

FIMO PIM SHIELD

Product Catalogue



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PIM Shield[®] solutions

Passive Intermodulation (PIM) is the generation of interfering signals caused by non-linearities in a wireless system. When the downlink signals at a cell site mix in non-linear junctions in the RF path, they produce sum and difference signals that can fall in an operator's uplink.

These PIM signals can elevate the receive noise floor, reducing a cell's sensitivity or even blocking calls. PIM interference can affect both the cell that creates it, as well as other nearby receivers.

PIM is typically caused by loose metal-to-metal contacts or galvanic corrosion up to 100 meters in front of or 3 meters above, below or behind transmitting antennas. Typical PIM sources found in front of antennas include power lines, rusty protective barriers, rooftop parapet walls or other operator's radio equipment. Site design changes may be required to mitigate these sources.

Other sources of PIM found near antennas include stainless steel cable support brackets attached to galvanized steel support structures, poorly designed cable support hardware that allows loose metal-to-metal contact, and loose mechanical fasteners on radio and antenna mounting brackets. These sources of PIM can be easily corrected by performing PIM Hygiene to repair obvious problems and by replacing poorly designed cable supports with products that are optimized for low PIM performance.

Cellular network operators are understandably concerned about the quality of their service. The negative impact of PIM interference on network performance cannot be understated. Providers need to add more coverage and more data capacity to meet customer demands. Reduced network performance due to PIM interference can be frustrating to customers and have a negative impact on customer retention and brand loyalty. No provider wants to be the leader in unreliable coverage, dragging data and dropped calls.

FIMO, in partnership with ConcealFab, a leader in external PIM mitigation solutions, has developed a line of low PIM cable support solutions optimized for the European market. FIMO's PIM Shield[®] products are designed to prevent PIM at the source, eliminating sources of harmful interference and improving network performance.

PIM Hunting Process & Products

PIM sources can be located inside the antenna feed system (internal PIM) or can be located beyond the antenna radome (external PIM). External PIM sources can be a challenge to locate since they can be caused by non-linear objects in any direction relative to the antenna. In addition, these sources may be located many meters in front of the antenna or may be located directly behind or beside the antenna.

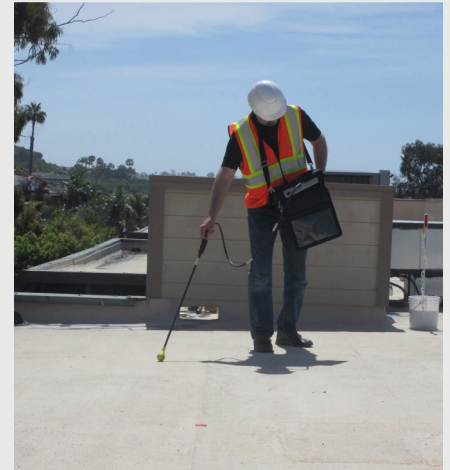
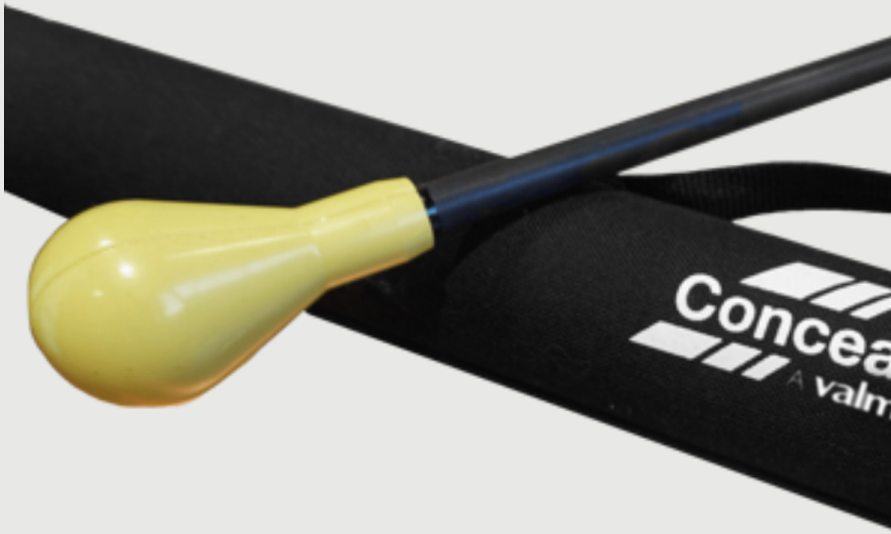
ConcealFab developed a process for locating external PIM sources in 2016 using commercially available PIM analyzers to excite external PIM sources and a PIM probe connected to a spectrum analyzer to precisely locate the sources. PIM Blankets and PIM Foil were developed to temporarily suppress PIM sources found to show the improvement that can be achieved with a permanent repair.

Since 2016, the test and measurement industry has worked closely with mobile operators to improve the external PIM hunting process. To supplement the traditional PIM hunting method using PIM analyzers, a new method has been developed that uses site radios to excite PIM sources and a CPRI analyzer to monitor uplink noise. ConcealFab's Front and Back Absorber kits speed this new PIM hunting process by quickly identifying PIM source direction relative to the site antennas.

FIMO offers the full range of ConcealFab PIM Hunting and PIM Barrier solutions. Contact FIMO to coordinate hands-on training to teach technicians how to use these products to efficiently locate and mitigate external PIM at cell sites.

PIM HUNTING

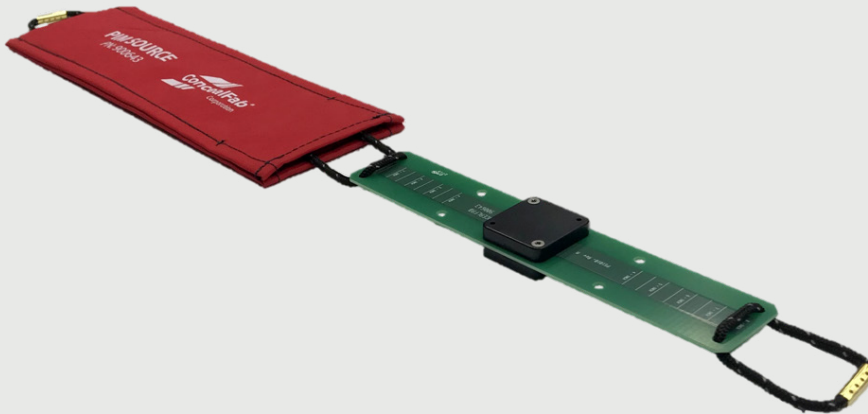




CODE	ARTICLE
90 7320 0001	PIM test probe

SPECIFICATION

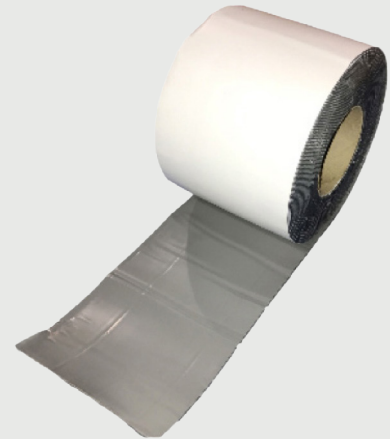
General	The PIM test probe is used in conjunction with other test and measurement equipment to precisely locate external PIM sources in the field. Once PIM locations are identified, mitigation materials available from ConcealFab can be applied to reduce the PIM levels and improve site performance.
Frequency Range	600 MHz to 4000 MHz
PIM Performance	IM3 < -90 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, static test.
Near Field Signal Variation VS. Orientation	<5 dB variation in received signal level when probe is rotated 90° relative to an external PIM source
RF Connector	Type N (female)
Construction	ABS protective probe tip, filament wound epoxy shaft, Times Microwave TuffGrip® handle
Dimensions	35-inch long, 1.9-inch diameter at probe tip 890 mm long, 48 mm diameter at probe tip
ROHS	Compliant



CODE	ARTICLE
90 0643 0000	PIM Source Assembly, 700 MHz

SPECIFICATION

General	The 900643 PIM Source Assembly is a diode-based external PIM source optimized to provide maximum PIM in the 700 MHz band. The PIM Source Assembly includes an integrated "PIM Blanket" shielded pouch to suppresses PIM when not in use.
Frequency Range	698 – 788 MHz
PIM Performance	IM3 > -50 dBm (PIM source exposed) IM3 < -100 dBm (PIM source inside shielded pouch) When tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, static test, vertical orientation.
Materials	FR4 printed circuit card assembly Germanium diode Molded ABS plastic covers to protect diode Nylon fabric cover on shielded pouch Braided Nylon cords
Outside Dimensions	12.0-inch x 4.0-inch x 0.75-inch (inside shielded pouch) 305 mm x 102 mm x 19 mm (inside shielded pouch)
Weight	0.2 lbs. 0.9 kg
ROHS	Compliant



CODE	ARTICLE	ROLL WIDTH	ROLL LENGHT	COLOR	QTY PER CASE
90 8587 0625.B	PIM Tape	6 inch - 152 mm	25 FT - 7.62 m	Black	4
90 8587 0625.W	PIM Tape	6 inch - 152 mm	25 FT - 7.62 m	White	4
90 8587 1225.B	PIM Tape	12 inch - 305 mm	25 FT - 7.62 m	Black	2
90 8587 1225.W	PIM Tape	12 inch - 305 mm	25 FT - 7.62 m	White	2

SPECIFICATION

General	PIM Shield® Tape is a permanent RF barrier that can be installed over sources of Passive intermodulation (PIM) to instantly improve site performance. PIM Shield® tape is designed to bond to a wide variety of surfaces including metals (galvanized steel, aluminum), single ply roofing (EPDM, TPO), multiply roofing (SBS modified bitumen, asphalt BUR), concrete, brick and wood. The tape's extra-thick, highly compliant synthetic resin adhesive enables strong bonds to irregular surfaces.
PIM performance	IM3 < -100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, static test.
RF attenuation	>10 dB (600 MHz to 2700 MHz)
Construction	Low PIM metal foil sandwiched between UV stable TPO outer layer and high tack, synthetic resin adhesive layer with silicone release liner.
Total thickness	0.070 inch 1,8 mm
Surface Preparation	Surface must be clean and dry prior to application. Moisture, dust, dirt, or other foreign matter should be removed. Remove oil and grease, etc. with a non-residue cleaner such as acetone or lacquer thinner.
Application Temperature	-20°F to +150°F (-28°C to +65°C). Treat surface with EternaPrime® surface conditioner for installations below 40°F (4°C).
Case Weight	30.1 lbs. 13.6 kg
Case Dimensions	17.5-inch x 13-inch x 9-inch 445 mm x 330 mm x 230 mm



CODE	ARTICLE	LENGHT	WIDTH	TIE DOWN LOOPS	SHIPPING WEIGHT	SHIPPING DIMENSIONS
90 7640 1260	PIM Blanket	120 inch - 3.05 m	60 inch - 1.52 m	6	15.5 lbs. 7.0 kg	19.5 x 8 x 8 inch 495 x 203 x 203 mm
90 7640 0660	PIM Blanket	60 inch - 1.52 m	60 inch - 1.52 m	4	8 lbs. 3.6 kg	18 x 7 x 7 inch 457 x 178 x 178 mm
90 7640 0630	PIM Blanket	60 inch - 1.52 m	30 inch - 0.75 m	4	4.4 lbs. 2 kg	18 x 5.5 x 5.5 inch 457 x 140 x 140 mm
90 7640 0330	PIM Blanket	30 inch - 0.75 m	30 inch - 0.75 m	4	2.4 lbs. 1.1 kg	17.3 x 5.5 x 5.5 inch 439 x 140 x 140 mm

SPECIFICATION

General	PIM blankets are temporary RF barriers that can be deployed on rooftops, both in front of as well as behind base station antennas to help isolate sources of Passive intermodulation (PIM). When a PIM blanket is placed over an external PIM source, PIM from that source typically reduces by >30 dB. PIM blankets not only help validate the exact location of external PIM but also show the level of improvement that could be achieved with a permanent repair.
PIM performance	IM3 < -120 dBm when tested in accordance with IEC 62037-8, far field test, 2x 20W test tones, static test, vertical orientation.
RF attenuation	>10 dB (600 MHz to 2 GHz) >20 dB (>2 GHz)
Construction	Low PIM metal foil sandwiched between heavy duty vinyl outer fabric layers. Nylon webbing tie-down loops provided at corners.



