

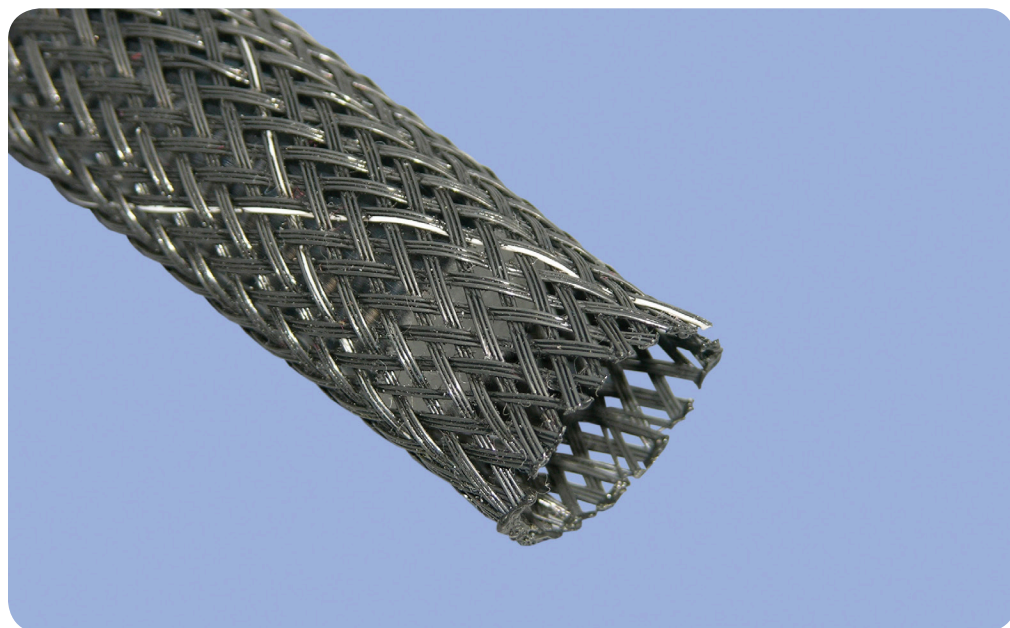


ABRASION/MECHANICAL

# Expando® FR & FR Plus Black with a White Tracer

## Product Highlights

- Operating temperature from -70°C to +125°C (-94°F to +257°F)
- UL 1441 VW-1
- F.A.R. Part 25 (Expando FR Plus)
- Does not trap heat or humidity
- Rot-free
- Expandable design accommodates a variety of sizes



**Expando® FR & FR Plus Black with a White Tracer** are expandable sleeves constructed of flame retardant monofilaments that are designed for applications up to +125°C (+257°F). They both meet the flammability requirements of VW-1 and FAR Part 25. Expando FR Plus balances the properties of mechanical and thermal stability with economy. The patented Bentley-Harris Plus treatment makes end termination neater and easier. The Plus treatment creates a webbing between the filaments of the sleeving to reduce end-fray during installation, allowing Expando FR Plus to be cut with ordinary scissors. This reduces assembly time and eliminates the need for proper ventilation equipment required for hot-knife cutting.

Expando FR & FR Plus Black with a White Tracer protective oversleeves have many applications in the electronics, marine, and general manufacturing industries. The ability of these sleeves to retain flexibility at low temperatures makes them ideal for exposed applications in weather stations, navigation beacons, radar antennas, and airborne and space systems.

Expando products are tough, lightweight oversleeves used to protect cable assemblies, hoses 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.

Our manufacturing sites are certified ISO 9001, ISO/TS 16949, or AS/EN 9100, and ISO 14001

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**BentleyHarris®**  
Protection Products

# Performance Data – Expando® FR & FR Plus Black with a White Tracer

Property	Test Method	Result
Operating Temperature Range		-70°C to +125°C (-94°F to +257°F)
Low Temperature Flexibility	MIL-DTL-23053E	-70°C (-94°F)
Flammability	UL 1441	VW-1
Flammability	F.A.R. Part 25	Pass

## Product Specifications

Longitudinal shrinkage should be taken into account when utilizing expansion properties of the sleeve

Commercial Part Number	Recommended Application Range mm (in)		Maximum Weight g/m (lb/ft)	Standard Packaging m (ft)
	Min Ø	Max Ø		
Expando FR Plus 3-0/9 Expando FR 3-0/9	3 (1/8")	7.5 (5/16")	3.55 (0.0024) 3.44 (0.0023)	610 (2,000')
Expando FR Plus 6-0/9 Expando FR 6-0/9	4 (1/6")	13 (1/2")	6.18 (0.0042) 5.89 (0.0040)	305 (1,000')
Expando FR Plus 10-0/9 Expando FR 10-0/9	6 (1/4")	14 (9/16")	11.91 (0.0080) 11.70 (0.0079)	152 (500')
Expando FR Plus 13-0/9 Expando FR 13-0/9	10 (3/8")	25 (1")	12.65 (0.0085) 12.60 (0.0085)	152 (500')
Expando FR Plus 19-0/9 Expando FR 19-0/9	16 (5/8")	37 (1-7/16")	19.64 (0.0132) 19.64 (0.0132)	152 (500')
Expando FR Plus 32-0/9 Expando FR 32-0/9	19 (3/4")	45 (1-3/4")	26.19 (0.0176) 26.19 (0.0176)	76 (250')
Expando FR Plus 45-0/9 Expando FR 45-0/9	23 (15/16")	58 (2-5/16")	44.20 (0.0297) 44.20 (0.0297)	76 (250')

\*Expando sleeving products made with the patented "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 Federal-Mogul Systems Protection for information on protection products for these applications.

## Part Numbering System

Example	Product Name	Size	Color	Quantity
	Expando FR Plus	3	0/9 (black with white tracer)	610m

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