Rail

Multi-Conductor Control Cables

LSZH, XLPO, 600V, 110°C, Shielded & Un-Shielded for Rail Transit Applications

- EXRAD® Irradiation Crosslinked LSZH XLPO Insulation and Jacket
- Wide Temperature Range, -40°C to 110°C
- Excellent Mechanical Properties
- Moisture and sunlight resistant
- Conformance to Applicable European and North American Rail Transit Standards
- Excellent fluid / oil resistance
- Halogen Free
- Available in AWG or metric conductors

CABLE CONSTRUCTION:

Conductor:	Flexible TC stranding, AWG or mm^2
Insulation:	EXRAD irradiation cross-linked modified polyolefin
Circuit ID:	Printed on each primary wire or colored/striped.
Fillers:	Solid or fibrillated to provide a well-rounded cable
Cable:	Components twisted <= 4in/10cm lay
Binder:	Polyester tape, helically wrapped with overlap
Shield:	Foil shield / tinned copper Braid (optional)
Sheath:	LSZH irradiation cross-linked modified polyolefin
Print:	As required. Includes part number, date of mfr., traceability

Custom designs available. Pairs, Triads, Mixed sizes, CANBUS, Ethernet, Specialty Data, Custom shielding, Additional components. Consult factory for details.

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CONFORMANCE TO PERFORMANCE STANDARDS:

NFPA 130 - Standard for Fixed Guideway Transit and Passenger Rail Systems - 2017

Chapter 8 - Vehicles

Section 8.6.7.1 - Wiring, Electrical Insulation

Section 8.6.7.1.1.1

FT4/IEEE1202 - Flame Testing of Cables for use in Cable Tray - 2012

ANSI/UL 1685 - for total smoke released and peak smoke release rate

PR EN45545-2 - Requirements for fire behavior of materials and components on Railway Vehicles

Table 5, Requirement Set R15 (EL1A)

Test Method Reference T09.03 - Height of Charred Zone

EN 50305 - Railway applications - Railway rolling stock cables having special fire performance - Test methods

Section 9.1.1 Test for cable diameters between 6mm to 12mm (6mm < D < 12mm)

EN 60332-3-25 - Test for vertical flame spread of vertically mounted bunched wires and cables

Section 9.1.2 Test for cable diameters less than or equal to 6mm (D <= 6mm)

EN 60332-3-25 - with variations described in EN50305 section 6.1.2 and Table 4. Test Method Reference T13

EN 61034-2 - Measurement of smoke density of cables burning under defined conditions, Test Procedure and Requirements

Test Method Reference T15

EN 50305 - Railway applications - Railway rolling stock cables having special fire performance - Test methods

Section 9.2.3 and 9.2.4, Toxicity Index (ITC)

EN 50264—Railway Rolling Stock Power and Control Cables having Special Fire Performance

NFPA-502 2017 - Standard for Road Tunnels, Bridges, and Other Limited Access Highways - 2017 Edition

Chapter 12 - Electrical Systems

Section 12.2.1.4

MIL-DTL-24643 Section 4.8.23 - Acid Gas Equivalent <=2%

MIL-DTL-24643C- Low Smoke Halogen-Free Cables for Shipboard Use

Section 3.3 - Materials

Section 4.8.24 - Halogen content - all components <0.2%

Section 4.8.23 - Acid Gas Equivalent <=2%

Section 4.8.28 - Toxicity Index

Section 4.8.26 - Smoke Index

NES 711 - Determination of Smoke Index of Products of Combustion from Small Specimens of Material

NES 713 - Determination of Toxicity Index of Products of Combustion from Small Specimens of Material

