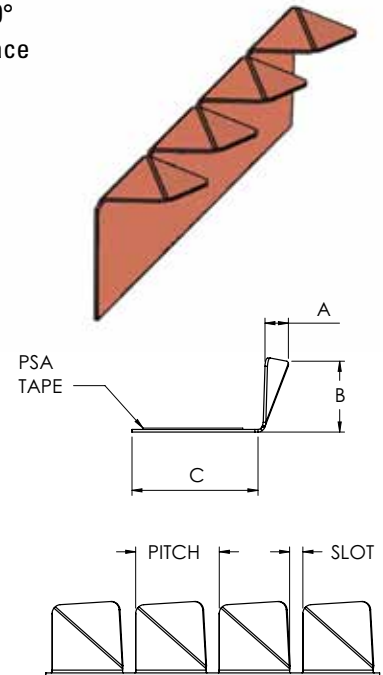
## Twist Series: Right-Angle

Twist series right-angle gaskets utilize a high-performance twist design to accommodate 90° EMI shielding requirements. These strips allow engineers to shield circular or minimal surface area applications since the contact area is perpendicular to the mounting surface.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	Thickness	Pitch	Slot	Length	# Fingers
30B05-BFA024000T	0.030"	0.080"	0.160"	0.003"	0.095"	0.015"	24"	253
30M05-BFA024000T	0.030"	0.080"	0.160"	0.002"	0.095"	0.015"	24"	253
30B11-BFA024000T	0.070"	0.110"	0.200"	0.003"	0.165"	0.015"	24"	146
30M11-BFA024000T	0.070"	0.110"	0.200"	0.002"	0.165"	0.015"	24"	146

Custom configurations also available.



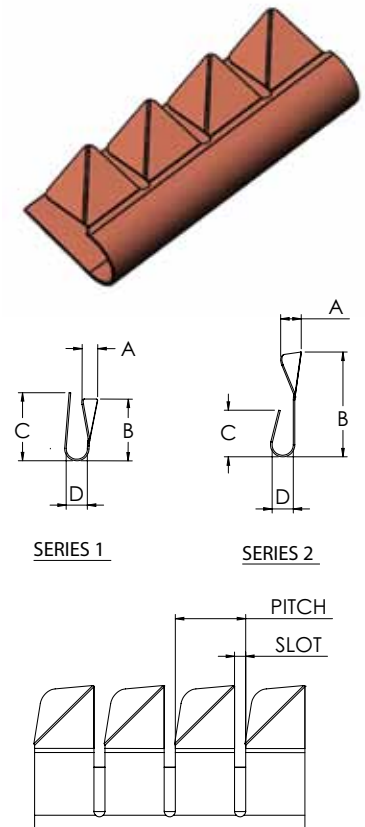
## Twist Series: Clip-On

Twist series clip-on gaskets are primarily used when space is at a premium or when design considerations prohibit the use of pressure-sensitive adhesives.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Thickness	Pitch	Slot	Length	# Fingers	Clip Series
31B01-BFA016000N	0.030"	0.150"	0.150"	0.070"	0.003"	0.095"	0.015"	16"	169	1
31M01-BFA016000N	0.030"	0.150"	0.150"	0.070"	0.002"	0.095"	0.015"	16"	169	1
31B05-BFA016000N	0.070"	0.210"	0.210"	0.070"	0.003"	0.165"	0.015"	16"	97	1
31M05-BFA016000N	0.070"	0.210"	0.210"	0.070"	0.002"	0.165"	0.015"	16"	97	1
31B09-BFA016000N	0.030"	0.275"	0.175"	0.070"	0.003"	0.095"	0.015"	16"	169	2
31M09-BFA016000N	0.030"	0.275"	0.175"	0.070"	0.002"	0.095"	0.015"	16"	169	2
31B13-BFA016000N	0.030"	0.275"	0.175"	0.050"	0.003"	0.095"	0.015"	16"	169	2
31M13-BFA016000N	0.030"	0.275"	0.175"	0.050"	0.002"	0.095"	0.015"	16"	169	2
31B17-BFA016000N	0.070"	0.378"	0.250"	0.070"	0.003"	0.165"	0.015"	16"	97	2
31M17-BFA016000N	0.070"	0.378"	0.250"	0.070"	0.002"	0.165"	0.015"	16"	97	2
31B21-BFA016000N	0.070"	0.378"	0.250"	0.050"	0.003"	0.165"	0.015"	16"	97	2
31M21-BFA016000N	0.070"	0.378"	0.250"	0.050"	0.002"	0.165"	0.015"	16"	97	2

Custom configurations also available.





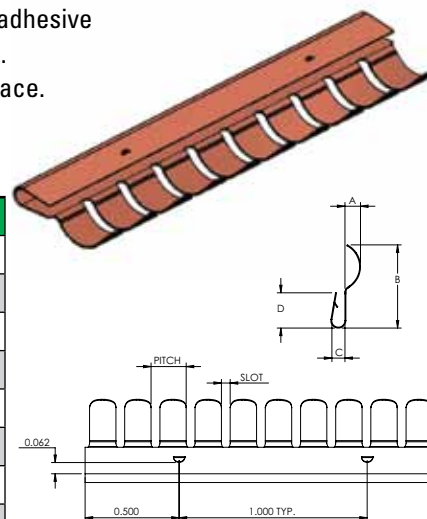
## Clip-On

Clip-on gaskets are designed for high-temperature applications where pressure-sensitive adhesive mounting is not possible or when a design requires a secure mechanical fastening method. These gaskets are available in a variety of sizes and will clip on to any plastic or metal surface.

### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Thickness	Pitch	Slot	Lance	Length
32B01-BFA016000N	0.100"	0.300"	0.070"	0.190"	0.005"	0.187"	0.047"	-	16"
32M01-BFA016000N	0.100"	0.300"	0.070"	0.190"	0.003"	0.187"	0.047"	-	16"
32B07-BFA016000N	0.080"	0.440"	0.070"	0.190"	0.005"	0.187"	0.047"	-	16"
32M07-BFA016000N	0.080"	0.440"	0.070"	0.190"	0.003"	0.187"	0.047"	-	16"
32B17-BFA016000N	0.210"	0.600"	0.070"	0.190"	0.005"	0.187"	0.047"	-	16"
32M17-BFA016000N	0.210"	0.600"	0.070"	0.190"	0.003"	0.187"	0.047"	-	16"
32B25-BFA016000N	0.260"	1.090"	0.070"	0.280"	0.005"	0.375"	0.040"	-	16"
32M25-BFA016000N	0.260"	1.090"	0.070"	0.280"	0.003"	0.375"	0.040"	-	16"
32B27-BFA016000N	0.080"	0.440"	0.105"	0.190"	0.005"	0.187"	0.047"	-	16"
32M27-BFA016000N	0.080"	0.440"	0.105"	0.190"	0.003"	0.187"	0.047"	-	16"
32B30-BFA016000N	0.100"	0.300"	0.070"	0.190"	0.005"	0.187"	0.047"	D-Lance	16"
32M30-BFA016000N	0.100"	0.300"	0.070"	0.190"	0.003"	0.187"	0.047"	D-Lance	16"
32B31-BFA016000N	0.080"	0.440"	0.070"	0.190"	0.005"	0.187"	0.047"	D-Lance	16"
32M31-BFA016000N	0.080"	0.440"	0.070"	0.190"	0.003"	0.187"	0.047"	D-Lance	16"
32B32-BFA016000N	0.210"	0.600"	0.070"	0.190"	0.005"	0.187"	0.047"	D-Lance	16"
32M32-BFA016000N	0.210"	0.600"	0.070"	0.190"	0.003"	0.187"	0.047"	D-Lance	16"
32B33-BFA016000N	0.260"	1.090"	0.070"	0.280"	0.005"	0.375"	0.040"	D-Lance	16"
32M33-BFA016000N	0.260"	1.090"	0.070"	0.280"	0.003"	0.375"	0.040"	D-Lance	16"
32B34-BFA016000N	0.080"	0.440"	0.105"	0.190"	0.005"	0.187"	0.047"	D-Lance	16"
32M34-BFA016000N	0.080"	0.440"	0.105"	0.190"	0.003"	0.187"	0.047"	D-Lance	16"

Custom configurations also available.

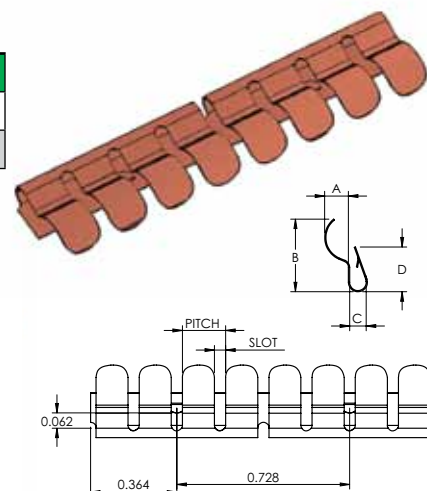


## Clip-On Pro

### Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Thickness	Pitch	Slot	Lance	Length
32B05-BFA016000T	0.100"	0.300"	0.070"	0.190"	0.005"	0.182"	0.047"	D-Lance	16"
32M05-BFA016000T	0.100"	0.300"	0.070"	0.190"	0.003"	0.182"	0.047"	D-Lance	16"

Custom configurations also available.



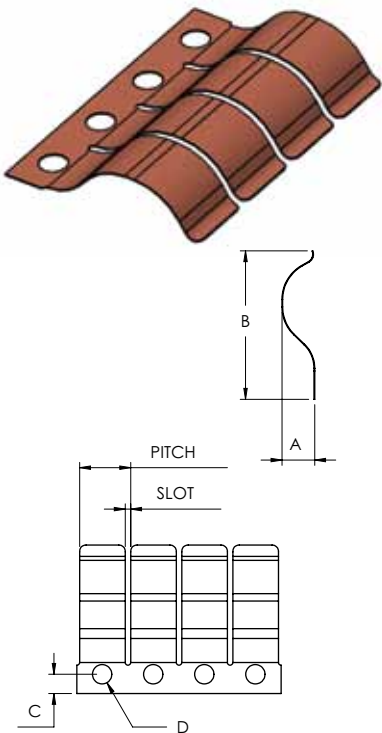
# Large-Enclosure

Large-enclosure gaskets are designed to shield enclosure doors, shelters, shielded rooms, and architectural seams. These gaskets are ideal for compression or wiping applications, or when a high deflection range is required. Parts are available in 24 in. strips or 25 ft. coils.

