GMT-221

Flexible Polyolefin, Milspec Qualified, Flame Retardant Shrink Tube

SHRINK RATIO 2:1
SAE-AMS-DTL-23053/5A CLASS 1 & 3
RoHS COMPLIANT
UL RECOGNIZED COMPONENT
E306685 cUL CERTIFIED
UL 224 VW-1 FLAME TEST

GMT-221 provides optimal insulation for cable assemblies, wire harnesses, and wire connections. It is designed to provide resistance to abrasion, thermal heat, and fluids in demanding environments. It provides excellent protection for wire bundles and may be used for wire identification. JP-8 Fuel resistance and hydraulic fluid resistance.

GMT-221 Applications:

- General Purpose Insulation & Repair
- Wire & Cable Harnessing & Bundling
- Cable & Connector Protection
- Spools Used in Automatic
- Cutting Machine

Applications

- Operating Temperature: -55 to 135°C
- Shrink Temperature: 120°C
- Flame Retardant (Except Clear), UL Standard 224
- Shrink Ratio: 2:1
- Environmentally Friendly

Physical & Electrical Properties

Category	Characteristic	Test Requirement	Test Procedure/Condition	Result
A. Sleeving Properties as Supplied	1. Inner Diameter, in	WS Sample ≥ 0.125	4.6.3.1.1 of M/23053	≥ 0.125
		WM Sample ≥ 0.375	4.6.3.1.1 of M/23053	≥ 0.375
	2. Heat Shock	4 Hrs @ 250°C	4.6.3.1.1 of M/23053	No Crack, Flow or drip
		360° bend at 3 seconds	4.6.3.1.1 of M/23053	No Crack
	3. Secant Modulus, psi	< 25,000	ASTM D 882 & 23053/5 4.6.12.1	Two Sample Avg < 25,000 PSI
	4. Concentricity, %	>70	ASTM D 2671 & 23053/5 4.6.3.3	Sample A & B > 70%
	5. Color Stability	175°C @ 24 Hrs	4.6.6 of M/23053/5	Slight Darkening, but no Discoloration
	6. Restricted Shrinkage	175°C @ 30 min.	4.6.6 of M/23053/5	No Cracking
	7. Voltage Withstand, V	2000 @ 1 Min	UL224,2500V,60 sec	No breakdown
B. Sleeving Properties after Unrestricted Shrinkage	1. Inner Diameter - Sample A, in	200°C @ 3 minutes	4.6.5 of M/23053	WS Sample ID Before Rec. > 0.185 After Rec. =0.062

	2. Inner Diameter - Sample B	200°C @ 3 minutes	4.6.5 of M/23053/5E	WM Sample ID Before Rec. > 0.375, After Rec. =0.187
	3. Wall Thickness, inches	After Unrestricted Shrinkage	4.6.3.2 of M/23053E	WS Sample WT = 0.2
		After Unrestricted Shrinkage	4.6.3.2 of M/23053E	WM Sample WT = 0.28"
	4. Tensile Strength	Min of 1500	ASTM D 638 & 4.6.13 of M/23053	AVG > 1500
	5. Dielectric Strength, kV/mm	Min of 500	ASTM 2671 & ASTM D 149	≥15
		Min of 500	ASTM 2671 & ASTM D 149	WM Sample > 500 PSI
	6. Volume Resistivity, Ω·cm	Min of 10^{14}	ASTM D 876	$>10^{14}$
	7. Specific Gravity	Max of 1.35	ASTM D 792	≤1.35
	8. Water Absorption, %	Max of 0.05	ASTM D 570 24 Hr immersion	<0.05
	9. Corrosion	175°C @ 16 Hrs	4.6.7.1 of M/23053/5E	No Pitting or Blacking
	10. Low temperature Flexibility	Negative 55°C for 4 hrs	4.6.7.1 of M/23053/5E	No Cracking
	11. Flammability	Self Extinguishing within one minute and no more than 25% or Indicator Flag Burned or Charred	UL 224 VW-1	Pass
	1. Heat Resistance	175°C @ 168 Hrs	ASTM D 638 & 4.6.13	>100%
	2. Fluid Resistance	See Table 2	Max of .05%	

