

UL and CSA Type LFMC (6200 Series)

Scope

This specification covers Kaf-Tech® UL LIQUID-TUFF™ Liquidtight Flexible Steel Conduit designed for use as a raceway for power, control and communication cables in accordance with Article 350 of the National Electrical Code. The product is Underwriters Laboratories Inc. (UL) Listed for 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 UL Listed in all trade sizes for direct burial in either earth or concrete encasement, outdoor use and sunlight resistance. In addition the product is CSA certified for use at 75°C (167°F) in dry and oily locations and for minus -30°C (22°F) low temperature applications. This Liquidtight Flexible Steel Conduit is manufactured and tested in accordance with Underwriters Laboratories Inc. Standard UL 360 and CSA Group Standard CSA C22.2 Number 56. The product carries the UL Listing Mark and the CSA Certification Mark.

Construction

The Type LFMC (UL) Liquidtight Flexible Steel Conduit shall be formed from a zinc coated galvanized low carbon steel strip having a uniform width and thickness. The 3/8 through 1-1/4 Trade Sizes are manufactured with square-lock profile that contains a continuous bonding strip. The 1-1/2 through 4 Trade Sizes are manufactured with a fully interlocked "S" profile without a bonding strip. The construction shall be in accordance with UL 360 and CSA C22.2 Number 56 requirements. The finished Type LFMC dimensions shall be in accordance with Table 5.1 of UL 360 and Table 2 of CSA C22.2 No. 56 which are summarized in Table 1.

Grounding

Permanent circuit ground protection is provided through the continuous bonding strip built into the conduit core in sizes 3/8 through 1-1/4. A separate grounding conductor is required by the NEC® for trade sizes 1-1/2 and larger. The Canadian Electric Code requires a grounding conductor for all trade sizes of Liquidtight Flexible Steel Conduit.

Jacket - PVC

A rugged moisture, oil and sunlight resistant polyvinyl chloride (PVC) jacket shall be applied directly over the flexible metal conduit with a wall thickness in accordance with Table 4.1 of UL 360 and Table 4 of CSA C22.2 No.56 which are summarized in Table 1. Jacket Color: Gray, Black, Red, Orange, Yellow, or Green

Markings

The surface of the outer jacket shall be clearly marked with a legible print legend in compliance with UL 360, and CSA C22.2 No. 56.

Performance Tests

In accordance with UL 360 and CSA C22.2 No. 56, the completed UL LIQUID-TUFF™ Liquidtight Flexible Steel Conduit shall meet all of the performance requirements outlined in Appendix A.

Description

- UL bonding strip 3/8 – 1-1/4 for grounding
- UL Liquidtight all sizes
- Sunlight resistant
- Flame retardant PVC jacket
- Hot dipped zinc galvanized low carbon steel core
- Available in Gray, Black, Red, Orange, Yellow or Green. Specialty colors available upon request
- Available with FT-4 PVC upon request



Temperature Rating

- 80°C/176°F DRY
- 60°C/140°F WET
- 70°C/158°F OIL
- UL Listed for -40C/-40F LOW TEMPERATURE

Applications

Suitable for use in:

- NEC® 350 Liquidtight Flexible Metal Conduit Type LFMC
- Wet Locations
- Direct Burial in earth
- Concrete Embedment
- Exposure to Sunlight and Weather
- Grounding in 3/8 to 1-1/4 trade sizes per NEC® 250.118(6)
- Flexible Connections in Hazardous Locations: Class I Div 2 NEC® 501.10(B)(2)(4), Class II Div 1 NEC® 502.10(A)(2)(2), Class II Div 2 NEC® 502.10(B)(2), Class III Div 1 NEC® 503.10(A)(3)(2) and Class III Div 2 NEC® 503.10(B).
- Raised Computer Room Floors per NEC® 645.5(E)(1)(b)(11)
- Service Entrance Wiring up to 6 feet per NEC® 230.43(15)
- Marinas and Boatyards per NEC® 555.13(A)(1)
- Electric signs and Outdoor Lighting per NEC® 600.31(A) and 600.32(A)(1)
- Flexible Connections for hoists and cranes per NEC® 610.11(C)
- Wiring Elevators, Dumbwaiters, Escalators, Moving Walks, Platforms and Stairway Chairlifts per NEC® 620.21
- Motors for Permanently Installed Pools where Flexible Connections are required per NEC® 680.21(A)(2)
- Spas and Hot Tubs where Flexible Connections are required per NEC® 680.42(A)(1)
- Feeders for Natural and Artificially Made Bodies of Water where Flexible Connections are required per NEC® 682.13
- Solar Photovoltaic (PV) Systems per NEC® 690.31(A)
- Fire Pump Wiring per NEC® 695.6(D)
- Electric Fire Pump Control Wiring per NEC® 695.14(E)

References & Ratings

- Underwriters Laboratories Inc. Standard: UL 360 File: E26540
- CSA Group: Standard: C22.2 No. 56 File: 51593
- NFPA 70 NEC® Article 350
- Canadian Electric Code (CEC) Part I Clause 12-1300
- UL Listed in all Trade Sizes for Direct Burial which includes Concrete Encasement
- Conduit in Trade Sizes 1-1/2 and larger require an equipment grounding conductor per NEC® 350.60

TABLE 1.