## Popular Standard Configurations

ORBEL Part Number	A	B	C	D	Thickness	Pitch	Slot	Length	# Fingers
33B01-BFA300000N	0.250"	1.090"	0.160"	0.140"	0.005"	0.375"	0.040"	300"	Coil
33M01-BFA300000N	0.250"	1.090"	0.160"	0.140"	0.003"	0.375"	0.040"	300"	Coil
33B03-BFA300000N	0.410"	1.630"	0.190"	0.140"	0.007"	0.500"	0.040"	300"	Coil
33M03-BFA300000N	0.410"	1.630"	0.190"	0.140"	0.005"	0.500"	0.040"	300"	Coil

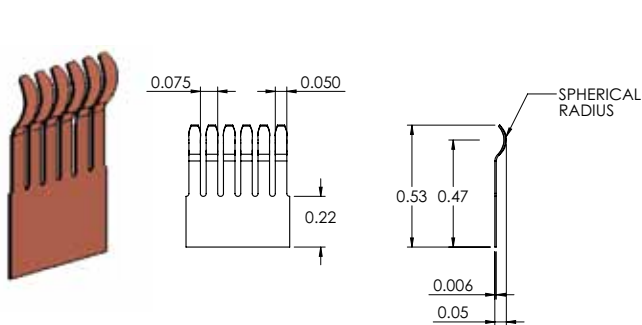
Custom configurations also available.



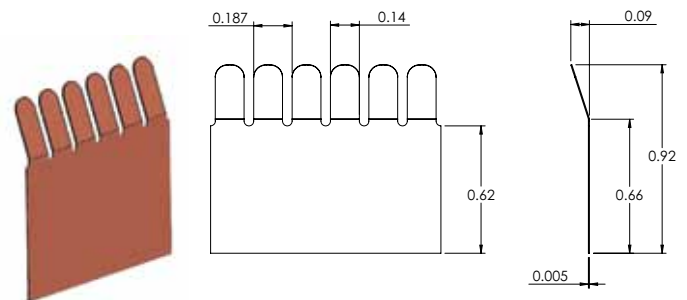
## EMI Contact Strips

EMI contact strips are generally used for grounding and shielding for high-frequency EMI applications. These strips are available in a variety of sizes and thicknesses, with many strips featuring a spherical radius designed to limit resistance at the contact point.

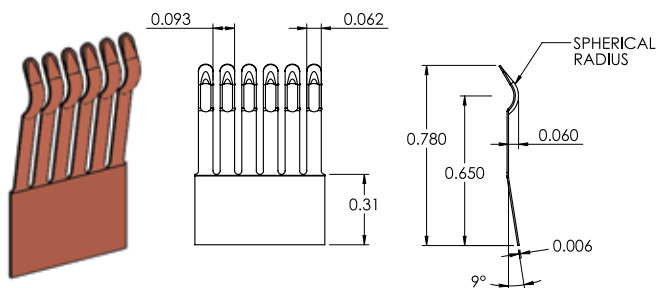
**ORBEL Part Number 36B18-BFA016000N**



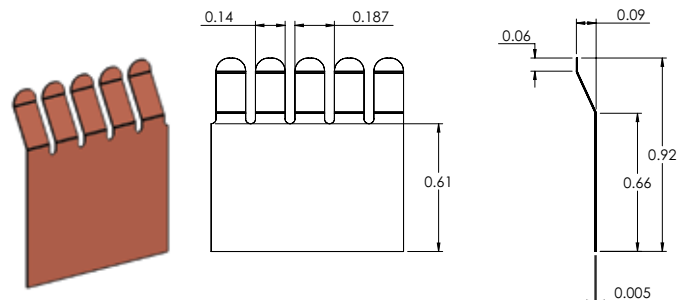
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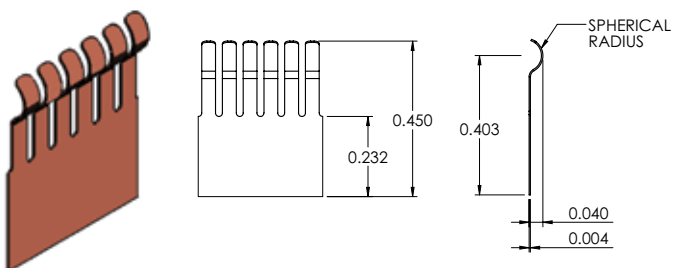
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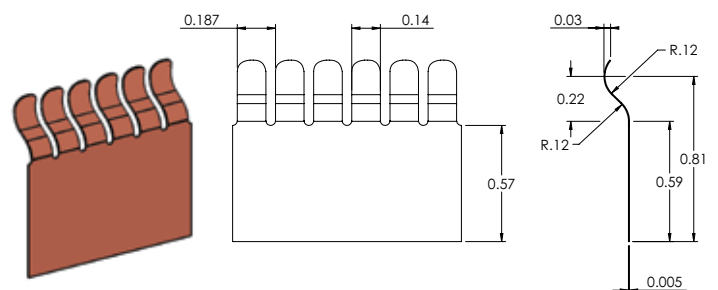
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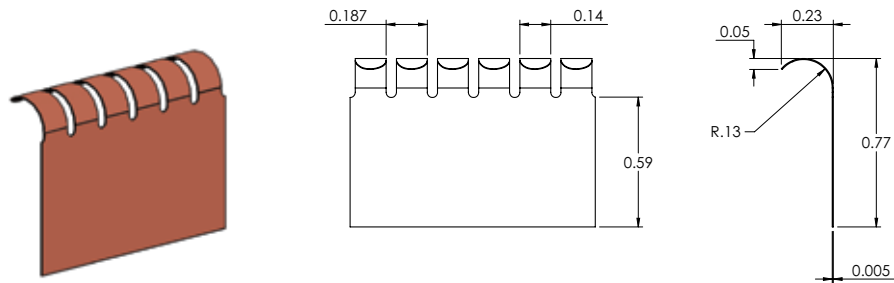
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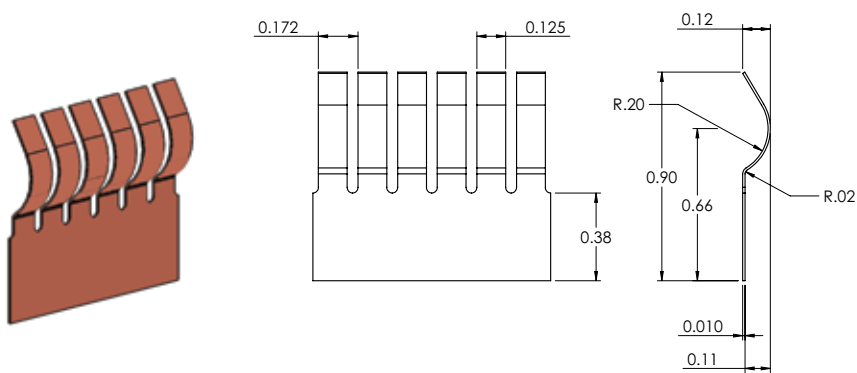
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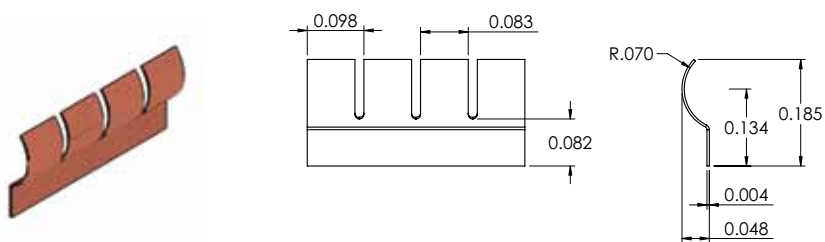
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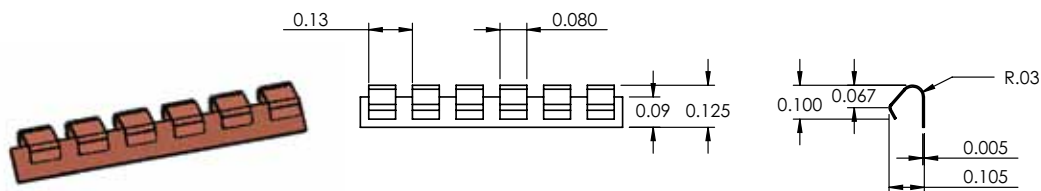
**ORBEL Part Number 36B26-BFA016000N**



**ORBEL Part Number 36B33-BFA016000N**

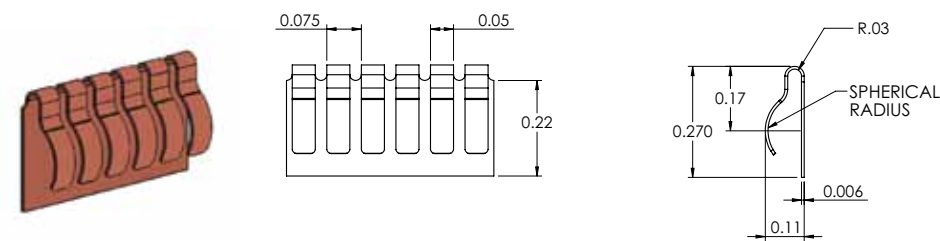


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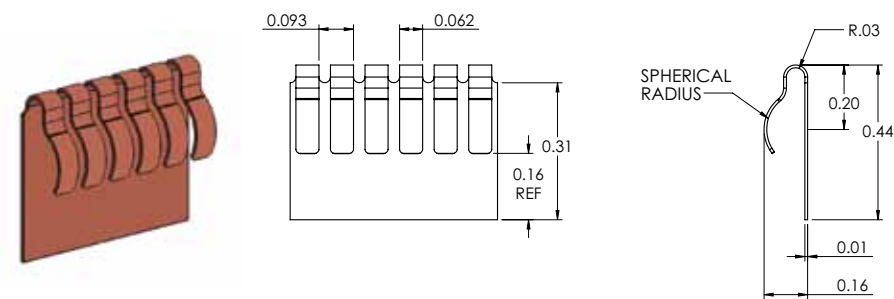