Physical & Electrical Properties

Condition	Property	Sample WM	Sample BW	Requirement
Intial	Tensile Strength, psi	1721 (41)	1575 (92)	1,500 min
	Ultimate Elongation, %	487 (17)	442 (42)	200 min
Pass / Fail		Pass	Pass	Pass
Heat Aged (*3)	Ultimate Elongation, %	415 (28)	439 (24)	100 min
Pass / Fail		Pass	Pass	Pass
MIL-H-5606 (*4)	Tensile Strength, psi	1090 (34)	1143 (30)	1,000 min
Pass / Fail		Pass	Pass	Pass
MIL-A-8243 (*4)	Tensile Strength, psi	1090 (34)	1143 (30)	1,000 min
Pass / Fail		Pass	Pass	Pass
MIL-L-7808 (*4)	Tensile Strength, psi	1679 (92)	1714 (57)	1,000 min
Pass / Fail		Pass	Pass	Pass
MIL-23699 (*4)	Tensile Strength, psi	1782 (102)	1840 (57)	1,000 min
Pass / Fail		Pass	Pass	Pass
JP-8 (*4)	Tensile Strength, psi	1260 (6)	1069 (195)	1,000 min
Pass / Fail		Pass	Pass	Pass
5% NaCL (*4)	Tensile Strength, psi	1845 (84)	1862 (75)	1,000 min
Pass / Fail		Pass	Pass	Pass

Notes
*3 -- Aged in laboratory oven for 168 hours at a nominal 175°C
*4 -- Aged in the corresponding fluid for 24 hrs at ambient laboratory conditions.
Specimens were wiped off and allowed to rest for 45 (± 15) minutes prior to evaluation.

Dimensions

Part No. with Nominal Inner Diameter in inches	As Supplied		After Recovery	
	Nominal Inner Diameter, mm	Actual Inner Diameter, mm	Maximum Inner Diameter, mm	Wall Thickness, mm
GMT-221(S or 4ft)-3/64-(Color Code)	0.8	1.10 ± 0.10	0.58	0.41 ± 0.07
GMT-221(S or 4ft)-1/16-(Color Code)	1.2	1.70 ± 0.10	0.79	0.43 ± 0.07
GMT-221(S or 4ft)-3/32-(Color Code)	2.0	2.50 ± 0.10	1.17	0.51 ± 0.07
GMT-221(S or 4ft)-1/8-(Color Code)	3.0	3.50 ± 0.10	1.58	0.51 ± 0.07
GMT-221(S or 4ft)-3/16-(Color Code)	4.5	5.00 ± 0.10	2.36	0.51 ± 0.07
GMT-221(S or 4ft)-1/4-(Color Code)	6.0	6.60 ± 0.10	3.18	0.64 ± 0.07
GMT-221(S or 4ft)-3/8-(Color Code)	9.0	9.65 ± 0.10	4.75	0.64 ± 0.07
GMT-221(S or 4ft)-1/2-(Color Code)	12.0	13.00 ± 0.20	6.35	0.64 ± 0.07
GMT-221(S or 4ft)-3/4-(Color Code)	18.0	19.50 ± 0.30	9.53	0.76 ± 0.07
GMT-221(S or 4ft)-1-(Color Code)	25.0	26.00 ± 0.30	12.7	0.89 ± 0.07
GMT-221(S or 4ft)-1-1/4-(Color Code)	30.0	31.00 ± 0.50	15.0	0.89 ± 0.07
GMT-221(S or 4ft)-1-1/2-(Color Code)	38.0	39.00 ± 0.50	19.1	1.00 ± 0.07
GMT-221(S or 4ft)-2-(Color Code)	50.0	52.50 ± 1.50	25.4	1.15 ± 0.07

Ordering Information

Color Code: 0=BLK, 1=BRN, 2=RED, 3=ORN, 4=YLW, 5=GRN, 6=BLU, 7=VIO, 8=GRY, 9=WHT, X=CLR P/N Example: GDR-1/4-0 = Black 1/4" Tubing