

PIM SHIELD®

Passive Intermodulation (PIM) Reduction Solutions



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We're the backbone of the wireless industry.

Serving wireless carriers, contractors, and integrators for nearly two decades, we are telecom's premier manufacturer and distributor of wireless site components and safety products.

You need it fast? We've got you covered.

Our warehouses are fully stocked and strategically located around the United States to facilitate the immediate shipment of your order. With our national footprint, we can reach 99% of the U.S. in a single day.

Quality you would expect from Valmont.

Engineered and manufactured to exacting tolerances with comprehensive quality control processes in place, our products are the best quality available anywhere. Period. We build with the contractor in mind; our parts are securely packaged, safe to use, and easy to install.

We're constantly innovating. It's part of who we are.

Our engineering and product development teams belong to all prominent telecommunication trade organizations and have a keen eye on new developments and changes in the industry. This foresight enables us to remain at the leading edge of new developments and challenges, allowing us to provide efficient, cost-effective new technologies that solve our customers' unique challenges.

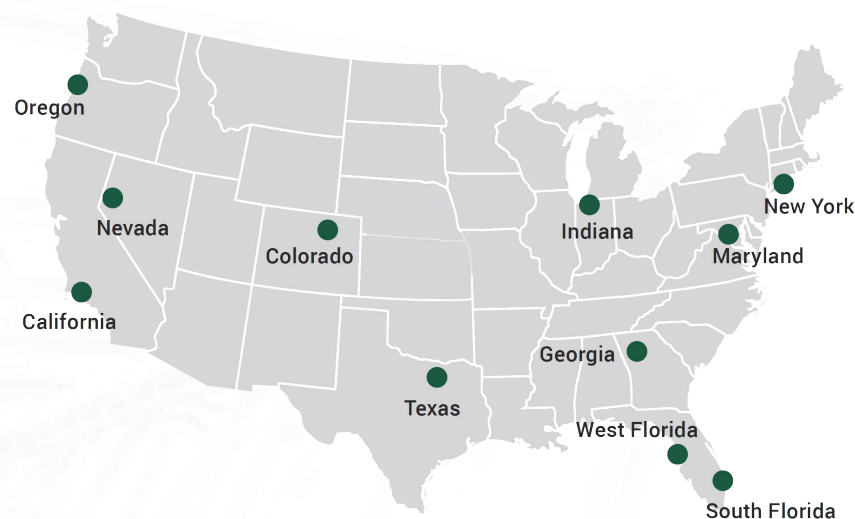
With us, you're first.

Everything we do is with our customers in mind, and providing an optimal experience is our top priority. Whether purchasing through our knowledgeable customer service team or our fast and secure website, we guarantee that you will have a first-class experience with us.



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Our Convenient Nationwide Locations



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Preserving signal integrity. Increasing network performance.



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With the advent of new technologies and the ever-growing demand for greater connectivity, Passive Intermodulation (PIM) has become a more prevalent issue in recent years.

With new frequency bands constantly being deployed, the inevitability of competing carrier signals and the corresponding PIM interference is driving the need for low PIM components in the high-risk PIM zone close to antennas.

The backbone of a typical cell site consists of thousands of essential components like brackets and mounts. By their very nature, these accessories are prone to PIM generation caused by corrosion, connection designs, and installation practices, all of which result in RF interference and a reduction in overall network performance.

Given the growing concern of PIM, we are committed to offering dynamic solutions that help remove signal interference. PIM mitigation and optimal network performance are intrinsically woven throughout our product development process. From the early stages of R&D to physical design, material composition, and our testing practices - everything is engineered to increase network efficiency.



PIM Shield is a registered trademark of ConcealFab, Inc., a Valmont company.

Understanding External Passive Intermodulation (PIM)

Passive intermodulation (PIM) is a form of interference created when downlink signals at a cell site mix at “non-linear” objects in the RF path. Any loose metal-to-metal contact or dissimilar metal contact in front of or in the reactive near field behind an antenna can generate PIM.

What causes external PIM?

Metal Objects in Front of Antennas

Cable trays, air handling units, sky lights and vent pipes are just a few of the metal objects commonly found on rooftops in front of base station antennas.