# EMI Contact Strips

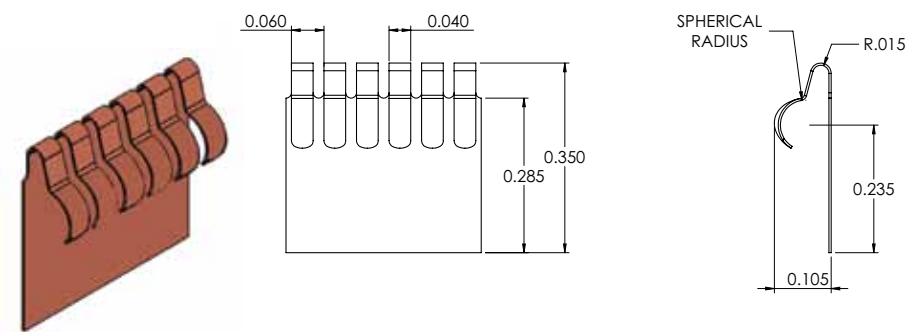
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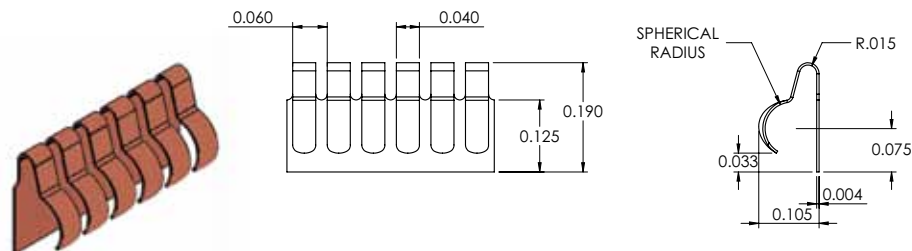
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## ORBEL Part Number 36B37-BFA016000N

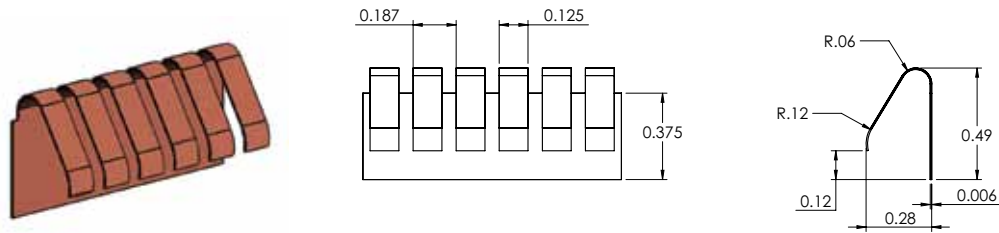


## ORBEL Part Number 36B30-BFA016000N

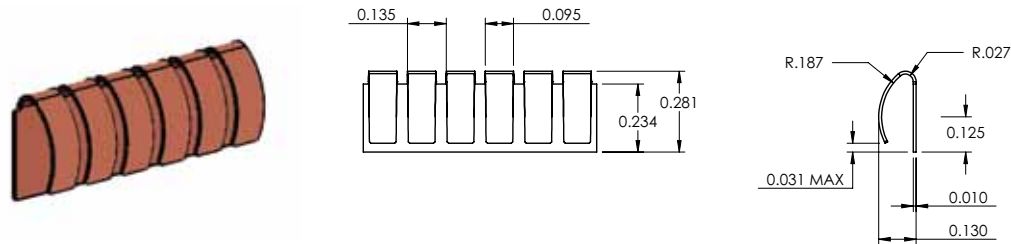




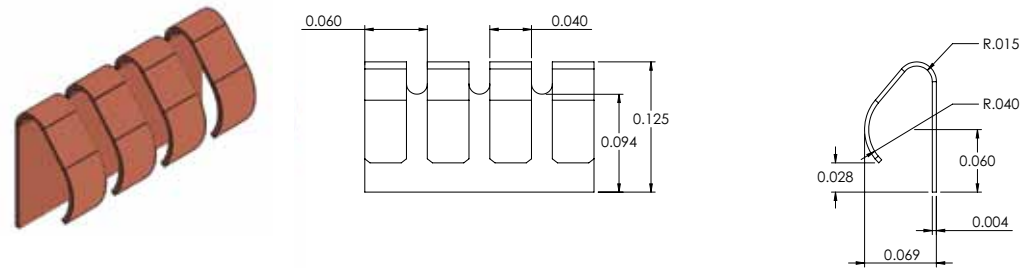
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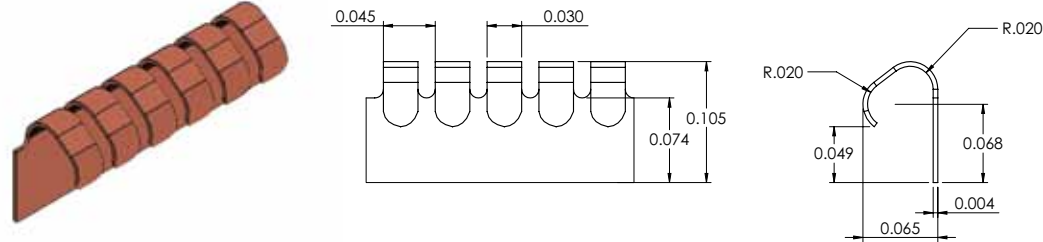
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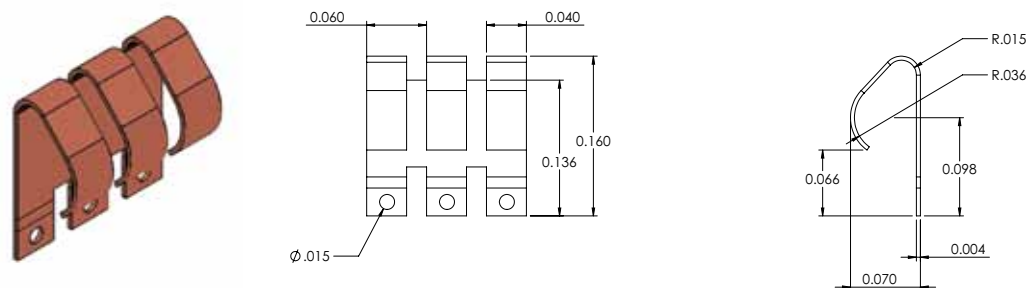
**ORBEL Part Number 36B11-BFA016000N**



**ORBEL Part Number 36B35-BFA016000N**



**ORBEL Part Number 36B34-BFA016000N**



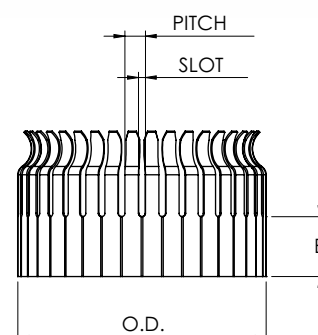
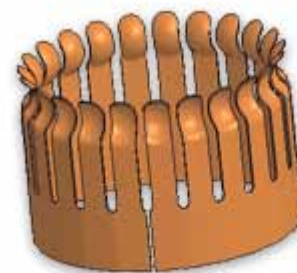
## EMI Contact Rings (Female)

Female contact rings are rolled so contact fingers are internal on the ring to accommodate cylindrical electrical contact for grounding or EMI shielding applications. Orbel offers standard off-the-shelf sizes as well as custom-rolled-diameter rings to meet specific applications.

### Popular Standard Configurations

ORBEL Part Number	Pitch	Slot	B	O.D.	# Fingers	Rec. Pin Diameter	Made from Strip #
36B10-BFA001219F	0.135"	0.040"	0.234"	1.219"	28	0.980"	36B10
36B10-BFA001000F	0.135"	0.040"	0.234"	1.000"	23	0.790"	36B10
36B10-BFA000875F	0.135"	0.040"	0.234"	0.875"	20	0.672"	36B10
36B18-BFA000290F	0.075"	0.025"	0.220"	0.290"	12	0.250"	36B18
36B18-BFA000440F	0.075"	0.025"	0.220"	0.440"	18	0.380"	36B18
36B18-BFA000550F	0.075"	0.025"	0.220"	0.550"	23	0.500"	36B18
36B18-BFA000800F	0.075"	0.025"	0.220"	0.800"	33	0.750"	36B18
36B20-BFA001040F	0.094"	0.031"	0.310"	1.040"	34	1.000"	36B20
36B21-BFA001240F	0.094"	0.031"	0.300"	1.240"	41	1.000"	36B21
36B12-BFA001250F	0.127"	0.050"	0.090"	1.250"	31	1.090"	36B12
36B12-BFA000910F	0.127"	0.050"	0.090"	0.910"	22	0.740"	36B12
36B12-BFA000650F	0.127"	0.050"	0.090"	0.650"	16	0.480"	36B12
36B28-BFA001010F	0.075"	0.025"	0.220"	1.010"	42	0.840"	36B28
36B30-BFA001010F	0.060"	0.020"	0.130"	1.210"	63	1.060"	36B30

Custom configurations also available.



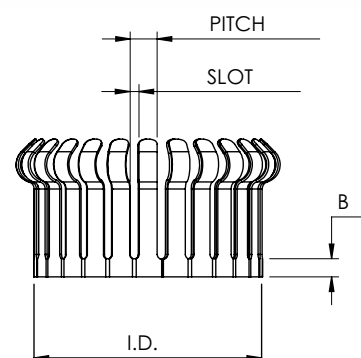
## EMI Contact Rings (Male)

Male contact rings are rolled so contact fingers are external on the ring to accommodate cylindrical electrical contact for grounding or EMI shielding applications. Orbel offers standard off-the-shelf sizes as well as custom-rolled-diameter rings to meet specific applications.

### Popular Standard Configurations

ORBEL Part Number	Pitch	Slot	B	I.D.	# Fingers	Rec. Hole Size	Made from Strip #
36B18-BFA000210M	0.075"	0.025"	0.220"	0.210"	9	0.250"	36B18
36B18-BFA000330M	0.075"	0.025"	0.220"	0.330"	14	0.380"	36B18
36B18-BFA000450M	0.075"	0.025"	0.220"	0.450"	19	0.500"	36B18
36B18-BFA000690M	0.075"	0.025"	0.220"	0.690"	29	0.750"	36B18
36B18-BFA000950M	0.075"	0.025"	0.220"	0.950"	40	1.000"	36B18
36B18-BFA001450M	0.075"	0.025"	0.220"	1.450"	61	1.500"	36B18
36B20-BFA000890M	0.094"	0.031"	0.310"	0.890"	30	1.000"	36B20
36B21-BFA001240M	0.094"	0.031"	0.310"	1.240"	42	1.500"	36B21

Custom configurations also available.





