

## INTRODUCTION

### Sleeving and Shielding Solutions

Complete range of  
**SLEEVE, WRAP-AROUND,  
COLD APPLIED & EDGE  
PROTECTION.**

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**Performance products for  
demanding environments.**

A range of protective sleeves are available from world leading manufacturers, providing protection for electrical harnesses, hoses and pipes against heat, abrasion, chemicals fluids and electrical noise. Applications range from commercial products through to high performance products that can be used in the most demanding environments.

Protective sleeves come in a wide variety of constructions, sizes and colours including wrap-around, push-on, heat-shrinkable, spiral binding, metal braids and protective edging.

Temperature capabilities from -70°C to +1100°C

#### Features & Benefits

- Mechanical protection
- Chemical resistance
- Electrical insulation
- Fluid and solvent resistance
- Moisture protection
- Strain relief, flexibility
- Aesthetic enhancement
- Fast and efficient installation



#### Typical Applications

Customers in a variety of aerospace, defence, energy, industrial and transport markets utilise our products in a host of applications including:

##### Aerospace

- Wire harnesses protection from abrasion in fuselage applications and in the wings.
- Electrical barrier against arc generated from a short circuit.
- EMI and lightning protection inside fuselage and on the wings, VTP & HTP sections.

##### Defence

- EMI protection on radar systems
- High temperature mechanical protection.
- NBC protection of wire harnesses.

##### Electronics

- Protection of wire harnesses in electrical cabinets and enclosures.
- Dielectric protection of sensitive wire harnesses.
- Protection of wiring from high temperatures.

##### Marine

- Thermal and mechanical protection.
- Fire protection of tubing, wiring and hoses.

##### Transport

- Mechanical protection of wire harnesses located in panels and inside HVAC systems.
- Protection against UV and stone impingement above and underneath the car body.
- EMI shielding to reduce emissions.

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Product	Type	Description
<b>Abrasion / Mechanical Protection</b>		
<b>HFT5000</b>	Heat-shrink	Heat-shrinkable (2:1) fabric tubing, provides outstanding abrasion, chafing & cutting protection, even at high temperatures.
<b>Expando® PT Plus</b>	Push-on	Highly expandable braid (1:3) with strong mechanical protection; treated to prevent end-fray; available in a variety of colours.
<b>Expando® TCP V0</b>	Push-on	Expandable braid (1:2) with strong mechanical protection; with low toxicity and smoke emission
<b>Expando® HR &amp; HR Plus</b>	Push-on	Highly expandable braid (1:3) with good mechanical protection and outstanding chemical resistance, treated to prevent end fray.
<b>Expando® PPS</b>	Push-on	Expandable light weight braid (1:2) with strong mechanical protection; with low toxicity and smoke emission
<b>Expando® HTNS-L/HO</b>	Push-on	Expandable braid (1:2) with strong mechanical protection; oil water repellent treated sleeve plus soft to the cable structure.
<b>Expando® HTNS-LA/HO</b>	Push-on	Expandable braid (1:3) with strong mechanical protection; oil water repellent treated sleeve plus soft to the cable structure.
<b>Roundit® 2000</b>	Wrap-around	Self-wrapping sleeve with strong mechanical protection; quick and easy installation on cables.
<b>Roundit® 2000 FR</b>	Wrap-around	Self-wrapping sleeve with strong mechanical protection; soft to the cable structure.
<b>Roundit® 2000 V0</b>	Wrap-around	Self-wrapping with high mechanical protection; ideal flame resistance with low toxicity and smoke emission.
<b>Roundit® 2000 NX</b>	Wrap-around	Self-wrapping sleeve with high mechanical protection, ideal for high temperature mechanical performance.
<b>Roundit® 2000 NX HT</b>	Wrap-around	Self-wrapping sleeve with high mechanical protection, ideal for high temperature mechanical performance; High Temperature
<b>Thermal Management</b>		
<b>Textalu® 1202</b>	Push-on	An insulative fibreglass sleeve, with a heavy aluminium coating designed to protect components in high temperature areas.
<b>Thermotubix® - Industrial</b>	Push-on	Silicone coated sleeve with good resistance to high temperature, fire and molten splashes.
<b>Thermotubix® - Aerospace</b>	Push-on	Silicone coated sleeve with enhanced fire protection; provides excellent protection against high temperatures and fire.
<b>Electromagnetic Shielding / Screening</b>		
<b>Roundit® 2000 NX Cu/Ni EMI</b>	Wrap-around	Tough self-wrapping solution; flexible and easy to install offering a combination of EMI shielding & abrasion resistance long term.
<b>Raybraid® 90 &amp; 101/103</b>	Push-on	Tubular braiding for electrical screening of wire bundles, with minimum 90% optical coverage, greater for 101 and 103.
<b>Miscellaneous</b>		
<b>GTB Spiral binding</b>	Wrap-around	PTFE spiral binding can be used in industrial and commercial environments, ideal for control panels.
<b>Rayrim® / TPEM</b>	Edge Protection	Commercial protective adhesive lined edging. Application on internal and external radii as well as straight edges.
<b>Spring-Fast® Mil-Spec<sup>#</sup></b>	Edge Protection	The fastest, safest, most reliable way to protect wires, cables and tubing from abrasion. Very flexible for sharp radii corners.

<sup>#</sup> Spring-Fast® other options and variations are available, please contact us for more information.

Temp. Range	Specification	Construction	Sizes
<b>Abrasion / Mechanical Protection</b>			
-40°C to +150°C	E199379 Rated 135°C	Polyolefin/polyester, with 2:1 shrink ratio	6 to 35mm recovered
-70°C to +125°C	UL recognised component • MIL-DTL-235053E -70°C • ASTM D-3418 +250°C	Material : Polyester Colours: Black, Natural and others	3 to 64mm
-50°C to +150°C	NF 16101 • NF 16102 • ASTM E662 • ASTM E162:	Material : UL 94 VO Rated Polyester Colour: Black with grey tracer	3 to 50 mm
-70°C to +150°C	UL 1441 VW-1 Flammability • FAR Part 25	Material: Halar® (E-CTFE) Fluoropolymer Colour: Black with white tracer / inverse	3 to 64 mm
-70°C to +200°C	UL 1441 VW-1 Flammability • FAR Part 25 • ASTM E662 Smoke	Material: Polyphenylene sulfide Colour: Black or Natural	3 to 45 mm
-60°C to +240°C	EN 6049-003 • PAN 6480P • FAR Part 25 • UL 224 • UL 94	Material: Nomex® Colour: Olive Green	2 to 40 mm
-60°C to +240°C	EN6049-004 • FAR Part 25 • UL 224 • UL 94	Material: Nomex® Colour: Olive Green	3 to 50 mm
-70°C to +125°C	FMVSS-302 Test Method D45 1333 Self-extinguishing Type B	Material : Polyester Colour: Black	5 to 45 mm
-50°C to +150°C	NF 16101 - 16102: I2 F2 • ASTM E662 • ASTM E162	Material : Flame-retardant Polyester Colour: Black	5 to 50 mm
-50°C to +150°C	NF 16101 • NF 16102 • ASTM E662 • ASTM E162:	Material : UL 94 VO Rated Polyester Colour: Black	5 to 50 mm
-60°C to +200°C	FAR Part 25	Material: Nomex® and PPS Colour: Olive Green	5 to 40 mm
-60°C to +260°C	FAR Part 25	Material: Nomex® and PEEK Colour: Olive Green with twin ivory tracer	5 to 40 mm
<b>Thermal Management</b>			
-50°C to +550°C	FMVSS 302 test D45 1333 Type A • ISO 6722	Material: Fibreglass, Aluminium Colour: Aluminium grey	5 to 24 mm
-54°C to +260°C	Flame resistant	Material: Fibreglass and silicone Colour: Reddish-brown	8 to 101 mm
-54°C to +260°C	Flame resistant • 15 min withstand @ 1100°C	Material: Fibreglass and silicone Colour: Reddish-brown	8 to 101 mm
<b>Electromagnetic Shielding / Screening</b>			
-60°C to +200°C	EN 6049-008 • FAR Part 25	Material: Nickel-plated copper & polyester Colour: Olive Green	5 to 38 mm
up to +150°C		Material: Series 90 & 101 Tinned Copper; Series 103 Nickel Copper	3 to 30 mm*
<b>Miscellaneous</b>			
-70°C to +260°C	PAN 6480 • AS4 1088	Material: PTFE Colour: Black	3 to 25 mm
-55°C to +80°C		Material: Polyolefin Colour: Black	0.6 to 4.2 mm
-40°C to +185°C	FAR Part 25 • MIL-STD-202F • AS9000 Compliant • FAA/CAA Recognised	Material: Polymer coated, stainless steel. Plus polymer cushion	0.6 to 6.6 mm

\* Raybraid® 101/103 is available in sizes 3 to 20mm only

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# Protective Sleeving

## HFT5000

Polyolefin/polyester construction

Heat-shrinkable fabric tubing

### Abrasion and Mechanical Protection

HFT5000 is made from a very flexible heat-shrinkable fabric and at temperatures above +110°C shrinks to fit securely around a range of shapes and sizes. Designed to provide mechanical abrasion protection, noise and rattle suppression, for components such as rubber hoses, plastic pipes, and harness wiring bundles.

The woven construction makes HFT5000 extremely flexible and resistant to trapping water, heat and humidity. It also provides outstanding abrasion, chafing and cutting protection, even at high temperatures.

