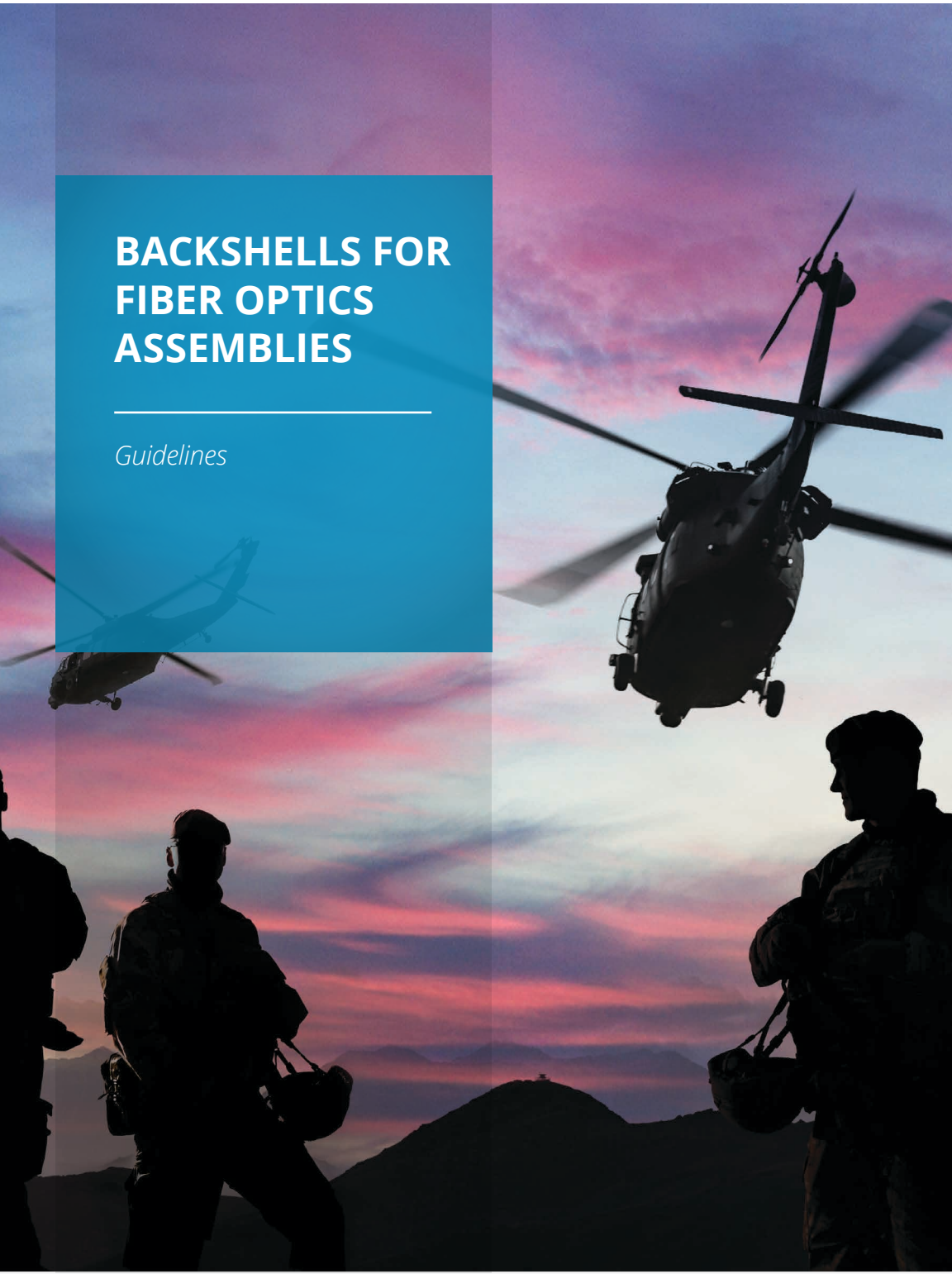
BACKSHELLS FOR FIBER OPTICS ASSEMBLIES

Guidelines



Radiall

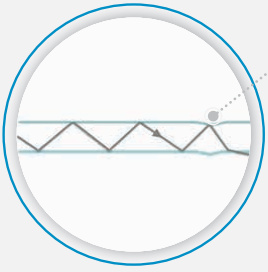
COTS BACKSHELL LIMITATIONS FOR OPTICS

BACKSHELL INTERNAL DIAMETER

The diameter of a COTS backshell will likely interfere with the MIL-DTL-38999 type R8 rear grommet. The backshell bead deforms the grommet and degrades sealing performance.

GROMMET INTERFERENCE

BACKSHELL BEAD



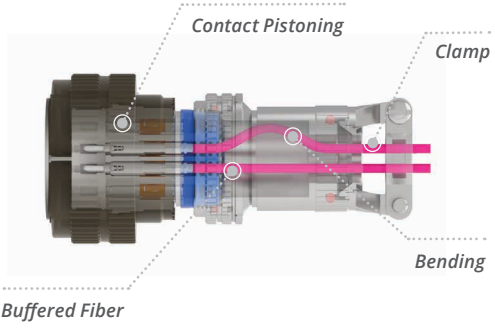
MICROBENDING

Fiber optics are sensistive to microbending. Transmission performances can be severely impacted due to the direct cable compression. Basic strain relief and tie-wrap design backshells are not recommended.

FIBER CONSTRAINTS

Cable buckling can happen inside a backshell that is not selected properly.

Physical contacts compress when mated to ensure high quality connectivity. When mated, contact pistoning makes the fiber translate backward inside the 1.8 mm sleeve. Cable buckling over too short of a distance can create an uncontrolled bending radius, leading to stress on the fiber and propagation losses.



