



## HEAT SHRINK PRODUCTS

### HEAT SHRINK THIN WALL TUBING

Part Number	Material	Product Type	Shrink Ratio	Operating Temp. & Voltage Rating	Min. Shrink Temp.	Full Recovery Temp.	Flame Retardant	Agency Certification	Military Standard	General Description
<a href="#">QBG</a>	Polyolefin	Thin Wall	2:1	-55°C to +105°C, 600V	90°C	110°C	-	-	-	Flexible, Thin Wall Tubing for Flexible Gas Pipes mm Sizes: 23 to 76.2mm
<a href="#">Q1</a>	Polyolefin	Thin Wall	2:1	-55°C to +105°C, 600V	80°C	100°C	-	-	-	Non Flame-Retardant, General Purpose, Flexible, Glossy Black or Clear mm Sizes: 1.0 to 50mm, Inch Sizes: 3/64" to 2"
<a href="#">Q2-CB</a>	Polyolefin	Ultra Thin Wall	2:1	-55°C to +125°C, 300V	70°C	100°C	VW-1	242540	-	No PBB's, PBBE's, PBBO's, Low Cadmium and Lead mm Sizes: 1.0 to 10mm, Inch Sizes: 3/64" to 1/2"
<a href="#">Q2-F</a>	Polyolefin	Thin Wall	2:1	-55°C to +135°C, 600V	70°C	100°C	VW-1	E236137  242540	SAE-AMS-DTL 23053/5 Class 1 & 3	No PBB's, PBBE's, PBBO's, Very Flexible, Highly Flame-Retardant mm Sizes: 1.2 to 151mm, Inch Sizes: 3/64" to 6"
<a href="#">Q2-F3X</a>	Polyolefin	Thin Wall	3:1	-55°C to +135°C, 600V	70°C	100°C	VW-1	E236137  242540	SAE-AMS-DTL 23053/5 Class 1 & 3	No PBB's, PBBE's, PBBO's, Very Flexible, High Shrink Ratio, Highly Flame-Retardant mm Sizes: 1.5 to 39mm, Inch Sizes: 1/16" to 1 1/2"
<a href="#">Q2-F4X</a>	Polyolefin	Thin Wall	4:1	-55°C to +135°C, 600V	70°C	100°C	VW-1	E236137  242540	SAE-AMS-DTL 23053/5 Class 1 & 3	No PBB's, PBBE's, PBBO's, Very Flexible, High Shrink Ratio, Highly Flame-Retardant mm Sizes: 19.1 to 115mm, Inch Sizes: 3/4" to 4 1/2"
<a href="#">Q2-F2X(YG)</a> <a href="#">Q2-F3X(YG)</a>	Polyolefin	Thin Wall	2:1, 3:1	-55°C to +135°C, 600V	70°C	100°C	VW-1	E236137  242540	SAE-AMS-DTL 23053/5 Class 1 & 3	Yellow-Green Striped, Flexible, Flame-Retardant Tubing 2:1 - mm Sizes: 1.2 to 101.6mm, Inch Sizes: 3/64" to 4", 3:1 - 1.6 to 39mm, Inch Sizes: 1/16" to 1 1/2"
<a href="#">Q2-HF</a>	Polyolefin	Thin Wall	2:1	-55°C to +105°C, 600V	70°C	100°C	-	242540	SAE-AMS-DTL 23053/5	Halogen Free Polyolefin Tubing, Low Smoke mm Sizes: 1.0 to 150mm
<a href="#">Q2-LS</a>	Polyolefin	Thin Wall	2:1	-45°C to +125°C, 600V	65°C	95°C	MVSS 302	242540	-	Very Flexible, Low Shrink Temperature, Halogen Free Polyolefin Tubing mm Sizes: 1.6 to 50.8mm, Inch Sizes: 1/16" to 2"