### Features & Benefits

- 2:1 shrink ratio for easy installation
- Highly flexible woven construction
- Outstanding abrasion resistance over a wide temperature range
- Resistance to harsh environments
- Easily cut with standard industrial cutting equipment
- Low shrink temperature for safe installation onto heat sensitive substrates
- Halogen free

### Operating Temperature

- From -40°C to +125°C (3000 hours)
- From -40°C to +150°C (1000 hours)

### Installation

- Minimum shrink temperature +110°C
- Minimum full recovery +140°C to +190°C
- Maximum storage temperature +60°C

### Materials Description

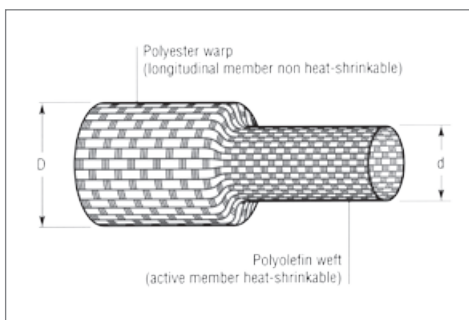
Warp material: Polyester  
Weft material: Irradiated, modified polyolefin  
Coating: Modified polyolefin

2:1 shrink ratio



### Specifications & Approvals

- UL E199379 135°C
- RW2060



Properties	Test	Results
<b>Abrasion resistance</b> (200g load, 0.3mm radius metal blade, 10Hz, 10mm stroke, 144 000 cycles)	+23°C	No wear to underlying rubber hose
	+80°C	No wear to underlying rubber hose
	+135°C	No wear to underlying rubber hose
<b>Thermal aging</b>	3000 hrs at +125°C	No deterioration at +80°C
	1000 hrs at +150°C	No deterioration +80°C
<b>Flammability</b>	MVSS302	Pass
<b>Low temperature flexibility</b>	4 hrs at -40°C & +125°C	No cracking
<b>Cold impact</b>	200g weight from	
	100mm at -40°C	No cracking
<b>Thermal shock</b>	100 cycles between	
	-40°C and +125°C	No deterioration at +80°C
<b>Fluid resistance:</b> Antifreeze (50% ethylene glycol) • Engine oil (SAE 10w/30) • Mineral hydraulic fluid • Detergent (1% Teepol) Brake fluid (DOT 4) • Unleaded gasoline • Diesel fuel • Battery acid (1.25 SG H <sub>2</sub> SO <sub>4</sub> ).	24hrs immersion at +23°C	No deterioration in abrasion resistance at +80°C

Inside Diameter		Std Pack Size	Part Number
Supplied (mm)	Recovered (mm)	Spools (SP)	
4	2	500m	HFT5000-4/2-0-SP
6	3	500m	HFT5000-6/3-0-SP
12	6	500m	HFT5000-12/6-0-SP
20	10	400m	HFT5000-20/10-0-SP
30	15	400m	HFT5000-30/15-0-SP
40	20	300m	HFT5000-40/20-0-SP
50	25	200m	HFT5000-50/25-0-SP
60	30	200m	HFT5000-60/30-0-SP
70	35	150m	HFT5000-70/35-0-SP

**Note:** The fully recovered wall thickness will be approximately 1mm and longitudinal shrinkage on full recovery is between 10% and 20%.

**Part Number Example; HFT5000-60/30-0-SP** 60mm inside diameter, black tubing, supplied on a spool.

### Ordering Information

Standard colour: **0** = Black  
 Size selection: The largest size that will fit snugly over the component(s)  
 Standard packaging: Spools (SP), for MOQ please contact us.  
 Ordering description: Specify product name, size and colour: HFT5000-20/10-0-SP

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# Protective Sleeving

## EXPANDO® PT and PT Plus

Polyester (PET)

Expandable braided sleeving

### Abrasion and Mechanical Protection

Tough, lightweight over sleeves used to protect cable assemblies, hose and wire harnesses from chafing, cutting and abrading. The open-braid construction of Expando products enables each size to expand to fit several application shapes and diameters. This open-textile construction also makes them highly flexible and resistant to trapping water, heat and humidity.

Expando PT and Expando PT Plus are braided polyester (PET) sleeves designed for applications up to 125°C. General purpose industrial/commercial products, Expando PT and PT Plus balance the properties of mechanical and thermal stability with economy.

The patented 'Plus' treatment makes end termination neater and easier, by creating a webbing between the filaments of the sleeving to reduce end fray during installation and through the life of the product, allowing it to be cut with ordinary scissors.

Expando PT and Expando PT Plus over sleeves have many applications in the marine, electronic and general manufacturing industries. Retains flexibility at low temperatures making both versions ideal for exposed applications in weather stations, navigation beacons and radar antennas.

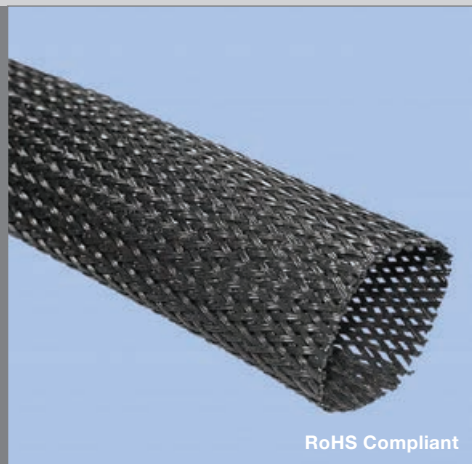
### Features & Benefits

- Abrasion resistant
- Halogen free
- 1:3 expansion ratio
- Does not trap heat or humidity
- Rot free
- Self extinguishing when used to encase typical non-flammable wires or cables.
- 'Plus' version eliminates the need for hot-knife cutting
- Available in 6 colours

### Operating Temperature

- From -70°C to +125°C

1:3 expansion ratio



RoHS Compliant

### Specifications & Approvals

- UL Recognised component

### Notes

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

**EXPANDO® PT and PT Plus****Polyester (PET)****Expandable braided sleeving**

Properties	Test	Results	
<b>Melt Temperature</b>	ASTM D-2117	+250°C	
<b>Low Temperature flexibility</b>	MIL-DTL-23053E	-70°C	
<b>Copper Corrosivity</b>	MIL-I-23053	No Effect	
		Expando PT	Expando PT Plus
<b>Smoke Density</b>	ASTM E-1354	D <sub>mc</sub> =2.12	D <sub>mc</sub> =2.05
<b>Hard Vacuum</b> • TML (Mass) • CVCM (Condensation) • WVR (Steam)	ASTM E-595	0.30% 0.03% 0.16%	Expando sleeving products made with the 'Plus' treatment should not be used in hard vacuum environments nor immersed in solvents, or liquids where 'Plus' particles could contaminate the system environment. Consult us for info.
<b>Fluid resistance</b> • JP4 Jet Fuel (MIL-T-5624) • Hydraulic Fluid (MIL-H-5606) • Lube Oil (MIL-I-7808) • De-icing Fluid (MIL-A-8243) • Salt Water (O-S-1926)	MIL-I-23053	Tensile Retention 100% 99% 100% 99% 100%	

Recommended Application Range		Weight	Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Nom g/m	Spools	
2	6	2.62 2.62	600m	Expando PT 3-Colour Expando PT Plus 3-Colour
3	11	4.32 3.93	300m	Expando PT 6-Colour Expando PT Plus 6-Colour
6	13	9.90 9.49	150m	Expando PT 10-Colour Expando PT Plus 10-Colour
6	19	12.60 11.61	150m	Expando PT 13-Colour Expando PT Plus 13-Colour
13	32	19.64 18.01	150m	Expando PT 19-Colour Expando PT Plus 19-Colour
19	45	26.19 24.85	75m	Expando PT 32-Colour Expando PT Plus 32-Colour
32	70	44.20 42.56	75m	Expando PT 45-Colour Expando PT Plus 45-Colour
38	89	54.02 53.34	75m	Expando PT 51-Colour Expando PT Plus 51-Colour
45	114	58.17 63.40	75m	Expando PT 64-Colour Expando PT Plus 64-Colour

**Part Number Example; Expando PT 13-0** 13mm inside diameter, black tubing, supplied in 150m spools.

**Ordering Information**

Preferred colour: 0 = Black  
 Non preferred colours: 3=Orange, 4=Yellow, 6=Blue, 8=Grey, 9=Natural/White  
 Standard packaging: Spools only, for MOQ please contact us



# Protective Sleeving

## EXPANDO® TCP V0

UL94 V0 rated Polyester

Expandable braided sleeving

### Abrasion and Mechanical Protection

Expando® TCP V0 is an expandable braided sleeve manufactured from modified polyester monofilaments classified UL 94 V0 which offers excellent flame-retardant properties. It is designed for the protection of tubing and maintenance of wire and cable bundles and commonly used on Rail and Military ground vehicles..

This product has a highly expandable structure which allows for easy installation over long lengths, even after fitting of end connectors. Expando TCP V0 has an expansion ratio of 1:2 which enables a large number of diameters to be covered with a limited range of sizes.

The properties of the monofilament ensures excellent performance of this sleeve in the most diverse and hostile environments. The product is used in a wide range of industries including railway and electrical / electronic devices.

### Features & Benefits

- 1:2 expansion ratio
- UL 94 V0 raw material
- Zero halogen
- Self extinguishing
- Excellent abrasion resistance
- Easy installation over long lengths

### Operating Temperature

- From -50°C to +150°C

1:2 expansion ratio



RoHS Compliant

### Specifications & Approvals

- UL94 V0 Rated (raw material)
- EN 45545-2

### Notes

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

**EXPANDO® TCP V0****UL94 V0 rated Polyester****Expandable braided sleeving**

Properties	Test	Results
<b>Abrasion resistance</b>	NF F 63-808	Pass
<b>Fire / Smoke / Toxicity</b>	UL 94 NF 16101 / 16102 DIN 5510 § 2 & 54837 CEI 20-38 ASTM E 662 - ASTM E 162 EN 45545-2	Raw material classified V0 I2 - F1 Zero halogen S4, SR2, ST2 T=1.3 Pass R22, HL3, R23, HL3
<b>Fluid resistance</b> • Hydraulic fluids: NATO.0.156	EN 6059-303 Immersion 24hrs @ 70°C	No visible degradation or alteration after being exposed.

Recommended Range		Std Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Spools	
2	5	200m	TCP-V0-3mm-Colour
4	8	200m	TCP-V0-5mm-Colour
5	9	200m	TCP-V0-6mm-Colour
6	12	200m	TCP-V0-8mm-Colour
7	15	100m	TCP-V0-10mm-Colour
10	18	100m	TCP-V0-12mm-Colour
12	23	50m	TCP-V0-15mm-Colour
16	28	50m	TCP-V0-20mm-Colour
21	35	50m	TCP-V0-25mm-Colour
26	45	50m	TCP-V0-30mm-Colour
36	60	50m	TCP-V0-40mm-Colour
45	75	50m	TCP-V0-50mm-Colour

**Part Number Example; Expando TCP-V0-15-Black**

12mm to 23mm inside diameter, black sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour:

0 = Black, with grey tracer: or 8 = Grey with black tracer

Standard packaging:

Spools only, for MOQ please contact us

# Protective Sleeving

## **EXPANDO® HR and HR Plus** **Halar® (E-CTFE) Fluoropolymer** **Tough, lightweight expandable sleeving**

### **Abrasion and Mechanical Protection**

3 Expando® HR is an expandable sleeve constructed of Halar® (E-CTFE) fluoropolymer that is designed for applications up to 150°C. Inherently flame-retardant, it is a UL Recognised Component which meets VW-1 requirements and will not melt and drip on direct exposure to flame. Expando HR is a special purpose, highly reliable solution for military and aerospace applications. It offers good mechanical properties, performs well in both high and low temperature environments and has outstanding chemical resistance.