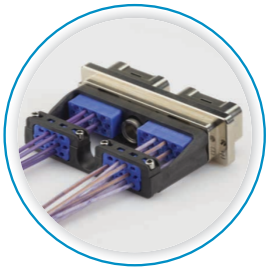
CABLE BUCKLING

RECTANGULAR OPTICAL CONNECTOR BACKSHELLS

EPX™ BACKSHELLS

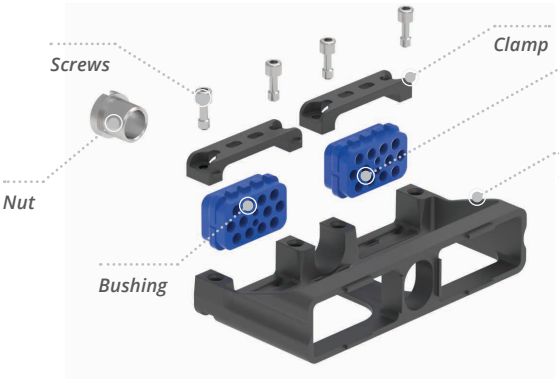
Maintain the optical performances in EN4644

EPX™ B1 and B2 benefit from an optimized fiber optic strain relief. Its short and lightweight composite design is compatible with 1.8 mm and 2.8 mm ARINC802 cables.



EPXB2

EPXB1



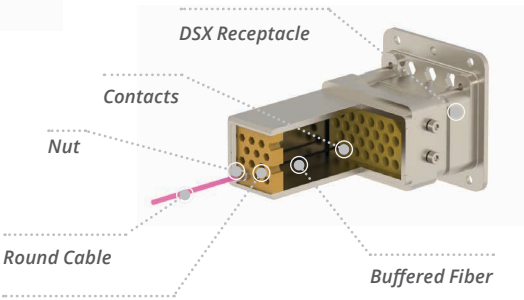
EASY WIRING

Bushing is compatible with 1.8 mm and 2.8 mm ARINC802 cables.

DSX BACKSHELLS

Maintain the optical performances in ARINC 404

Radiall has developed a backshell to support the deployment of fiber optics inside industry standard ARINC404 connectors. Each round cable is individually retained by the crimping ferrule, making structured cable configurations pull-proof. The distance between the contact and the backshell clamp is optimized in order to avoid uncontrolled cable buckling.