ORDERING INFORMATION						PRODUCT DIMENSIONS/BEND RADIUS			
Product Code	Trade Size	Metric Designator	Coil Length (ft)	Reel Length (ft)	Approx. Weight 100 feet (pounds)	Min. Average Thickness of Jacket (Inches)	Internal Diameter (min/max) (inches)	Over Jacket (min/max) (inches)	Bend Radius (inches)
GRAY									
6201-30-00	3/8	12	100	—	24	0.03	0.484/0.504	0.690/0.710	2
6201-45-00	3/8	12	—	500	24	0.03	0.484/0.504	0.690/0.710	2
6201-60-00	3/8	12	—	1000	24	0.03	0.484/0.504	0.690/0.710	2
6201-65-00	3/8	12	—	2500	24	0.03	0.484/0.504	0.690/0.710	2
6202-30-00	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-45-00	1/2	16	—	500	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-00	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-68-00	1/2	16	—	3500	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-00	3/4	21	100	—	49	0.035	0.820/0.840	1.030/1.050	4.25
6203-45-00	3/4	21	—	500	49	0.035	0.820/0.840	1.030/1.050	4.25
6203-60-00	3/4	21	—	1000	49	0.035	0.820/0.840	1.030/1.050	4.25
6203-66-00	3/4	21	—	2000	49	0.035	0.820/0.840	1.030/1.050	4.25
6204-30-00	1	27	100	—	79	0.035	1.041/1.066	1.290/1.315	6.5
6204-41-00	1	27	—	400	79	0.035	1.041/1.066	1.290/1.315	6.5
6204-64-00	1	27	—	1250	79	0.035	1.041/1.066	1.290/1.315	6.5
6205-24-00	1-1/4	35	50	—	103	0.035	1.380/1.410	1.630/1.660	8
6205-40-00	1-1/4	35	—	200	103	0.035	1.380/1.410	1.630/1.660	8
6205-47-00	1-1/2	35	—	750	103	0.035	1.380/1.410	1.630/1.660	8
6206-24-00	1-1/2	41	50	—	109	0.04	1.575/1.600	1.865/1.900	9
6206-35-00	1-1/2	41	—	150	109	0.04	1.575/1.600	1.865/1.900	9
6206-62-00	1-1/2	41	—	600	109	0.04	1.575/1.600	1.865/1.900	9
6207-24-00	2	53	50	—	146	0.04	2.020/2.045	2.340/2.375	11.12
6207-30-00	2	53	—	100	146	0.04	2.020/2.045	2.340/2.375	11.12
6207-80-00	2	53	—	300	146	0.04	2.020/2.045	2.340/2.375	11.12
6208-22-00	2-1/2	63	25	—	169	0.05	2.480/2.505	2.840/2.875	14.62
6208-79-00	2-1/2	63	—	275	169	0.05	2.480/2.505	2.840/2.875	14.62
6209-22-00	3	78	25	—	195	0.05	3.070/3.100	3.460/3.500	17.5
6209-56-00	3	78	—	175	195	0.05	3.070/3.100	3.460/3.500	17.5
6220-22-00	3-1/2	91	25	—	230	0.06	3.500/3.540	3.960/4.000	20
6220-56-00	3-1/2	91	—	175	230	0.06	3.500/3.540	3.960/4.000	20
6210-22-00	4	103	25	—	250	0.06	4.000/4.040	4.460/4.500	24
6210-30-00	4	103	—	100	250	0.06	4.000/4.040	4.460/4.500	24

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

Review NEC® 350.60 and 250.118(6) for grounding requirements.

Made in USA of US and/or imported materials.