The patented 'Plus' treatment makes end termination neater and easier, by creating a webbing between the filaments of the sleeving to reduce end fray during installation, allowing it to be cut with ordinary scissors. This reduces assembly time and eliminates the need for proper ventilation equipment required for hot-knife cutting

Expando HR protective oversleeve has many uses in the aerospace, marine, electronic, military, nuclear and general manufacturing industries.

Expando products are tough, lightweight over sleeves used to protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The open-weave construction of Expando products enables each size to expand to fit several application shapes and sizes. This open-weave construction also makes them highly flexible and resistant to trapping water, heat and humidity.

\* Halar is a registered trademark of Solvay Solexis

### **Features & Benefits**

- Excellent abrasion resistance
- 1:3 expansion ratio
- Flame resistant
- UL recognised component
- Low vacuum outgassing

### **Operating Temperature**

- From -70°C to +150°C

1:3 expansion ratio



### **Specifications & Approvals**

- UL Recognised component

### **Notes**

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

**EXPANDO® HR and HR Plus****Halar® (E-CTFE) Fluoropolymer****Tough, lightweight expandable sleeving**

Properties	Test	Results	
<b>Melt Temperature</b>	ASTM D-2117	+240°C	
<b>Low Temperature flexibility</b>	MIL-DTL-23053E	-70°C	
<b>Copper Corrosivity</b>	MIL-I-23053	No Effect	
		Expando HR	Expando HR Plus
<b>Flammability</b>	FAR Part 25 UL 1441	VW-1	Pass VW-1 classified
<b>Smoke Density</b>	ASTM E-1354	D <sub>mc</sub> =0.30	D <sub>mc</sub> =0.30
<b>Hard Vacuum</b> • TML (Mass) • CVCM (Condensation) • WVR (Steam)	ASTM E-595	0.14% 0.02% 0.01%	Expando sleeving products made with the 'Plus' treatment should not be used in hard vacuum environments nor immersed in solvents, or liquids where 'Plus' particulates could contaminate the system environment. Consult us for info.
<b>Fluid resistance</b> • JP4 Jet Fuel (MIL-T-5624) • Hydraulic Fluid (MIL-H-5606) • Lube Oil (MIL-I-7808) • De-icing Fluid (MIL-A-8243) • Salt Water (O-S-1926)	MIL-I-23053	Tensile Retention 97% 100% 99% 98% 98%	

Recommended Application Range		Weight	Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Nom g/m	Spools	
2	6	4.02	600m	HR-3mm-Colour HR-Plus-3mm-Colour
3	11	5.96	300m	HR-6mm-Colour HR-Plus-6mm-Colour
6	19	17.9	150m	HR-13mm-Colour HR-Plus-13mm-Colour
12	32	26.85	150m	HR-19mm-Colour H-Plus-19mm-Colour
19	45	34.31	150m	HR-32mm-Colour HR-Plus-32mm-Colour
32	70	56.69	75m	HR-45mm-Colour HR-Plus-45mm-Colour

**Part Number Example; Expando HR-32-Black**

19mm to 45mm inside diameter, black tubing, supplied in 150m spools.

**Ordering Information**

Preferred colours: Black with white tracer, or White with black tracer  
 Standard packaging: Spools only, for MOQ please contact us

## EXPANDO® PPS

Polyphenylene Sulfide

Expandable braided sleeving

### Abrasion and Mechanical Protection

Expando® PPS (Polyphenylene Sulfide) is an expandable sleeve designed for mechanical protection in high temperatures. Rated to +200°C, and meets VW-1 flame test requirements.

The inherent properties of PPS gives low levels of flammability, toxicity, smoke generation and hard vacuum off gassing. Because of its high use temperature, Expando PPS resists damage from high temperature air guns used with heat-shrinkable elements such as strain reliefs, terminations and identification sleeves.

Expando PPS is used in the aerospace industry for its outstanding properties in extreme environments. This product should be considered for aircraft, space, military, marine and hostile environment applications.

Expando products are tough, lightweight over sleeves used to protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The open-weave construction of Expando products enables each size to expand to fit several application shapes and sizes. This open-weave construction also makes them highly flexible and resistant to trapping water, heat and humidity.

### Features & Benefits

- 1:3 expansion ratio
- High temperature capability
- Meets VW-1 requirements
- BMS 13-52 Type III
- Low toxicity, smoke generation and out gassing

### Operating Temperature

- From -70°C to +200°C



### Specifications & Approvals

- BMS 13-52 Type III

### Notes

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

Properties	Test	Results
<b>Melt temperature</b>	ASTM D-3418	285°C
<b>Low temperature flexibility</b>	MIL-DTL-23053E	-70°C
<b>Flammability</b>	UL 1441	VW-1
	FAR Part 25	Pass
<b>Smoke Density</b>	ASTM E662	Dmax <50
<b>Copper Corrosivity</b>	MIL-I-23053	No effect
<b>Hard Vacuum</b> • TML (Mass) • CVCM (Condensation)	ASTM E-595	Meets industry limits 1.0% max 0.1% max
<b>Fluid resistance</b> • Jet Fuel JP-4 (MIL-T-5624) • Hydraulic Fluid (MIL-H-5606) • Lubricating Oil (MIL-I-7808) • De-Ice Fluid (MIL-A-8243) • Reference Oil 2 (ASTM D-471) • Salt Water (O-S-1926)	MIL-DTL-23053	No visible degradation or alteration after being exposed. Retains >97% of its initial breaking strength

Recommended Application Range		Weight	Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Nom g/m	Spools	
2	6	3.44	610m	Expando-PPS-3mm-Colour
3	13	5.89	305m	Expando-PPS-6mm-Colour
6	19	12.11	152m	Expando-PPS-13mm-Colour
13	32	14.24	152m	Expando-PPS-19mm-Colour
25	45	26.34	76m	Expando-PPS-32mm-Colour
32	64	28.72	76m	Expando-PPS-45mm-Colour

**Part Number Example; Expando-PPS-6mm-Black**

3mm to 13mm inside diameter, black sleeving, supplied in 305m spools as standard.

**Ordering Information**

Standard Colour:

Black or Natural

Standard packaging:

Spools only, for MOQ please contact us

# Protective Sleaving

## EXPANDO® HTNS L/HO

Meta Aramid NOMEX®

Expandable braided sleeving

### Abrasion and Mechanical Protection

Expando® HTNS-L/HO is a thin wall braided sleeve manufactured from Meta-Aramid Nomex®. Its highly expandable structure allows easy installation over long lengths after fitting of end connectors with a limited range of product sizes.

3

Expando HTNS-L/HO's flexible, expandable and non-flammable properties ensure excellent performance in the most diverse and aggressive environments. The product is designed for protection of wire and cable bundles against flame, high temperatures and mechanical abrasion.

The properties of Expando HTNS-L/HO ensure excellent resistance to gamma and x-rays.

Expando HTNS-L/HO has an oil and water repellent treatment (HO) to reduce humidity absorption and to improve impermeability to fluids.

Expando products are tough, lightweight over sleeves used to protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The open-weave construction of Expando products enables each size to expand to fit several application shapes and sizes. This open-weave construction also makes them highly flexible and resistant to trapping water, heat and humidity.

Ideal for military, marine and aerospace applications.

\* Nomex is a registered trademark of E.I. DuPont de Nemours.

### Features & Benefits

- 1:2 expansion ratio
- Thin wall
- Lightweight
- Self-extinguishing
- Excellent abrasion protection
- Resistant to gamma and x-rays
- Oil/water repellent

### Operating Temperature

- From -60°C to +240°C (continuous) and up to +310°C (short term).

1:2 expansion ratio



RoHS Compliant

### Specifications & Approvals

- EN 6049-003
- PAN 6480P

### Notes

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

Properties	Test	Results
<b>Carbonisation</b>	Above +370°C	Does not melt
<b>Abrasion resistance</b>	EN 6059 Part 403	Pass
<b>Bending strength</b>	50,000 bending cycles at +180°C	Excellent
<b>Flame resistance</b> (self-extinguishing properties)	UL 224	VW-1
	UL 94	Base material classified VO
	FAR 25 AMDT.25-72§ 853(b)	Pass
<b>Humidity resistance</b>	1000hrs at +150°C in air saturated with water vapour	Retains 70% of its original tensile strength
<b>Water/oil repellent treatment</b>	EN 6059 Part 305	Pass
<b>Fluid resistance</b> • JP4 Jet Fuel, NATO F44 • Hydraulic fluids: Skydrol 500B4 & L D4 • Mineral oil, MIL-L-7870A • Synthetic oil, MIL-L-23699 • Cleaning fluids: Forane 141B & MIL-L-87936 • De-icing fluid, MIL-A-8243	EN 6059 Part 303 (24hrs with various temperatures)	Pass

Recommended Application Range		Weight	Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Nom g/m	Spools	
1	2	2.70	100m	HTNS-L/HO-2mm-Green
2	4	4.00	100m	HTNS-L/HO-4mm-Green
4	8	8.00	100m	HTNS-L/HO-6mm-Green
6	12	12.00	50m	HTNS-L/HO-8mm-Green
8	16	14.00	50m	HTNS-L/HO-10mm-Green
10	20	17.00	50m	HTNS-L/HO-15mm-Green
12	24	22.00	50m	HTNS-L/HO-20mm-Green
15	30	32.50	50m	HTNS-L/HO-25mm-Green
20	40	38.00	50m	HTNS-L/HO-30mm-Green

**Part Number Example; Expando HTNS-L/HO-10mm-Green**

8mm to 16mm inside diameter, Olive-Green sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour:

Green (Olive Green)

Standard packaging:

Spools only, for MOQ please contact us



## EXPANDO® HTNS LA/HO

Meta Aramid NOMEX®

Expandable braided sleeving

### Abrasion and Mechanical Protection

Expando® HTNS-LA/HO is a thin wall braided sleeve manufactured from Meta-Aramid Nomex®. Its highly expandable structure of 1:3 allows easy installation over long lengths after fitting of end connectors with a limited range of product sizes.