Roofing Materials & Construction

Common problems include overlapping steel deck members, plates and screws used to secure insulation, and over-lapping sheet metal used for flashing.

Galvanic Corrosion

Stainless steel and galvanized steel are at opposite ends of the galvanic series and small pockets of corrosion will form where these materials touch.

Metal Snap-In Hangers

Loosely touching metal-to-metal interfaces between hangers are prime sources of PIM, as are the galvanic corrosion pockets created when hangers are attached to galvanized steel support brackets.

Hose Clamps

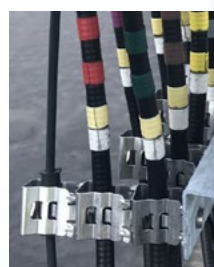
The galvanic mismatch between the stainless-steel banding and galvanized steel pipe generates PIM, as does the ability to maintain a secure metal to metal connection.

Metal Strut Fasteners

Nut retaining springs, snap-in stainless steel fasteners, bolted connects between struts and connections between the strut and round members at sites can all be sources of PIM.

Angle Adapters

PIM is generated by the galvanic mismatch between stainless-steel angle adapters and galvanized steel angle.



How can we mitigate external PIM?

Eliminate Galvanic Mismatches at Junctions

Galvanic mismatches can be eliminated by making sure the same metal and finish is used on both sides of a junction.

Ensure High Contact Pressure at Junctions

It is perfectly fine for metal to touch metal as long as the junction between parts is designed to maintain high contact pressure. Large contacting surfaces should be avoided.

Insulate Junctions

If high contact pressure between metal parts can't be guaranteed, or galvanic mismatches prevented, insulate the parts to prevent electrical contact.

Block RF from Reaching the Junction

If a metal to metal junction can't be fixed using one of the above methods, install an RF barrier material to prevent RF energy from reaching the non linear junction.

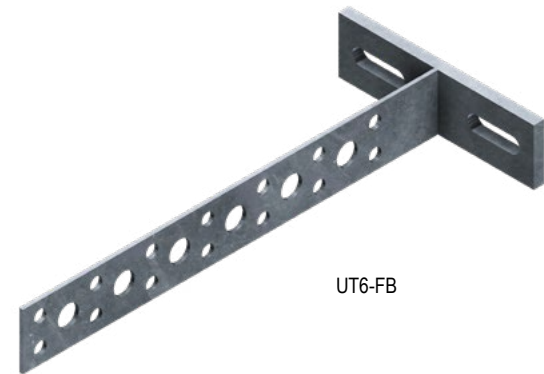


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T-Brackets

- Brackets are galvanized steel to avoid PIM issues with dissimilar metals
- Fit 2-3/8" to 4-1/2" OD legs
- Purchase 1/2" U-bolts separately
- Include holes for snap-in hangers and for 3/8" hardware

Part #	# of Snap-In Holes	# of 7/16" Holes
UT4-FB	4	8
UT6-FB	6	14
UT8-FB	8	18

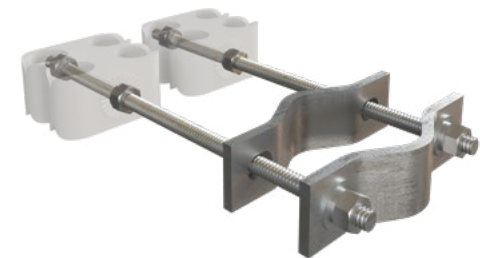


UT6-FB

Cable Block Brackets

- For mounting cable blocks to round tower members
- Galvanized brackets and hardware
- Cable blocks purchased separately

Part #	Description	Mounting Range	U of M
ACP-PMB	Small Cable Block Bracket	1-1/2" to 3-1/2" OD	Each
DCP-PMB	Large Cable Block Bracket	3-1/2" to 6-5/8" OD	Each