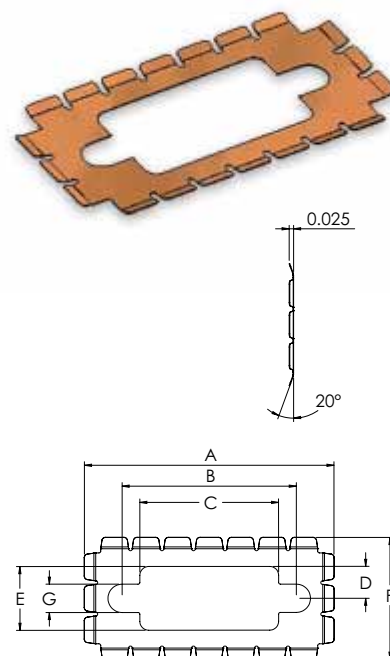
## D-Sub Connector Shields

D-sub connector gaskets offer superior grounding and EMI shielding for virtually any connector application. The unique independent finger design maintains excellent surface contact for irregular surfaces or tolerance stack-up. Orbel offers standard and custom connector gaskets.

### Popular Standard Configurations

ORBEL Part Number	# Pins	A	B	C	D	E	F	G	Pitch	Thickness
37B01-BFA001412N	9	1.412"	0.984"	0.784"	0.220"	0.440"	0.690"	0.160"	0.178"	0.004"
37S01-SSA001412N	9	1.412"	0.984"	0.784"	0.220"	0.440"	0.690"	0.160"	0.178"	0.004"
37B02-BFA001412N	9	1.412"	0.984"	0.784"	0.180"	0.360"	0.690"	0.160"	0.178"	0.004"
37S02-SSA001412N	9	1.412"	0.984"	0.784"	0.180"	0.360"	0.690"	0.160"	0.178"	0.004"
37B03-BFA001740N	15	1.740"	1.312"	1.112"	0.180"	0.360"	0.690"	0.160"	0.175"	0.004"
37S03-SSA001740N	15	1.740"	1.312"	1.112"	0.180"	0.360"	0.690"	0.160"	0.175"	0.004"
37B04-BFA001740N	15	1.740"	1.312"	1.112"	0.220"	0.360"	0.690"	0.160"	0.175"	0.004"
37S04-SSA001740N	15	1.740"	1.312"	1.112"	0.220"	0.360"	0.690"	0.160"	0.175"	0.004"
37B05-BFA002280N	25	2.280"	1.852"	1.652"	0.180"	0.360"	0.360"	0.160"	0.174"	0.004"
37S05-SSA002280N	25	2.280"	1.852"	1.652"	0.180"	0.360"	0.360"	0.160"	0.174"	0.004"
37B06-BFA002280N	25	2.280"	1.852"	1.652"	0.220"	0.440"	0.690"	0.160"	0.174"	0.004"
37S06-SSA002280N	25	2.280"	1.852"	1.652"	0.220"	0.440"	0.690"	0.160"	0.174"	0.004"
37B07-BFA002928N	37	2.928"	2.500"	2.290"	0.220"	0.440"	0.690"	0.160"	0.184"	0.004"
37S07-SSA002928N	37	2.928"	2.500"	2.290"	0.220"	0.440"	0.690"	0.160"	0.184"	0.004"

Custom configurations also available.



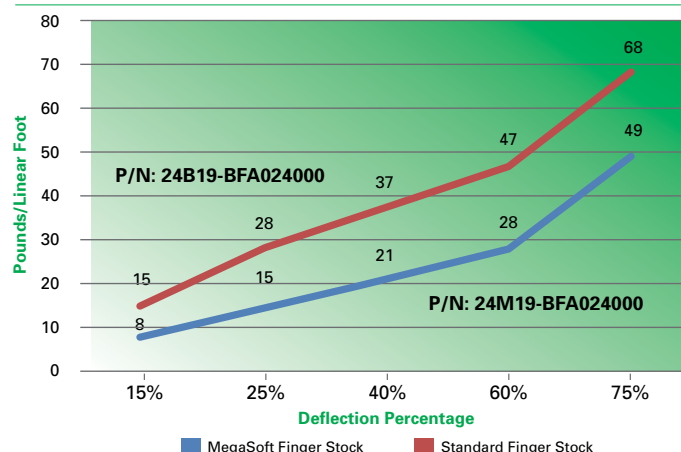
## MEGASOFT™ FINGER-STOCK PRODUCTS

Orbel's MegaSoft™ finger-stock products are ideal for compression-force-sensitive applications where thinner, lighter cabinet construction is required.

MegaSoft fingers offer a 40% reduction in compression force versus typical finger-stock gaskets while increasing cycle life. Low compression forces allow designers the flexibility to utilize thinner materials and less costly latches and hinges for electronic enclosure construction without compromising shielding performance. MegaSoft fingers are available on all of Orbel's standard finger-stock configurations.

- Low compression forces
- Shielding effectiveness comparable to standard product
- Increases finger-stock cycle life
- Enables thinner, lighter cabinet construction
- Available on all standard and custom gaskets

### DEFLECTION/COMPRESSION FORCE DATA Standard Finger Stock vs. MegaSoft™ Finger Stock

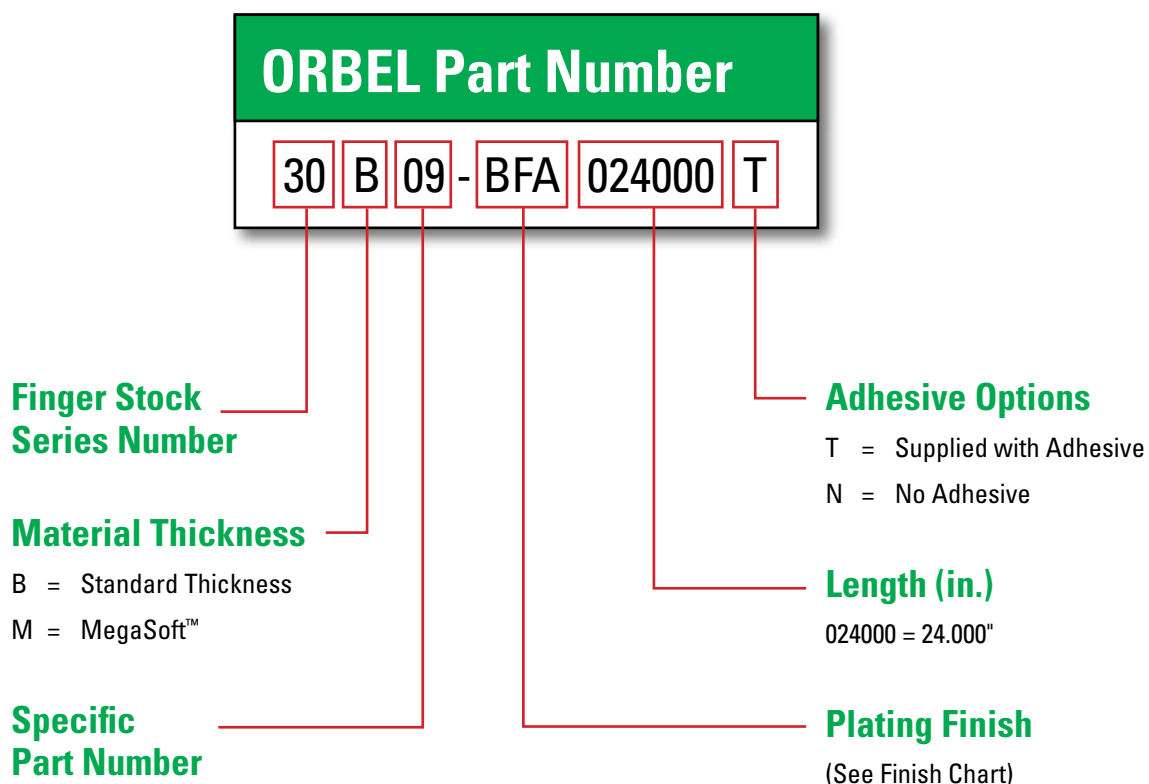


All technical data presented herein is accurate to the best of our knowledge based on Orbel's most up-to-date testing information and material specs. This information is not presented as a warranty or guarantee and is not intended to be all-inclusive as to conditions of use.

# HOW TO ORDER FINGER-STOCK GASKETS

The chart below is an easy-to-use reference on how Orbel finger-stock gasket part numbers are created and used to order standard and custom gaskets. Custom configurations that fall outside of our standard gasket styles are also available.

**Sample Part Number: 30B09-BFA024000T**



PLATING FINISHES			
Finish Type	Finish Code	Finish Type	Finish Code
SILVER	AGA	NICKEL, ELECTROLESS	NIP
GOLD .000050" MIN	AUA	TIN/LEAD 90/10, MATTE	PBA
GOLD .000050" MIN with NICKEL FLASH UNDERPLATE	AUK	TIN/LEAD 60/40, MATTE	PBB
BRIGHT FINISH, UNPLATED	BFA	TIN/LEAD 90/10, BRIGHT	PBC
BRIGHT FINISH, SOLDERABLE	BFS	TIN/LEAD 60/40, BRIGHT	PBD
CADMIUM + CLEAR CHROMATE	CDA	TIN, BRIGHT	SNA
CADMIUM + YELLOW CHROMATE	CDB	TIN, MATTE	SNB
NICKEL, BRIGHT	NIA	ZINC + CLEAR CHROMATE	ZNA
NICKEL, MATTE OR SULFAMATE NICKEL	NIB	ZINC + YELLOW CHROMATE	ZNB

*All plating thicknesses are .0001" min. except where noted.*



# CIRCUIT BOARD STIFFENERS & BUS BARS

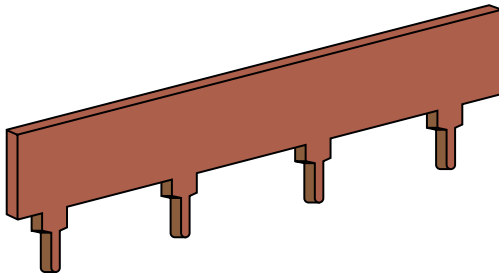


Orbel specializes in standard and custom circuit board stiffeners designed to strengthen and protect printed circuit boards from broken component lead wires, cracked solder joints, and traces during shock and vibration. They can also be used as power distribution bus bars to eliminate the need for heavy traces. Increasing and ensuring the ongoing rigidity of today's state-of-the-art circuit boards is extremely important in aerospace, defense, and other applications that require extreme operating environments.