TABLE 1. (continued)

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)	Min. Average Thickness of Jacket (inches)	Internal Diameter (min/max) (inches)	Over Jacket (min/max) (inches)	Bend Radius (inches)
BLACK									
6201-30-BK	3/8	12	100	—	24	0.03	0.484/0.504	0.690/0.710	2
6202-30-BK	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-45-BK	1/2	16	—	500	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-BK	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-BK	3/4	21	100	—	49	0.035	0.820/0.840	1.030/1.050	4.25
6203-45-BK	3/4	21	—	500	49	0.035	0.820/0.840	1.030/1.050	4.25
6203-60-BK	3/4	21	—	1000	49	0.035	0.820/0.840	1.030/1.050	4.25
6204-30-BK	1	27	100	—	79	0.035	1.041/1.066	1.290/1.315	6.5
6204-80-BK	1	27	—	400	79	0.035	1.041/1.066	1.290/1.315	6.5
6205-24-BK	1-1/4	35	50	—	103	0.035	1.380/1.410	1.630/1.660	8
6205-40-BK	1-1/4	35	—	200	103	0.035	1.380/1.410	1.630/1.660	8
6206-24-BK*	1-1/2	41	50	—	109	0.04	1.575/1.600	1.865/1.900	9
6206-35-BK*	1-1/2	41	—	150	109	0.04	1.575/1.600	1.865/1.900	9
6207-30-BK*	2	53	—	100	146	0.04	2.020/2.045	2.340/2.375	11.12
NOTE: All dimensions and weights are subject to normal manufacturing tolerances. Review NEC® 350.60 and 250.118(6) for grounding requirements, conduit sizes 1-1/2" and larger.									
RED*									
6202-30-RD	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-RD	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-RD	3/4	21	100	—	49	0.03	0.820/0.840	1.030/1.050	4.25
6203-45-RD	3/4	21	—	500	49	0.03	0.820/0.840	1.030/1.050	4.25
ORANGE*									
6202-30-OE	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-OE	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-OE	3/4	21	100	—	49	0.03	0.820/0.840	1.030/1.050	4.25
6203-45-OE	3/4	21	—	500	49	0.03	0.820/0.840	1.030/1.050	4.25
YELLOW*									
6202-30-YW	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-YW	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-YW	3/4	21	100	—	49	0.03	0.820/0.840	1.030/1.050	4.25
6203-45-YW	3/4	21	—	500	49	0.03	0.820/0.840	1.030/1.050	4.25
GREEN*									
6202-30-GN	1/2	16	100	—	31	0.03	0.622/0.642	0.820/0.840	3.25
6202-60-GN	1/2	16	—	1000	31	0.03	0.622/0.642	0.820/0.840	3.25
6203-30-GN	3/4	21	100	—	49	0.03	0.820/0.840	1.030/1.050	4.25
6203-45-GN	3/4	21	—	500 †	49	0.03	0.820/0.840	1.030/1.050	4.25

NOTE: All dimensions and weights are subject to normal manufacturing tolerances. Made in USA of US and/or imported materials. Review NEC® 350.60 and 250.118(6) for grounding requirements.

† 3/4" available on 1000' reels. Call for details.

* Minimum order quantity required.

Appendix A	
UL Performance Tests	CSA Performance Tests
UL 360 Standard	CSA C22.2 NO. 56 STANDARD
RESISTANCE TEST	-
FAULT CURRENT	-
IMPACT	-
-	COLD IMPACT
TENSION	TENSION
CRUSHING	-
PIPE STIFFNESS for DIRECT BURIAL	-
ROOM TEMPERATURE FLEXIBILITY	-
LOW TEMPERATURE FLEXIBILITY	LOW TEMPERATURE FLEXIBILITY
ZINC COATING	ZINC COATING
VERTICAL FLAME	VERTICAL FLAME
PHYSICAL PROPERTIES of JACKET	PHYSICAL PROPERTIES of JACKET
ORIGINAL TENSILE and ELONGATION	ORIGINAL TENSILE and ELONGATION
AIR OVEN AGING TESTS	AIR OVEN AGING TESTS
OIL IMMERSION in AIR OVEN TESTS	OIL IMMERSION in AIR OVEN TESTS
DEFORMATION TEST	DEFORMATION TEST
MECHANICAL WATER ABSORPTION	-
MOISTURE PENETRATION	-
SUNLIGHT RESISTANCE	-
TEST for SECURENESS of FITTINGS	COMPATIBILITY with CONNECTORS
TEST for DURABILITY of INK PRINTING	-
-	PINHOLE TEST

Reference Standards	
UL 360	Standard for Liquidtight Flexible Metal Conduit
CSA C22.2 No. 56	Standard for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit
UL 514B	Standard for Conduit, Tubing and Cable Fittings
NFPA 70	National Electric Code (NEC®) Articles 250, 350, 390, 501, 502, 503, 504, 511, 620, 645, 680 and 690
NEMA RV 3	Application and Installation Guidelines for Flexible and Liquidtight Flexible Metal Conduits
Department of Defense Adopted UL 360 on October 1, 1987	