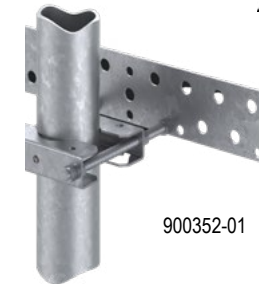


ACP-PMB

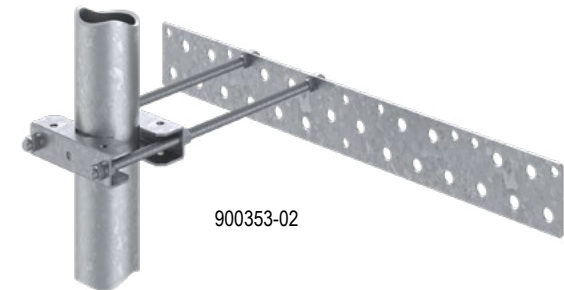
Cable Support Bar

- Galvanized steel construction
- Mounts to round legs 2-3/8" to 4-1/2" in diameter
- Lower weight than competitive alternatives
- Double number of connections with Extra Bar kits
- 3/4" holes accept low PIM snap-ins
- Highly configurable

Part #	Description
900352-01	Pole Mount Kit, 13-Position
900352-02	Pole Mount Kit, 13-Position, Extended Range
900353-01	Cable Support Bar, Pole Mount Kit, 22 Position
900353-02	Cable Support Bar, Pole Mount Kit, 22 Position, Extended Range
900354	Cable Support, Extra Bar Kit, 13 Position
900355	Cable Support, Extra Bar Kit, 22 Position



900352-01



900352-02



900353-02 with 900355 Extra Bar Kit

Universal Angle Adapters

- Weather-resistant nylon material
- Includes two 3/4" accessory mounting holes
- Torque-stop set bolt ensures proper attachment force

Part #	Description	U of M
PAA-U	Nylon Angle Adapter	10 pack



Galvanized 3/8" Angle Adapters

- Hot-dip galvanized steel construction
- Serrated teeth grab onto and hold steel surfaces
- Galvanized hardware includes 3/8" square-head bolt and fillister screw with lock washer
- 1" opening

Part #	Description	U of M
GAP38	Angle Adapter	10 pack



3-Way Universal Standoff Adapters

- Weather-resistant nylon material
- Mount to round or flat members
- Include 3/4" and 3/8" accessory mounting holes
- Slots for 1/2" to 5/8" hose clamps, cable ties, or banding

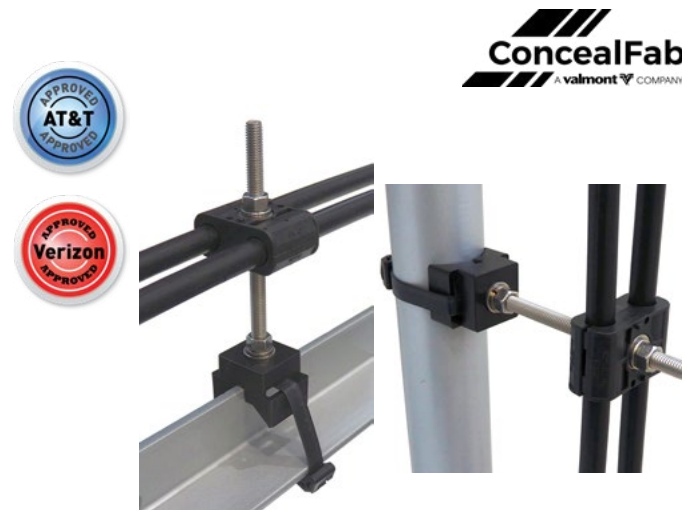
Part #	Size	U of M
PIMTRAP	3-7/16" x 2-1/8" x 1-5/8"	10 pack



Multi-Function Cable Support Base

- Cost efficient
- UV stable, glass-filled nylon construction
- Mounts to angle or round members using low PIM acetal straps
- 3/8" accessory mounting hole
- 3/8" stainless steel nut included

Part #	Description	U of M
901043-10	Multi-Function Cable Support Base	10 pack



Multi-Function Snap-in Adapter 1 Position

- Cost efficient
- UV stable, glass-filled nylon constructio
- Mounts to angle or round members using low PIM acetal straps
- 3/4" accessory mounting hole