ASTM D470-13 - Section 13, Immersion Testing

NYCT specifications TSC Dec 2009, Table 3-20 and TC rev7, Table 3-23

Lubricating oil MIL-L-23699, Hydraulic Fluid MIL-H-5606, Gasoline, Water

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Product Number	No. of Cond.	Size (TC) AWG | mm²		Strand	Conductor Diameter (nom) in | mm		Insulated Conductor Diameter (nom)		Cable Diameter (nom) in | mm		Net Weight lb/1000ft kg/100m		OPTIONAL Shield (s) Diameter in | mm		Shielded Net Weight lb/1000ft | kg/100m	
EXRAD-CCR-2C24(s)	2	24	0.25	7/32	0.024	0.61	0.046	1.17	0.134	3.4	10.4	1.6	0.167	4.3	2.1	3.2
EXRAD-CCR-3C24	3	24	0.25	7/32	0.024	0.61	0.046	1.17	0.150	3.8	12.1	1.8	0.175	4.5	2.0	3.0
EXRAD-CCR-4C24	4	24	0.25	7/32	0.024	0.61	0.046	1.17	0.161	4.1	14.4	2.2	0.189	4.8	1.8	2.7
EXRAD-CCR-5C24	5	24	0.25	7/32	0.024	0.61	0.046	1.17	0.177	4.5	17.8	2.7	0.205	5.2	2.2	3.3
EXRAD-CCR-6C24	6	24	0.25	7/32	0.024	0.61	0.046	1.17	0.197	5.0	20.8	3.1	0.224	5.7	2.6	3.9
EXRAD-CCR-7C24	7	24	0.25	7/32	0.024	0.61	0.046	1.17	0.209	5.3	26.2	3.9	0.236	6.0	3.3	4.9
EXRAD-CCR-12C24	12	24	0.25	7/32	0.024	0.61	0.046	1.17	0.256	6.5	41.6	6.2	0.283	7.2	5.2	7.8
EXRAD-CCR-25C24	25	24	0.25	7/32	0.024	0.61	0.046	1.17	0.354	9.0	86.6	12.9	0.390	9.9	10.8	16.1
EXRAD-CCR-2C22	2	22	0.35	19/34	0.030	0.76	0.052	1.32	0.156	4	14.6	2.2	0.185	4.7	1.8	2.7
EXRAD-CCR-3C22	3	22	0.35	19/34	0.030	0.76	0.052	1.32	0.165	4.2	16.9	2.5	0.193	4.9	2.1	3.2
EXRAD-CCR-4C22	4	22	0.35	19/34	0.030	0.76	0.052	1.32	0.181	4.6	20.2	3.0	0.207	5.3	2.5	3.8
EXRAD-CCR-5C22	5	22	0.35	19/34	0.030	0.76	0.052	1.32	0.197	5.0	24.9	3.7	0.224	5.7	3.1	4.6
EXRAD-CCR-6C22	6	22	0.35	19/34	0.030	0.76	0.052	1.32	0.217	5.5	29.1	4.3	0.244	6.2	3.6	5.4
EXRAD-CCR-7C22	7	22	0.35	19/34	0.030	0.76	0.052	1.32	0.232	5.9	36.7	5.5	0.260	6.6	4.6	6.8
EXRAD-CCR-12C22	12	22	0.35	19/34	0.030	0.76	0.052	1.32	0.283	7.2	58.2	8.7	0.311	7.9	7.3	10.9
EXRAD-CCR-25C22	25	22	0.35	19/34	0.030	0.76	0.052	1.32	0.378	9.6	121.3	18.1	0.413	10.5	15.2	22.6
EXRAD-CCR-2C20	2	20	0.50	19/32	0.038	0.96	0.056	1.42	0.173	4.4	20.8	3.1	0.189	4.8	2.6	3.9
EXRAD-CCR-3C20	3	20	0.50	19/32	0.038	0.96	0.056	1.42	0.181	4.6	24.1	3.6	0.209	5.3	3.0	4.5
EXRAD-CCR-4C20	4	20	0.50	19/32	0.038	0.96	0.056	1.42	0.197	5.0	28.8	4.3	0.213	5.4	3.6	5.4
EXRAD-CCR-5C20	5	20	0.50	19/32	0.038	0.96	0.056	1.42	0.217	5.5	35.5	5.3	0.244	6.2	4.4	6.6
EXRAD-CCR-6C20	6	20	0.50	19/32	0.038	0.96	0.056	1.42	0.236	6.0	41.6	6.2	0.256	6.5	5.2	7.8
EXRAD-CCR-7C20	7	20	0.50	19/32	0.038	0.96	0.056	1.42	0.256	6.5	52.4	7.8	0.283	7.2	6.6	9.8
EXRAD-CCR-12C20	12	20	0.50	19/32	0.038	0.96	0.056	1.42	0.299	7.6	83.1	12	0.319	8.1	10.4	15.5
EXRAD-CCR-25C20	25	20	0.50	19/32	0.038	0.96	0.056	1.42	0.413	11	173.2	25.8	0.445	11.3	21.7	32.3

All dimensions and weights are nominal and subject to variation within industry best-practice.

