

Abrasion Protection Materials Technical Data (continued)

UL Temperature Index	Ratings and Approvals			Physical Properties				Chemical Resistance			
	Flammability (UL 94)	Melting Temperature	Abrasion Resistance (Lower number is better)	Specific Gravity (D792)	Minimum Tensile @23°C (psi)	Water Absorption (Max. 24 hrs.)	Organic Solvents	Alkalies	Acids	Petro-Chemicals	

Sleeving

Polyethylene Terephthalate (PET) This material is a thermoplastic polyester material designed for indoor applications. It is rated for use up to 257°F and will tolerate short-term exposure up to 446°F. Colors: Weather Resistant Black, White and Gray.	-94°F (-70°C) to 257°F (125°C)	V-0	500°F (260°C)	—	1.39	100,000 (D876)	0.08%	Resistant to some solvents	Resistant to most weak bases	Resistant	Some Discoloration
Flame Retardant Polyethylene Terephthalate (PET) This material is a self-extinguishing thermoplastic polyester that can be used indoors. It is also rated for use up to 257°F and will tolerate short term exposure up to 446°F. It is provided with tracers to identify the flame retardant material.	-94°F (-70°C) to 257°F (125°C)	UL 1441 VW-1	469°F (243°C)	—	1.39	39,295 (D876)	0.08%	Resistant to some solvents	Resistant to most weak bases	Resistant	Resistant Some Discoloration

CLT

Black Polyethylene Lowest cost material is for use up to 122°F. Other colors may be available.	-40°F (-40°C) to 122°F (50°C)	HB	—	—	0.926 – 0.940	1500 (D638)	—	Resistant except to halogenated hydrocarbons	Resistant	Resistant	Resistant No Discoloration
Nylon 6 Nylon is a strong, impact modified, heat stabilized, durable high abrasion resistant material.	-40°F (-40°C) to 230°F (110°C)	HB	410°F (211°C)	—	1.06 – 1.16	8000 (D638)	—	Resistant except to halogenated hydrocarbons	Resistant	Not recommended	Resistant No Discoloration

CLT Fittings

Black Polypropylene Lowest cost material is for use up to 212°F. Halogen-Free.	-40°F (-40°C) to 122°F (50°C)	UL94 HB	—	—	1.04	3,900 (D638)	0.02 – 0.03%	Resistant except to halogenated hydrocarbons	Resistant	Resistant except to oxidizing acids	Resistant Some Discoloration
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PVC

PVC Non-Shrink Tubing* This material provides insulation and protection for continuous use at temperature -4°F (-20°C) to 221°F(105°C).	-4°F (-20°C) to 221°F (105°C)	UL 224 VW-1**	—	—	1.35	2500 (D876)	—	Resistant except to aromatic hydrocarbons, ketones and esters	Resistant	Resistant	Resistant No Discoloration
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Grommet Edging

Natural Polyethylene Lowest cost material for indoor use up to 122° F. Natural is available in all sizes.	-40°F (-40°C) to 122°F (50°C)	HB	239°F (115°C)	22 mg	0.91 – 1.09	1400 (D638)	—	Resistant below 140°F (60°C) except to chlorinated solvents	Resistant	Resistant except to oxidizing acids	Some Discoloration
Weather Resistant Polyethylene This material has the same properties as natural polyethylene, and also has additives which allow it to resist the effects of ultraviolet light and acid rain in an outdoor environment. This product is available in black only.	-40°F (-40°C) to 122°F (50°C)	HB	239°F (115°C)	20 mg	0.93 – 1.09	2000 (D638)	0.03%	Resistant below 140°F (60°C) except to chlorinated solvents	Resistant	Resistant except to oxidizing acids	No Discoloration
Flame Retardant Polyethylene* UL94-V-0 Rating This material is self-extinguishing and passes the UL94 flame retardant test with a V-0 rating.	-4°F (-20°C) to 122°F (50°C)	V-0	270°F (132°C)	22 mg	1.23 – 1.37	1200	0.02%	Resistant below 194°F (90°C) except to chlorinated solvents	Resistant	Resistant except to oxidizing acids	Some Discoloration
Nylon Nylon is strong, durable, self-extinguishing material for indoor use up to 149°F. It offers a combination of lightweight, wide temperature range, and high abrasion resistance. This material is suitable for applications where heavy vibration or stress exists on the wiring or tubing.	-40°F (-40°C) to 149°F (65°C)	V-2	491°F (255°C)	7 mg	1.03 – 1.15	12,400 (D638)	1.5%	Resistant except to phenols and formic acid	Resistant	Resistant to most weak acids	No Discoloration

Note: Typical operating temperature ranges are extended based on end use application and specific environment tests.