<a href="#">Q2-R</a>	Polyolefin	Semi-Rigid Thin Wall	2:1	-45°C to +135°C, 600V	90°C	130°C	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/5 Class 1 & 3	Semi-Rigid Flame-Retardant Tubing, Resistant to Common Chemicals and Solvents mm Sizes: 1.2 to 25.4mm, Inch Sizes: 3/64" to 1"
<a href="#">Q2-Z</a>	Polyolefin	Thin Wall	2:1	-55°C to +125°C, 600V	70°C	100°C	VW-1	E236137  242540	-	Environment Friendly, Flexible, Flame-Retardant mm Sizes: 1.0 to 150mm, Inch Sizes: 3/64" to 6"
<a href="#">Q2-3X</a>	Polyolefin	Thin Wall	3:1	-55°C to +125°C, 600V	70°C	100°C	VW-1	E236137  242540	-	Flexible, High Shrink Ratio, Highly Flame-Retardant mm Sizes: 1.5 to 39mm, Inch Sizes: 1/16" to 1 1/2"
<a href="#">Q2-XT</a> <a href="#">Q2-XT(HF)</a>	Polyolefin	Thin Wall	Non-Shrink	-55°C to +125°C, 600V	80°C	80°C	VW-1	-	-	No PBB's, PBBE's, PBBO's, Non-Shrink, Irradiated Flexible, Flame-Retardant, (HF) Version is Halogen Free Size: AWG 18 to 1/2"
<a href="#">Q-150K</a>	Modified PVDF	Flexible Thin Wall	2:1	-55°C to +150°C, 600V	135°C	150°C	VW-1	E245010	SAE-AMS-DTL 23053/18	Black, Flexible, High Temperature, Chemical Resistant, Polyvinylidene Fluoride(PVDF) Kynar® mm Sizes: 1.2 to 38.1mm, Inch Sizes: 3/64" to 1 1/2"
<a href="#">Q-175K</a>	PVDF	Semi-Rigid Thin Wall	2:1	-55°C to +175°C, 600V	175°C	-	VW-1	E245010	SAE-AMS-DTL 23053/8	Clear, High Temperature, Chemical Resistant, Polyvinylidene Fluoride(PVDF) Kynar® mm Sizes: 1.2 to 25.4mm, Inch Sizes: 3/64" to 1"
<a href="#">Q-200E</a> <a href="#">Q-200E(TW)</a>	Modified Fluorelastomer Viton®	Very Flexible Thin Wall	2:1	-55°C to +200°C, 600V	150°C	175°C	VW-1	E245010	SAE-AMS-DTL 23053/13	Flexible, Elastic, High Temperature, Solvent Resistant, Viton® Q-200E - mm Sizes: 3.2 to 50.8mm, Inch Sizes: 1/8" to 2", Q-200E(TW) - mm Sizes: 9.5 to 50.8, Inch Sizes: 3/8" to 2"
<a href="#">Q-PTFE</a>	Modified PTFE	Semi-rigid Thin Wall	2:1	-65°C to +260°C, 600V	-	350°C	Self-extinguish	-	SAE-AMS-DTL 23053/12	Polytetrafluoroethylene Tubing Sizes: AWG 20 to AWG 0
<a href="#">QDR</a> <a href="#">QDR(TW)</a>	Modified Elastomer	Very Flexible Thin Wall	2:1	-75°C to +150°C, 600V	-	175°C	VW-1	-	SAE-AMS-DTL 23053/16	Diesel Resistant Elastomer QDR - mm Sizes: 3.2 to 76.2, Inch Sizes: 1/8" to 3"; QDR(TW) - mm Sizes: 2.4 to 38.1, Inch Sizes: 3/32" to 1 1/2"