Part #	Description	U of M
901044-10	PIM Shield Multi-Function Snap-in Adapter, 1 Position	10 pack



Multi-Function Snap-in Adapter 2 Position

- Cost efficient
- UV stable, glass-filled nylon constructio
- Mounts to angle or round members using low PIM acetal straps
- Two 3/4" and one 3/8" accessory mounting holes
- 3/8" nut not included

Part #	Description	U of M
901045-10	PIM Shield Multi-Function Snap-in Adapter, 2 Position	10 pack



Standoff Adapters

- Attach with nylon cable ties, plastic round-member adapters, or acetal banding
- PSK is for use with cable blocks
 - Accept 3/8" standard nut to allow threaded rod attachment
 - Hold up to 3 cable blocks
 - Fit on round or flat members
- SA1C is for use with snap-in hangers

Part #	Description	U of M
PSK	Plastic Standoff Adapter	10 pack
SA1C	Standoff Adapters	10 pack



Plastic Polymer Stackable Snap-In Hangers

- For use on horizontal cable runs only; not to be used on vertical cable runs
- PIM-free polymer material
- Self-adjusting variable diameter
- Space-saving design for tighter applications
- Use with SA1C PIM-free standoff adapters

Part #	Cable Size Range	AT&T Approved Cables	U of M
SICP47	4.0 to 7.0 mm	2 fiber jumpers and 4 fiber jumpers	10 pack
SICP710	7.1 to 10.00 mm	RET cables	10 pack
SICP1014	10.1 to 14.0 mm	12 & 10 AWG 2C power cables	10 pack
SICP1416	14.1 to 16.1 mm	8 AWG 2C power cables or 1/2" coax jumpers	10 pack



Hybrid Snap-In Hangers

- Patented “Hybrid” snap-in design provides insulation at the mating interfaces to prevent metal-to-metal contact
- High strength
- Easy to install, remove and reposition
- No tools required
- 360° rotation at mounting interface

Part #	Description	U of M
PSHS-1319-10	Hybrid Snap-In, 13 to 19 mm, (1/2 in)	10 pack
PSHS-2630-10	Hybrid Snap-In, 26 to 30 mm, (7/8 in)	10 pack
PSHS-3642-10	Hybrid Snap-In, 36 to 42 mm, (1-1/4")	10 pack
PSHS-4852-10	Hybrid Snap-In, 48 to 52 mm, (1-5/8")	10 pack



PSHS-1319



PSHS-4852

PIM-Free Isolator for Metal Snap-In Hangers

- Reduce PIM by avoiding metal-to-metal contact for snap-in hangers
- Isolator snaps between hangers and mounting surface and between stacked hangers

Part #	Description	U of M
SA-ISO	PIM Free Isolator for Snap-In Hangers	10 pack



SA-ISO shown with Snap-In Hanger



Cable Blocks

- Manufactured from glass-filled polypropylene for long-term UV resistance
- Interior ribs, combined with increased width, supply superior cable retention
- Mount with 3/8" mounting hardware shown below

Part #	Cable Size & Type	U of M
CXB4	Fiber Kit (4-6mm)	10 pack
CXB14-2	1/4" Cable (8mm)	10 pack
CXB38	3/8" Cables & LMR-400	10 pack
CXB12	1/2" Corrugated	10 pack
CXB78	7/8" Corrugated	10 pack
CXB114	1-1/4" Corrugated	10 pack
CXB158	1-5/8" Corrugated	10 pack
CXB214	2-1/4" Corrugated	10 pack



Stainless Steel Cable Block Hardware Kits

- 3/8" stainless steel construction for corrosion resistance and ease of use
- Highest quality 304 series stainless steel
- Each kit contains 10 threaded rods, 30 flat washers, 30 lock washers, and 30 nuts

Part #	Rod	Material
CH65	3/8" x 6-1/2"	Stainless steel
CH80	3/8" x 8"	Stainless steel
CH95	3/8" x 9-1/2"	Stainless steel
CH120	3/8" x 12"	Stainless steel