*Contains halogens. Other materials are halogen free.

**Limited sizes in Clear

Part Number System for Thin Wall Heat Shrink

HSTT	12	48	Q	10
Type	Expanded Diameter	Tube Length	Package Quantity	Color
HSTT = Thin Wall	05 = 3/64" (1.2mm)	3 = 3" (76.2mm)	(If Tube Length Specified)	NONE = Black
HSTTV = Thin Wall VW-1	06 = 1/16" (1.6mm)	6 = 6" (152.4mm)	1 = 1 Pc.	C = Clear
HSTTN = Thin Wall Neoprene	09 = 3/32" (2.4mm)	9 = 9" (228.6mm)	2 = 2 Pcs.	1 = Brown
HSTTK = Thin Wall PVDF	12 = 1/8" (3.2mm)	12 = 12" (304.8mm)	3 = 3 Pcs.	2 = Red
HSTTT = Thin Wall TFE‡	19 = 3/16" (4.8mm)	48 = 48" (1.2m)	5 = 5 Pcs.	3 = Orange
HSTTP = Thin Wall PVC	25 = 1/4" (6.4mm)	Y = 6" Pcs.	X = 10 Pcs.	4 = Yellow
HSTTPN = Crystal Clear Thin Wall PVC	38 = 3/8" (9.5mm)	NONE = REEL	Q = 25 Pcs.	5 = Green
HSTTVA = Flexible Adhesive Lined	50 = 1/2" (12.7mm)		LQ = 75 Pcs.	6 = Blue
HSTTRA = Semi-Rigid Adhesive Lined	75 = 3/4" (19.1mm)		CQ = 125 Pcs.	10 = White
HSTTA = Thin Wall Adhesive Lined	100 = 1" (25.4mm)		T = 200 Pcs.	45 = Yellow/Green
HSTT4A = 4:1 Thin Wall Adhesive Lined	150 = 1 1/2" (38.1mm)		TL = 250 Pcs.	
HST = Thick Wall Adhesive Lined	200 = 2" (50.8mm)		Reels (If No Tube Length Specified)	
HSEC = Heat Shrink End Caps Adhesive Lined	300 = 3" (76.2mm)		Q = 25' (7.6m)	
HSECFR = Heat Shrink End Caps Flame Retardant Adhesive Lined	400 = 4" (101.6mm)		L = 50' (15.2m)	
	0.4 = 0.40" (10.2mm)		C = 100' (30.5m)	
	0.5 = 0.47" (11.9mm)		T = 200' (61.0m)	
	0.8 = 0.80" (20.3mm)		D = 500' (152.4m)	
	1.0 = 1.0" (25.4mm)		M = 1000' (304.8m)	
	1.1 = 1.1" (27.9mm)			
	1.5 = 1.5" (38.1mm)			
	2.0 = 2.0" (50.8mm)			
	2.7 = 2.7" (68.6mm)			
	3.0 = 3.0" (76.2mm)			
	3.5 = 3.5" (88.9mm)			
	4.0 = 4.0" (101.6mm)			

For Standard Packages containing 6" (152.4mm) lengths, refer to individual pages for complete part number offering.
 Note: The above information is to be used as a guide. For specific part number offerings review individual pages for verification.
 ‡TFE is Polytetrafluoroethylene material.