3

Expando HTNS-LA/HO's flexible, expandable and non-flammable properties ensure excellent performance in the most diverse and aggressive environments. The product is designed for protection of wire and cable bundles against flame, high temperatures and mechanical abrasion.

The properties of Expando HTNS-LA/HO ensure excellent resistance to gamma and x-rays.

Expando HTNS-LA/HO has an oil and water repellent treatment (HO) to reduce humidity absorption and to improve impermeability to fluids.

Expando products are tough, lightweight over sleeves used to protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The open-weave construction of Expando products enables each size to expand to fit several application shapes and sizes. This open-weave construction also makes them highly flexible and resistant to trapping water, heat and humidity.

Ideal for military, marine and aerospace applications.

\* Nomex is a registered trademark of E.I. DuPont de Nemours.

### Features & Benefits

- 1:3 expansion ratio
- Thin wall
- Lightweight
- Self-extinguishing
- Excellent abrasion protection
- Resistant to gamma and x-rays
- Oil/water repellent

### Operating Temperature

- From -60°C to +240°C (continuous) and up to +310°C (short term).

1:3 expansion ratio



### Specifications & Approvals

- EN 6049-003
- PAN 6480P

### Notes

Longitudinal shrinkage should be taken into account when utilising the full expansion properties of the sleeve. Available in spool lengths as standard, or as cut to length to requirements to special order.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

Properties	Test	Results
<b>Carbonisation</b>	Above +370°C	Does not melt
<b>Abrasion resistance</b>	EN 6059 Part 403	Pass
<b>Bending strength</b>	50,000 bending cycles at +180°C	Excellent
<b>Flame resistance</b> (self-extinguishing properties)	UL 224	VW-1
	UL 94	Base material classified VO
	FAR 25 AMDT.25-72§ 853(b)	Pass
<b>Humidity resistance</b>	1000hrs at +150°C in air saturated with water vapour	Retains 70% of its original tensile strength
<b>Water/oil repellent treatment</b>	EN 6059 Part 305	Pass
<b>Fluid resistance</b> • JP4 Jet Fuel, NATO F44 • Hydraulic fluids: Skydrol 500B4 & L D4 • Mineral oil, MIL-L-7870A • Synthetic oil, MIL-L-23699 • Cleaning fluids: Forane 141B & MIL-L-87936 • De-icing fluid, MIL-A-8243	EN 6059 Part 303 (24hrs with various temperatures)	Pass

Recommended Application Range		Weight	Pack Size	Part Number
Minimum Ø (mm)	Maximum Ø (mm)	Nom g/m	Spools	
2	6	5.50	100m	HTNS-LA/HO-5mm-Green
5	15	11.00	100m	HTNS-LA/HO-10mm-Green
8	24	18.00	100m	HTNS-LA/HO-15mm-Green
12	36	22.00	50m	HTNS-LA/HO-25mm-Green
22	60	31.00	50m	HTNS-LA/HO-40mm-Green

**Part Number Example; HTNS-L/HO-10mm-Green**

8mm to 16mm inside diameter, Olive-Green sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour:

Green (Olive Green)

Standard packaging:

Spools only, for MOQ please contact us

# Protective Slewing

## ROUNDIT® 2000

Polyester

Self Wrap-around slewing

### Abrasion and Mechanical Protection

Roundit® 2000 is a wrap-around slewing manufactured from modified monofilament and textured polyester yarn, designed for mechanical protection and maintenance of wire and cable bundles. Its construction with 100% covering ratio provides excellent cut-through and abrasion resistance.

The self-wrapping feature of Roundit® 2000 allows for quick and easy installation and removal of the product for assembly and maintenance applications. Roundit® 2000 may be applied or removed without any manipulation of connectors or fittings and offers an innovative solution in areas where breakouts are required.

Its wrappable construction allows stocking of a limited range of sizes to cover a wide range of diameters. The 'Roundit®-Tool', a special assembly tool, is also available to ease installation.

Roundit® 2000 has many applications in the aerospace, motorsport, marine, defence, railway, electronics and manufacturing industries.

For installation it is recommended to maintain a minimum of 25% overlap at all times

### Features & Benefits

- Excellent cut-through and abrasion resistance
- Self wrapping design
- Easy to apply and remove
- Ideal for retro-fit and maintenance without having to disconnect components
- Lightweight construction
- Aesthetic solution

### Operating Temperature

- From -70°C to +125°C

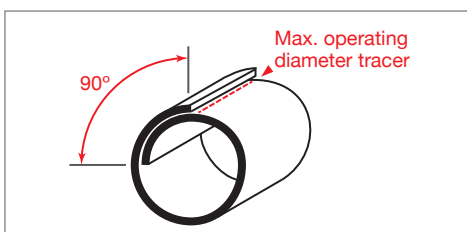


### Specifications & Approvals

- UL Recognised component, versions also available.

### Notes

Maximum application size is determined by wrapping the product around a mandrel of a given size to obtain 90° of overlap (average value).



For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.


All numeric data shows average or typical values.

### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.

Properties	Test	Results
<b>Melt Temperature</b>	ASTM D-276	+256°C
<b>Low Temperature flexibility</b>	MIL-DTL-23053E	-70°C
<b>Copper Corrosivity</b>	MIL-I-23053	No effect
<b>Fire Resistance</b>	FMVSS-302 (D45 1333)	Self-extinguishing, type B
<b>Smoke Density</b>	ASTM E-1354	Please ask for info
<b>Hard Vacuum</b> <ul style="list-style-type: none"> <li>• TML (Mass)</li> <li>• CVCN (Condensation)</li> <li>• WVR (Steam)</li> </ul>	ASTM E-595	0.63% 0.16% 0.06%
<b>Fluid resistance</b> <ul style="list-style-type: none"> <li>• JP4 Jet Fuel (MIL-T-5624)</li> <li>• Hydraulic Fluid (MIL-H-5606)</li> <li>• Lube Oil (MIL-I-7808)</li> <li>• De-icing Fluid (MIL-A-8243)</li> <li>• Salt Water (O-S-1926)</li> </ul>	MIL-I-23053	Tensile Retention 100% 100% 100% 100% 100%

Application Range		Weight	Pack Size	Part Number
Min Ø mm	Max Ø mm	g/m	Spools (m)	
1	5	11	150	Roundit-2000-5mm-Black
5	8	14	100	Roundit-2000-8mm-Black
10	13	21	50	Roundit-2000-13mm-Black
16	19	28	25	Roundit-2000-19mm-Black
19	25	39	25	Roundit-2000-25mm-Black
25	29	41	25	Roundit-2000-29mm-Black
29	32	45	25	Roundit-2000-32mm-Black
32	38	54	25	Roundit-2000-38mm-Black

Application Tool		
	5 Single end	Roundittool 5
	8 Single end	Roundittool 8
	13 Single end	Roundittool 13
	5, 8 and 13, 19 Double end	Roundittool 5-19

**Part Number Example; Roundit-2000-13mm-Black**

13mm inside diameter, black sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour: 0 = Black

Standard packaging: Spools only, for MOQ please contact us

# Protective Sleaving

## ROUNDIT® 2000 FR

Flame Retardant Polyester

Self Wrap-around sleaving

### Abrasion and Mechanical Protection

Roundit® 2000FR is a wrap-around sleaving manufactured from flame-retardant polyester monofilaments and multifilaments, designed for mechanical protection and maintenance of wire and cable bundles. Its construction with 100% covering ratio provides excellent cut-through and abrasion resistance.

The self-wrapping feature of Roundit® 2000FR allows for quick and easy installation and removal of the product for assembly and maintenance applications. Roundit® 2000FR may be applied or removed without any manipulation of connectors or fittings and offers an innovative solution in areas where breakouts are required.

Its wrappable construction allows stocking of a limited range of sizes to cover a wide range of diameters. The 'Roundit®-Tool', a special assembly tool, is also available to ease installation.

Roundit® 2000FR has many applications in the aerospace, motorsport, marine, defence, railway, electronics and manufacturing industries.

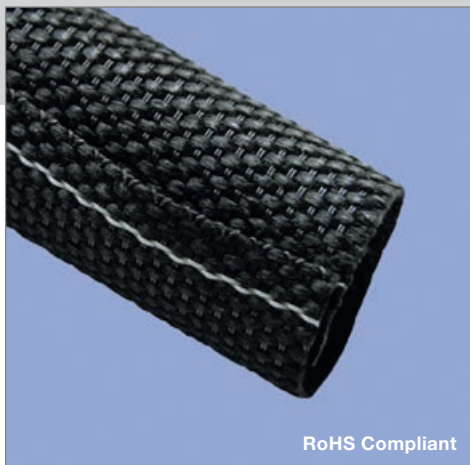
For installation it is recommended to maintain a minimum of 25% overlap at all times

### Features & Benefits

- Excellent abrasion resistance
- Flame retardant
- Zero halogen
- Self wrapping design
- Easy to apply and remove
- Ideal for retro-fit and maintenance without having to disconnect components
- Lightweight construction
- Aesthetic solution

### Operating Temperature

- From -50°C to +150°C



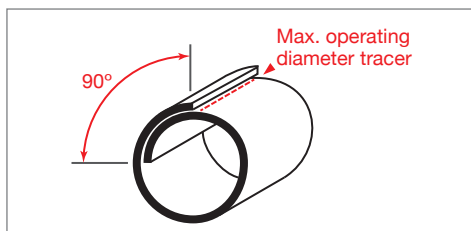
RoHS Compliant

### Specifications & Approvals

- NF16101/16102
- EN 45545-2

### Notes

Maximum application size is determined by wrapping the product around a mandrel of a given size to obtain 90° of overlap (average value).



For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.


### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.