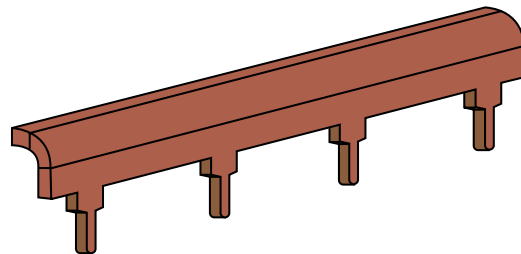
Orbel's standard circuit board stiffeners are made from 0.040"-thick alloy 110 copper and bright tin plated for solderability. Offered in two standard configurations, straight (Type A) or right-angle (Type B), Orbel's unique modular design allows engineers to modify our standard product to create custom stiffener designs quickly and cost-effectively.

- Easily installs onto printed circuit boards
- Available in any length and various heights
- Variety of material and finish options
- Standard and custom circuit board stiffeners

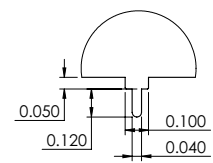
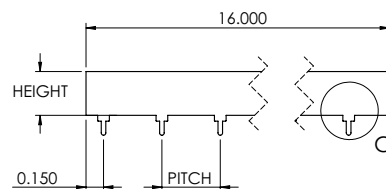
## Straight Stiffener (Type A)



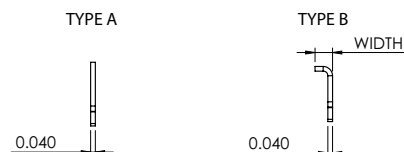
## Right-Angle Stiffener (Type B)



ORBEL Part Number	Height	Type	Width	Pitch	Length
I-0250AB000-016000	0.250"	A	N/A	0.500"	16
I-0375AB000-016000	0.375"	A	N/A	0.500"	16
I-0500AB000-016000	0.500"	A	N/A	0.500"	16
I-0500AC000-016000	0.500"	A	N/A	1.000"	16
I-0750AB000-016000	0.750"	A	N/A	0.500"	16
I-0178AB100-016000	0.178"	B	0.100"	0.500"	16
I-0303AB100-016000	0.303"	B	0.100"	0.500"	16
I-0428AB100-016000	0.428"	B	0.100"	0.500"	16
I-0628AC150-016000	0.628"	B	0.150"	1.000"	16
I-0678AB100-016000	0.678"	B	0.100"	0.500"	16

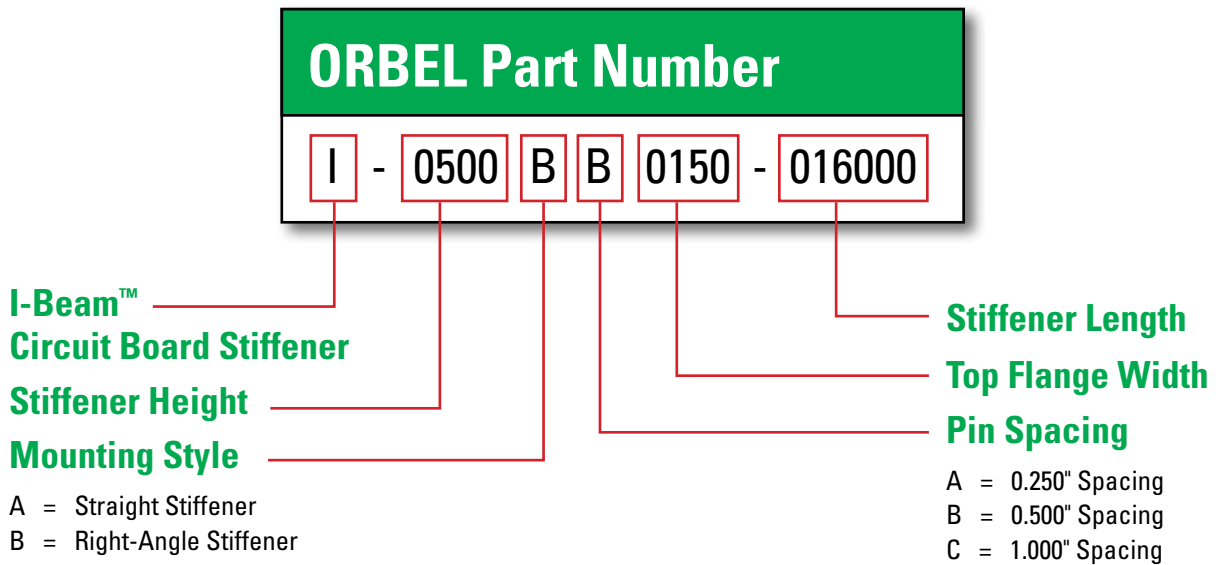


DETAIL C  
SCALE 2 : 1



# HOW TO ORDER CIRCUIT BOARD STIFFENERS

Sample Part Number: I-0500BB0150-016000



*For additional materials, material thicknesses, and plating finishes, please consult Orbel.*

## BATTERY TABS & CONTACTS



The industry's leading producer of precision metal stampings, Orbel specializes in standard and custom battery tabs, battery contacts, and interconnect parts that support the ever-evolving product requirements of the battery industry.

### Battery Tabs

Orbel offers standard and custom battery tabs in a variety of materials suitable for soldering or welding, and our photo-etching process allows the design of custom notches, holes, and dimples. Photo etching is also a cost-effective way to produce intricate custom-shaped tabs.

- Materials include nickel, tin-plated steel, and nickel-plated copper
- Material thicknesses ranging from 0.0007" to 0.032"
- Rectangular tabs available in unlimited widths and lengths
- Features include notches, holes, and welding dimples

### Battery Contacts & Interconnect Parts

From single- and dual-style leaf springs to clip-on and board-mounted battery contacts, Orbel's state-of-the-art etching and universal forming minimizes customer expenses from prototyping through production. Orbel can support high-volume applications with dedicated tooling and high-speed presses designed to minimize piece costs.

- Materials include beryllium copper, steel, and more
- Material thicknesses ranging from 0.002" to 0.032"
- Expert engineering design assistance
- In-house tooling, forming, heat treating, and plating

# METALIZED FABRIC GASKETS



Ideal for the control of electromagnetic performance, Orbel's comprehensive line of metalized fabric gaskets is manufactured from a resilient polyurethane foam core and wrapped with a durable high-performance nickel-plated copper-conductive fabric. Orbel offers over 100 standard fabric-over-foam gaskets in a wide variety of shapes and profiles. Custom modifications include cut-to-length, kiss-cutting, and miter-cutting for frame-style gaskets.

## Custom Design & Manufacturing

Whether starting with one of our standard gasket designs or creating a brand-new design template, Orbel can serve as your start-to-finish engineering and production partner. Orbel has been producing the world's most effective metalized fabric gaskets for decades, experience that allows us to create precisely what will work best for your application. Orbel fabric-over-foam gaskets are ideal for shielding seams, doors, access panels, and a host of other end-uses.

Cost-effective, user-friendly, and easily compressed, metalized fabric gaskets from Orbel are highly flame-resistant and provide the ability to operate at higher frequencies. Couple that with the industry's shortest lead times, expert engineering, and unrivaled customer service, and your solution is clear—Orbel.

# PERFORMANCE SPECS

## Electrical Properties

- Shielding Effectiveness: >80dB attenuation 30MHz to 3GHz
- Surface Resistance: <0.05 ohms per square inch
- Volume Resistivity: 0.005-0.017 ohms/cm

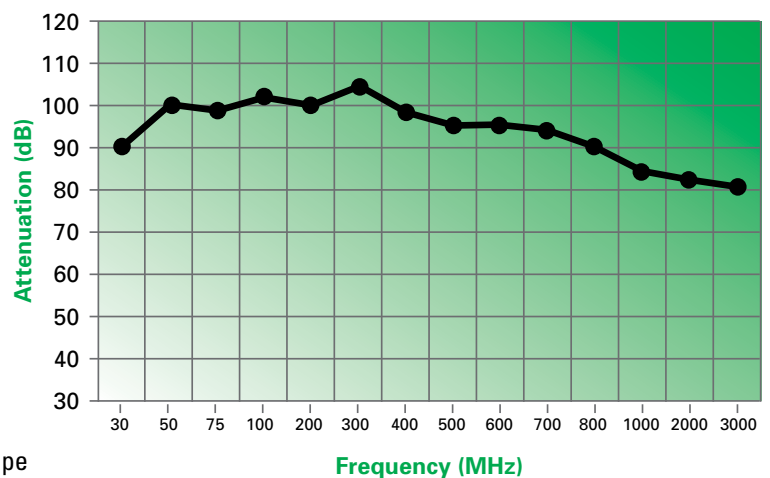
## Mechanical Properties

- Material Specifications
  - Fabric: Flame-retardant and abrasion-resistant electrically conductive nickel-plated copper nylon ripstop fabric
  - Foam Core: Flame-retardant resilient open-cell urethane foam
- Adhesive: 0.002"-thick nickel-filled conductive acrylic tape
- Standard Profiles: Rectangles, squares, D-shapes, bell shapes, C-fold, P-shapes, T-shapes, and knife shapes
- Deflection Operating Range: 30%-75% deflection
- Compression Force: 1-3 pounds per square inch at 50% deflection
- Temperature Range: -40°F to 158°F (-40°C to 70°C)
- Custom Shapes Available: Cut-to-length, die-cut gaskets, kiss-cut, mitered corners, and custom profiles

## Environmental Properties

- Application Conditions: Good barrier against dust and air but not for use as a fluid seal
- Galvanic Compatibility: Compatible with many surfaces including aluminum, steel, and zinc
- Shelf Life: 2 years if stored in a temperature- and humidity-controlled environment

## SHIELDING EFFECTIVENESS



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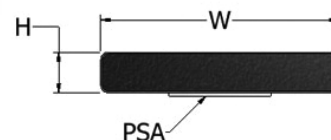
## Hi-Flex™ Rectangular

### Popular Standard Configurations

ORBEL Part Number	H	W
020R196-024000	.020"	.196"
020R275-024000	.020"	.275"
020R400-024000	.020"	.400"
040R125-024000	.040"	.125"
040R200-024000	.040"	.200"
040R275-024000	.040"	.275"
040R395-024000	.040"	.395"
040R510-024000	.040"	.510"
050R090-024000	.050"	.090"
050R225-024000	.050"	.225"
060R100-024000	.060"	.100"
060R125-024000	.060"	.125"
060R157-024000	.060"	.157"
060R200-024000	.060"	.200"
060R394-024000	.060"	.394"
060R500-024000	.060"	.500"
080R160-024000	.080"	.160"
080R200-024000	.080"	.200"
080R275-024000	.080"	.275"
080R400-024000	.080"	.400"
080R500-024000	.080"	.500"

Custom configurations also available.