CODE	ARTICLE	ROLL WIDTH	ROLL LENGTH	WEIGHT	DIMENSIONS
90 0964 1810	PIM Foil	18 inch - 45.7 cm	100 FT - 30.5 m	4.7 lbs. - 2.1 kg	21 x 4.5 x 4.5 inch 53.5 x 11.5 x 11.5 cm
90 0964 3610	PIM Foil	36 inch - 91.4 cm	100 FT - 30.5 m	9 lbs. - 4.1 kg	39 x 4.5 x 4.5 inch 99.1 x 11.5 x 11.5 cm
90 1067 0000	PIM Foil Soft Case				

SPECIFICATION

General	PIM Foil is a light weight, temporary RF barrier that can be deployed on rooftops, both in front of as well as behind base station antennas to help isolate sources of Passive intermodulation (PIM). When PIM Foil is placed over an external PIM source, PIM from that source typically reduces by >30 dB. PIM Foil not only helps validate the exact location of external PIM but also show the level of improvement that could be achieved with a permanent repair.
Application	Overlap rows of PIM Foil by 3-inches (7,6 cm) when covering large areas. Dashed line printed on 36-inch (92 cm) wide Foil provides guide for overlap. Tape PIM Foil in place to prevent movement due to wind. Surfaces must be clean and free of dust and dirt to improve tape adhesion. Tape adjacent rows of PIM Foil together as required to prevent separation. Additional ballast may be required in addition to tape to prevent lifting in wind. Not recommended for wind speeds > 10 mph (1.6 kph). For higher wind applications, use PIM Blankets. PIM Foil provides some tear and puncture resistance and with care can be used multiple times before having to be replaced.
PIM performance	IM3 < -120 dBm when tested in accordance with IEC 62037-8, far field test, 2x 20W test tones, static test, vertical orientation.
RF attenuation	>10 dB (600 MHz to 2 GHz) >20 dB (>2 GHz)
Construction	Low PIM metal foil with dielectric coating applied to both sides, supplied on 3-inch (7.6 cm) kraft core. For permanent repairs, PIM Foil must be covered by UV stable protective layer such as Vinyl tape or TPO / EPDM roofing membrane.
General	PIM Foil Soft Case makes it easy to transport multiple rolls of PIM Foil (ConcealFab 900946-xx-100) to and from job sites. The case includes a shoulder strap and handles for carrying as well as metal D-rings for hoisting.
Capacity	The interior volume allows for carrying up to 4X ConcealFab 900964-36-100 or 8X ConcealFab 900964-18-100.
Material	Cordura® tear resistant Nylon fabric
Case Inside Dimensions	9-inch x 9-inch x 44-inch
Weight	6.1 lbs. 6.1 lbs.





CODE	ARTICLE	KIT INCLUDES
9011240000	PIM Absorber Kit, Front	1x PIM blanket with integrated clips and tie-down loops 1x Pole attach strap 4x RF absorber panels, 24-inch x 24-inch x 4-inch (61 x 61 x 10 cm) 4x Adjustable bungee straps
9011250000	PIM Absorber Kit, Back, 2-IN	3x RF absorber panels, 24-inch x 24-inch x 2-inch (61 x 61 x 5 cm) 2x RF absorber panels, 12-inch x 24-inch x 2-inch (31 x 61 x 5 cm)
9011620000	PIM Absorber, Back, 1-IN	3x RF absorber panels, 24-inch x 24-inch x 1-inch (61 x 61 x 2.5 cm) 2x RF absorber panels, 12-inch x 24-inch x 1-inch (31 x 61 x 2.5 cm)
9012300000	Absorber Kit Soft Case*	28-inch x 28-inch x 13-inch (71 x 71 x 33 cm) main compartment Pouch in front to store bungee straps

*Two Absorber Kit Soft Cases are required to transport one Front Absorber Kit (901124) and one Back Absorber Kit (901162 or 901125) with a Side PIM Blanket (007640-240008)

PIM ABSORBER KIT, FRONT



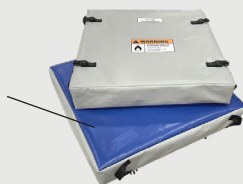
General

The front PIM Absorber kit is a Patent Pending low PIM blanket assembly designed to be secured to the front face of base station antennas. The front absorber kit suppresses forward radiation from the antenna with minimum PIM generation and minimum reflection back into the antenna feed system. The front PIM Absorber kit can be used with ConcealFab's back PIM Absorber kit (901125 or 901162) and Side PIM Blanket (007640-240008) to help determine the direction of external PIM sources relative to site antennas.

SPECIFICATION

PIM Performance	IM3 < -97 dBm when tested in accordance with IEC 62037-8, 700 MHz and 1900 MHz 2x 20W test
Return Loss	RL >10 dB (typical) with absorber panel(s) touching front surface of base station antenna
RF Attenuation	>38 dB (1 GHz to 3 GHz) >50 dB (>3 GHz)
Power Handling	Warning! The Front Absorber kit includes flammable materials and can ignite if exposed to excess /prolonged RF Heating. The power Handling capability of the Front Absorber Kit is impacted by the antenna size, antenna beamwidth and operating frequency. Please refer to the User Guide for safe operational limits.
Shipping Dimensions / Weight	27-inch x 27-inch x 22-inch (70 x 70 x 56 cm) / 25 lbs. (12 kg)

Install pads with gray surface facing out. Blue surface goes against blanket



Absorber panels secured to blanket using 4x clips



Loops provided to hold blanket tight against antenna face using bungee straps provided

PIM ABSORBER KIT, BACK, 2-INCH

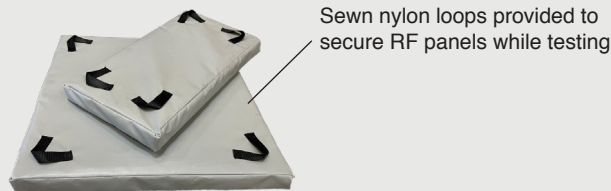


General

Back PIM Absorber kit panels are designed to be installed between the back of a base station antenna and the antenna mounting pipe. The back absorber panels suppress rear radiation from the antenna with minimum PIM generation. The back PIM Absorber kit can be used with ConcealFab's front PIM Absorber kit (901124) and Side PIM Blanket (007460-240008) to help determine the direction of external PIM sources relative to site antennas.

SPECIFICATION

PIM Performance	IM3 < -100 dBm when tested in accordance with IEC 62037-8, near field test 700 MHz and 1900 MHz, 2x 20W test tones, static test
RF Attenuation	>8 dB (1 GHz to 3 GHz) >15 dB (>3 GHz)
Power Handling	Warning! The Back Absorber kit includes flammable materials and can ignite if exposed to excess / prolonged RF Heating. Only install the Back Absorber kit in the low power region behind base station antennas. Do not install the Back Absorber kit in front base station antennas.
Shipping Dimensions / Weight	27-inch x 27-inch x 12-inch (70 x 70 x 31 cm) / 17 lbs. (7.8 kg)



PIM ABSORBER KIT, BACK, 1-INCH



General

Back PIM Absorber kit panels are designed to be installed between the back of a base station antenna and the antenna mounting pipe. The back absorber panels suppress rear radiation from the antenna with minimum PIM generation. The back PIM Absorber kit can be used with Conceal-Fab's front PIM Absorber kit (901124) and Side PIM Blanket (007640-240008) to help determine the direction of external PIM sources relative to site antennas.

SPECIFICATION

PIM Performance	IM3 < -100 dBm when tested in accordance with IEC 62037-8, near field test 700 MHz and 1900 MHz, 2x 20W test tones, static test
RF Attenuation	>8 dB (1 GHz to 3 GHz) >15 dB (>3 GHz)
Power Handling	Warning! The Back Absorber kit includes flammable materials and can ignite if exposed to excess / prolonged RF Heating. Only install the Back Absorber kit in the low power region behind base station antennas. Do not install the Back Absorber kit in front base station antennas.
Shipping Dimensions / Weight	27-inch x 27-inch x 6-inch (70 x 70 x 15.5 cm) / 14 lbs. (6.3 kg)



PIM Beginner's Guide

The theory behind External PIM can be long and complex. But on field, you just need a few, quick, guidelines to start mitigating this problem. Here you can find them!



Inspect all connections

Tighten all loose hardware



Inspect your site

Avoid any unnecessary metal-to-metal contact



Remove rust using wire brush

Wipe surface clean with rag with solvent to remove metal dust

Replace these clamps with FIMO PIM SHIELD ones





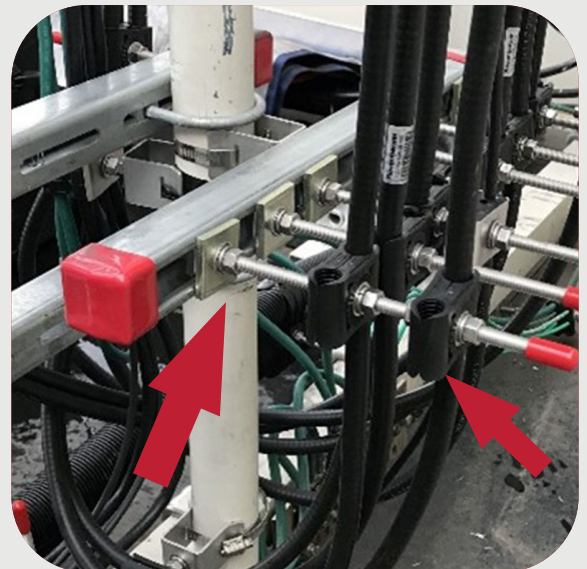
Inspect your site after the job is finished

Clean up all leftovers, especially metallic ones



Stainless steel clamps in contact with galvanized steel poles will create galvanic effect. This is a huge source of PIM