Properties	Test	Results
Filament Melt Temperature		+250°C
Oxygen Index	NF EN ISO 4589-2	IO 31.75%
Dynamic Cut Through	BS G212	Pass
Abrasion Resistance	NF F 63-808	Pass
Fluid resistance • Hydraulic fluids: NATO.0.156	EN 6059-303 Immersion for 24hrs at +70°C	No visible degradation or alteration after being exposed
Fire / Smoke / Toxicity	NF 16 101 & NF 16 102 DB DIN 5510 § 2 & 54 837 UNI CEI 20-38 ASTM E 662 - ASTM E 162 EN 45545-2	I2 - F2 S4, SR2, ST2 T = 1.7 Pass R22, HL3, R23, HL3

Application Range		Weight	Pack Size	Part Number
Min Ø mm	Max Ø mm	g/m	Spools (m)	
1	5	9	150m	Roundit-2000FR-5mm-Black
5	8	12	100m	Roundit-2000FR-8mm-Black
8	13	18	50m	Roundit-2000FR-13mm-Black
13	19	25	25m	Roundit-2000FR-19mm-Black
19	25	36	25m	Roundit-2000FR-25mm-Black
25	29	37	25m	Roundit-2000FR-29mm-Black
29	32	43	25m	Roundit-2000FR-32mm-Black
32	38	54	25m	Roundit-2000FR-38mm-Black
38	50	75	25m	Roundit-2000FR-50mm-Black**

\*\* Size 50 is made of two sizes 25 sewn together.

Application Tool		
	5 Single end	Roundit-Tool-5
	8 Single end	Roundit-Tool-8
	13 Single end	Roundit-Tool-13
	5, 8 and 13, 19 Double ended	Roundit-Two-Head

#### Part Number Example; Roundit-2000FR-13mm-Black

13mm inside diameter, black sleeving, supplied in 50m spools as standard.

#### Ordering Information

Standard Colour:

0 = Black

Standard packaging:

Spools only, for MOQ please contact us

# Protective Sleevings

## ROUNDIT® 2000 V0

UL94 V0 Rated Polyester

LFH Wrap-around sleeving

### Abrasion and Mechanical Protection

Roundit® 2000V0 is a wrap-around sleeving manufactured from UL 94 V0 rated flame-retardant polyester monofilaments and multifilaments, designed for mechanical protection and maintenance of wire and cable bundles and has excellent cut-through and abrasion resistance.

The self-wrapping feature of Roundit® 2000V0 allows for quick and easy installation and removal of the product for assembly and maintenance applications. Roundit® 2000V0 may be applied or removed without any manipulation of connectors or fittings and offers an innovative solution in areas where breakouts are required.

Its wrappable construction allows stocking of a limited range of sizes to cover a wide range of diameters. The 'Roundit®-Tool', a special assembly tool, is also available to ease installation.

Roundit® 2000V0 has many applications in the aerospace, motorsport, marine, defence, railway, electronics and manufacturing industries.

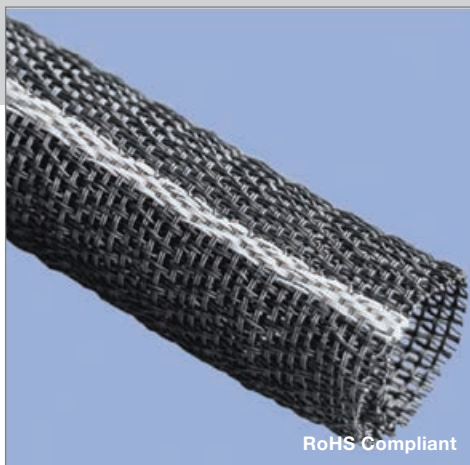
For installation it is recommended to maintain a minimum of 25% overlap at all times

### Features & Benefits

- Excellent abrasion resistance
- Self extinguishing
- Halogen free
- Self wrapping design
- Easy to apply and remove
- Ideal for retro-fit and maintenance without having to disconnect components
- Lightweight construction
- Aesthetic solution

### Operating Temperature

- From -50°C to +150°C

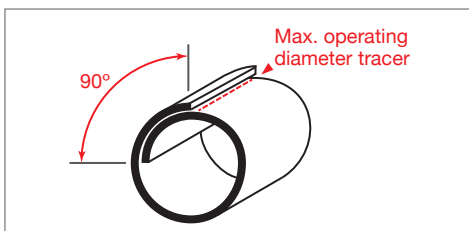


### Specifications & Approvals

- UL94 V0 Rated (raw material)
- EN 45545-2

### Notes

Maximum application size is determined by wrapping product around a mandrel of a given size to obtain 90° of overlap (average value).



For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.


All numeric data shows average or typical values.

### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.

Properties	Test	Results
<b>Filament Melt Temperature</b>		+240°C
<b>Oxygen Index</b>	NF EN ISO 4589-2	IO 37%
<b>Fluid resistance:</b> • Hydraulic fluids: NATO.0.156	EN 6059-303 Immersion for 24hrs at +70°C	No visible degradation or alteration after being exposed
<b>Abrasion Resistance</b>	ISO 6722	1464 cycles (size 19)
<b>Fire / Smoke / Toxicity</b>	UL 94 NF 16101 / 16102 DB DIN 5510 § 2 & 54 837 UNI CEI 20-38 BS6853 ASTM E-162 & ASTM E 662 EN 45545-2	Raw material classified V0 I2 - F2 Halogen free S4, SR2, ST2 T=1,4 R = 1.3, A0 = 0.193, OI = 34.9% Pass R22, HL3, R23, HL3

Application Range		Weight	Pack Size	Part Number
Min Ø mm	Max Ø mm	g/m	Spools (m)	
1	5	7	150m	Roundit-2000-V0-5mm-Black
5	8	9	100m	Roundit-2000-V0-8mm-Black
8	13	14	50m	Roundit-2000-V0-13mm-Black
13	19	18	25m	Roundit-2000-V0-19mm-Black
19	25	24	25m	Roundit-2000-V0-25mm-Black
25	29	28	25m	Roundit-2000-V0-29mm-Black
29	32	31	25m	Roundit-2000-V0-32mm-Black
32	38	35	25m	Roundit-2000-V0-38mm-Black
38	50	58	25m	Roundit-2000-V0-50mm-Black

Application Tool		
	5 Single end	Roundit-Tool-5
	8 Single end	Roundit-Tool-8
	13 Single end	Roundit-Tool-13
	5, 8 and 13, 19 Double ended	Roundit-Two-Head

**Part Number Example; Roundit-2000V0-13mm-Black**

13mm inside diameter, black sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour:

0 = Black, with white tracer

Standard packaging:

Spools only, for MOQ please contact us



## ROUNDIT® 2000 NX

Polyphenylene Sulfide and NOMEX®

High temperature wrap-around sleaving

### Abrasion and Mechanical Protection

Roundit® 2000 NX is a woven combination of Nomex® and PPS (polyphenylene sulfide). The Nomex®/PPS blend in flat weave construction gives Roundit 2000 NX a rugged yet smooth texture and appearance for high temperature bundling and abrasion resistance. This product is rated to +200°C and is non-halogenated.

Roundit 2000 NX is ideal for commercial and defence aircraft applications due to its excellent abrasion resistance and halogen-free qualities.

Roundit® products are tough, lightweight over sleeves used to bundle and protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The self-wrapping feature of Roundit products allows quick and easy application and removal of the product for assembly and maintenance. The product may also be applied or removed without disturbing connectors or fittings.

\* Nomex is a registered trademark of E.I. DuPont de Nemours.

### Features & Benefits

- Excellent cut-through and abrasion resistance
- Halogen free
- Tough fabric texture
- Oil and water repellent
- Self-wrapping design

### Operating Temperature

- From -60°C to +200°C (continuous) and up to +220°C (short term).

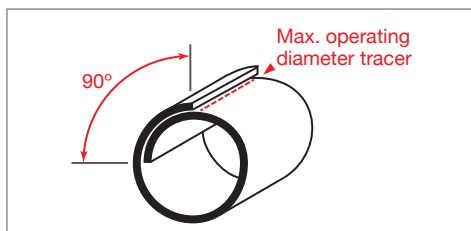


### Specifications & Approvals

- EN 6049-006
- BMS 13-81 Type 1
- DMS2379 Class 4, type 4
- JN1149

### Notes

Maximum application size is determined by wrapping product around a mandrel of a given size to obtain 90° of overlap (average value).



For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.


### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.

**ROUNDIT® 2000 NX**  
**Polyphenylene Sulfide and NOMEX®**  
 High temperature wrap-around sleeving

Properties	Test	Results
<b>Classification flammability</b>	ABD 031 & FAR 25§ 853	Conforms - no halogen content
<b>Smoke density/toxicity</b>	NF F 16-101	F3, I4
<b>Water repellent</b>	EN 6059 Part 305	Pass
<b>Abrasion resistant</b>	EN 6059 Part 403	Pass
<b>Dynamic cut-through</b>	EN 6059 Part 405	Pass
<b>Vibrations</b>	DO 160B	No cable abrasion
<b>Mould growth</b>	EN 6059 Part 306	Pass
<b>Fluid resistance</b> <ul style="list-style-type: none"> <li>• JP4 Jet Fuel (NATO F44)</li> <li>• Hydraulic Fluid, Skydrol 500B4</li> <li>• Mineral oil, MIL-L-7870A</li> <li>• Synthetic oil, MIL-L-23699</li> <li>• Cleaning fluids MIL-L-87936</li> <li>• De-icing fluid, MIL-A-8243</li> </ul>	EN 6059-303	Good resistance

Application Range		Weight	Pack Size	Part Number
Min Ø mm	Max Ø mm	g/m	Spools (m)	
1	5	13	150m	Roundit-2000-NX-5mm-Colour
5	8	18	100m	Roundit-2000-NX-8mm-Colour
8	13	26	50m	Roundit-2000-NX-13mm-Colour
16	19	38	25m	Roundit-2000-NX-19mm-Colour
19	25	47	25m	Roundit-2000-NX-25mm-Colour
25	32	65	25m	Roundit-2000-NX-32mm-Colour
32	40	90	25m	Roundit-2000-NX-40mm-Colour

Application Tool		
	5 Single end	Roundit-Tool-5
	8 Single end	Roundit-Tool-8
	13 Single end	Roundit-Tool-13
	5, 8 and 13, 19 Double ended	Roundit-Two-Head

**Part Number Example; Roundit-2000-NX-13mm-Green**

13mm inside diameter, black sleeving, supplied in 50m spools as standard.