ORBEL Part Number	H	W
090R250-024000	.090"	.250"
100R200-024000	.100"	.200"
100R375-024000	.100"	.375"
100R500-024000	.100"	.500"
125R187-024000	.125"	.187"
125R250-024000	.125"	.250"
125R375-024000	.125"	.375"
125R500-024000	.125"	.500"
130R190-024000	.130"	.190"
150R275-024000	.150"	.275"
150R375-024000	.150"	.375"
150R500-024000	.150"	.500"
160R200-024000	.160"	.200"
160R354-024000	.160"	.354"
160R600-024000	.160"	.600"
187R375-024000	.187"	.375"
187R500-024000	.187"	.500"
250R375-024000	.250"	.375"
250R500-024000	.250"	.500"
375R500-024000	.375"	.500"

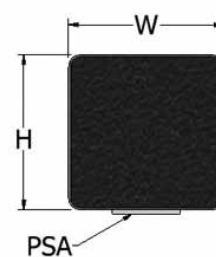


## Hi-Flex™ Square

### Popular Standard Configurations

ORBEL Part Number	H	W
080S080-024000	.080"	.080"
093S093-024000	.093"	.093"
118S118-024000	.118"	.118"
157S157-024000	.157"	.157"
195S195-024000	.195"	.195"
236S236-024000	.236"	.236"
250S250-024000	.250"	.250"
375S375-024000	.375"	.375"
395S395-024000	.395"	.395"
500S500-024000	.500"	.500"
670S670-024000	.670"	.670"

Custom configurations also available.



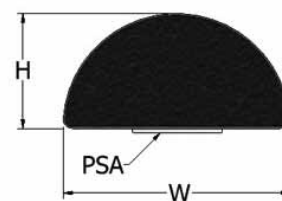


## Hi-Flex™ D-Shaped

### Popular Standard Configurations

ORBEL Part Number	H	W
040D150-024000	.040"	.150"
040D200-024000	.040"	.200"
050D125-024000	.050"	.140"
050D187-024000	.050"	.187"
050D250-024000	.050"	.250"
060D150-024000	.060"	.150"
060D250-024000	.060"	.250"
070D135-024000	.070"	.135"
070D180-024000	.070"	.180"
080D080-024000	.080"	.080"
080D157-024000	.080"	.157"
080D394-024000	.080"	.394"
090D090-024000	.090"	.090"
090D150-024000	.090"	.150"
100D300-024000	.100"	.300"
110D180-024000	.110"	.180"
120D150-024000	.120"	.150"

Custom configurations also available.

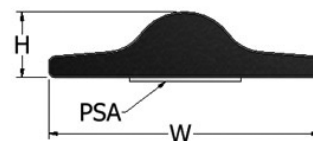


## Hi-Flex™ Bell-Shaped

### Popular Standard Configurations

ORBEL Part Number	H	W
070B180-024000	.070"	.180"
070B564-024000	.070"	.564"
080B315-024000	.080"	.315"
080B450-024000	.080"	.450"
080B675-024000	.080"	.675"
100B300-024000	.100"	.300"
100B394-024000	.100"	.394"
120B400-024000	.120"	.400"
120B600-024000	.120"	.600"
130B256-024000	.130"	.256"
150B500-024000	.150"	.500"
200B500-024000	.200"	.500"

Custom configurations also available.

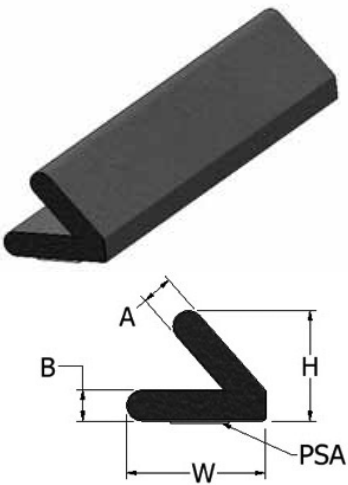


# Hi-Flex™ C-Fold

## Popular Standard Configurations

ORBEL Part Number	H	W	A	B
195C325-024000	.195"	.325"	.120"	.040"
225C250-024000	.225"	.250"	.120"	.040"
240C415-024000	.240"	.415"	.100"	.040"
250C280-024000	.250"	.280"	.125"	.060"
315C315-024000	.315"	.315"	.080"	.080"
385C420-024000	.385"	.420"	.115"	.060"
415C450-024000	.415"	.450"	.135"	.065"
465C420-024000	.465"	.420"	.165"	.156"
675C590-024000	.675"	.590"	.500"	.051"

Custom configurations also available.

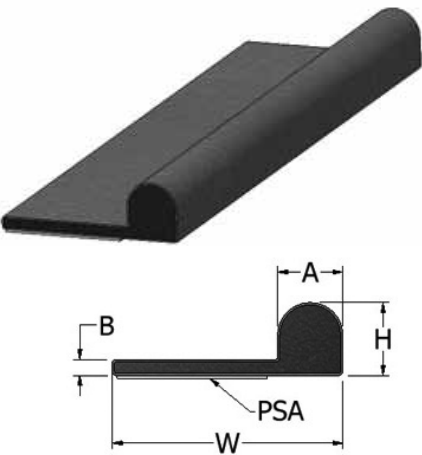


# Hi-Flex™ P-Shaped

## Popular Standard Configurations

ORBEL Part Number	H	W	A	B
040P200-024000	.040"	.200"	.118"	.015"
060P275-024000	.060"	.275"	.118"	.015"
080P250-024000	.080"	.250"	.118"	.020"
118P520-024000	.118"	.520"	.242"	.020"
145P520-024000	.145"	.520"	.150"	.020"
170P395-024000	.170"	.395"	.150"	.079"
200B395-024000	.200"	.395"	.170"	.090"
200P480-024000	.200"	.480"	.170"	.090"
375P887-024000	.374"	.887"	.500"	.051"

Custom configurations also available.

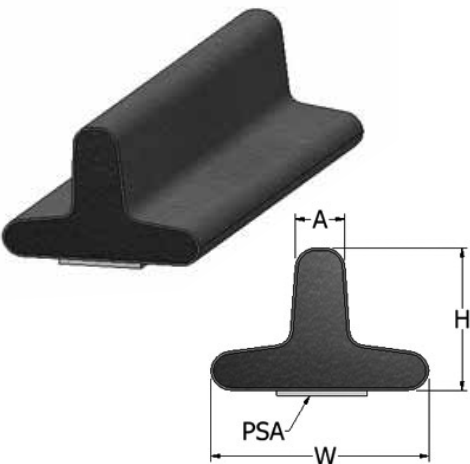


# Hi-Flex™ T-Shaped

## Popular Standard Configurations

ORBEL Part Number	H	W	A
152T235-024000	.152"	.235"	.050"
165T270-024000	.165"	.270"	.050"
200T480-024000	.190"	.300"	.060"

Custom configurations also available.

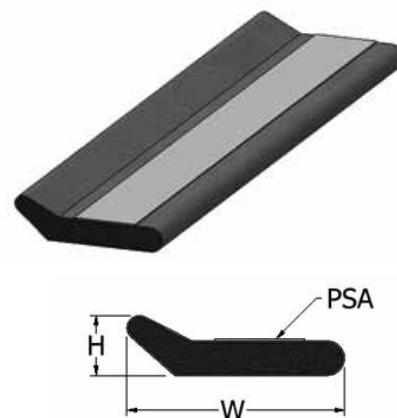


## Hi-Flex™ Knife-Shaped

### Popular Standard Configurations

ORBEL Part Number	H	W
070K340-024000	.070"	.340"
088K445-024000	.088"	.445"
106K315-024000	.106"	.315"
106K445-024000	.106"	.445"
110K450-024000	.110"	.450"
150K500-024000	.150"	.500"
190K600-024000	.190"	.600"
250K750-024000	.250"	.750"
312K707-024000	.312"	.707"
350K750-024000	.350"	.750"

Custom configurations also available.



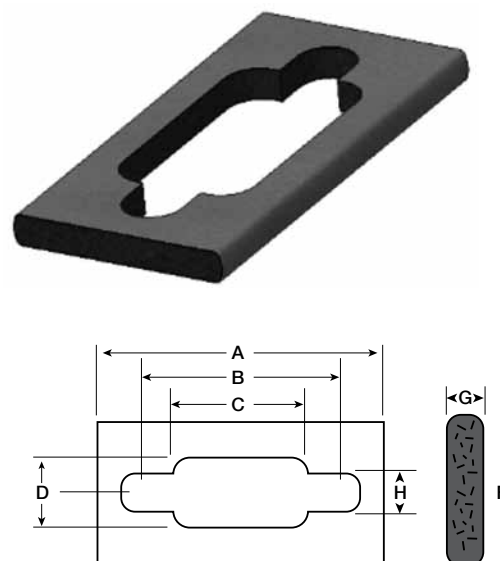
## D-Sub Gaskets

- Over 100 standard configurations
- Standard D-sub gaskets: 9-, 15-, 25-, 37-, and 50-pin
- Standard material thickness is 1mm and 2mm
- Optional PSA

### Popular Standard Configurations

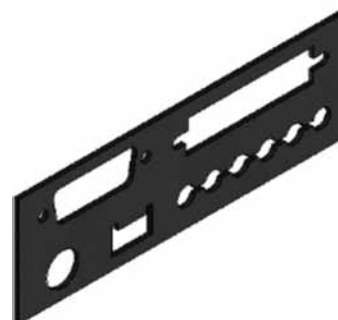
ORBEL Part Number	Type	A	B	C	D	E	F	G	H
140DS700-09	9-Pin	1.40"	0.98"	0.78"	0.44"	0.22"	0.70"	0.10"	0.15"
175DS700-15	15-Pin	1.75"	1.31"	1.11"	0.44"	0.22"	0.70"	0.10"	0.15"
228DS700-25	25-Pin	2.28"	1.85"	1.65"	0.44"	0.22"	0.70"	0.10"	0.15"
293DS700-37	37-Pin	2.93"	2.50"	2.29"	0.44"	0.22"	0.70"	0.10"	0.15"
284DS700-50	50-Pin	2.84"	2.41"	2.20"	0.44"	0.22"	0.70"	0.10"	0.15"

Custom configurations also available.