RETAINER SYSTEM – ROUND CABLE

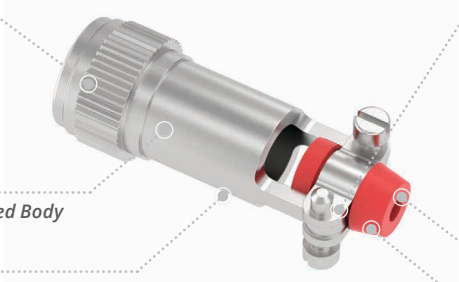
DSX backshell uses the same technology as the carousel backshell. The Radiall nut and neck round cable design saves fiber from microbending when crimping and makes tight structure cables pull-proof.

CIRCULAR OPTICAL CONNECTOR BACKSHELLS

Maintain the optical performances in MIL-DTL-38999

In order to solve the issues with COTS electrical backshells, Radiall developed its own optical backshell range. The R8 product range has been designed to fit with the LuxCis® ARINC801 and Series III MIL-DTL-38999 interfaces. 45° and 90° angled extension cups can be assembled between the R8 connector and backshell.

MIL-DTL-38999 Backshell Thread



Extended Body

STRAIN-RELIEF

This versatile solution for standard cable and cables with braided sleeve bundles features an extended body and a strain-relief mechanism that supports pull-proof cables and prevents microbending.

Bushing

CABLE BUCKLING MANAGEMENT

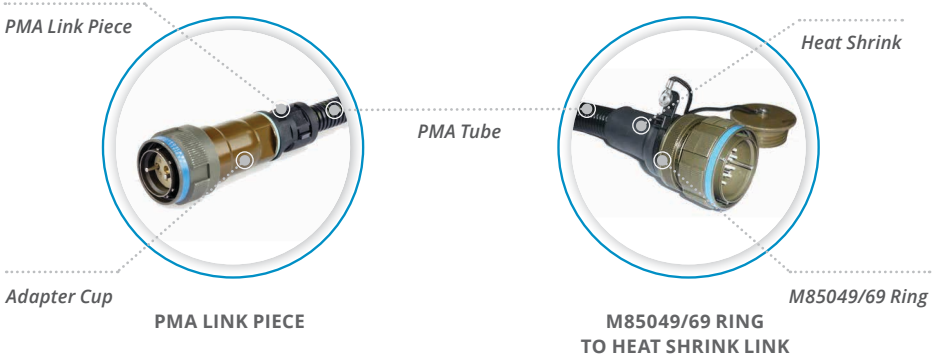
When mated, the LuxCis® contact is compressed to obtain physical contact. The cable bends between the strain-relief and the contact, which causes cable buckling. The backshell length is optimized so that the fiber bending radius does not impact the optical performance.

MICROBENDING

The bushing acts as a dampener and limits the strain-relief pressure while clamping the cable.

CONVOLUTED TUBE

There are two designs for convoluted tubing attachments. The first design consists of a PMA link piece on the backshell adapter cup. The second method uses an M85049/69 ring and heat shrink to secure the PMA tubing on the R8 connector. Both assembly methods are sealed solutions.



BRAIDED SLEEVE

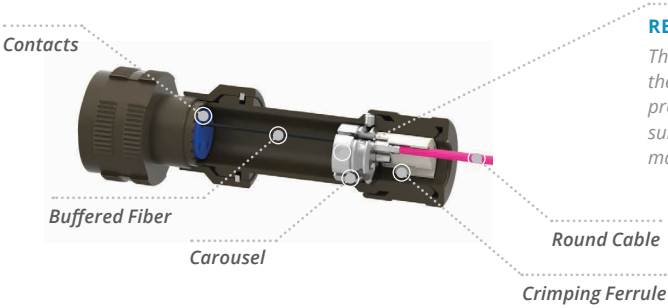
Radiall's proprietary cup design makes it easy to crimp the braided sleeve using a metal clamp, tie wrap or heat shrink. The design prevents the clamp from compressing the fiber. Additionally, the cup can be used on its own.