**Ordering Information**

Standard Colour: Green (Olive Green)

Other colours Red, Orange

Standard packaging: Spools only, for MOQ please contact us

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## ROUNDIT® 2000 NX HT PEEK Monofilaments and NOMEX® High temperature wrap-around sleeving

### Abrasion and Mechanical Protection

Roundit® 2000 NX HT is a woven combination of PEEK monofilaments and Nomex® multifilaments. It includes an oil and water repellent treatment in order to prevent the absorption of condensation build-up caused by the extreme changes aircraft are subjected to. Designed for mechanical protection and maintenance of wire and cable bundles, its 100% covering ratio provides excellent cut through and abrasion resistance.

Roundit® products are tough, lightweight over sleeves used to bundle and protect cable assemblies, hoses and wire harnesses from chafing, cutting and abrading. The self-wrapping feature of Roundit products allows quick and easy application and removal of the product for assembly and maintenance. The product may also be applied or removed without disturbing connectors or fittings.

This high temperature version is differentiated from the standard Roundit 2000 NX by a wide ivory tracer on the outer side.

\* Nomex is a registered trademark of E.I. DuPont de Nemours.

### Features & Benefits

- Excellent cut-through and abrasion resistance
- Halogen free
- Tough fabric texture
- Oil and water repellent
- Self-wrapping design

### Operating Temperature

- From -70°C to +260°C

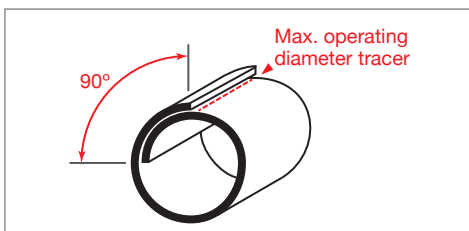


### Specifications & Approvals

- EN 6049-007

### Notes

Maximum application size is determined by wrapping product around a mandrel of a given size to obtain 90° of overlap (average value).



For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.


All numeric data shows average or typical values.

### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.

Properties	Test	Results
Flammability & Smoke	ABD 031 & FAR 25§ 853	Conforms - no halogen content
Water repellent	EN 6059 Part 305	Pass
Abrasion resistant	EN 6059 Part 403	Pass
Dynamic cut-through	EN 6059 Part 405	Pass
Vibrations	DO 160B	No cable abrasion
Mould growth	EN 6059 Part 306	Pass
<b>Fluid resistance</b> <ul style="list-style-type: none"> <li>• JP4 Jet Fuel (OTAN F44)</li> <li>• Hydraulic Fluid, Skydrol 500B4</li> <li>• Mineral oil, MIL-L-7870A</li> <li>• Synthetic oil, MIL-L-23699</li> <li>• Cleaning fluids MIL-L-87936</li> <li>• De-icing fluid, MIL-A-8243</li> </ul>	EN 6059-303	Good resistance

Application Range		Weight	Pack Size	Part Number
Min Ø mm	Max Ø mm	g/m	Spools (m)	
1	5	20	150m	Roundit-2000-NX-HT-5mm-Green
5	8	27	100m	Roundit-2000-NX-HT-8mm-Green
8	13	39	50m	Roundit-2000-NX-HT-13mm-Green
13	19	60	25m	Roundit-2000-NX-HT-19mm-Green
19	25	73	25m	Roundit-2000-NX-HT-25mm-Green
25	32	93	25m	Roundit-2000-NX-HT-32mm-Green
32	40	116	25m	Roundit-2000-NX-HT-40mm-Green

Application Tool		
	5 Single end	Roundit-Tool-5
	8 Single end	Roundit-Tool-8
	13 Single end	Roundit-Tool-13
	5, 8 and 13, 19 Double ended	Roundit-Two-Head

#### Part Number Example; Roundit-2000-NX-HT-13mm-Green

13mm inside diameter, black slewing, supplied in 50m spools as standard.

#### Ordering Information

Standard Colour:

Green (Olive Green)

Standard packaging:

Spools only, for MOQ please contact us

# Protective Sleeving

## TEXTALU® 1202

Glass fibre, Aluminium coating

Thermal Sleeving

### Thermal Management

Textalu® 1202 is an insulative fibreglass sleeving with a heavy aluminium coating designed to protect components in high temperature areas. It produces superior insulation to components that must maintain stable temperature to assure performance efficiency. The infra-red emissivity rating of Textalu 1202 heavy aluminium coating, combined with its fibreglass braid, ensures temperature stability inside the sleeving despite external fluctuations due to radiant heat.

### Features & Benefits

- Fibreglass liner withstand up to +550°C
- Excellent thermal protection
- High flexibility

### Operating Temperature

- From -40°C to +200°C



### Specifications & Approvals

- ISO 6722 Heat ageing
- FMVSS 302 flame resistance

Properties	Test	Results
Heat ageing	ISO 6722 240h at 225°C	No visible degradation or loss of flex.
Flame resistance	FMVSS 302, test method D45 1333	Non flammable, Type A
Fluid resistance <ul style="list-style-type: none"><li>• Motor, oil, protection oil, mineral hydraulic, automatic transmission fluid &amp; zinc chloride.</li><li>• Engine coolant</li><li>• Unleaded petrol 98 &amp; diesel.</li></ul>	D47 1924 <ul style="list-style-type: none"><li>• Immersion for 15s @ 22°C followed by drying period of 24h @ 175°C.</li><li>• Immersion for 24h @ 118°C</li><li>• Immersion for 24h @ 40°C</li></ul>	No visible degradation or alteration after being exposed to test cycles

Inside Diameter	Wall Thickness	Pack Size	Part Number
Nominal (mm)	mm	Spools	
5	0.55	200m	TEXTALU-1202-5mm
8	0.65	150m	TEXTALU-1202-8mm
10	0.75	150m	TEXTALU-1202-10mm
12	0.75	150m	TEXTALU-1202-12mm
15	0.75	150m	TEXTALU-1202-15mm
18	1.00	100m	TEXTALU-1202-18mm
20	1.50	50m	TEXTALU-1202-20mm
22	1.50	50m	TEXTALU-1202-22mm

**Part Number Example; TEXTALU-1202-5mm** 5mm inside diameter, supplied in 200m spools as standard.

### Ordering Information

Standard Colour: Aluminium grey  
Standard packaging: Spools only

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**THERMOTUBIX® Industrial****Glass fibre, Silicone****Thermal Sleeving****RoHS Compliant****Thermal Management**

Thermotubix® industrial is a thick wall sleeving with knitted fibreglass inner lining with an external coating of flame retardant silicone rubber. Providing an effective protection against sustained high temperatures, flames and molten splashes that can seriously damage electrical cables and hydraulic, gas and lubricant supply lines. Typically used in Rail, Steel and Petrochemical industries to protect against hazards including high temperature exposure.

**Features & Benefits**

- Excellent thermal protection
- High flexibility
- Commercial grade

**Operating Temperature**

- From -54°C to +260°C

Inside Diameter	Wall Thickness	Std Pack Size	Part Number
Nominal (mm)	mm	Spools	
8.0	3.0	15m	THERMOTUBIX-IND-8
9.5	3.0	15m	THERMOTUBIX-IND-9.5
12.7	3.0	15m	THERMOTUBIX-IND-12.7
16.0	3.0	15m	THERMOTUBIX-IND-16
19.0	3.0	15m	THERMOTUBIX-IND-19
22.0	3.0	15m	THERMOTUBIX-IND-22
25.0	3.0	15m	THERMOTUBIX-IND-25
32.0	3.0	15m	THERMOTUBIX-IND-32
38.0	3.0	15m	THERMOTUBIX-IND-38
45.0	3.0	15m	THERMOTUBIX-IND-45
51.0	3.0	15m	THERMOTUBIX-IND-51
57.0	3.0	15m	THERMOTUBIX-IND-57
64.0	3.0	15m	THERMOTUBIX-IND-64
76.0	3.0	15m	THERMOTUBIX-IND-76
89.0	3.0	15m	THERMOTUBIX-IND-89
101.0	3.0	15m	THERMOTUBIX-IND-101

**Part Number Example; THERMOTUBIX-IND-25** 25mm inside Ø, supplied in 15m spools as standard.

**Ordering Information**

Standard Colour:

Red iron oxide

Standard packaging:

Spools only, for MOQ please contact us

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## **THERMOTUBIX® Aerospace**

**Glass fibre, Silicone**

**Thermal Sleeving**

### **Thermal Management**

Thermotubix® Aerospace sleeving is a thickwall braided fibreglass inner lining, coated with a specially compounded, flame retardant silicone rubber. This product can be easily installed on cables and hoses and expands to pass over fittings and couplings.

3

The aerospace grade offers an effective protection against sustained high temperatures, flames and molten metal splashes that can seriously damage electrical cables and hydraulic, gas and lubricant supply lines

The construction of Thermotubix Aerospace ensures an excellent fire protection for tubing up to +1100°C peak temperature according to SAE-ASTM specifications.

This product provides thermal protection against internal and external hazards in a variety of industries, including aerospace, marine, iron and steel, plus automotive.

### **Features & Benefits**

- Fire protection up to +1100°C (15 min) and +800°C (30 min).
- Flexibility to -54°C
- Resistant to hydraulic fluids and lubricating oils.

### **Operating Temperature**

- From -54°C to +260°C



### **Specifications & Approvals**

- SAE Aerospace AS 1072 Type 2
- Tested in accordance with UL 73 and conform to UL 181 standards.
- EN 45545-2

### **Notes**

Also available with an indelible ink marking, for more information please contact us.

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

### **Thermobande®**

There is also a coated fibreglass tape, called Thermobande® available. This is often used for fire protection of tubing after the fitting of end terminations.

Available in six different sizes ranging from 25mm to 152mm wide, to accommodate most situations.

Please contact us for more information.



**THERMOTUBIX® Aerospace****Glass fibre, Silicone****Thermal Sleeving**

Properties	Test	Results
Low temperature flexibility	ASTM D-746	-54°C
Peak temperature		15 min. at +1100°C 30 min. at +800°C
Flammability	ASTM D-350, Method B	Not flammable
Fire / Smoke / Toxicity	NF 16101 & NF 16102 DIN 5510 §2 & 54837 DIN EN ISO 5659-2 EN 45545-2	I2 F0 S4, SR2, ST2 CIT 8 min: 0.036 / FED 30 min: 0.031 R22, HL3, R23, HL3 > 64mm R9 HL3
Fluid resistance	1 Hour soak in: Gasoline, Engine oil, Power steering fluid, Transmission fluid, Coolant, Battery acid.	No cracking or degradation resulted from soak in any of the tested fluids.