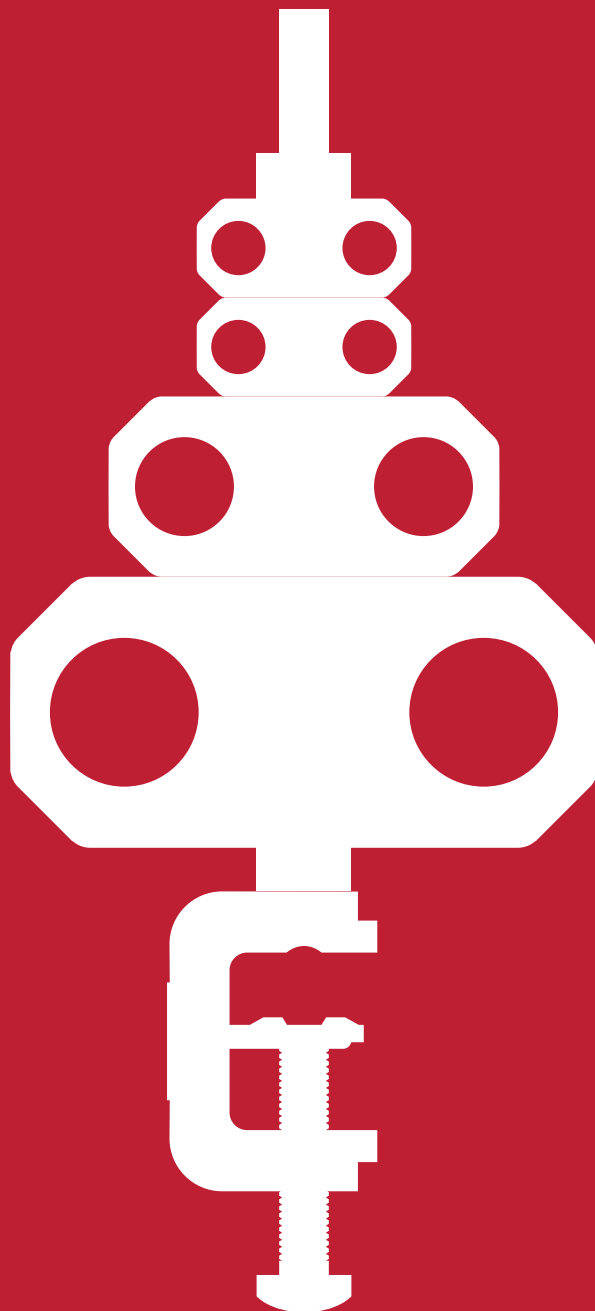
Replace these clamps with FIMO PIM SHIELD ones



**All these problems can occur simultaneously!
Check your site and use FIMO PIM SHIELD products!**

PIM SHIELD

Cable Clamps & Fastening Devices





MATERIAL	
Components	P.A. UV Resistant
Operating Temperature	- 40°C + 125°C
Colour	Black
System PIM Performance	IM3 < -100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus.

MMP
Plastic Cable Clamps

MMP Combined Cable Clamp is the brand new FIMO PIM SHIELD solution for the installation of both fiber and power cables.

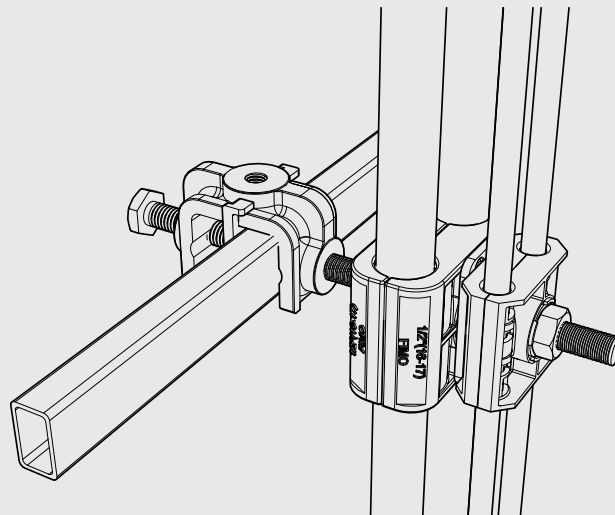
Being full plastic ensures the best PIM performance while keeping high mechanical strength even in harsh environments. MMP Combined Cable Clamp is guaranteed up to 200 Km/h wind load.

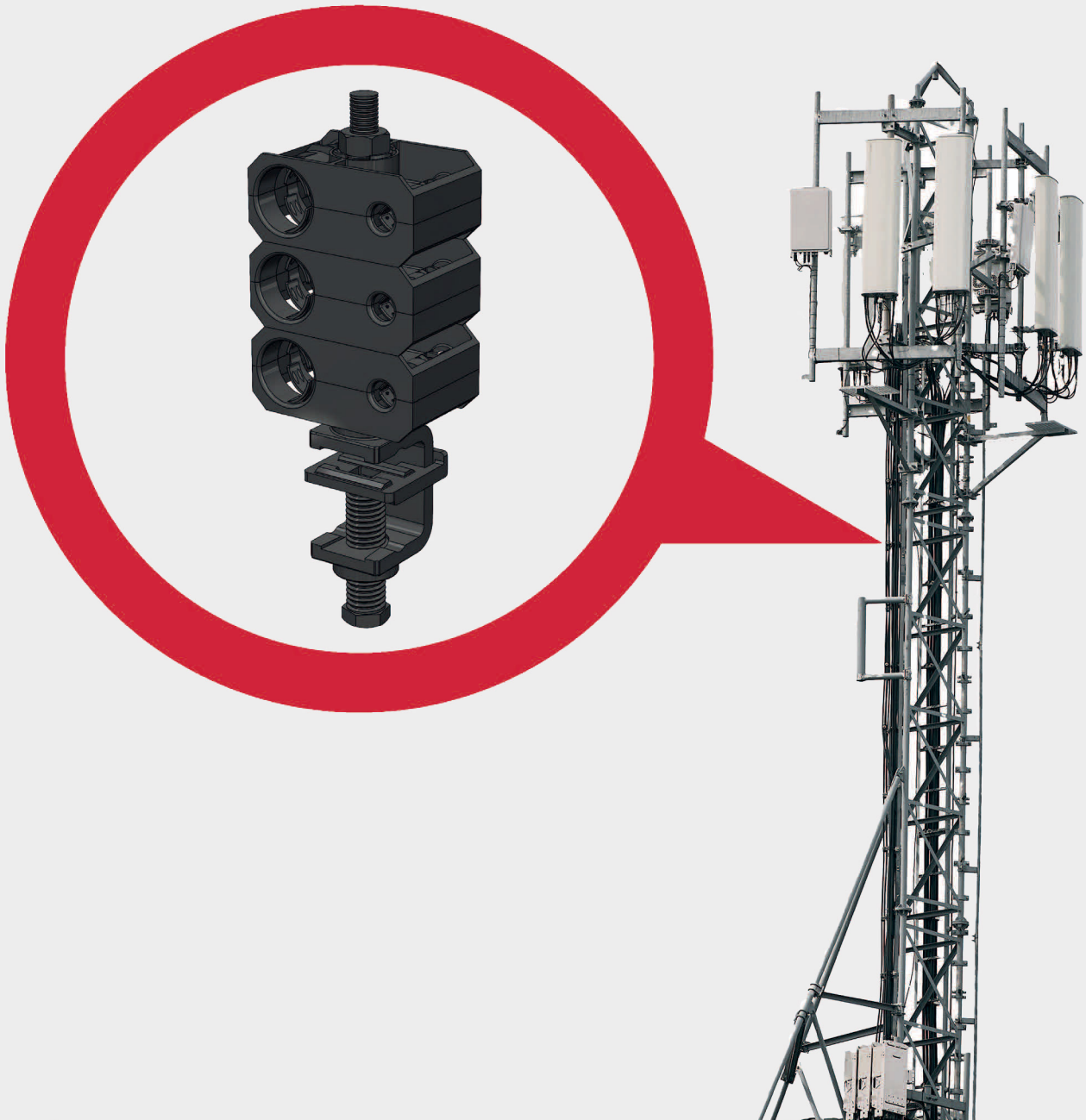
Recommended with SAC double saddles, SEC double saddles and SOX single or double saddles.

For customized solutions, contact us.

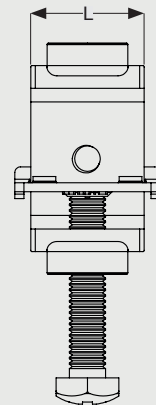
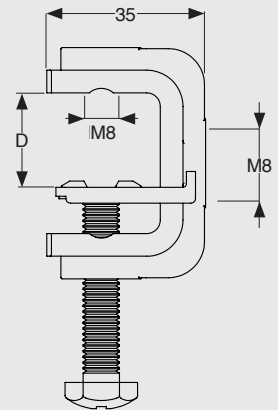
FEATURES & BENEFITS

- PIM free Cable Clamp
- Optimal design and high-performance compound with high mechanical resistance and flexibility
- High security factor K in all axial tests
- High ice and wind load resistance (up to 200 km/h)





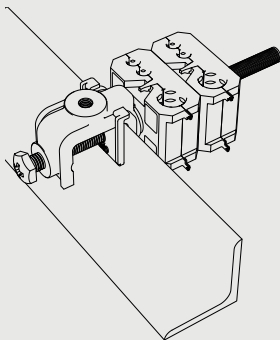
Full Plastic Clamp
Installation in the last 3 meters below the antennas is suggested for optimized efficiency



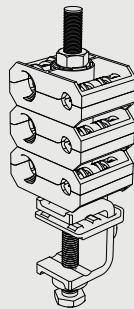
MPM 8/25
Self-Locking M8 Mini Plastic Clamp

Enbloc plastic mini clamp with self-centering plastic pressure plate and plastic self-locking M8 screw. Appreciated for its simple and adaptable installation.

Recommended with SAC double saddles, SEC double saddles and SDS stackable modular double saddles.




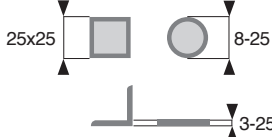
MPM + SAC

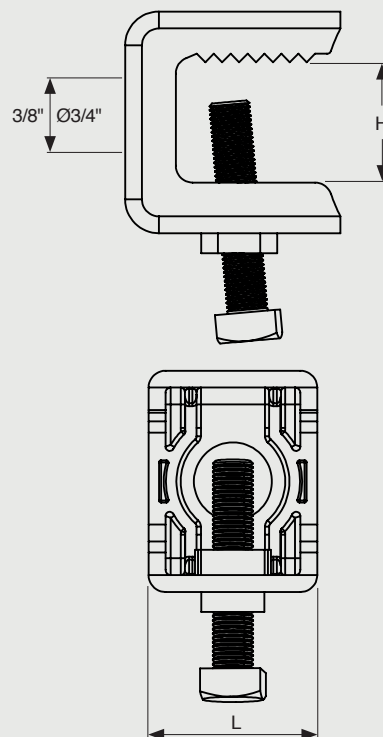


MPM + SEC

MATERIAL

Fiberglass P.A., U.V. Resistant
 Black Colour
 Halogen Free

PICTURE	CODE	ARTICLE	D	L	FOR PROFILE	BAG	BOX	WEIGHT
	61 1523 2525.PA	MPM 8/25	3 - 25	25		20	100	21



MDM P
Plastic Universal Angle Adaptor

Heavy Duty monobloc bidirectional plastic clamp available with three 3/4" holes and slots for the installation with two plastic tie wraps to various structures like poles and pylons. The 3/4" holes allow the combination with SIC H and SIC P snap-in cable clamps. Two specific plastic reduction inserts (ISP 3/4" - 3/8" V and O) are foreseen for the installation with a 3/8" locking screw on flats, rounds and angular, and for the installation of cable blocks with 3/8" hardware.