## I/O Backplane Gaskets

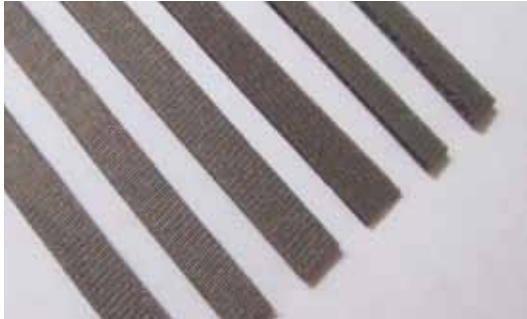
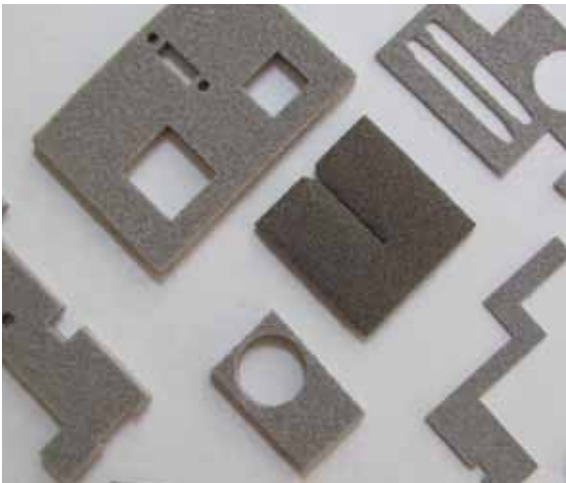
- Fully custom gaskets
- Any width, length, and thickness in any cutout configuration
- Optional PSA



# ULTRAFLEX™ CONDUCTIVE FOAM

Orbel's UltraFlex™ conductive foam shielding material offers X, Y, and Z-axis conductivity and very low closure force, making it ideal for many shielding applications. This unique gasket construction consists of nickel-plated copper polyurethane foam protected between two layers of conductive polyester fabric, providing excellent conductivity and EMI shielding performance. Conductive foam is supplied with and without conductive pressure-sensitive adhesive on one side.

- Standard thicknesses are 0.039" (1mm), 0.079" (2mm), and 0.118" (3mm)
- Supplied in sheets, strips, or custom die-cut shapes
- Wide compression range
- Low compression force
- Excellent conductivity and shielding performance



## Sheet Configurations

ORBEL Part Number	H	W	L
04 0U1020	0.040"	10.00"	20.00"
040U2020	0.040"	20.00"	20.00"
080U1020	0.080"	10.00"	20.00"
080U2020	0.080"	20.00"	20.00"
120U1020	0.120"	10.00"	20.00"
120U2020	0.120"	20.00"	20.00"

For additional sizes, please contact Orbel's engineering team for assistance.

## Strip Configurations

ORBEL Part Number	H	W
040U200-020000	0.040"	0.200"
040U350-020000	0.040"	0.350"
040U500-020000	0.040"	0.500"
080U250-020000	0.080"	0.250"
080U375-020000	0.080"	0.375"
080U500-020000	0.080"	0.500"
120U250-020000	0.120"	0.250"
120U500-020000	0.120"	0.500"
120U750-020000	0.120"	0.750"

All technical data presented herein is accurate to the best of our knowledge based on Orbel's most up-to-date testing information and material specs. This information is not presented as a warranty or guarantee and is not intended to be all-inclusive as to conditions of use.

# ULTRAFLEX™ CONDUCTIVE FOAM

## Mechanical Properties

- Material Specification: Flame-retardant nickel-plated copper polyurethane foam protected between two layers of conductive polyester fabric
- Adhesive: 0.002"-thick nickel-filled conductive acrylic tape
- Configurations: Sheets, strips, or custom die-cuts
- Deflection Range: 30%-75% deflection
- Compression Force: 2.1 pounds per square inch at 30% deflection
- Temperature Range: -40°F to 158°F (-40°C to 70°C)
- Flammability: UL94HB

## Electrical Properties

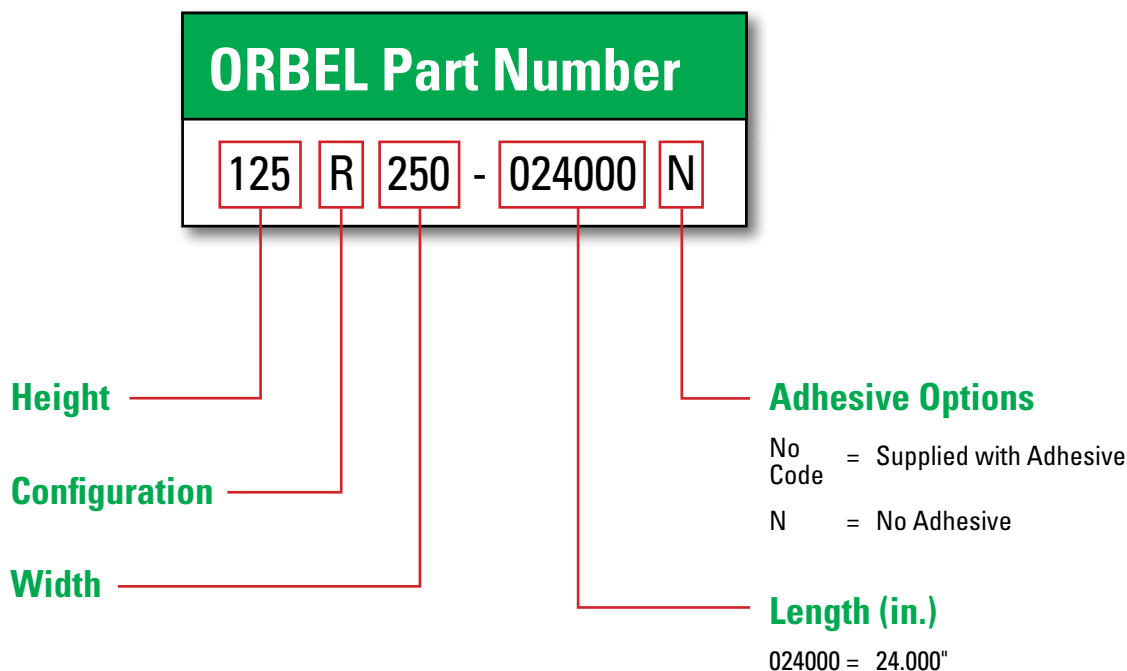
- Surface Resistivity: <0.02 ohms per square inch
- Z Resistivity: <0.01 ohms
- Shielding Effectiveness: >60dB attenuation 30MHz to 3GHz

## Environmental Properties

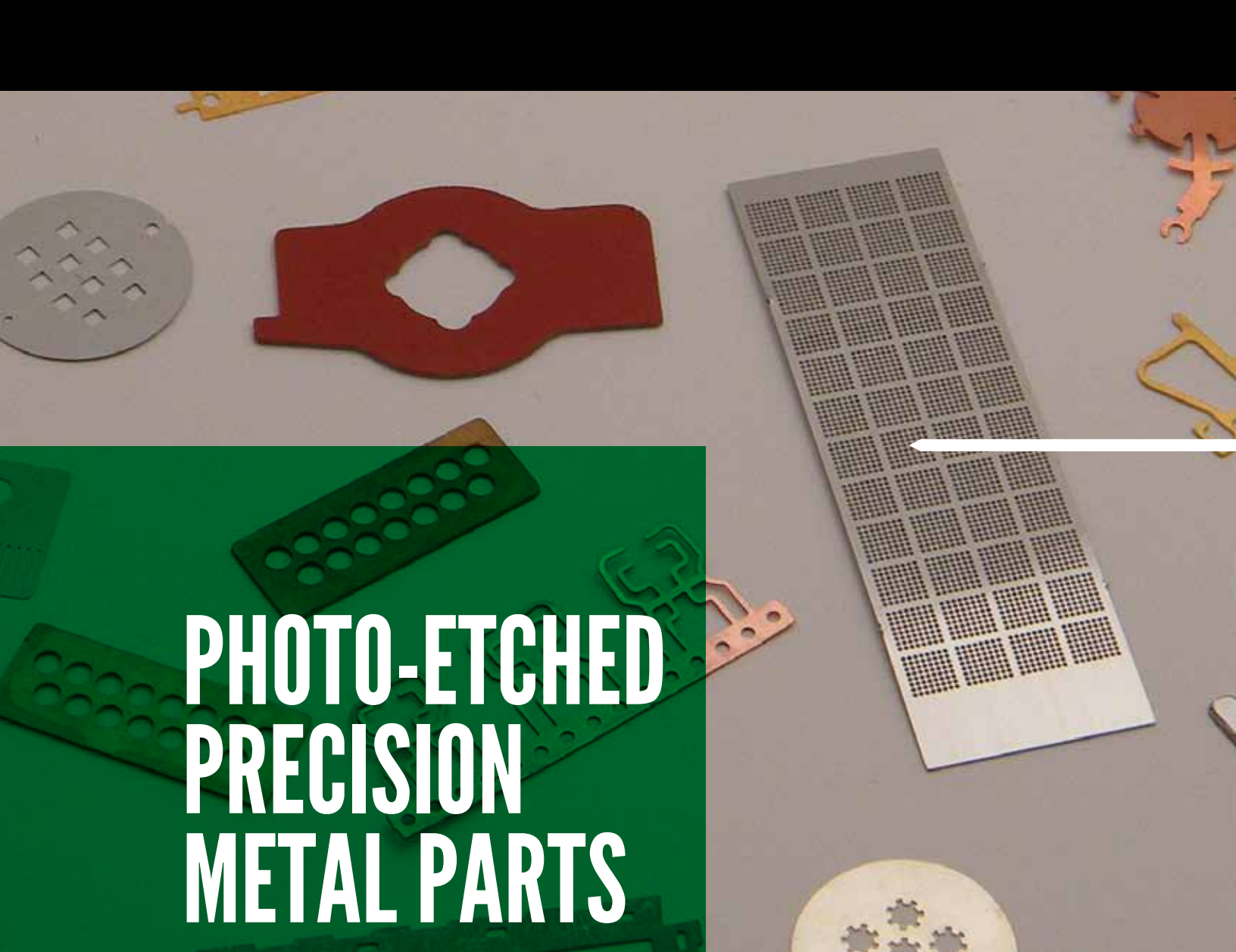
- Shelf Life: 2 years if stored in a temperature- and humidity-controlled environment

