



ABRASION/MECHANICAL

# Expando® HR & Expando® HR Plus

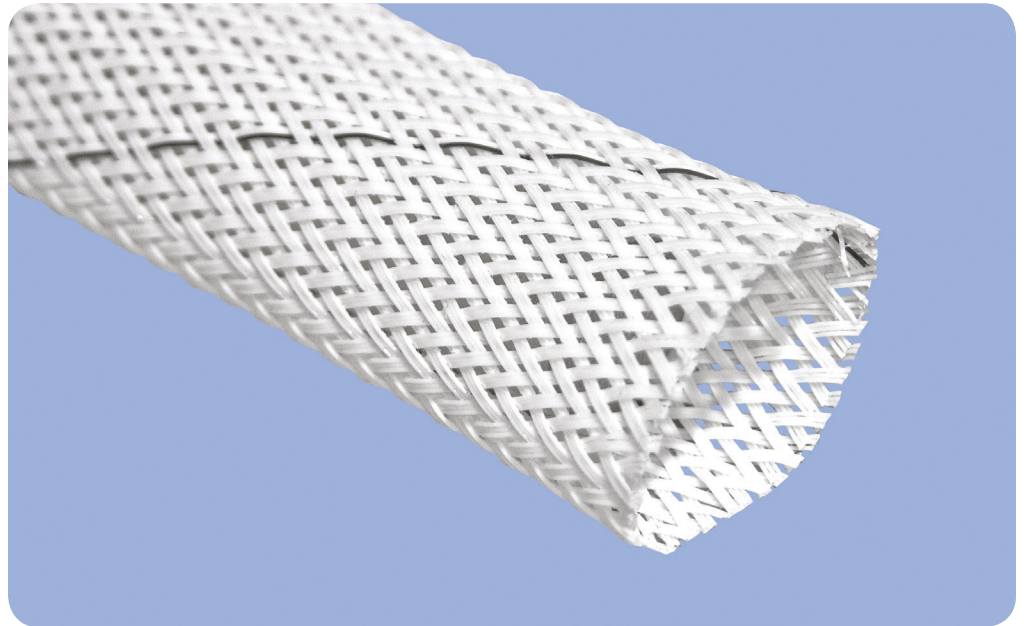
## Product Highlights

- Operating temperature from -70°C to +150°C (-94°F to +302°F)
- VW-1 according to UL 1441
- FAR 25 § 853
- UL Recognized Component
- Does not trap heat or humidity
- Rot-free
- Expandable design accommodates a variety of sizes



Our manufacturing sites are certified ISO 9000, QS 9000 or ISO/TS 16949 and ISO 14001

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**Expando® HR Plus** is an expandable sleeve constructed of Halar\* (E-CTFE) fluoropolymer that is designed for applications up to 150°C (302°F). Inherently flame-retardant, it is a UL Recognized Component which meets VW-1 requirements, and will not melt and drip on direct exposure to flame. Expando HR Plus 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 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 HR 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 HR Plus protective oversleeve has many uses in the aerospace, marine, electronic, military, nuclear and general manufacturing industries.

Expando products are tough, lightweight oversleeves 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.

**BentleyHarris®**  
Protection Products

# Performance Data – Expando® HR & Expando HR Plus

| Property                    | Test Method                                    | Result                            |
|-----------------------------|--|-----------------------------------|
| Operating Temperature Range |  | -70°C to +150°C (-94°F to +302°F) |
| Low Temperature Flexibility | MIL-DTL-23053D                                 | -70°C                             |
| Flammability                | UL 1441<br>FAR 25 § 853                        | VW-1<br>Pass                      |
| Smoke Density               | ASTM E-662<br>Flaming Mode<br>Non-Flaming Mode | Dmax <50<br>Dmax <50              |
| Abrasion resistance         | EN 6059 Part 403                               | 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 HR Plus 3-X/X<br>Expando HR 3-X/X   | 2 (3/32")                             | 6 (1/4")    | 4.42 (0.00297)<br>4.42 (0.00297) | 610 (2,000')              |
| Expando HR Plus 6-X/X<br>Expando HR 6-X/X   | 3 (1/8")                              | 11 (7/16")  | 6.55 (0.00440)<br>6.06 (0.00407) | 305 (1,000')              |
| Expando HR Plus 13-X/X<br>Expando HR 13-X/X | 6 (1/4")                              | 19 (3/4")   | 19.64 (0.0132)<br>19.64 (0.0132) | 152 (500')                |
| Expando HR Plus 19-X/X<br>Expando HR 19-X/X | 13 (1/2")                             | 32 (1-1/4") | 29.47 (0.0198)<br>27.83 (0.0187) | 152 (500')                |
| Expando HR Plus 32-X/X<br>Expando HR 32-X/X | 19 (3/4")                             | 45 (1-3/4") | 37.65 (0.0253)<br>37.65 (0.0253) | 76 (250')                 |
| Expando HR Plus 45-X/X<br>Expando HR 45-X/X | 32 (1-1/4")                           | 70 (2-3/4") | 62.21 (0.0418)<br>62.21 (0.0418) | 76 (250')                 |

X/X = Color Code: 0/9 for black with white tracer

9/0 for white with black tracer

\*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 HR Plus | 3    | 9/0 (white with black tracer) | 610m     |

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