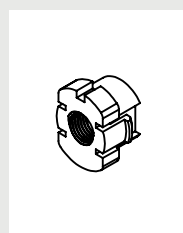
MDM 3x3/4" P
Plastic Universal Angle Adaptor
3 holes 3/4"

MDM 2x3/4" P
Plastic Universal Angle Adaptor
2 holes 3/4" and locking screw

MDM 3/8" P
Plastic Universal Angle Adaptor
2 reductions 3/8" and locking screw

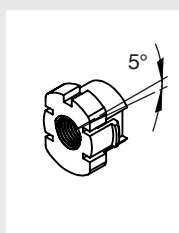
MATERIAL	
Locking screw	Glass reinforced P.A. U.V. Resistant
Body	Glass reinforced P.A. U.V. Resistant
Colour	Black

FIGURE	CODE	ARTICLE	H		L	BAG	BOX	WEIGHT (gr)
			mm	in				
	61 2523 3019	MDM 3x3/4"P	3 - 25.4	0.118 - 1	40	10	100	30
	61 2523 2019	MDM 2x3/4"P	3 - 25.4	0.118 - 1	40	10	100	70
	61 2523 3038	MDM 3/8"P	3 - 25.4	0.118 - 1	40	10	100	76



ISP 3/4"-3/8" V
Reduction insert

Plastic reduction insert for the installation of cable blocks with 3/8" hardware.



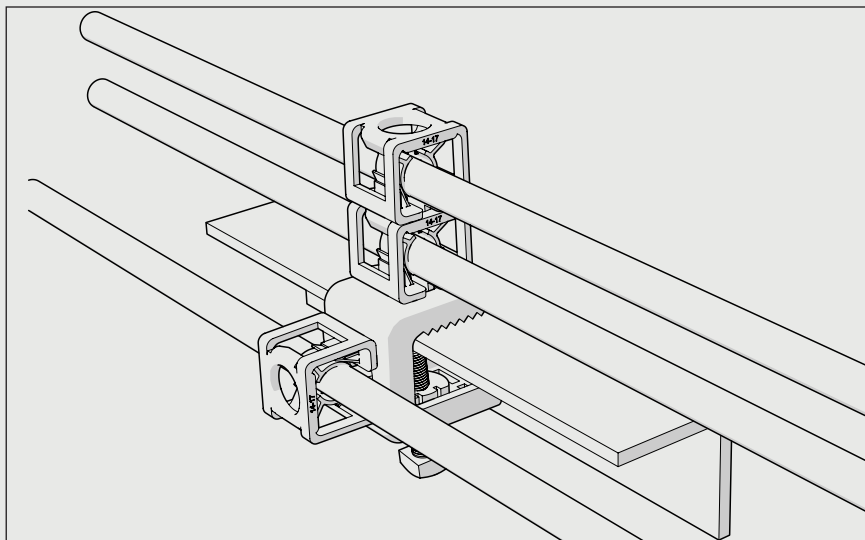
ISP 3/4"-3/8" O
Reduction insert

Plastic reduction insert for locking screw

MATERIAL	
Insert	Glass reinforced P.A. U.V. Resistant
Colour	Black

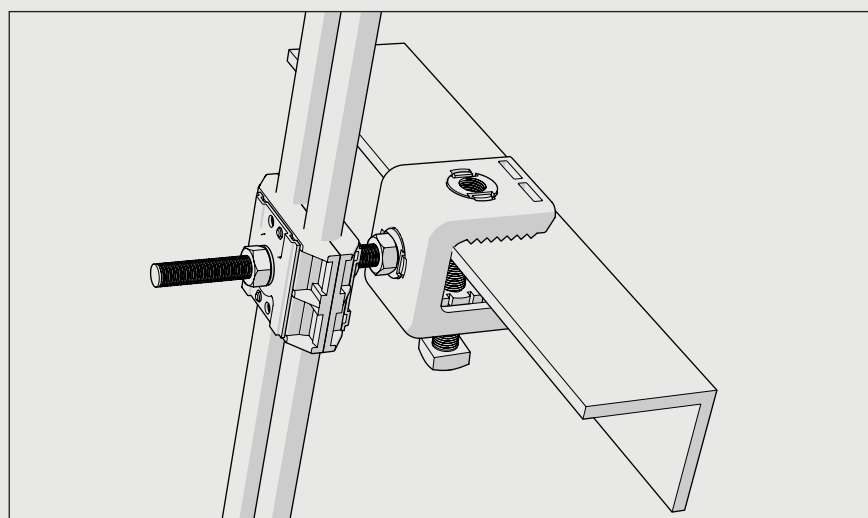
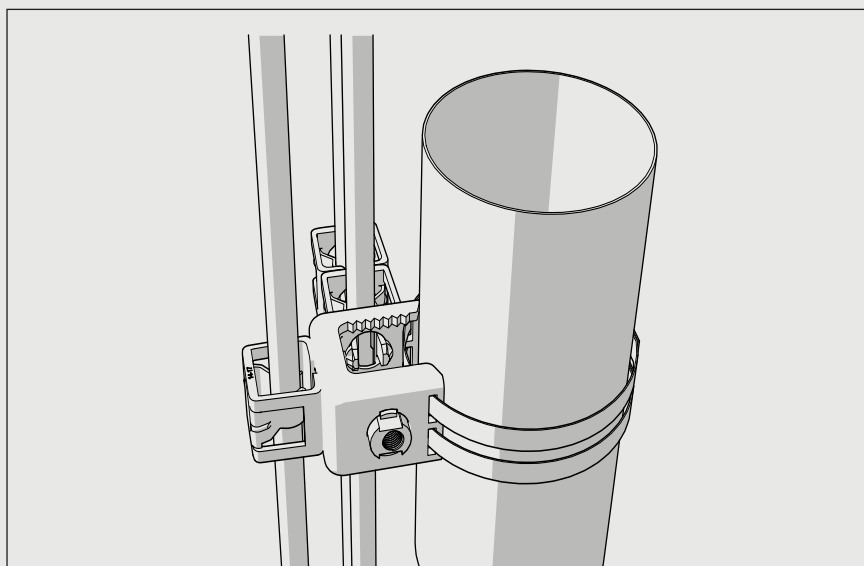
FIGURE	CODE	ARTICLE	THREADED HOLE	BAG	BOX	WEIGHT (gr)
	61 2523 1938	ISP 3/4" - 3/8" V	3/8" straight for hardware	10	100	3
	61 2523 2938	ISP 3/4" - 3/8" O	3/8" inclined for locking screw	10	100	3

Plastic Universal Angle Adaptor



MDM P + SIC P on angular installed with locking screw

MDM P + SIC P on pole installed with PIM Shield cable support straps



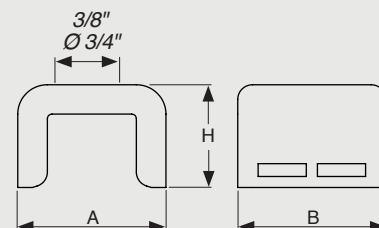
MDM P + cable block on angular installed with locking screw

Plastic Single Hanger Adaptor




SHA P Plastic Single Hanger Adaptor

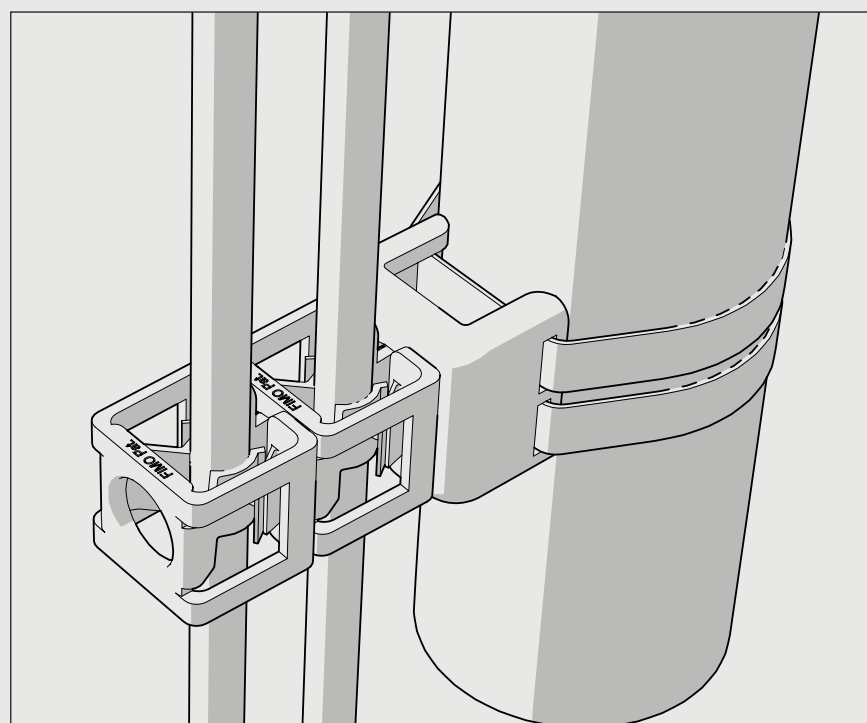
SHA P plastic single hanger adaptor is a socle to be applied with two plastic tie wraps to various structures like poles and pylons. Available with a 3/4" hole to be used in combination with SIC P and SIC H snap-in clamps or with ISP 3/4" – 3/8" V reduction insert.



MATERIAL

Body	P.A. U.V. Resistant
Colour	Black

FIGURE	CODE	ARTICLE	A	B	H	BAG	BOX	WEIGHT (gr)
	61 1807 2819	SHA 28-3/4" P	40	40	28	10	100	15



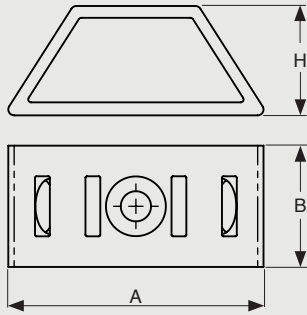
SHA 28-3/4" P + SIC P on pole installed with PIM Shield cable support straps

MHA P

Plastic Multi Hanger Adaptor

MHA P Plastic Multi Hanger Adaptor

MHA P plastic multi hanger adaptor can be applied with plastic tie wrap to various structures like poles and pylons. The MHA P adaptor creates three multidirectional fixing points for SIC P and SIC H snap in clamps.