### HEAT SHRINK MEDIUM / HEAVY WALL TUBING - ADHESIVE LINED

<a href="#">Q5-2X</a>	Polyolefin	Dual Wall	2:1	-45°C to +125°C, 600V	100°C	125°C	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/4	Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing mm Sizes: 3.2 to 38.1mm, Inch Sizes: 1/8" to 1 1/2"
<a href="#">Q5-3X</a>	Polyolefin	Dual Wall	3:1	-45°C to +125°C, 600V	80°C	120°C	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/4	Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing mm Sizes: 3.0 to 50.0mm, Inch Sizes: 1/8" to 2"
<a href="#">Q5-4X</a>	Polyolefin	Dual Wall	4:1	-45°C to +125°C, 600V	80°C	125°C	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/4	Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing mm Sizes: 4.0 to 52.0mm, Inch Sizes: 3/16" to 2"
<a href="#">Q5-F3X</a>	Polyolefin	Dual Wall	3:1	-55°C to +125°C, 600V	100°C	-	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/4	Adhesive-Lined, Flexible, Polyolefin Tubing mm Sizes: 3.0 to 40mm, Inch Sizes: 1/8" to 1 1/2"
<a href="#">Q5-F4X</a>	Polyolefin	Dual Wall	4:1	-55°C to +125°C, 600V	100°C	-	Self-extinguish in 30 seconds	E236137  242540	SAE-AMS-DTL 23053/4	High Shrink Ratio, Adhesive-Lined, Flexible, Flame-Retardant Tubing mm Sizes: 4 to 52mm, Inch Sizes: 3/16" to 2"



# Q2-F



**FLEXIBLE, FLAME RETARDANT POLYOLEFIN TUBING**  
**ENVIRONMENT FRIENDLY, HIGHLY FLAME RETARDANT**  
**SHRINK RATIO 2:1**

### Features/Applications

Provides both commercial and military applications electrical insulation and protects in-line components, disconnect terminals and splices with its high strength and excellent resilience. Bundles wires for very flexible light-duty harnesses. Identifies or color-codes wires, cables, terminals and components.

- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approval:  File No. E236137,  242540
- 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259
- Material: No PBB's, PBBO's, PBBE's, Free of Cadmium & Lead
- Standard colors: Black, red, blue, yellow, green, white, clear (class 2)
- RoHS Compliant



### Technical Data

Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	14 MPa
Elongation at Break	ASTM D 2671	600%
Elongation After Aging (175°C, 168 hrs.)	ASTM D 2671	350%
Flammability	UL 224 VW-1, SAE-AMS-DTL-23053/5	Pass
Heat Shock (250°C, 4 hrs.)	ASTM D 2671	No cracking
Cold Bend (-55°C, 4 hrs.)	ASTM D 2671	No cracking
Dielectric Strength	ASTM D 150	20kV/mm
Volume Resistance	ASTM D 876	10 <sup>14</sup> Ω.cm
Copper Corrosion	UL 224	Pass
Water Absorption	ASTM D 570	0.15%
Chemical Resistance	SAE-AMS-DTL-23053/5	Pass
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	UL 224	> 30%

### Product Dimensions

Size (Inch)	As Supplied (mm)			After Recovered (mm)			Standard Packaging		
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Box Length *(QX) (Feet)	Cut to Length Pcs. *(QB)		
							6"	48"	
3/64	1.2	0.6	0.40	100	1000	50	40	25	
1/16	1.6	0.8	0.40	100	1000	50	36	25	
3/32	2.4	1.2	0.48	100	500	50	32	25	
1/8	3.2	1.6	0.48	100	500	50	28	25	
3/16	4.8	2.4	0.48	100	500	30	24	25	
1/4	6.4	3.2	0.56	100	500	30	20	25	
5/16	8.0	4.0	0.62	100	250	30	18	25	
3/8	9.5	4.8	0.62	100	250	30	16	25	
1/2	12.7	6.4	0.62	100	200	15	14	5	
5/8	15.9	8.0	0.68	50	200	15	14	5	
3/4	19.1	9.5	0.68	50	200	15	12	5	
1	25.4	12.7	0.87	50	200	15	8	5	
1 1/4	31.8	15.9	1.00	50	100	-	8	5	
1 1/2	38.1	19.1	1.00	50	100	-	5	5	
2	50.8	25.4	1.10	50	100	-	3	5	
3	76.2	38.1	1.20	--	100	-	2	2	
4	102.0	50.8	1.35	--	100	-	1	2	
5	125.0	63.5	1.40	--	50	-	1	2	
6	151.0	75.0	1.40	--	50	-	1	2	