Inside Diameter	Wall Thickness	Std Pack Size	Part Number
Nominal (mm)	mm	Spools	
8.0	4.0	30m	THERMOTUBIX-8
9.5	4.0	30m	THERMOTUBIX-9.5
12.7	4.0	30m	THERMOTUBIX-12.7
16.0	4.0	30m	THERMOTUBIX-16
19.0	4.0	30m	THERMOTUBIX-19
22.0	4.0	30m	THERMOTUBIX-22
25.0	4.0	15m	THERMOTUBIX-25
32.0	4.0	15m	THERMOTUBIX-32
38.0	4.0	15m	THERMOTUBIX-38
45.0	4.0	9m	THERMOTUBIX-45
51.0	4.0	9m	THERMOTUBIX-51
57.0	4.0	9m	THERMOTUBIX-57
64.0	4.0	6m	THERMOTUBIX-64
76.0	4.0	6m	THERMOTUBIX-76
89.0	4.0	6m	THERMOTUBIX-89
101.0	4.0	6m	THERMOTUBIX-101

6m and 9m standard packaging spools are supplied in one continuous length 15m and 30m with variable cut lengths with a minimum of 4.5m length.

**Part Number Example; THERMOTUBIX-51** 51mm inside Ø, supplied in 9m spools as standard.

**Ordering Information**

Standard Colour:

Red iron oxide

Standard packaging:

Spools only, for MOQ please contact us



# Protective Sleeving

## ROUNDIT® 2000NX EMI Cu/Ni

Polyphenylene Sulfide and NOMEX®

Self-wrapping electromagnetic shielding

### Electromagnetic Shielding and Screening

Roundit® 2000NX EMI Cu/Ni is a self-wrapping sleeve designed for mechanical protection and EMI shielding of wire and cable bundles. The outer layer, which supplies the abrasion resistance, is manufactured from PPS monofilaments and Nomex® with an oil and water repellent treatment. The inner layer is composed of nickel-plated copper (Cu/Ni), which provides the EMI insulation. The outer layer construction with a 100% covering ratio provides excellent cut-through and abrasion resistance.

Roundit 2000 NX EMI is also available with an internal layer of PTFE tape; allowing wire harnesses to be protected from the internal metal layer. The self-wrapping feature allows for quick and easy installation and removal of the product for assembly and maintenance.

Roundit 2000 NX EMI has many applications in the aerospace and defence industries from aircraft seating looms to RN Vessels

\* Nomex is a registered trademark of E.I. DuPont de Nemours.

### Features & Benefits

- High performance EMI shielding
- Halogen free
- Oil and water repellent
- Salt spray resistant (500 hours)

### Operating Temperature

- From -60°C to +200°C



### Specifications & Approvals

- ASD EN 6049-008

### Notes

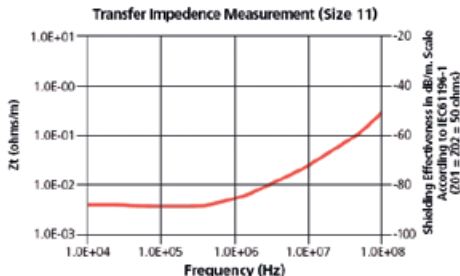
Nominal size is determined by wrapping product around a mandrel of a given size to obtain 90° of overlap (average value).

For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

### Application Tool

A professional aluminium assembly tool 'ROUNDIT-TOOL' is available for sizes 5, 8, 13 and 19mm, see table. Please note that a basic red plastic tool used for demonstration is also available free of charge on request.



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**ROUNDIT® 2000NX EMI Cu/Ni****Polyphenylene Sulfide and NOMEX®****Self-wrapping electromagnetic shielding**

Properties	Test	Results
<b>Rapid change of temperature</b>	EN2591-305	Pass
<b>Fire / Smoke / Toxicity</b>	ABD 013 & FAR 25 § 853	Pass
<b>Water repellency</b>	EN 6059 Part 305	Pass
<b>Abrasion resistance</b>	EN 6059 Part 403	Pass
<b>Dynamic cut-through</b>	EN 6059 Part 405	Pass
<b>Chemical</b>		
<b>Fluid resistance</b> <ul style="list-style-type: none"> <li>• Jet fuel: JP4 (Otan F44)</li> <li>• Hydraulic fluid: Skydrol 500 B4</li> <li>• Mineral oil: MIL-L-7870A</li> <li>• Synthetic oil: MIL-L-23699</li> <li>• Cleaning fluids: MIL-L-87936</li> <li>• De-icing fluid: MIL-A-8243</li> </ul>	EN 6059-303	Good resistance
<b>Salt spray resistance</b>	EN 2591-307 for 500 hours ASTM B355	Pass Class 27 Nickel plated copper
<b>Mould growth</b>	EN 6059 Part 306	Pass
<b>EMI Performances</b>		
<b>Transfer Impedance</b>	IEC 60512-23-3 Triaxial method	Size 11: Ro = 3.45 mΩ/m

Inside Diameter		Max Weight	Pack Size	Part Number
Nominal (mm)	Max (mm)	Nom g/m	Spools	
6	10.0	83	50m	ROUNDIT-2000-NX-EMI-*-6mm-Green
11	14.8	131	50m	ROUNDIT-2000-NX-EMI-*-11mm-Green
17	23.0	192	25m	ROUNDIT-2000-NX-EMI-*-17mm-Green
23	30.4	247	25m	ROUNDIT-2000-NX-EMI-*-23mm-Green
30	39.3	322	25m	ROUNDIT-2000-NX-EMI-*-30mm-Green
38	49.0	409	25m	ROUNDIT-2000-NX-EMI-*-38mm-Green

When \* = **A** the sleeving comes without internal PTFE layerWhen \* = **B** the sleeving comes with internal PTFE layer**Part Number Example; ROUNDIT-2000-NX-EMI-B-17mm-Green**

17mm nominal inside Ø, supplied in 25m spools as standard.

**Ordering Information**

Standard Colour:

Green (Olive Green)

Standard packaging:

Spools only, for MOQ please contact us

## RAYBRAID®

### Tinned Copper or Nickel tubular braid Electromagnetic Shielding

#### Electromagnetic Shielding and Screening

Raybraid® 90 has a minimum of 90% optical coverage and is available in a wide range of sizes to cover 2mm to 36mm diameters.

Raybraid® 101 and 103 have a minimum of 93% and maximum 100% optical coverage and is available in a wide range of sizes to cover 2.5mm to 38mm diameters.

Standard Raybraid 90 and 101 are tinned copper and Raybraid 103 is nickel plated copper for high temperature applications. Raybraid 101 and 103 are also fully compatible with Tinel-Lock® adaptors for termination of the braid to connectors and backshells.

Raybraid is supplied on a round tube former which facilitates assembly and is more robust than braid supplied in flattened form.

\* Raybraid & Tinel-Lock brands are registered trademarks of Tyco Electronics

#### Features & Benefits

- Screening military harnesses
- Minimum 90% optical coverage
- 101 and 103 Super flexible
- Good expansion ratio
- Supplied on plastic former to maintain round profile and is more robust than braid supplied in flattened form

#### Operating Temperature

- Raybraid 90 & 101 up to 150°C
- Raybraid 103 above 150°C



#### Raybraid 90 (Tinned Copper Braid)

- Minimum 90% optical coverage.
- Available in a wide range of sizes to cover 2.0mm to 36.0mm diameters.

#### Raybraid 101 (Tinned Copper Braid)

- Minimum 93% maximum optical coverage, with very usable expansion ratio.
- Available in a wide range of sizes to cover 2.5mm to 38mm diameters.
- Fully compatible with Tinel-Lock adapters for termination of the braid to associated connectors.

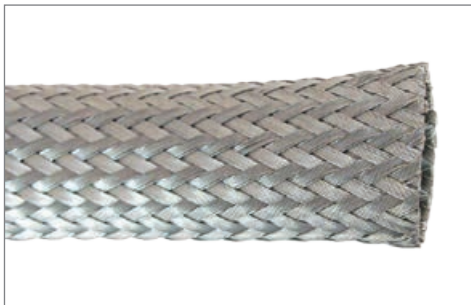
#### Raybraid 103 (Nickel Copper Braid)

- Minimum 93% maximum optical coverage, with very usable expansion ratio.
- Available in a wide range of sizes to cover 2.5mm to 38mm diameters.
- Fully compatible with Tinel-Lock adapters for termination of the braid to associated connectors.

#### Notes

For applications that require a limited wire shielding tape which can be wound around a cable for installation and repair, we offer 000W280. Supplied in 4.5m rolls, width 20mm, material tinned copper. For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.



**Raybraid 90**

Diameter of former	No. of Carriers	Ends per Carrier	Strand Size	Cable Bundle		Pack Size	Part Number
mm			AWG/mm	Min(mm)	Max (mm)	m	
3.0 (±0.13)	16	5	36/0.13	2.0	3.5	100	RAY-90-3.0
4.0 (±0.25)	16	7	36/0.13	3.0	5.0	100	RAY-90-4.0
5.0 (±0.25)	24	6	36/0.13	4.0	6.0	100	RAY-90-5.0
6.0 (±0.25)	24	7	36/0.13	5.0	7.0	100	RAY-90-6.0
10.0 (±0.25)	24	9	34/0.16	7.0	12.0	100	RAY-90-10.0
12.5 (±0.25)	24	10	34/0.16	11.0	13.0	100	RAY-90-12.5
15.0 (±0.38)	24	11	32/0.20	13.0	18.0	50	RAY-90-15.0
20.0 (±0.38)	36	7	32/0.20	17.0	23.0	50	RAY-90-20.0
25.0 (±0.38)	36	9	30/0.25	22.0	28.0	50	RAY-90-25.0
30.0 (±0.38)	36	9	28/0.32	27.0	36.0	50	RAY-90-30.0

**Raybraid 101 and 103**

Diameter of former	No. of Carriers	Ends per Carrier	Strand Size	Cable Bundle		Pack Size	Part Number
mm			AWG/mm	Min(mm)	Max (mm)	m	
3.0 (±0.13)	16	10	38/0.10	2.5	5.0	100	RAY-10X-3.0
4.0 (±0.25)	24	7	36/0.13	3.5	7.5	100	RAY-10X-4.0
6.0 (±0.25)	24	9	36/0.13	4.5	9.5	100	RAY-10X-6.0
7.5 (±0.25)	24	14	36/0.13	7.0	14.0	100	RAY-10X-7.5
10.0 (±0.25)	36	12	36/0.13	8.0	22.0	100	RAY-10X-10.0
12.5 (±0.25)	36	15	36/0.13	11.0	24.0	100	RAY-10X-12.5
20.0 (±0.38)	48	16	36/0.13	16.0	38.0	50	RAY-10X-20.0

When **X** = Should be replaced with type of braid required i.e. **RAY-101** or **RAY-103**

**Part Number Example; RAY-103-7.5**

Nickel plated copper braid supplied 7.5mm nominal inside Ø, supplied in 100m spools as standard.