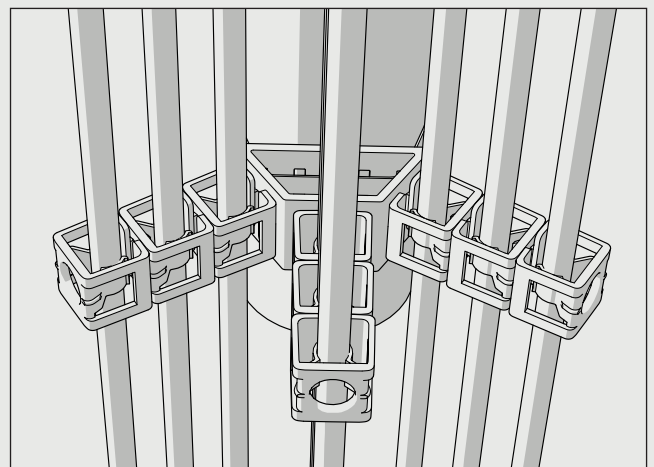


MATERIAL

Body	P.A. U.V. Resistant
Colour	Black

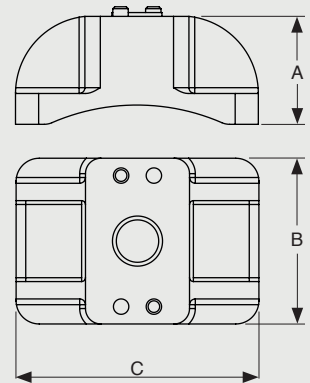
FIGURE	CODE	ARTICLE	A	B	H	BAG	BOX	WEIGHT (gr)
	85 1004 9003.P	MHA 3x3/4" P	86	41	37	10	100	32

MHA P + 3 stacked SIC P on pole installed with PIM Shield cable support straps



BAP

Plastic Tower Adaptors

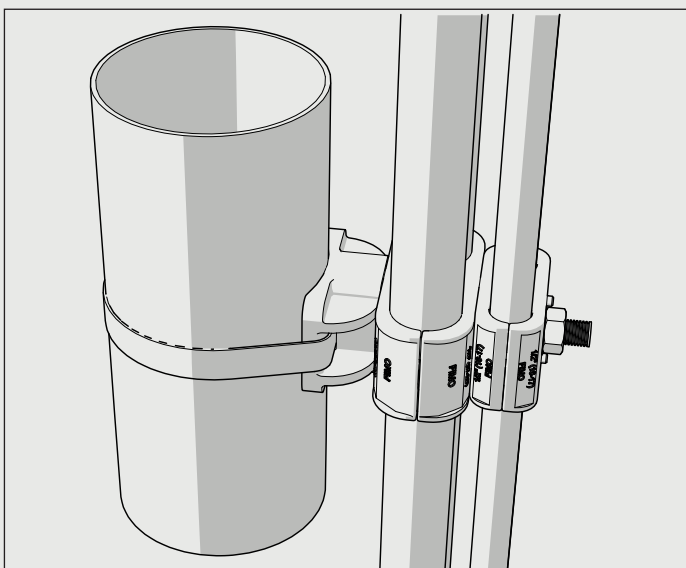
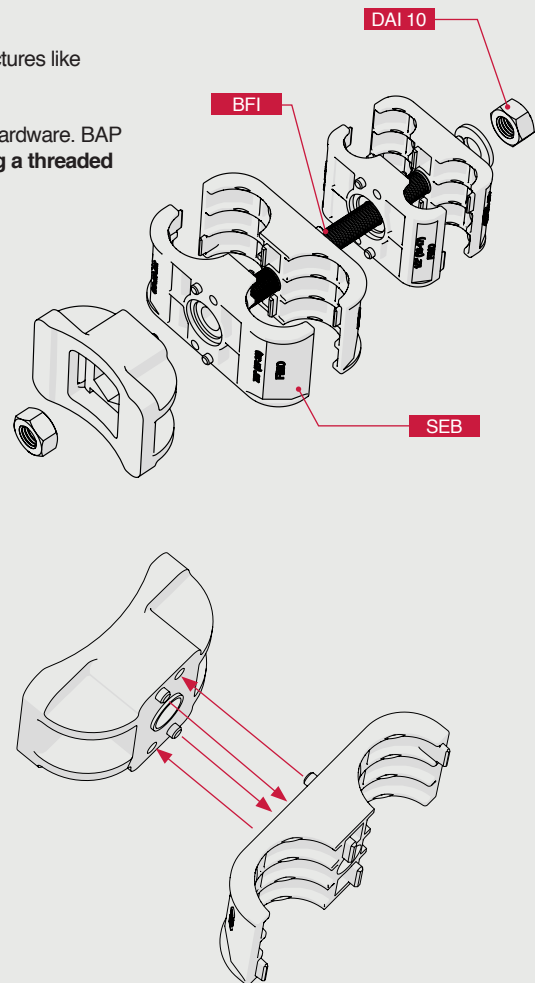


MATERIAL	
Socles	P.A. U.V. Resistant
Colour	Black

BAP 10 Plastic Tower Adaptors Collar

BAP plastic socles can be applied with metal strips and hose clamps to various structures like poles and pylons.

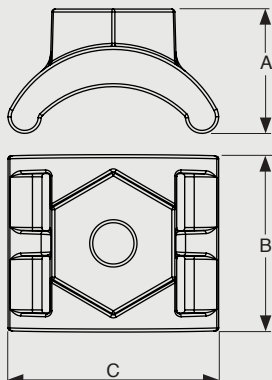
BAP plastic socles can be used for the installation of cable blocks with 3/8" or M10 hardware. BAP 10 has been specifically designed for the installation of SEB and SEM saddles **using a threaded bar and nut (M10 or 3/8")**.



BAP + SEB
installed on pole with PIM Shield cable support straps

BAP

Plastic Tower Adaptors



MATERIAL

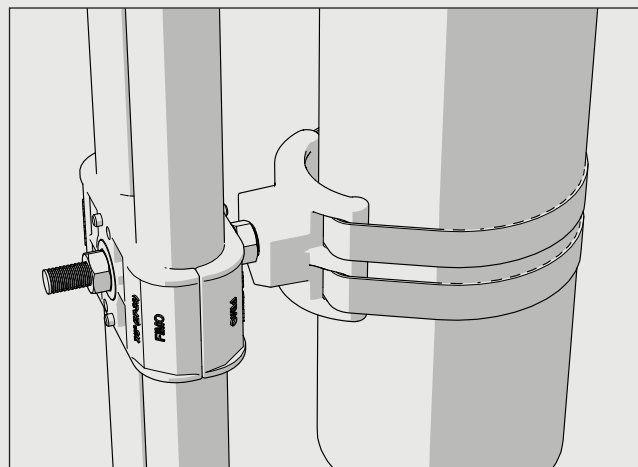
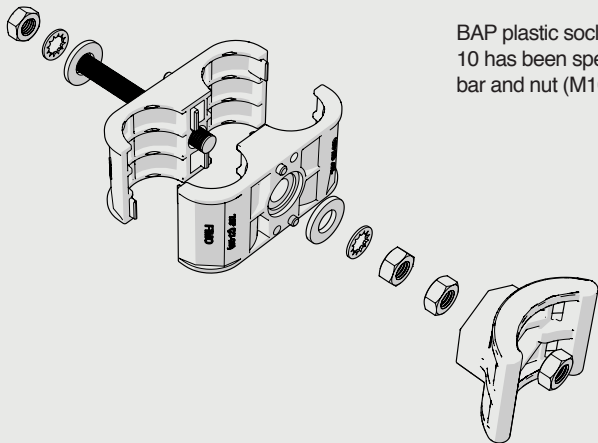
Socles	P.A. U.V. Resistant
Colour	Black



BAP 10 2HC Plastic Tower Adaptors Collar

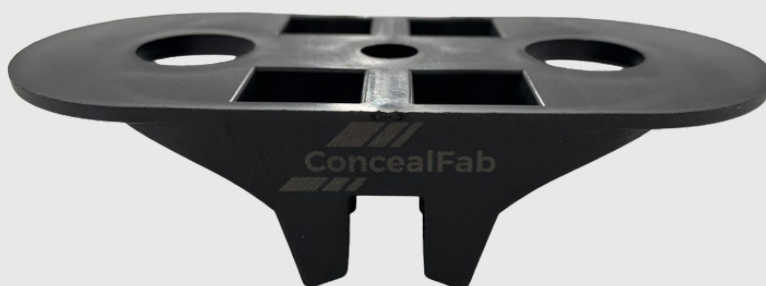
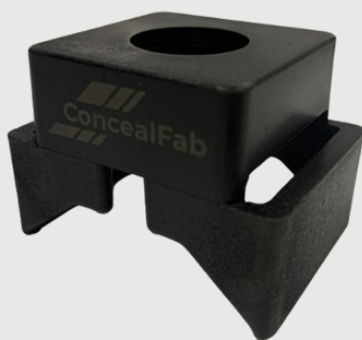
BAP plastic socles can be applied with plastic tie wraps to various structures like poles and pylons.

BAP plastic socles can be used for the installation of cable blocks with 3/8" or M10 hardware. BAP 10 has been specifically designed for the installation of SEB and SEM saddles using a threaded bar and nut (M10 or 3/8").



BAP 10 2HC + SEB
installed on pole with PIM Shield cable support straps

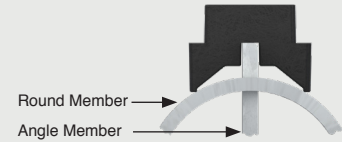
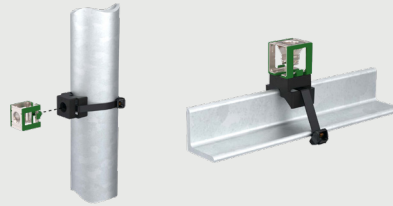
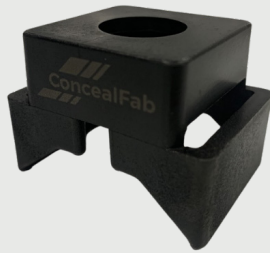
FIGURE	CODE	ARTICLE	A	B	C	FOR POLE Ø	BAG	BOX	WEIGHT (gr)
	61 3209 1000	BAP 10	28	43	63	> 50 mm - 2 in	10	100	29
	61 3209 2000	BAP 10 2HC	32	45	54	> 50 mm - 2 in	10	100	26



CODE	ARTICLE	Q.TY per CASE
9010440010	PIM Shield Multi-Function Snap-in Adapter 1 Position	10
9010450010	PIM Shield Multi-Function Snap-in Adapter 2 Position	10

General

The PIM Shield Multi-Function Snap-in Adapter provides a low passive intermodulation method to support one stack of snap-in style cable hangers in high-risk PIM zones.



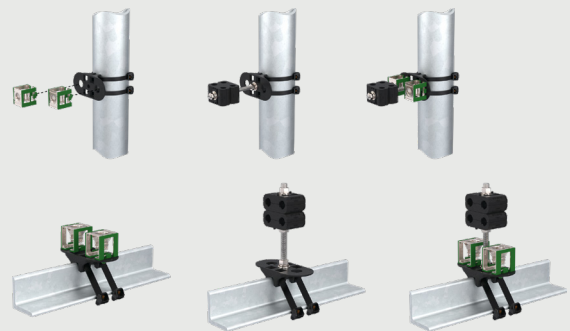
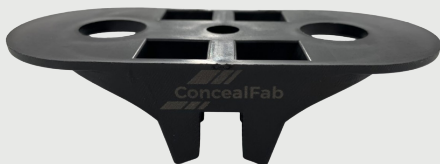
SPECIFICATION

Mounting	Secure the Snap-in Adapter to existing round or angle member using PIM Shield Cable Strap (900443-16-50 or 900443-27-25) or equivalent.
Round Member Attachment	2.37-inch (60 mm) minimum outside diameter
Angle Member Attachment	0.25-inch (6,35 mm) maximum angle flange thickness
System PIM Performance	IM3 <-100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus.
Material	UV Stable, glass filled Nylon
Operating Temperature	-40°C to +70°C
Case Dimensions	12.5-inch x 9.5-inch x 7-inch / 318 mm x 241 mm x 178 mm
Case Weight	7.1 Lbs. / 3,5 kg

PIM Shield Multi-Function Snap-in Adapter 2 Position

General

The PIM Shield Multi-Function Snap-in Adapter provides a low passive intermodulation method to support two stacks of snap-in style cable hangers and/or one threaded rod in high-risk PIM zones.



