

-- Military Spec Adhesive-Lined Heat Shrink Tubing --

DF-135 (4X)

Highly flame-retardant, flexible, adhesive-lined, Military Spec polyolefin heat shrink tubing; Shrink ratio 4:1

Applications

Typically used in applications that require both flame retardant and environmental sealing capability. The high shrink ratio is ideal for irregular shaped connectors and components.

Features

- Highly flame retardant
- Superior sealing against water, moisture or other contaminants
- Inner adhesive bonds to plastics, steel and polyethylene
- Shrink ratio 4:1
- Initial shrinkage temperature: $\geq 70^{\circ}\text{C}$
- Fully shrink temperature: $\geq 125^{\circ}\text{C}$
- Continuous operating temperature: -55°C to 135°C

Specification/Standards

Military	UL	RoHS
SAE-AMS-DTL-23053/4	UL224	✓

Standard Sizes and Dimensions

Ordering Size in.	(mm)	Expanded I.D. (Minimum)	mm	Recovered I.D. (Maximum)	mm	Recovered Total Wall Thickness (Normal)	mm	Recovered Adhesive Thickness	mm
5/32	(4)	4.0		1.0		1.0±0.15		0.4±0.15	
1/4	(6)	6.0		1.5		1.1±0.15		0.4±0.15	
5/16	(8)	8.0		2.0		1.5±0.15		0.5±0.15	
1/2	(12)	12.0		3.0		1.7±0.15		0.5±0.15	
5/8	(16)	16.0		4.0		2.0±0.15		0.6±0.15	
25/32	(20)	20.0		5.0		2.3±0.25		0.6±0.15	
1	(24)	24.0		6.0		2.6±0.25		0.6±0.15	
1-1/4	(32)	32.0		8.0		3.0±0.30		0.7±0.15	
1-1/2	(40)	40.0		10.0		3.0±0.30		0.7±0.15	
2	(52)	52.0		13.0		3.3±0.30		0.7±0.20	

Typical Properties

Property	Test Method	Standard	Typical Performance
Tensile Strength (MPa)	ASTM D 2671	≥ 12	12.5
Ultimate Elongation (%)	ASTM D 2671	≥ 300	450
Tensile Strength after Heat Aging (MPa)	MIL-DTL-23053/4	≥ 8.4	8.5
Ultimate Elongation after Heat Aging (%)	MIL-DTL-23053/4	≥ 100	350
Dielectric Strength (kV/mm)	IEC243	≥ 15	17.5
Volume Resistivity (ohm-cm)	ASTM D 876	$\geq 10^{14}$	2.5×10^{14}

Hot Melt Adhesive Property

Property	Test Method	Standard
Water Absorption	ASTM D570	$\leq 0.2\%$
Softening Point ($^{\circ}\text{C}$)	ASTM E28	90±5
Peel Strength (PE)	ASTM D 1000	120N/25mm
Peel Strength (AL)	ASTM D 1000	80N/25mm

Elenets®

Heat Shrink Tubing and Devices

Product Catalog

Single-Wall Polyolefin Tubing

Universal Heat Shrink Tubing

- ES (2X)
Flame-retardant, universal heat shrink tubing with excellent physical and mechanical properties.
- ES (3X)
Flame-retardant, universal heat shrink tubing with excellent physical and mechanical properties.
- TS (2X)
Ultra thin wall, very flexible, flame-retardant heat shrink tubing.
- SW-105 (2X)
105°C low-temperature, non self-extinguishing, flexible heat shrink tubing.
- SW-150 (2X)
150°C flame-retardant, flexible heat shrink tubing.

Military Spec Heat Shrink Tubing

- SF-135 (2X)
Flame-retardant, flexible, multi-purpose, Military Spec heat shrink tubing.
- SF-135 (3X)
Flame-retardant, flexible, multi-purpose, Military Spec heat shrink tubing.

Dual Wall (Adhesive-Lined) Tubing

Flexible Adhesive-Lined Polyolefin Tubing

- DE (2X)
Flexible, adhesive-lined, polyolefin heat shrink tubing.
- DE (3X)
Flexible, adhesive-lined, polyolefin heat shrink tubing.

DE (4X)
Flexible, adhesive-lined, polyolefin heat shrink tubing.

Military Spec Adhesive-Lined Heat Shrink Tubing

DF-135 (3X)
Highly flame-retardant, flexible, adhesive-lined, Military Spec polyolefin heat shrink tubing.

DF-135 (4X)
Highly flame-retardant, flexible, adhesive-lined, Military Spec polyolefin heat shrink tubing.

Heat Shrink Tubing For Automotive Wiring Harnesses

DW-R (4X)
Semi-rigid, high shrink ratio, adhesive-lined heat shrink tubing for automotive wiring harnesses.

DW-RF (4X)
Highly flame-retardant, semi-rigid, adhesive-lined heat shrink tubing for automotive wiring harnesses.

DW-L (4X)
Low-temperature, adhesive-lined heat shrink tubing for automotive wiring harnesses.

Heat Shrink Tubing For Automotive Oil-Pipe Protection

DW-O
Adhesive-lined, heat shrink tubing for automotive oil-pipe protection.

Thick Adhesive-Lined Polyolefin Tubing

DTK (3X)
Thick-wall, low-temperature adhesive-lined, flexible, polyolefin heat shrink tubing.

Heat Shrink End Caps And Repair Sleeve

HSDW-CAPS (4X)
Adhesive-lined, heat shrinkable insulating caps.

HSDW-CAPSR (4X)
Semi-rigid, adhesive-lined, heat shrinkable insulating caps.

HSDW-CT (4X)
Semi-rigid adhesive-lined heat shrink insulation connectors.

HSDW-TAPE (1.4X)
Adhesive-lined, cross-linked polyolefin heat shrink tape.

Medium and Heavy-Duty Tubing

Medium-Duty Tubing

MEE
Flame-retardant, medium wall, adhesive-lined heat shrink tubing.

MEE-R
Semi-rigid, high resistance, medium wall, adhesive-lined heat shrink tubing.

Heavy-Duty Tubing

HEE
Flame-retardant, heavy wall, adhesive-lined heat shrink tubing.

HEE-R
Semi-rigid, high resistance, heavy wall, adhesive-lined heat shrink tubing.

Heat Shrinkable Busbar Insulation Tubing

FBTM
Flexible medium wall 1~25kV busbar insulation tubing.

FBTH
Flexible 35kV busbar insulation tubing.

Special Purpose Tubing

TFE
PTFE Teflon tubing.

TFE200 (1.7X)
Heat shrink Teflon tubing.

W150 (2X)
Diesel resistant, flexible, elastomeric heat shrink tubing.

GT200 (2X)
Thin wall, fluoroelastomer heat shrink tubing.

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