

LIQUID-TUFF™

Low Smoke Zero Halogen – LSZH-VF

Non-UL Liquidtight Flexible Metal Conduit

Description

- Low smoke, zero halogen raceway
- Low toxicity generation characteristics
- Hot dipped zinc galvanized low carbon steel core
- Excellent temperature ratings
- Black thermoplastic polyurethane jacket
- Sunlight resistant
- Flame retardant TPU jacket

Temperature Rating

- 80°C/176°F Dry
- 60°C/140°F Wet
- 70°C/158°F Oil resistant
- -40°C

Applications

- Wherever limiting toxic material of combustion is needed
- 600 volt and lower circuits



References & Ratings

- Non-UL core
- ASTM® E 162 Flame Spread Index
- ASTM® E 662 Smoke Density Generation
- Bombardier SMP-800C Toxic Gas Generation
- UL 94 Tests for Flammability of Plastic Materials for Parts

Ordering Information

Product Dimensions/Bend Radius

Product Code	Trade Size (inches)	Trade Size (mm)	Coil Length (feet)	Reel Length (feet)	Approx. Weight/100 feet (pounds)	External Diameter (inches)		Internal Diameter (min/max) inches	Bend Radius (inches)
						Over Conduit (min/max)	Over Jacket (min/max)		
6751-30-00	3/8	12	100'	—	21	0.594/0.614	0.690/0.710	0.484/0.504	2
6752-30-00	1/2	16	100'	—	25	0.732/0.765	0.820/0.840	0.622/0.642	3.25
6752-45-00	1/2	16	—	500'	25	0.732/0.765	0.820/0.840	0.622/0.642	3.25
6752-60-00	1/2	16	—	1000'	25	0.732/0.765	0.820/0.840	0.622/0.642	3.25
6753-30-00	3/4	21	100'	—	32	0.930/0.960	1.030/1.050	0.820/0.840	4.25
6753-45-00	3/4	21	—	500'	32	0.930/0.960	1.030/1.050	0.820/0.840	4.25
6753-60-00	3/4	21	—	1000'	32	0.930/0.960	1.030/1.050	0.820/0.840	4.25
6754-30-00	1	27	100'	—	43	1.201/1.226	1.290/1.315	1.041/1.066	6.5
6754-41-00	1	27	—	400'	43	1.201/1.226	1.290/1.315	1.041/1.066	6.5
6755-24-00	1¼	35	50'	—	57	1.540/1.570	1.630/1.660	1.380/1.410	8
6755-40-00	1¼	35	—	200'	57	1.540/1.570	1.630/1.660	1.380/1.410	8
6755-47-00	1¼	35	—	750'	57	1.540/1.570	1.630/1.660	1.380/1.410	8
6756-24-00	1½	41	50'	—	85	1.735/1.770	1.865/1.900	1.575/1.600	9
6757-24-00	2	53	50'	—	112	2.180/2.215	2.340/2.375	2.020/2.045	11.12
6758-22-00	2½	63	25'	—	116	2.640/2.675	2.840/2.875	2.480/2.505	14.62

NOTE: All dimensions and weights are subject to normal manufacturing tolerances.

Not listed for grounding.

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Scope

This specification covers AFC Cable Systems, Inc. LIQUID-TUFF™ Non-UL LOW SMOKE ZERO HALOGEN (LSZH) Liquidtight Flexible Metal Conduit designed for use where limiting smoke and toxic materials of combustion are important considerations. The product is intended for use at 80°C (176°F) in a dry location, 60°C (140°F) in a wet location and 70°C (158°F) in an oily location. It is also acceptable for outdoor use at -40°C (-40°F) low temperatures and is sunlight resistant. This Liquidtight Flexible Metal Conduit is manufactured and tested in accordance with generally accepted industry practices.

The product is designed to be used for specific applications where Underwriters Laboratories Inc. (UL) or other agency approvals are not required.