SPECIFICATION

Mounting	Secure the Snap-in Adapter to existing round or angle member using two PIM Shield Cable Straps (900443-16-50 or 900443-27-25) or equivalent. Torque threaded hardware to 10 FT-LB / 14 Nm (ConcealFab tool 900053).
Round Member Attachment	2.37-inch (60 mm) minimum outside diameter
Angle Member Attachment	0.39-inch (10 mm) maximum angle flange thickness
System PIM Performance	IM3 <-100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus. To achieve specified PIM performance, torque hardware to 10 FT-LB. / 14 Nm
Material	UV Stable, glass filled Nylon
Operating Temperature	-40°C to +70°C
Case Dimensions	15-inch x 11-inch x 8-inch / 381 mm x 280 mm x 203 mm
Case Weight	8.4 Lbs. / 3,8 kg



CODE	900443-16-50	900443-27-25
Strap Length	16 Inches - 406 mm	16 Inches - 686 mm
Grip Range	Up to 3-inch pipe (3.5-inch OD) Up to 76 mm pipe (89 mm OD)	Up to 6-inch pipe (6.6-inch OD) Up to 152 mm pipe (168 mm OD)
Quantity Per Bag	50	25
Bags Per Case	25	30
Case Dimensions	18-inch x 18-inch x 10-inch 458 mm x 458 mm x 255 mm	18-inch x 18-inch x 10-inch 458 mm x 458 mm x 255 mm
Case Weight	37.2 Lb.	34.4 Lb.

SPECIFICATION

General	PIM Shield Cable Straps are high strength, weather resistant, low passive intermodulation straps designed to secure ConcealFab's Cable Support Bases (sold separately) in high risk PIM zones. Straps are provided cut to length with the locking head pre-installed.
Design Life	Over 20 years outdoors
Industry Specification	Meets the performance requirements of Telcordia specification TR-TSY-000789
System PIM Performance	IM3 <-100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus.
Strap Material	Weather resistant Acetal (Delrin®)
Locking Head Material	Weather resistant Acetal (Delrin®) with stainless steel pawl
Strap Width	0.5 inch - 12,7 mm
Strap Thickness	0.056 inch - 1,4 mm
Loop break strength	- 40°C (- 40°F) - 400 Lbs. (181 kg) + 23°C (+73°F) - 375 Lbs. (170 kg) + 70°C (+ 158°F) - 200 Lbs. (91 kg)
Operating Temperature	-40°C to +70°C (-40°F to +158°F)

Delrin® is a registered trademark of E. I. Du Pont De Nemours and Company Corporation.

PIM SHIELD

Snap-in Cable Clamps



Hybrid Snap-in Cable Clamps



SIC H Hybrid Snap-in Cable Clamps

The SIC H quick cable fasteners have the shape of a square collar. Consisting of a stainless-steel body and a plastic fastening system, they are characterized by an elastic structure.

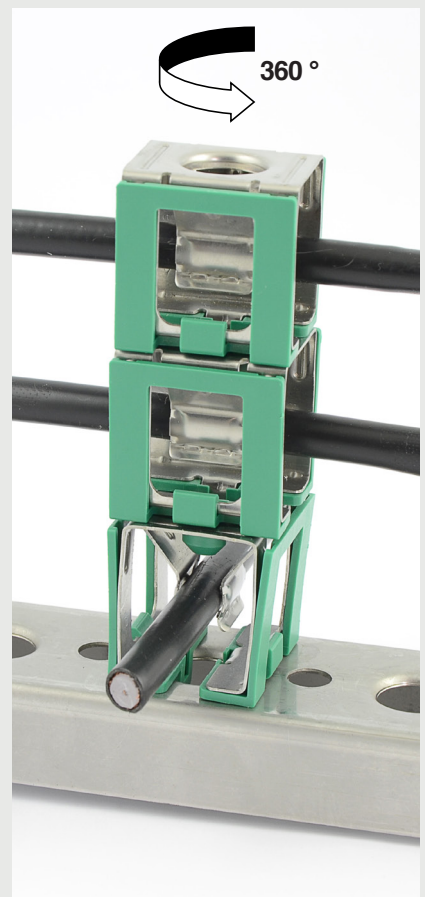
In this way, they can be easily spread out at the base, on which the plastic hooked feet are attached. First plugged into cables or pipes, they are then inserted into 19 mm (3/4") holes in specific dedicated structures. The collars have two shaped fins on the sides facing the inside, so as to securely but elastically hold the installed cable. The upper side of the square collars has a hole to accommodate other similar collars.

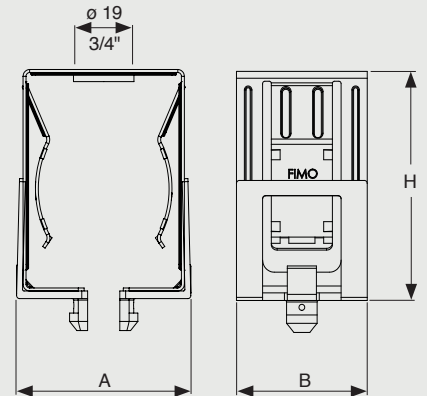
SIC H quick cable fasteners are quickly and easily applied on special profiles with holes diam. 19 mm, as well as on adapters specifically designed to be applied to structures of all kinds, such as flat irons, angles and commercial C-profiles. Quick assembly is performed in any case without the help of any tools. The plastic feet make possible to electrically insulate the cable clamp from the structure on which they are fixed or from another SIC H cable clamp (when stacked together).

The product thus created, allows to significantly reduce the phenomenon of passive intermodulation (PIM).

FEATURES & BENEFITS

- Monobloc steel body + plastic feet
- Simple, robust and elastic structure
- Hand-applied, fast, tool-free
- Possibility of overlap several collars, even of different sizes
- Soft and elastic hold of the cables
- Ideal for reducing passive intermodulation PIM





MATERIAL

Clamp	AISI 301 Stainless Steel
Fastening system	Glass reinforced P.A. U.V. Resistant
Colour	Green
System PIM Performance	IM3 <-100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus.

FIGURE	CODE	ARTICLE	FOR CABLES	N° CABLES	A	B	H	BAG	BOX	WEIGHT (gr)
	61 2109 0020	SIC 1 H	1/2" Ø 13 ÷ 19	1	36	40	41	10	100	35
	61 2109 0030	SIC 2 H	7/8" Ø 26 ÷ 30	1	36	40	41	10	100	35
	61 2109 0040	SIC 3 H	1.1/4" Ø 36 ÷ 42	1	60	45	76	10	100	87
	61 2109 0050	SIC 4 H	1.5/8" Ø 48 ÷ 52	1	60	45	76	10	100	87

Sales in North America through ConcealFab

Plastic Snap-in Cable Clamps



US Patent Pending
App. N. 16/433,160

SIC P
Plastic Snap-in Clamps

SIC P plastic snap-in clamps have been specifically designed for a quick and tool-less installation of cables. The high flexibility of the body, obtained with high-performance compound and optimal design, allows an easy handling by snapping into 19 mm (3/4") wide round holes.

After superimposing the clamp onto the cable, the SIC P can be mounted by locking it into the perforation of the according socket. An inner bracket pair holds the cable in position by applying elastic pressure with its variable geometry. Two pairs of flaps extending from the base cooperate with the brackets to further increase the axial retention of cable especially with bigger diameter cables. The high security factor K allows horizontal as well as vertical installations.

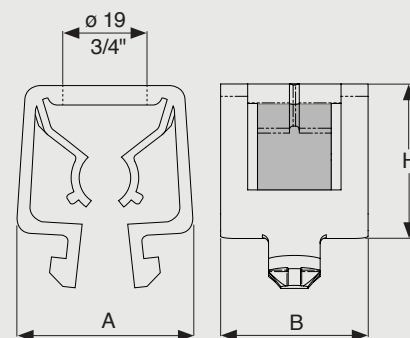
The head portion with the pass-through circular opening facilitates the mounting and stacking of further SIC P clamps, allowing mutual rotation and twistability.

4 versions, all sharing a common external frame, guarantee the capability to install cables in the range spanning from 4 to 17 mm, covering the majority of fiber optic cables, jumpers, electrical cables and pipes commonly used in the telecommunications industry.

FEATURES & BENEFITS

- Free hand, quick and easy installation
- Stackable and twistable (up to three clamps)
- Easily removable without tools
- Suitable for horizontal and vertical installations
- Single external frame for 4 versions (range: 4 – 17 mm diameter cables)
- Optimal design and high-performance compound with high mechanical resistance and flexibility
- High security factor K in all axial tests
- High ice and wind load resistance (up to 300 km/h)





MATERIAL

Clamp	Glass reinforced P.A. U.V. Resistant
Colour	Black
System PIM Performance	IM3 < -100 dBm when tested in accordance with IEC 62037-8, near field test, 2x 20W test tones, while subjected to dynamic stimulus.