Galvanized Cable Block Hardware Kits

- A36 Galvanized steel
- Each kit contains 10 threaded rods, 30 flat washers, 30 lock washers, and 30 nuts

Part #	Rod	Material
CH65-G	3/8" x 6-1/2"	Galvanized
CH80-G	3/8" x 8"	Galvanized
CH95-G	3/8" x 9-1/2"	Galvanized
CH120-G	3/8" x 12"	Galvanized



Barrel Cushions

- Our barrel cushions are designed to manage today's smaller cables, fiber, etc.
- These rubber inserts fit inside snap-in hangers, butterfly hangers, or cable blocks for easy installation; see chart below for proper hanger size
- Manufactured from UV-resistant EPDM rubber which is durable in extreme conditions

Part #	Cable Range	Hanger Size	U of M
Universal Barrel Cushions			
BCU12X	0.12" - 0.51" (3mm - 13mm)	1/2"	10 pk
BCU78X	0.16" - 0.55" (4mm - 14mm)	7/8"	10 pk
BCU114X	0.55" - 0.98" (14mm - 25mm)	1-1/4"	10 pk
BCU158X	0.55" - 1.42" (14mm - 36mm)	1-5/8"	10 pk
BCU214X	0.55" - 1.77" (14mm - 45mm)	2-1/4"	10 pk
BCU158M7	7 holes for 4mm - 9mm cables	1-5/8"	10 pk
Single-Hole Barrel Cushions			
CIN3812	LMR-400, 3/8" Flex, & RG11U	1/2"	10 pk
CIN28114	27mm - 29 mm Cables	1-1/4"	10 pk
CIN38158	38mm - 40mm Cables	1-5/8"	10 pk



Cable Cushions

- These cable cushions that fit inside hybrid snap-ins are available to support smaller diameter RET, DC power, grounding and fiber optic cables
- UV stable, EPDM rubber
- Color coded for easy identification
- Installs inside PIM Shield hybrid snap-in
- Sizes available for cables ranging from 4.5 mm to 30.3 mm

Part #	Description	U of M	Color
PSCC-1001-10	Cable Cushion, 4.5 to 6.5 mm	10 pack	Blue
PSCC-1002-10	Cable Cushion, 6.6 to 8.5 mm	10 pack	Gray
PSCC-1003-10	Cable Cushion, 8.6 to 10.5 mm	10 pack	Black
PSCC-2001-10	Cable Cushion, 10.6 to 12.5 mm	10 pack	Orange
PSCC-2002-10	Cable Cushion, 12.6 to 15.5 mm	10 pack	Black
PSCC-2003-10	Cable Cushion, 15.6 to 17.5 mm	10 pack	Gray
PSCC-4001-10	Cable Cushion, 19.6 to 30.3 mm	10 pack	Black



Plastic Round Member Adapters

- Non-conductive and non-corrosive
- 1/2" (13 mm) band
- Nylon 66 screw

Part #	OD Size Range	U of M
PHC1-10	1" - 2"	10 pack
PHC2-10	2" - 3"	10 pack
PHC3-10	3" - 4"	10 pack
PHC4-10	4" - 5"	10 pack
PHC5-10	5" - 6"	10 pack



Acetal Cable Tie

- Perfect for coaxial, fiber optic, and all other communication and electrical conducting cables
- 1/2" wide weather resistant acetal banding
- 250 lb loop tensile strength

Part #	Description
TWR50	Acetal Cable Tie, 50' reel
TWLH25	Buckles for Acetal Cable Tie, 25/pack
ABIT	Tensioning/cutting tool for Acetal Cable Tie



TWR50



ABIT



TWLH25

Acetal Tie Wraps

- Acetal heavy-duty cable ties
- Cut to length with locking head pre-installed
- 1/2" width
- UV resistant
- 400 lb loop tensile strength
- Use with ABIT tensioning/cutting tool
- Qualified to Telcordia TR-TSY-000789

Part #	Description	U of M
TW16	16" Acetal Tie Wrap	Bag of 50
TW27	27" Acetal Tie Wrap	Bag of 25