Braided sleeve to backshell clamping options

- *Metal Ring Clamp*
- *Tie Wrap*
- *Heat Shrink*
- *No Braid*

CAROUSEL BACKSHELL

Each 1.8 mm round cable receives a retainer ferrule that clamps onto the aramid fiber. The carousel acts as a thrust washer and protects the fiber by anchoring against any pull force, making tightly structured cable configurations pull-proof. In order to avoid uncontrolled cable buckling when mating the R8 connector, the distance between the contact and the carousel is optimized.

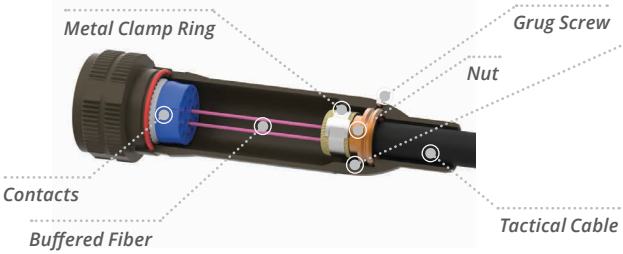


RETAINER SYSTEM – INDIVIDUAL CABLE

The aramid fiber is clamped in between the crimping ferrule and the neck, which prevents the fiber from microbending. This subsystem, called a retainer ferrule or nut, mates into the carousel.

TACTICAL BACKSHELL

The tactical backshell uses a retainer system that is crimped on the strength members of the tactical cable to help withstand extremely high traction. The nut directly locks on the backshell body stop. Two versions are available depending on the cable diameter.



RETAINER SYSTEM – TACTICAL CABLE

The aramid is clamped in between the crimping neck and the metal clamp ring or crimping ferrule. The nut sits inside the backshell body mechanical stop and is locked in position using a grug screw.

EMI/RFI

Designed to use with rigid tubing, the M85049/78 and M85049/18 backshell series feature a gland system for sealing and strain relief. The backshell is able to maintain grounding continuity with metallic tubing.

M85049/78 AND M85049/18

Braided sleeve to backshell clamping options

- *PMA Tubing*
- *PMA Tubing and Metallic Braid*
- *Buffered Metallic Spiral Conduit*

SINGLE-CHANNEL BACKSHELLS

Ruggedized solution for the LxC-R® and EZ-Lux™ series

The single-channel backshell mates with LxC-R® and EZ-Lux™ plugs. The backshell extender body screws in at the rear of the connector. On the cable side, the backshell clamps directly on the breakout cable or armored tubing.

DIRECT TUBE CRIMPING

This solution features an excellent tubing compression ratio. The backshell should only be used with Radiall selected tubing.

SELECTION GUIDELINES

			SPECIFICATIONS				CABLE STRUCTURE COMPATIBILITY			CABLE DIAMETER COMPATIBILTY		
	Backshell	Tubing	Sealing	Serviceability	Cost Effectiveness	Tensile Strength	Loose	Tight	Tactical	Individual 1.8 mm	Individual 2.8 mm	Tactical
R8 CIRCULAR	Strain Relief		No	****	***	**	•			•	•	
	Convoluted Tube	PMA	Yes	*****	***	****	•	•		•	•	
		Heat Shrink		*	*****	***						
	Braided Sleeve	W/ Braid	No	**	****	**	•	•		•	•	
		W/O Braid		***	****	*						
	Carousel		No	***	**	***		•		•		
	Tactical		Yes	**	*	*****			•			•
	EMI/RFI		Yes	*****	**	***	•	•		•	•	

SIMPLIFICATION *is our* **INNOVATION**

We advance the design and engineering process for innovators, groundbreakers and pioneers of technology. We reduce weight, improve durability and streamline installation to provide leading-edge connectors that drive product performance.

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