FIGURE	CODE	ARTICLE	FOR CABLES	N° CABLES	A	B	H	BAG	BOX	WEIGHT (gr)
	61 2209 0407	SIC 4-7 P	4 - 7	1	36	30	31	10	100	11
	61 2209 0710	SIC 7-10 P	7 - 10	1	36	30	31	10	100	11
	61 2209 1014	SIC 10-14 P	10 - 14	1	36	30	31	10	100	11
	61 2209 1417	SIC 14-17 P	14 - 17	1	36	30	31	10	100	11

GRR

Round Multiple Cushions for Cable Clamps



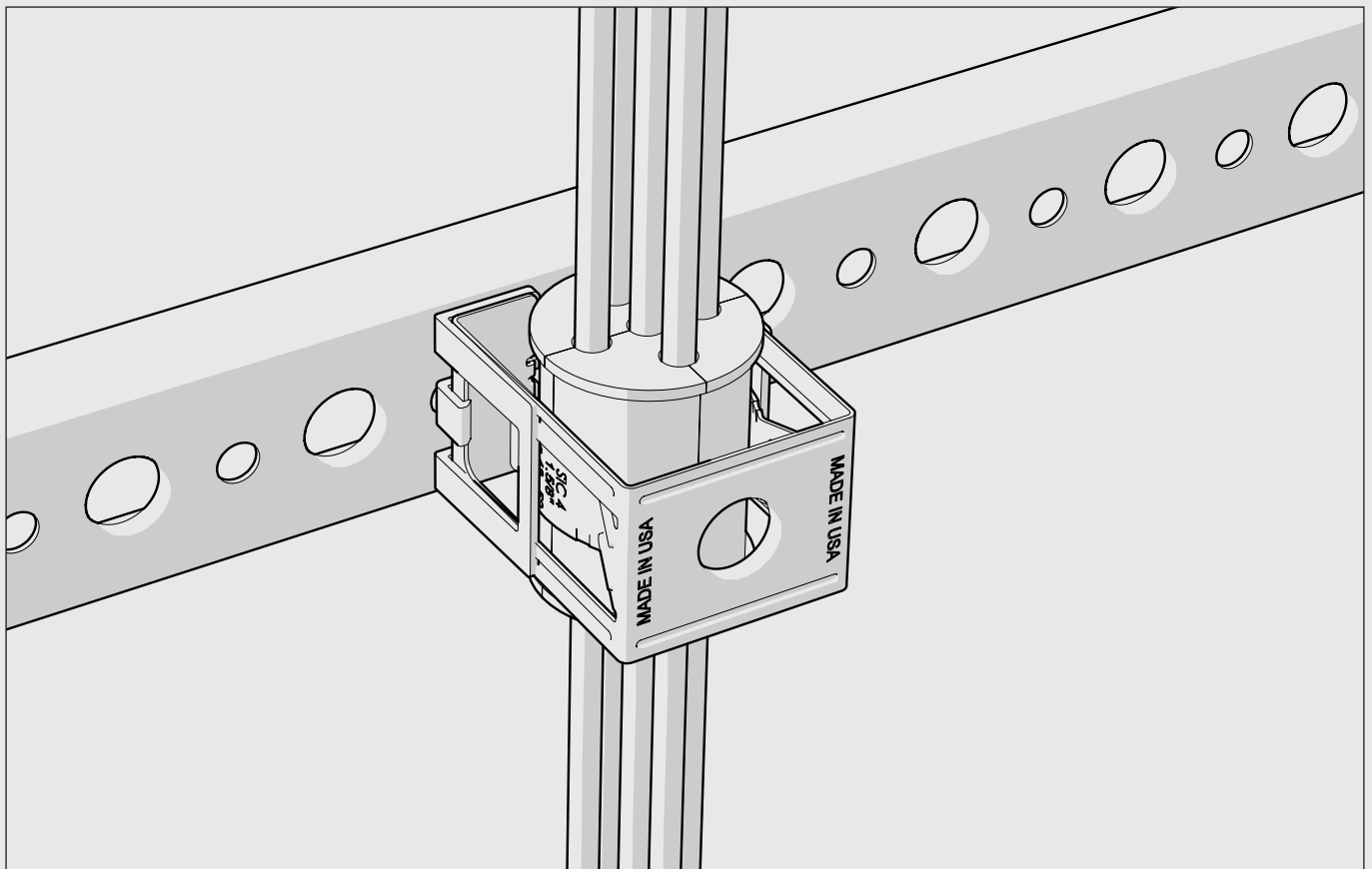
GRR Round Multiple Cushions for Cable Clamps

The GRR Round Multiple Cushions are suitable for reducing bracket diameter of snap-in Clamps to allow the fixing of multiple cables with a wide range of diameters.

Product range available upon request.

MATERIAL

Black EPDM, U.V. Resistant





MATERIAL

Rubber	EPDM, U.V. Resistant
Colour	Various

SRG Safe Rubber Guard

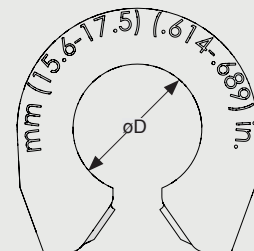
SRG rubber guards combined with SIC H snap-in clamps are the perfect solution for a quick, easy and safe installation of coaxial, fiber and power cables.

SRG rubber guard allows safe locking of coaxial, fiber optics and power cables, protecting cable and its jacket.

SRG rubber guards sizes cover a wide diameter range (4.5 – 16.5mm / .177 – .689 inches) of fiber optic and power cables.

FEATURES & BENEFITS:

- Strong and elastic structure
- Outer frame optimized for a smooth cable insertion
- One-hand instant mounting
- Safe and flexible fastening of cables
- Ideal for reducing passive intermodulation PIM



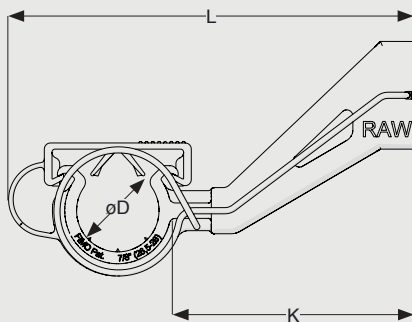
CODE	ARTICLE	øD		BAG	BOX	WEIGHT (g)
		mm	in			
61 4012 1001	SRG 1 (4,5-6,5)	4.5 - 6.5	.177 - .256	10	50	10
61 4012 1002	SRG 1 (6,6-8,5)	6.6 - 8.5	.259 - .335	10	50	9
61 4012 1003	SRG 1 (8,6-10,5)	8.6 - 10.5	.338 - .413	10	50	9
61 4012 2001	SRG 2 (10,6-12,5)	10.6 - 12.5	.417 - .492	10	50	17
61 4012 2002	SRG 2 (12,6-15,5)	12.6 - 15.5	.496 - .610	10	50	16
61 4012 2003	SRG 2 (15,6-17,5)	15.6 - 17.5	.614 - .689	10	50	14

PIM SHIELD

Radiating Cable Clamps



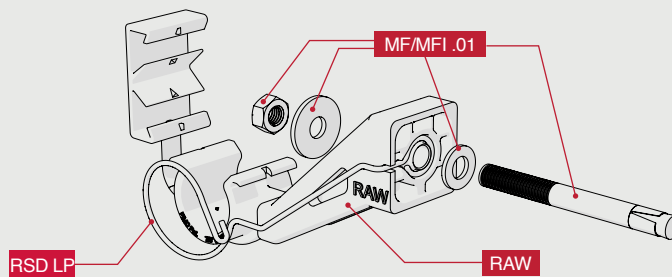
MATERIAL	
Body	PA6V0 Self Extinguishing Halogen Free UL94 - V0
Operating Temperature	- 40°C + 125°C
Colour	Black
RSD LP	AISI 316 Stainless Steel PIM free



RSD LP PIM Shield – RAW Security Device

The RSD LP PIM Shield Security Device is designed to be used in combination with RAW radiating cable clamps. The RSD LP PIM Shield can be pre-assembled with RAW clamps using different fastening anchors (available on request) for a fast and easy installation of the kit. The monoblock stainless steel body of RSD LP allows a secure elastic fastening of cables, without the use of tools.

The installation of a RAW + RSD LP PIM Shield kit at a suitable distance of 5 – 10 m prevents cable lines from falling down, in case of fire.



CODE*	ARTICLE	CABLES	FOR CABLES øD	K	L	BOX	WEIGHT
61 5021 0012	KIT RAW 1/2" - 80 + RSD LP	1/2"	15.5 - 17	80	117	50	47
61 5021 0078	KIT RAW 7/8" - 80 + RSD LP	7/8"	26.5 - 28	80	132	50	54
61 5021 0079	KIT RAW 7/8"M - 80 + RSD LP	7/8"	28 - 29.5	80	132	50	54
61 5021 0114	KIT RAW 1.1/4" - 80 + RSD LP	1.1/4"	38.5 - 40	80	143	50	63
61 5021 0115	IT RAW 1.1/4"M - 80 + RSD LP	1.1/4"	40.5 - 42	80	143	50	63
61 5021 0116	KIT RAW 1.1/4"M+ - 80 + RSD LP	1.1/4"	41 - 42.5	80	143	50	63
61 5021 0158	KIT RAW 1.5/8" - 80 + RSD LP	1.5/8"	48.5 - 50.5	80	152	50	68
61 5021 0159	KIT RAW 1.5/8"M - 80 + RSD LP	1.5/8"	50.5 - 52	80	152	50	68
61 5021 5012	KIT RAW 1/2" - 50 + RSD LP	1/2"	15.5 - 17	50	87	50	40
61 5021 5078	KIT RAW 7/8" - 50 + RSD LP	7/8"	26.5 - 28	50	102	50	47
61 5021 5079	KIT RAW 7/8"M - 50 + RSD LP	7/8"	28 - 29.5	80	102	50	47
61 5021 5114	KIT RAW 1.1/4" - 50 + RSD LP	1.1/4"	38.5 - 40	50	113	50	55
61 5021 5115	KIT RAW 1.1/4"M - 50 + RSD LP	1.1/4"	40.5 - 42	50	113	50	55
61 5021 5116	KIT RAW 1.1/4"M+ - 50 + RSD LP	1.1/4"	41 - 42.5	50	113	50	55
61 5021 5158	KIT RAW 1.5/8" - 50 + RSD LP	1.5/8"	48.5 - 50.5	50	122	50	60
61 5021 5159	KIT RAW 1.5/8"M - 50 + RSD LP	1.5/8"	50.5 - 52	50	122	50	60

* Version for M8 screws and anchors code .08 - * Version for M10 screws and anchors code .10 (Available upon Request)



PCO H



PCO V

MATERIAL

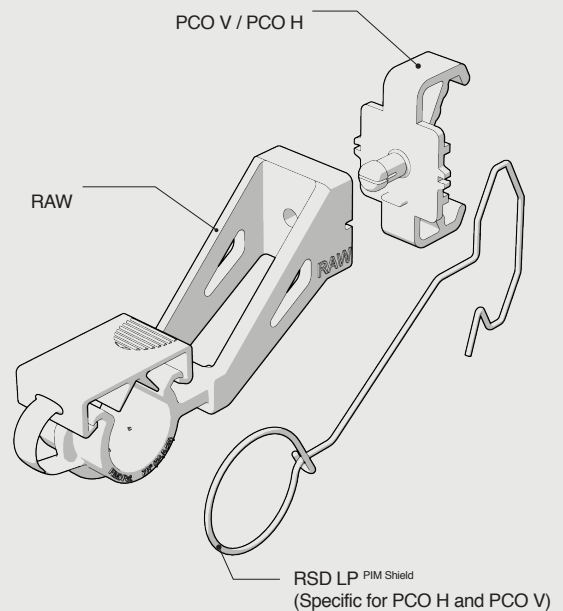
Body	PA6V0 Self Extinguishing Halogen Free UL94 - V0
Operating Temperature	- 40°C + 125°C
Colour	Black

PCO

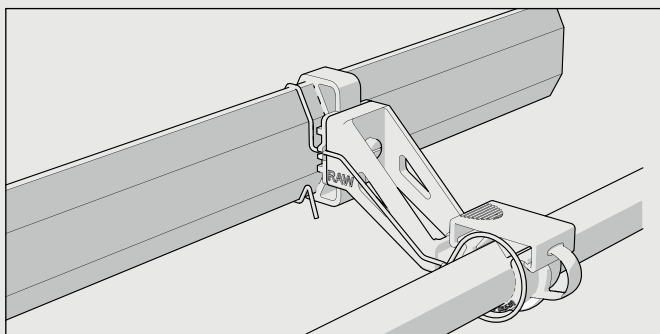
The PCO hooking system have been especially designed for quick installation with RAW clamp of radiating cables on specific ladders, provided with 56mm height.