Self-Grip Strapping

- Use for bundling wires and cables
- Wraps around anything and sticks to itself for fast and easy bundling
- Reusable
- Hook on one side, loop on the other

Part #	Size
SGS12x75	1/2" x 75' roll
SGS34x15	3/4" x 15' roll
SGS34x75	3/4" x 75' roll
SGS01x15	1" x 15' roll
SGS01x75	1" x 75' roll



Hook & Loop Cinch Straps

- Bundle and hold hoses, tubes, or cables
- Provide extra holding power
- Adjustable and reusable

Part #	Size	Package Quantity
VCT12-8	1/2" x 8"	25
VCT34-12	3/4" x 12"	25
VCS1x8	1" x 8"	25
VCS1x12	1" x 12"	25



Hook & Loop Cable Ties

- Industrial grade pre-cut straps
- Hook on one side, loop on the other
- Reusable
- Attaches to itself for fast and easy bundling

Part #	Size	Package Quantity
HLCT12X8	1/2" x 8"	100



XLD Non-Penetrating Rooftop Frame with RRU Mount

- Similar to the XLD non-penetrating rooftop pipe frames, but include a rear RRU mounting frame
- Reduce PIM by increasing separation between radios and antennas
- Standard kits include four 2-3/8" x 174" antenna mounting pipes
- If using other size antenna mounting pipes purchase SCX7-U universal crossover plate kits
- Welded trays for easy assembly
- Purchase MAT18 rubber mats separately



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Part #	CEQ#	Face Width	Mounting Pipes	Footprint	Mats Required	Description	Weight
RTP10-3RRU	CEQ.53343	10'-6"	(4) 2-3/8" x 174"	92" x 126"	6	XLD Non-Penetrating Rooftop Frame with RRU Mount	1,050 lb
RTP12-3RRU	CEQ.47545	12'-6"	(4) 2-3/8" x 174"	92" x 150"	8	XLD Non-Penetrating Rooftop Frame with RRU Mount	1,150 lb
RTP14-3RRU	CEQ.53333	14'-6"	(4) 2-3/8" x 174"	92" x 174"	12	XLD Non-Penetrating Rooftop Frame with RRU Mount	1,375 lb

Monopole RRU Mounts

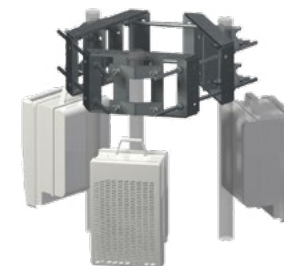
- Reduce PIM by increasing separation between radios and antennas
- Designed to stay as close as possible to the monopole for reduced wind area
- Mounting pipes are ordered separately



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6CHMT



UGLM-DCP

Part #	CEQ#	Monopole Size Range	Description	Mounting Pipes	Weight (without pipes)
UGLM-DCP	ANT.46630	10-1/2" – 28"	Mount up to 6 RRUs	Accepts 1-1/2" to 4-1/2" OD Mounting Pipes (Ordered Separately)	113 lb
6CHMT	ANT.46628	17-1/2" to 56"	Six Sector Monopole Attachment	Accepts 2-3/8" or 2-7/8" Mounting Pipes (Six Required, Ordered Separately)	272 lb

Brite Zinc Spray (69% Zinc)

- Brite Zinc aerosol can
- 12.5 oz aerosol can covers 40 square feet
- One-step color matches the shiny look of hot-dip galvanizing
- Special no-clog nozzle
- Meets ASTM-A780 for corrosion protection
- **Not available for air or ocean shipment**

Part #	Size
BZ12	12.5 oz



First Zinc Aerosol Spray Can (95% Zinc)

- 12.5 oz aerosol can
- Traditional flat gray color
- Meets or exceeds requirements of ASTM-A780, DOD-P-21035B; MIL-P-46105; MIL-P-26915B; SSPC PS-12; PS-20; PS-22; PS-29 & PS-30
- **Not available for air or ocean shipment**

Part #	Size
FZ13	12.5 oz



ZRC Cold Galvanizing Spray (95% Zinc)