Construction

The LIQUID-TUFF™ LSZH Liquidtight Flexible Metal Conduit shall be formed from zinc coated galvanized low carbon steel strip having a uniform width and thickness. The Low Smoke Zero Halogen designation shall be based upon testing to ASTM® 162 – Flame Spread Index, ASTM® E662 – Smoke Density Generation and Bombardier SMP-800C – Toxic Gas Generation. The finished LIQUID-TUFF™ LSZH Liquidtight Flexible Metal Conduit dimensions shall be in accordance with Table 3.

Jacket – TPU

A rugged low-smoke, moisture, oil, sunlight resistant and flame retardant thermoplastic polyurethane jacket shall be applied directly over the flexible metal conduit. The Low Smoke Zero Halogen jacket shall be tested to and comply with ASTM® 162 – Flame Spread Index, ASTM® E662 – Smoke Density Generation and Bombardier SMP-800C – Toxic Gas Generation. The test results are summarized in Table 1. In addition the jacket shall comply with Table 2 of this specification.



Reference Standards

ASTM® E 162	Flame Spread Index
ASTM® E 662	Smoke Density Generation
Bombardier SMP-800C	Toxic Gas Generation
UL 94	Tests for Flammability of Plastic Materials for Parts

Grounding

A separate grounding conductor is required for all trade sizes.

Markings

The surface of the outer jacket shall be clearly marked with the applicable print legend.

Performance Tests

The completed LIQUID-TUFF™ LSZH Non-UL Liquidtight Flexible Metal Conduit shall meet all of the performance requirements outlined in Appendix A.

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Table 1
LIQUID-TUFF™ LSZH-VF Combustion and Flammability Properties

PROPERTY	TEST	RESULTS
Vertical Burn (Material)	UL 94	UL Listed: V-O Rating No Flaming Drips
Vertical Burn (Conduit)	UL 360	Passed
Oxygen Index % (Material)	ASTM® D 2863	25%
Flame Spread Index	ASTM® E-162	Passed No Flaming Drips
Smoke Generation (Flaming)	ASTM® E662 (NFPA-258)	Ds=13 @ 1.5 min Ds=57 @ 4.0 min No Flaming Drips
Smoke Generation (Non-flaming)	ASTM® E662 (NFPA-258)	Ds=1 @ 1.5 min Ds=8 @ 4.0 min No Flaming Drips
Toxic Gas Generation	Bombardier SMP-800C	Pass

Testing performed by independent test laboratory.
Test results available upon request.

Table 2
Jacket Thickness

Conduit Trade		Minimum Acceptable Average Thickness of Jacket, (inches)
Trade Size	Metric Designator	
3/8	12	0.030
1/2	16	0.030
3/4	21	0.035
1	27	0.035
1¼	35	0.035
1½	41	0.040
2	53	0.040
2½	63	0.050

Table 3
Conduit Diameters
Acceptable Internal and External Diameters

Conduit Size		Internal Diameter, In.		Over Conduit, In.		Over Jacket, In.	
Trade Size, In.	Metric Designator	Min.	Max.	Min.	Max.	Min.	Max.
3/8	12	0.484	0.504	0.594	0.614	0.690	0.710
1/2	16	0.622	0.642	0.732	0.765	0.820	0.840
3/4	21	0.820	0.840	0.930	0.960	1.030	1.050
1	27	1.041	1.066	1.201	1.226	1.290	1.315
1¼	35	1.380	1.410	1.540	1.570	1.630	1.660
1½	41	1.575	1.600	1.735	1.770	1.865	1.900
2	53	2.020	2.045	2.180	2.215	2.340	2.375
2½	63	2.480	2.505	2.640	2.675	2.840	2.875

Appendix A

Performance Tests

Flexibility
Low Temperature Flexibility
Zinc Coating
Vertical Flame
Physical Properties
Deformation
Mechanical Water Absorption
Moisture Penetration
Sunlight Resistance
Test for Durability of Ink Printing