**Ordering Information**

Standard Material: Tinned or Nickel copper braid

Standard packaging: Spools only, for MOQ please contact us

**Spiral Binding**

**PTFE**

**Spiral Binding**

PTFE Spiral binding can be used in industrial and office environments for the following applications:

- Organising wires for communication, computer equipment and control panels
- OEM applications for protecting tubes and harnesses
- Abrasion protection for control panel wiring
- Eliminate lacing cord and tie-offs

**Features & Benefits**

- Re-usable
- Flexible and fast installation
- Allows breakouts and re-routing
- Harness multiple cables into a single manageable bundle

**Operating Temperature**

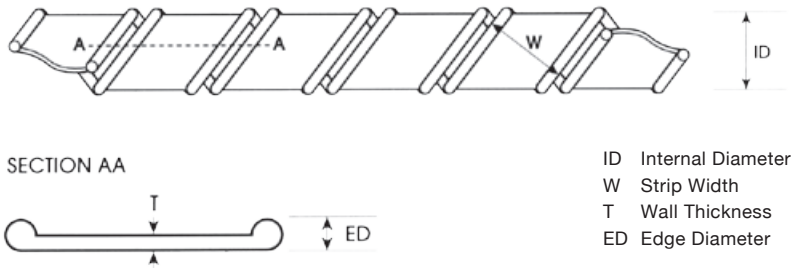
- -70°C to 260°C



RoHS Compliant

**Specifications & Approvals**

- PAN 6480
- AS4 1088



ID	Width (W)	Thickness	Edge Ø (ED)	Weight	Part Number
Nominal (mm)	Max (mm)	Nom g/m	(mm)	(g/m)	
3.0 (±0.25)	5.0 (±0.25)	0.75 (±0.08)	1.125	22.0	GTB-30-Colour
5.0 (±0.40)	5.0 (±0.25)	0.75 (±0.08)	1.125	33.0	GTB-50-Colour
7.5 (±0.50)	8.0 (±0.40)	0.75 (±0.08)	1.125	47.6	GTB-75-Colour
12.5 (±0.65)	10.0 (±0.50)	0.75 (±0.08)	1.125	76.9	GTB-125-Colour
25.5 (±0.80)	12.5 (±0.65)	1.25 (±0.10)	1.660	250.0	GTB-255-Colour

**Part Number Example; GTB-75-Black**

7.5mm Internal diameter spiral binding, in black.

**Ordering Information**

Standard Colour: Black.  
Non Standard colours: Natural, Red and Yellow  
Standard packaging: Spools only, please ask for details

## RAYRIM® and TPEM

Polyolefin

Heat Shrinkable Protective Edging



RoHS Compliant



Rayrim® and TPEM are extruded strips internally coated with heat activated adhesive, so that on heating the profile changes from a 'V' to form a 'U' and the adhesive bonds to the substrate profile. Typically electrical cabinets and enclosures. Manufactured from cross-linked Polyolefin, offering a clean and rapid means of covering metal, wood and glass edges for all round protection. The flexible nature of the product allows application to both internal and external radii, as well as straight edges.

### Features & Benefits

- Flexible
- Adhesive lined
- Adhesion strength: RAYRIM 25N/25mm minimum and TPEM 35N/25mm minimum

### Operating Temperature

- -55°C to +80°C

A	B	C	D	E	Std Pack Size		Description	
(mm)	(mm)	(mm)	(mm)	(mm)	(STK)	(SP)	RAYRIM No.	TPEM No.
0.6	0.5	3.5	0.8	1.25	60	100m	RAYRIM-NR-6-0-*	TPEM-NR-6-0-*
1.0	0.9	4.8	1.6	1.25	60	100m	RAYRIM-NR-7-0-*	TPEM-NR-7-0-*
2.0	0.9	6.6	2.5	2.25	60	75m	RAYRIM-NR-8-0-*	TPEM-NR-8-0-*
4.2	0.9	13.5	4.5	2.20	30	50m	RAYRIM-NR-9-0-*	TPEM-NR-9-0-*

MOQ is single stick length

### Application Range Guide

Plate Gauge	Thickness	Bending Radius	Part Number	
SWG	(mm)	Min. (mm)	RAYRIM No.	TPEM No.
30 - 24	0.31 - 0.56	10	RAYRIM-NR-6-0-*	TPEM-NR-6-0-*
23 - 16	0.61 - 1.63	15	RAYRIM-NR-7-0-*	TPEM-NR-7-0-*
15 - 10	1.83 - 3.25	20	RAYRIM-NR-8-0-*	TPEM-NR-8-0-*
9 - 5	3.66 - 5.38	25	RAYRIM-NR-9-0-*	TPEM-NR-9-0-*

### Part Number Example; RAYRIM-NR-8-0-SP

Black protective edging for 2mm panel thickness, supplied on 75m spool.

### Ordering Information

Standard Colour: Black  
Standard packaging: In 1.2m Sticks (STK) or Spools (SP)

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## SPRING-FAST®

### Protective grommet edging

Spring-Fast® is a revolutionary composite grommet edging, which is fast becoming a market leader in the field of wire and cable protection. Spring-Fast® provides the fastest, safest and most effective method of abrasion protection available.

The Spring-Fast® grommet edging is currently used throughout the Aerospace market to protect cables.

Spring-Fast® applications also include:

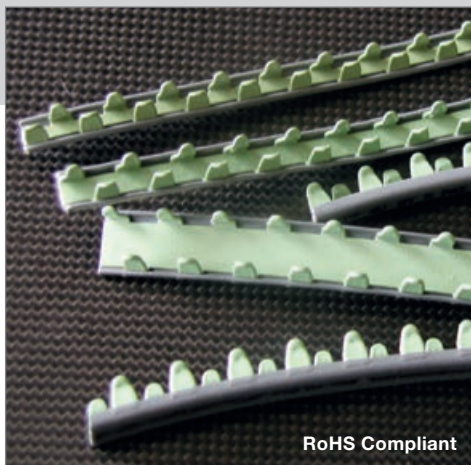
- Satellites & missiles
- Shipboard & airborne equipment
- Refrigeration & air conditioning equipment
- Uninterruptable power supplies
- Instrumentation & control panels
- Lighting systems

### Features & Benefits

- MIL Spec qualified
- Flexible construction to fit a wide range of applications
- No adhesive/curing time required to apply the grommet - snap on fit
- Saves considerable installation time
- No hazardous adhesives and solvents required during application
- Vibration proof
- Abrasion resistant
- Chemical resistant
- Long life expectancy
- Excellent performance under extreme temperatures and humidities
- Expansion co-efficient that closely matches the host material

Spring-Fast® was developed to provide increased performance and safety characteristics over the older nylon type protective edging. Spring-Fast® edging is safer and more reliable because it is constructed from a composite of polymer-encapsulated stainless steel, which is further enhanced by an additional polymer cushion.

Spring-Fast® mechanically locks on to any two axis contour with finger pressure in seconds, smoothing over any sharp edges that can come into contact with wire and cable harnesses, eliminating the problem of damage through vibration and subsequent abrasion.

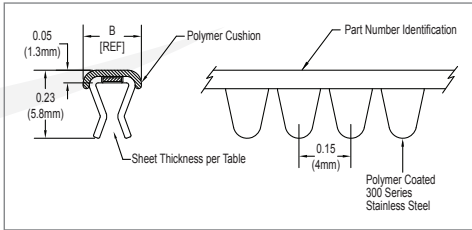
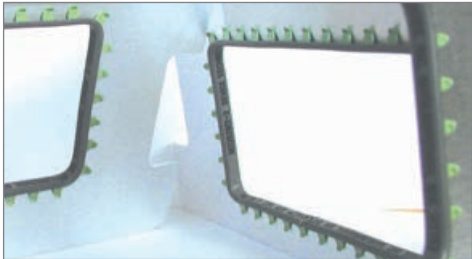


RoHS Compliant

### Specifications & Approvals

- FAA/CAA Recognised
- UL94 V0 Compliant
- NASM22529 qualified





Properties	Test
Operating temp <sup>1</sup>	-40°C to +85°C
Voltage breakdown	1500 Volts @ 60Hz
Flammability	FAR 25.601, FAR 25853 MIL-STD-202F (111A)
Vibration & shock	MIL-STD-1344 Method 2005.1 test condition 6, Letter J, Overall rms G 41.7
Salt spray	2000 Hours (minimum) MIL-STD-202F (101D)

Sheet Thickness	Spool Size	Cushion Width	Part Number
(mm)	(feet)	(mm)	
0.6 - 0.9	25 or 100	5.1	M22529/2-1R-spool size
0.9 - 1.6	25 or 100	5.1	M22529/2-2R-spool size
1.5 - 1.9	25 or 100	5.1	M22529/2-3R-spool size
1.8 - 2.4	25 or 100	6.1	M22529/2-4R-spool size
2.3 - 2.8	25 or 100	6.1	M22529/2-5R-spool size
2.7 - 3.4	25 or 100	6.1	M22529/2-6R-spool size
4.5 - 5.0	25 or 100	8.1	M22529/2-7R-spool size
6.1 - 6.6	25 or 100	9.7	M22529/2-8R-spool size

**Fitting**

A full range of tools are also available to assist with fitting, please ask for details;

- Full bypass shears - Cutting tool
- Roll-Fast® - Installation tool
- Castle Removal Tool

**Note**

Due to sheet thickness tolerances and finishes, end user should determine product sizes by trial. When sheet thickness is at maximum for the grommet chosen, end user may use a rubber mallet to set, or try the next size larger grommet.

**Part Number Example; M22529/2-8R-100**

A 100 foot length of protective edging, to suit thickness 6.1mm to 6.6mm.

**Ordering Information**

Standard Colour: Green, with grey polymer  
Standard packaging: 25ft or 100ft Spools