AERONAUTICAL
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 3631

Issued 1-15-57
Revised

PLASTIC EXTRUSIONS, FLEXIBLE, HIGH TEMPERATURE
Polyvinyl Chloride

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. FORM: Extruded tubing, cord, tape, or shapes, as ordered.

3. APPLICATION: Primarily as sleeving on wire or as bus bar insulation, particularly where transparency of the sleeve is desired, for operating temperatures up to 250 F.

4. TECHNICAL REQUIREMENTS:

4.1 General:

4.1.1 Composition: Polyvinyl chloride or its co-polymers.

4.1.2 Color and Condition: Unless otherwise specified, a colorless transparent product shall be furnished. Colored transparent, translucent, or opaque material shall be furnished only when so specified. Material shall be considered colorless if the color identification of the wire inside the tubing is clearly distinguishable, and shall be considered transparent if other identification marking on the wire inside the tubing is clearly legible.

4.1.3 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser as determined by a procedure agreed upon by purchaser and vendor.

4.1.4 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

4.2 Properties: Unless otherwise specified, the product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with listed ASTM methods, insofar as practicable.

4.2.1 As Received:

4.2.1.1	Tensile Strength, psi, min	1800	ASTM D876-54T
4.2.1.2	Elongation, %, min	250	ASTM D876-54T
4.2.1.3	Flammability, time to cease burning, sec, max	15	ASTM D876-54T (See Note 1)

4.2.1.4	Dielectric Strength (short time test), min		ASTM D876-54T (tubing) ASTM D149-55T (other forms)
	Under 0.020 in. thick, v per mil	750	
	0.020 in. thick and over, v	15000	
4.2.2	Processing Oil Resistance: (Immediate Deteriorated Properties)		ASTM D471-55T Medium: ASTM Oil #3 Temperature: 212 F ± 2 Time: 8 hr (See Note 2)
4.2.2.1	Shrinkage, Lengthwise, %, max	10	
4.2.2.2	Bend, 180 deg around 0.25 in. diameter at approximately 60 deg per sec at room temperature	No cracking	
4.2.2.3	Decomposition	None	
4.2.2.4	Surface Tackiness	None	
4.2.3	Moisture Resistance: (Immediate Deteriorated Properties)		
4.2.3.1	Water Absorption, change in weight, %, max	1.5	ASTM D570-54T Medium: Distilled Water Temperature: 70 - 85 F Time: 24 hr
4.2.3.2	Dielectric Strength change, %, max (See Note 3)	15	ASTM D876-54T Medium: Humidity 90 - 100% Temperature: 70 - 85 F Time: 96 hr
4.2.4	Dry Heat Resistance:		ASTM D573-53 Temperature: 265 F ± 2 Time: 2 hr (See Notes 2 and 4)
4.2.4.1	Shrinkage, Lengthwise, %, max	10	
4.2.4.2	Surface Tackiness	None	
4.2.4.3	Loss of Transparency	Negligible	
4.2.4.4	Elongation Retention, %, min (See Note 3)	75	Temperature: 265 F ± 2 Time: 400 hr
4.2.5	Softening Temperature: deg Fahr, min	185	ASTM D876-54T
4.2.6	Low Temperature Brittleness:		ASTM D746-55T (See Note 5)
4.2.6.1	At -25 F, as received	Pass	

Note 1. When forms other than tubing are tested the specimen shall be wrapped around the wire or otherwise held at the same angle as for tubing.

Note 2. Specimens shall be 6 in. long, and in the full section wherever possible. Tubing may be split if desired.

Note 3. Routine testing is not required.

Note 4. Time of 2 hr applies to 4.2.4.1, 4.2.4.2, and 4.2.4.3.

Note 5. Tubing shall be slit to provide specimen so mounted that hammer strikes convex side of specimen.

4.2.7 Mildew Resistance: Material shall be capable of passing the following fungus resistance test but shall contain no mercury compounds.

4.2.7.1 A mixed suspension prepared from viable cultures and containing a suitable wetting agent shall be sprayed over the test specimens supported on a non-nutrient agar medium. The test organisms shall be Aspergillis niger, Aspergillis flavus, Penicillium luteum, and Trichoderma T-1. A suitable control, such as untreated cotton twine, shall also be included. At the end of two weeks' incubation at 82 - 86 F not more than traces of growth on the specimens are permissible. The controls shall show abundant growth.

5. TOLERANCES: Unless otherwise specified, the following tolerances apply:

5.1 Tubing:

Nominal ID Inches (See Note 6)	ID, Inches min	ID, Inches max	Nominal Wall Thickness Inch	Wall Thickness Tolerance, Inch Plus and Minus
0.022	0.020	0.027	0.012	0.002
0.027	0.025	0.032	0.012	0.002
0.034	0.032	0.039	0.016	0.003
0.042	0.040	0.049	0.016	0.003
0.053	0.051	0.061	0.016	0.003
0.066	0.064	0.072	0.016	0.003
0.085	0.081	0.089	0.016	0.003
0.095	0.091	0.101	0.016	0.003
0.106	0.102	0.112	0.016	0.003
0.118	0.114	0.124	0.020	0.003
0.133	0.129	0.141	0.020	0.003
0.148	0.144	0.158	0.020	0.003
0.166	0.162	0.178	0.020	0.003
0.186	0.182	0.198	0.020	0.003
0.208	0.204	0.224	0.020	0.003
0.234	0.229	0.249	0.020	0.003
0.263	0.258	0.278	0.020	0.003
0.294	0.289	0.311	0.020	0.003
0.330	0.325	0.347	0.020	0.003
5/16	0.3125	0.334	0.025	0.003
3/8	0.375	0.399	0.025	0.003
7/16	0.438	0.462	0.025	0.003
1/2	0.500	0.524	0.025	0.003
5/8	0.625	0.655	0.030	0.003
3/4	0.750	0.786	0.035	0.005
7/8	0.875	0.911	0.035	0.005

Nominal ID Inches (See Note 6)	ID, Inches min	ID, Inches max	Nominal Wall Thickness Inch	Wall Thickness Tolerance, Inch Plus and Minus
1	1.000	1.036	0.035	0.005
1 1/4	1.250	1.290	0.040	0.005
1 1/2	1.500	1.550	0.045	0.006
1 3/4	1.750	1.812	0.055	0.008
2	2.000	2.070	0.060	0.010
2 1/4	2.250	2.330	0.065	0.010
2 1/2	2.500	2.590	0.070	0.010

Note 6. For intermediate nominal ID, use the tolerance for the next larger size.

5.2 Tape:

5.2.1

Nominal Width Inches	Tolerance, Inch Plus and Minus
0.500 and under	0.016
Over 0.500 to 0.625, incl	0.020
Over 0.625 to 0.750, incl	0.025
Over 0.750 to 1.000, incl	0.032
Over 1.000 to 1.250, incl	0.040
Over 1.250 to 2.000, incl	0.064

5.2.2

Nominal Thickness Inch	Tolerance, Inch Plus and Minus
0.019 and under	0.005
Over 0.019 to 0.031, incl	0.008
Over 0.031	0.010

5.3 Cord:

Nominal Dimension Inch	Tolerance, Inch Plus and Minus
0.156 and under	0.005
Over 0.156 to 0.188, incl	0.008
Over 0.188	0.010

6. QUALITY: The product shall be uniform in quality and condition, clean, smooth, and free from foreign materials and from imperfections detrimental to fabrication, appearance, or performance of parts.

7. REPORTS:

7.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product meets the requirements of this specification. This report shall include the purchase order number, material specification number, vendor's compound number, form, size or part number, and quantity.