HSTTVA Heat Shrink 4 Foot and 6 Inch Pieces (continued)

Part Number	Nominal Diameter		Min. Expanded I.D.		Max. Recovered I.D.		Nominal Recovered Wall Thickness		Std. Pkg. Qty.	Pieces per Package
	In.	mm	In.	mm	In.	mm	In.	mm		
6" (152.4mm) Pieces										
HSTTVA12-Y	0.125	3.2	0.125	3.2	0.063	1.6	0.021	0.5	1	7
HSTTVA19-Y	0.187	4.8	0.187	4.8	0.093	2.4	0.023	0.6	1	7
HSTTVA25-Y	0.250	6.4	0.250	6.4	0.125	3.2	0.029	0.7	1	5
HSTTVA38-Y	0.375	9.5	0.375	9.5	0.187	4.8	0.029	0.7	1	4
HSTTVA50-Y	0.500	12.7	0.500	12.7	0.250	6.4	0.030	0.8	1	4
HSTTVA75-Y	0.750	19.1	0.750	19.1	0.375	9.5	0.035	0.9	1	3
HSTTVA100-Y	1.00	25.4	1.00	25.4	0.500	12.7	0.042	1.1	1	2

**Material Performance Only.

***Shelf life applies only to expanded and recovered dimensions. Material performance is not affected.

HSTTVA Heat Shrink 4 Foot and 6 Inch Pieces

- Applications include insulating and protecting wires and cables
- Flexible tubing with an adhesive inner wall which seals and protects components from moisture and corrosion
- Voltage rating: 600 V
- Shrink ratio: 3:1
- Flammability: Outer wall flame retardant
- Mil Spec: AMS-DTL-23053/4 Class 3**
- Temperature range: -67°F to 230°F (-55°C to 110°C)
- For damp locations
- Material: Adhesive lined black cross-linked Polyolefin
- UL: E342365
- 5 year shelf life***



Part Number	Nominal Diameter		Min. Expanded I.D.		Max. Recovered I.D.		Nominal Recovered Wall Thickness		Std. Pkg. Qty.	Std. Ctn. Qty.
	In.	mm	In.	mm	In.	mm	In.	mm		
4' (1.22m) Pieces										
HSTTA19-48-Q	0.187	4.8	0.187	4.8	0.062	1.6	0.040	1.0	25	—
HSTTA25-48-Q	0.250	6.4	0.250	6.4	0.080	2.0	0.040	1.0	25	—
HSTTA25-48-TL	0.250	6.4	0.250	6.4	0.080	2.0	0.040	1.0	250	—
HSTTA38-48-Q	0.375	9.5	0.375	9.5	0.120	3.0	0.055	1.4	25	—
HSTTA38-48-TL	0.375	9.5	0.375	9.5	0.120	3.0	0.055	1.4	250	—
HSTTA50-48-5	0.500	12.7	0.500	12.7	0.160	4.1	0.070	1.8	5	—
HSTTA50-48-T	0.500	12.7	0.500	12.7	0.160	4.1	0.070	1.8	200	—
HSTTA75-48-5	0.750	19.1	0.750	19.1	0.250	6.4	0.085	2.2	5	—
HSTTA75-48-C	0.750	19.1	0.750	19.1	0.250	6.4	0.085	2.2	100	—
HSTTA100-48-5	1.00	25.4	1.00	25.4	0.320	8.1	0.100	2.5	5	—
HSTTA100-48-L	1.00	25.4	1.00	25.4	0.320	8.1	0.100	2.5	50	—
HSTTA150-48-5	1.50	38.1	1.50	38.1	0.510	12.9	0.100	2.5	5	—
HSTTA150-48-Q	1.50	38.1	1.50	38.1	0.510	12.9	0.100	2.5	25	—

Part Number	Nominal Diameter		Min. Expanded I.D.		Max. Recovered I.D.		Nominal Recovered Wall Thickness		Std. Pkg. Qty.	Std. Ctn. Qty.	Pieces per Package
	In.	mm	In.	mm	In.	mm	In.	mm			
6" (152.4mm) Pieces											
HSTTA19-Y	0.187	4.8	0.187	4.8	0.062	1.6	0.040	1.0	1	10	6
HSTTA25-Y	0.250	6.4	0.250	6.4	0.080	2.0	0.040	1.0	1	10	4
HSTTA38-Y	0.375	9.5	0.375	9.5	0.120	3.0	0.055	1.4	1	10	3
HSTTA50-Y	0.500	12.7	0.500	12.7	0.160	4.1	0.070	1.8	1	10	3
HSTTA75-Y	0.750	19.1	0.750	19.1	0.250	6.4	0.085	2.2	1	10	2
HSTTA100-Y	1.00	25.4	1.00	25.4	0.320	8.1	0.100	2.5	1	10	2
HSTTA150-Y	1.50	38.1	1.50	38.1	0.510	12.9	0.100	2.5	1	10	1

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