# HOW TO ORDER METALIZED FABRIC GASKETS

Sample Part Number: 125R250-024000N







# PHOTO-ETCHED PRECISION METAL PARTS

Orbel is the world's leading designer and manufacturer of thin-gauge photo-etched precision metal solutions. The result of today's most advanced photo-etching technology, Orbel's photo-etching techniques allow us to produce the most intricate of component designs while maintaining extremely tight tolerances.



## Start-To-Finish Custom Etching


Photo etching (also referred to as photo chemical milling, metal etching, chemical machining, or photo fabrication) is a fast, cost-effective way to produce a wide variety of precision metal parts. A start-to-finish custom photo-etching specialist, Orbel can help you design, prototype, and produce a finished metal part that meets the exact demands of your industry and application.

- One-side, two-side, and step-photo chemical etching processes
- Wide variety of materials
- Etching metal thicknesses ranging from 0.0007" to 0.032"
- Quick, cost-effective design modifications
- No need for hard tooling
- Burr- and stress-free high-quality precision parts
- In-house photo tooling allows extremely quick turnaround times

## Photo Etching Industries & Applications

Orbel's chemically etched products are used by many of the world's largest OEMs in a variety of industries including defense, aerospace, medical, automotive, energy storage, solar, telecommunications, instrumentation, wireless, and microwave. Applications include:

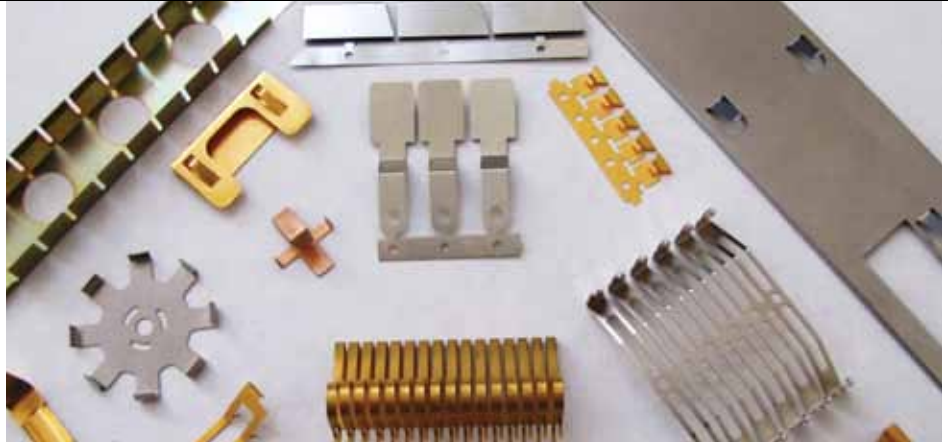
- |                               |                              |
|-------------------------------|------------------------------|
| ■ EMI/RFI Shielding           | ■ Battery Tabs/Tags/Contacts |
| ■ Board Level Shielding (BLS) | ■ Circuit Board Stiffeners   |
| ■ Actuator Springs            | ■ Encoder Disks              |
| ■ Antennas                    | ■ Filters, Screens, Sieves   |
| ■ Brackets, Washers           | ■ Flat Springs, Lead Frames  |
| ■ Contacts                    | ■ Heat Sinks                 |
| ■ Diaphragms                  | ■ Shims, Spacers             |
| ■ Electrical Connectors       |                              |



# PRECISION METAL STAMPINGS

The industry's leading custom stamping expert, Orbel utilizes state-of-the-art manufacturing techniques to produce precision-engineered metal stampings. Areas of precision metal stamping expertise include photo etching, blanking, secondary forming, and progressive die tooling.

- EMI/RFI Shielding Gaskets
- Battery Tabs/Tags/Contacts
- Custom Grounding Springs
- Electrical Contacts
- Connectors
- Circuit Board Stiffeners/Bus Bars
- Switches
- Metal Components
- Metal Gaskets
- Precision Metal Parts



## Optimized Design & Fabrication

Orbel specializes in designing and fabricating small intricate parts from thin strip materials ranging from 0.002" to 0.075" thick. Orbel's expert engineers can help optimize your design for manufacturability and assist in reducing overall cost. If you need full custom design and production service, Orbel can also ensure that your very specific needs are met.

## From Five To Five Million

At Orbel, we handle every aspect of metal stamping, from design, prototyping, and short runs to medium- and high-volume stamping. Whether you require five prototypes or need five million finished pieces, Orbel has your precision metal stamping solution.

- Dedicated prototype center
- Wide variety of materials including beryllium copper, stainless steel, brass, phosphorus bronze, copper alloys, nickel, tin-plated steel, and nickel-plated copper
- Forming, plating, and assembly capabilities
- Photo etching and secondary fabrication
- Computerized forming centers
- High-speed Bruderer presses for high-volume stamping
- Vacuum and fixture heat-treating
- Onsite plating facility (rack, barrel, and reel-to-reel)
- Tool and die manufacturing capabilities
- In-house tape-and-reel capabilities
- Medium- to high-volume production
- AS 9100C/ISO 9001 certification

# QUALITY COMMITMENT



An unwavering commitment to quality. It's what separates Orbel from our competitors. It's what guarantees the satisfaction of our customers. It's what makes us who we are.

From initial consultation to design engineering to production and delivery, quality is a key component of every aspect of the Orbel process. The same high standards we hold for each of our finished products are the same standards we set for each of our employees—count on Orbel to exceed your every expectation.

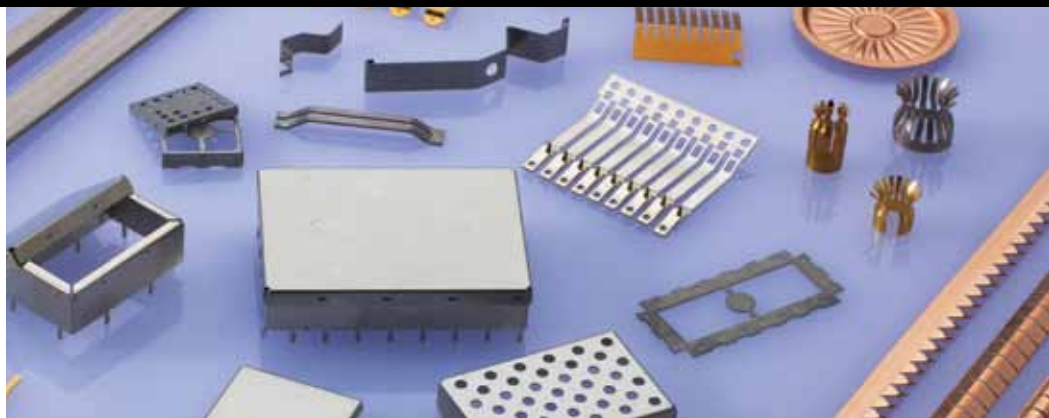
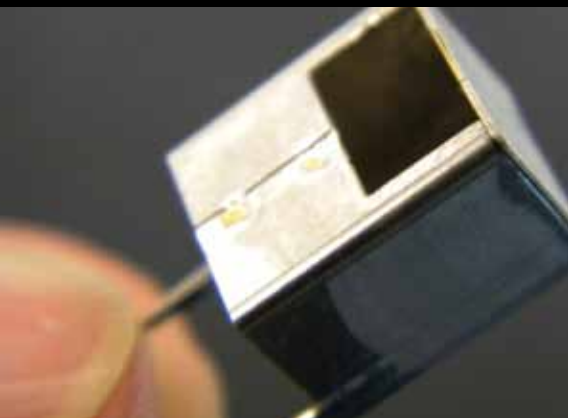
## Comprehensive Quality Control

Since 1961, Orbel has worked closely with our customers to establish a comprehensive quality control program. Customer feedback, strict guideline adherence, and meticulous production documentation are all critical to the ongoing success of this program. Internal product testing for all established quality parameters along with a proven sample retention program ensure that the highest quality standards are upheld.

Orbel conforms to the industry's highest quality standards and has earned today's most valuable quality certifications:

- AS 9100C/ISO 9001 Certification
- Conflict Metals Declaration
- RoHS Certification
- Orbel Quality Assurance Provisions
- REACH Declaration
- ITAR-Registered





# Every Solution the Result of Precision Production

Since 1961, Orbel has continually invested in the world's newest technologies as we ensured that our products remained at the forefront of the industry. Today, our 57,000 sq. ft. state-of-the-art manufacturing facility allows us to provide customers across the globe with a comprehensive range of engineered components. Every part that leaves the Orbel facility is the result of precision production.

With all operations onsite, Orbel can carefully control every aspect of the manufacturing process, guaranteeing the highest quality from start to finish. We offer the fastest turnaround times in the industry, and our comprehensive design resources ensure that every Orbel component meets the exact specifications of our customers. Whether you need five prototypes or five million finished pieces, Orbel has your solution.







**Quality. Consistency. Precision.** Since 1961, these have been the hallmarks of every component designed and produced by Orbel. Today, Orbel offers true start-to-finish custom engineered solutions—whatever your application requires, Orbel can deliver a finished product that will meet your demands.



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