The RAW – PCO cable clamps are designed to allow fast installation of radiating cables on ladders without need of tools. For installation, assembling cable clamp by inserting the pin on the PCO into the hole on the RAW and pushing till lock position and hooking lower collar corner on section. Push on upper part of collar to embrace section.

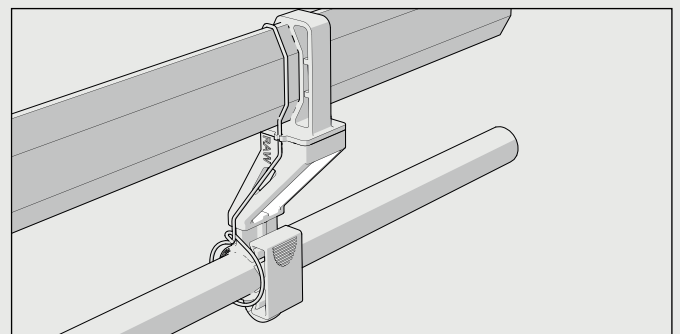
To prevent cable lines from falling, in case of fire, a RAW + RSD LP PIM Shield cable clamp can be installed among RAW – PCO cable clamps, without using metal screws and nuts, at a suitable distance of 5 – 10 m.



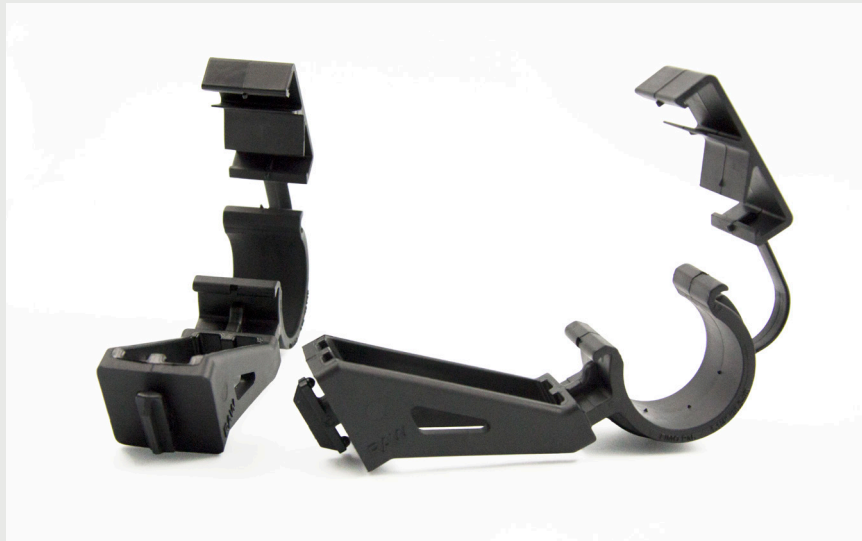
CODE	ARTICLE	BOX	WEIGHT
61 5045 0001	PCO 56 V	50	54
61 5046 0001	PCO 56 H	50	54



RAW + PCO 56 H on Section



RAW + PCO 56 V on Section



MATERIAL	
Body	PA6V0 Self Extinguishing Halogen Free UL94 - V0
Operating Temperature	- 40°C + 125°C
Colour	Black

RAW – APP

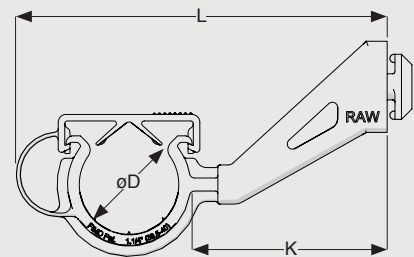
Monoblock Radiating Cable Clamps for Ladders

The RAW – APP cable clamps have been especially designed for quick installation of radiating cables on ladders, provided with rectangular slots 9x35 mm and 11x35 mm.

The RAW – APP cable clamps can be safely installed on metal ladders with thickness 1.25 – 1.5 mm, and include integrated spacer (80 mm).

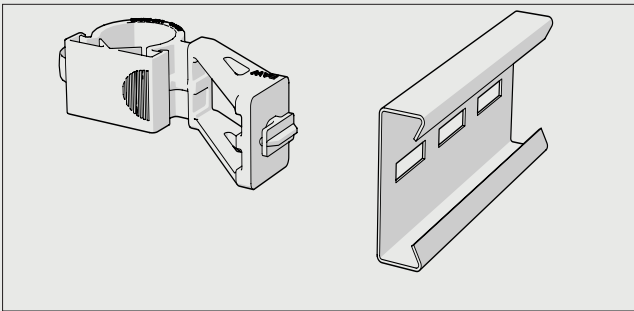
The RAW – APP cable clamps are designed to allow fast installation of radiating cables on ladders without need of tools. For installation insert the cable clamp in the rectangular slot on ladder and rotate till lock position.

To prevent cable lines from falling down, in case of fire, a RAW + RSD cable clamp can be installed among RAW – APP cable clamps, using metal screws and nuts, at a suitable distance of 5 – 10 m.

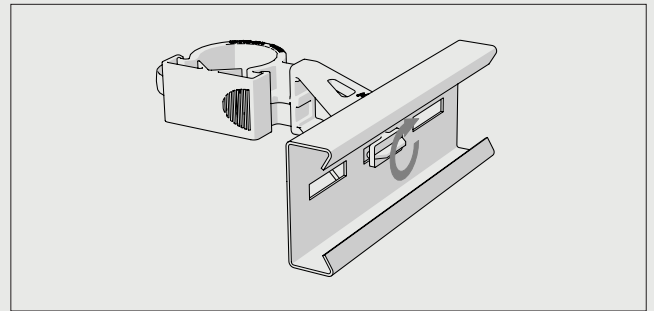


CODE	ARTICLE	CABLES	FOR CABLES øD	K	L	BAG	WEIGHT
61 5041 0012	RAW 1/2"- 80 APP11	1/2"	15.5 - 17	80	117	50	40
61 5041 0078	RAW 7/8"- 80 APP11	7/8"	26.5 - 28	80	132	50	47
61 5041 0079	RAW 7/8" M - 80 APP11	7/8"	28.5 - 29.5	80	132	50	47
61 5041 0114	RAW 1.1/4"- 80 APP11	1.1/4"	38.5 - 40	80	143	50	54
61 5041 0115	RAW 1.1/4" M - 80 APP11	1.1/4"	40.5 - 42	80	143	50	54
61 5041 0116	RAW 1.1/4" M+ - 80 APP11	1.1/4"	41 - 42.5	80	143	50	54
61 5041 0158	RAW 1.5/8"- 80 APP11	1.5/8"	48.5 - 50.5	80	152	50	59
61 5041 0159	RAW 1.5/8" M - 80 APP11	1.5/8"	50.5 - 52	80	152	50	59
61 5042 0012	RAW 1/2"- 80 APP9	1/2"	15.5 - 17	80	117	50	40
61 5042 0078	RAW 7/8"- 80 APP9	7/8"	26.5 - 28	80	132	50	47
61 5042 0079	RAW 7/8" M - 80 APP9	7/8"	28.5 - 29.5	80	132	50	47
61 5042 0114	RAW 1.1/4"- 80 APP9	1.1/4"	38.5 - 40	80	143	50	54

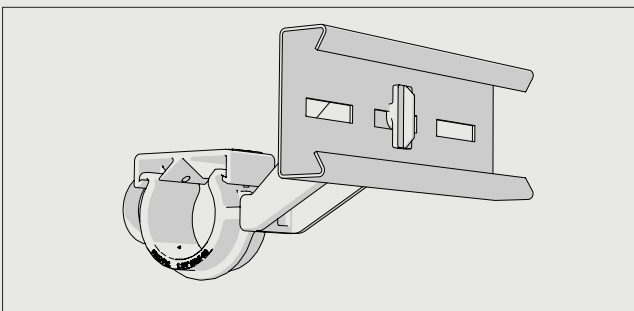
CODE	ARTICLE	CABLES	FOR CABLES øD	K	L	BAG	WEIGHT
61 5042 0115	RAW 1.1/4" M - 80 APP9	1.1/4"	40.5 - 42	80	143	50	54
61 5042 0116	RAW 1.1/4" M+ - 80 APP9	1.1/4"	41 - 42.5	80	143	50	54
61 5042 0158	RAW 1.5/8" - 80 APP9	1.5/8"	48.5 - 50.5	80	152	50	59
61 5042 0159	RAW 1.5/8" M - 80 APP9	1.5/8"	50.5 - 52	80	152	50	59
61 5045 0012	RAW 1/2" - 80 APP7	1/2"	15.5 - 17	80	117	50	40
61 5045 0078	RAW 7/8" - 80 APP7	7/8"	26.5 - 28	80	132	50	47
61 5045 0079	RAW 7/8" M - 80 APP7	7/8"	28.5 - 29.5	80	132	50	47
61 5045 0114	RAW 1.1/4" - 80 APP7	1.1/4"	38.5 - 40	80	143	50	54
61 5045 0115	RAW 1.1/4" M - 80 APP7	1.1/4"	40.5 - 42	80	143	50	54
61 5045 0116	RAW 1.1/4" M+ - 80 APP7	1.1/4"	41 - 42.5	80	143	50	54
61 5045 0158	RAW 1.5/8" - 80 APP7	1.5/8"	48.5 - 50.5	80	152	50	59
61 5045 0159	RAW 1.5/8" M - 80 APP7	1.5/8"	50.5 - 52	80	152	50	59



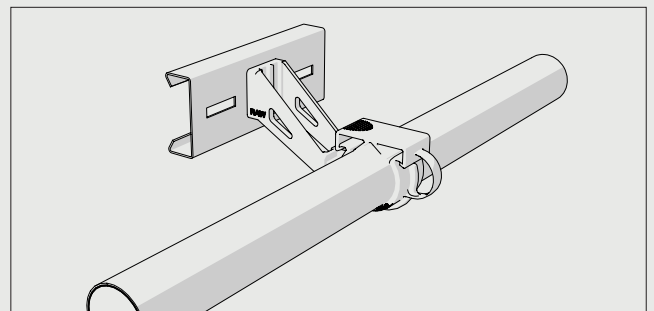
Rotate RAW
horizontally clockwise.



Insert TAB on back of RAW into slot.



Rotate RAW anticlockwise to vertical position



Insert cable and close bracket.

Installed in few seconds!

CONCLUSION

Identifying and addressing external PIM sources at cell sites can be a complex task, with some PIM sources being easier to detect than others. The success of the PIM testing on site relies on the proficiency and training of the team conducting the tests for PIM detection and mitigation. This will allow providers to limit interference even if small cell site saturation continues to increase and network demands continue to grow.

Modern radio access networks (LTE/5G NR) are more vulnerable to PIM effects than legacy systems due to greater bandwidth, increased number of frequency bands and data density, as well as other factors. This makes it much more important to stay on top of every possible PIM source, including external PIM.

Due to increased spectrum allocations, it's no longer possible to ignore or avoid conducted external PIM. Staying up to date and investing in next-generation PIM-mitigation strategies like the FIMO PIM SHIELD CLAMPS, you can sustain your signal quality for now, and into the future.

Choosing high-quality components, like FIMO clamps, that are specifically designed to minimize PIM is crucial. FIMO components are manufactured with materials and designs that minimize nonlinearities and improve performance.

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