- 12 oz aerosol can; 95% zinc metal in battleship gray flat finish
- Equivalent to hot-dip galvanizing
- Meets Federal Specification DOD-P21035A and MIL-P-26915
- Meets VOC standards in all 50 states
- **Not available for air or ocean shipment**

Part #	Size
ZRC-10000	12 oz



ZRC Galviline Galvanizing Repair Spray (95% Zinc)

- 12 oz aerosol can; 95% zinc metal in bright silver finish that blends with new hot-dip galvanizing
- Meets galvanizing repair specifications ASTM-A780 SSPC-Paint 20, and DOD-P-21035A
- Meets VOC standards in all 50 states
- **Not available for air or ocean shipment**

Part #	Size
ZRC-20010	12 oz



NO-OX Heavy Duty Rust Preventative and Lubricant

- Long term solution for lubrication and corrosion control
- Requires minimal surface preparation
- Contains metal wetting agents and rust inhibitors in a petrolatum wax base
- Semi-transparent non-drying film retains its properties indefinitely
- 8 oz can with applicator brush

Part #	Description	U of M
NO-OX-ID-8OZ	NO-OX 8 oz can	Each



Noalox

- Seals out air and moisture to prevent corrosion and reformation of oxide film on connections
- **Not available for air or ocean shipment**

Part #	Size
DOX4	4 oz
DOX8	8 oz



PIM Mitigation Paint

- PIM mitigation paint is a conductive acrylic polymer with enhanced elasticity designed to reduce external passive intermodulation (PIM) at cellular base stations. The paint is intended for large, flat surfaces and should NOT be applied directly to antenna mounting structures.
- High RF attenuation
- Crack resistant
- UV stable acrylic
- Water based
- Non-flammable
- Gallon can ships with special protective packaging
- Five gallon can must ship on a pallet

Part #	Description
901087-1-PKG	PIM Shield PIM Mitigation Paint, 1 Gallon
901087-5	PIM Shield PIM Mitigation Paint, 5 Gallon



PIM Mitigation Caulk

- PIM mitigation caulk is a thickened version of PIM paint that can be used to fill gaps and seal RF from reaching PIM sources generated at contacting surfaces
- Forms a highly elastic seal that resists cracking

Part #	Description	U of M
901088	PIM Seal PIM Mitigation Caulk, 10.1 oz tube	Each



PIM Blankets

- ConcealFab's PIM blankets are temporary RF barriers used to suppress PIM sources during the PIM hunting process
- PIM Barrier
- High RF attenuation
- Heavy duty vinyl construction
- Integrated tie-down loops

Part #	Description
007640-030030	PIM Blanket, 30" x 30"
007640-060030	PIM Blanket, 60" x 30"
007640-060060	PIM Blanket, 60" x 60"
007640-120060	PIM Blanket, 120" x 60"



PIM Tape

- PIM tape is a rapidly deployable RF barrier able to bond to a wide variety of surfaces including metals, single-ply roofing, multi-ply roofing, concrete, brick and wood.
- PIM Barrier
- High RF attenuation
- UV stable TPO outer protective layer
- High tack synthetic resin adhesive
- Silicone release liner

Part #	Description
008587-06-25-B	PIM Tape, 6" x 25' roll, black
008587-06-25-W	PIM Tape, 6" x 25' roll, white
008587-12-25-B	PIM Tape, 12" x 25' roll, black
008587-12-25-W	PIM Tape, 12" x 25' roll, white



Antenna Socks

- Use to conceal antennas on mono-pine, mono-palm, mono-elm, and mono-eucalyptus towers
- Available in 4', 6', and 8' lengths, 36" or 48" widths, and standard and heavy foliage densities
- Include attachment ties for installation
- Also available in custom sizes and colors, please inquire

Visit SitePro1.com/Concealment for more information.



RRU Socks

- Provide aesthetic coverage of radios on mono-pine, mono-palm, mono-elm, and mono-eucalyptus towers
- Include mounting frame to space the sock material away from the radio to allow air flow
- Include attachment ties and antenna pipe clamps for mounting
- Also available in custom sizes and colors, please inquire

Visit SitePro1.com/Concealment for more information.



NOTES

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