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Product Number	No. of Cond.	Size (TC) AWG | mm²		Strand	Conductor Diameter in | mm		Insulated Conductor Diameter		Cable Diameter in | mm		Net Weight lb/1000ft kg/100m		OPTIONAL Shield (s) Diameter in | mm		Shielded Net Weight lb/1000ft | kg/100m	
EXRAD-CCR-2C18(s)	2	18	1.0	19/30	0.050	1.26	0.070	1.77	0.201	5.1	30.2	4.5	0.220	5.6	3.8	5.6
EXRAD-CCR-3C18	3	18	1.0	19/30	0.050	1.26	0.070	1.77	0.213	5.4	37.5	5.6	0.236	6.0	4.7	7.0
EXRAD-CCR-4C18	4	18	1.0	19/30	0.050	1.26	0.070	1.77	0.228	5.8	42.9	6.4	0.256	6.5	5.4	8.0
EXRAD-CCR-5C18	5	18	1.0	19/30	0.050	1.26	0.070	1.77	0.262	6.7	57.0	8.5	0.276	7.0	7.1	10.6
EXRAD-CCR-6C18	6	18	1.0	19/30	0.050	1.26	0.070	1.77	0.287	7.3	65.7	9.8	0.307	7.8	8.2	12.3
EXRAD-CCR-7C18	7	18	1.0	19/30	0.050	1.26	0.070	1.77	0.315	8.0	70.4	11	0.335	8.5	8.8	13.1
EXRAD-CCR-12C18	12	18	1.0	19/30	0.050	1.26	0.070	1.77	0.358	9.1	115.1	17.2	0.390	9.9	14.4	21.5
EXRAD-CCR-25C18	25	18	1.0	19/30	0.050	1.26	0.070	1.77	0.504	12.8	217.3	32	0.531	13.5	27.2	40.5
EXRAD-CCR-2C16	2	16	1.5	19/29	0.056	1.42	0.085	2.17	0.236	6.0	42.2	6.3	0.256	6.5	5.3	7.9
EXRAD-CCR-3C16	3	16	1.5	19/29	0.056	1.42	0.085	2.17	0.248	6.3	51.0	7.6	0.268	6.8	6.4	9.5
EXRAD-CCR-4C16	4	16	1.5	19/29	0.056	1.42	0.085	2.17	0.272	6.9	63.0	9.4	0.291	7.4	7.9	11.8
EXRAD-CCR-5C16	5	16	1.5	19/29	0.056	1.42	0.085	2.17	0.307	7.8	77.8	12	0.327	8.3	9.7	14.5
EXRAD-CCC-6C16	6	16	1.5	19/29	0.056	1.42	0.085	2.17	0.333	8.5	94.5	14	0.354	9.0	11.8	17.6
EXRAD-CCR-7C16	7	16	1.5	19/29	0.056	1.42	0.085	2.17	0.358	9.1	110.6	17	0.394	10.0	13.8	20.6
EXRAD-CCR-12C16	12	16	1.5	19/29	0.056	1.42	0.085	2.17	0.437	11	173.8	25.9	0.476	12.1	21.7	32.4
EXRAD-CCR-25C16	25	16	1.5	19/29	0.056	1.42	0.085	2.17	0.610	16	348.3	51.9	0.650	16.5	43.5	64.9
EXRAD-CCR-2C14	2	14	2.5	41/30	0.071	1.80	0.108	2.75	0.287	7.3	65.7	9.8	0.307	7.8	8.2	12.3
EXRAD-CCR-3C14	3	14	2.5	41/30	0.071	1.80	0.108	2.75	0.307	7.8	81.8	12	0.323	8.2	10.2	15.3
EXRAD-CCR-4C14	4	14	2.5	41/30	0.071	1.80	0.108	2.75	0.343	8.7	101.9	15	0.358	9.1	12.7	19.0
EXRAD-CCR-5C14	5	14	2.5	41/30	0.071	1.80	0.108	2.75	0.370	9.4	121.4	18	0.406	10.3	15.2	22.6
EXRAD-CCR-6C14	6	14	2.5	41/30	0.071	1.80	0.108	2.75	0.417	11	149.5	22	0.449	11.4	18.7	27.9
EXRAD-CCR-7C14	7	14	2.5	41/30	0.071	1.80	0.108	2.75	0.453	12	168.8	25.2	0.492	12.5	21.1	31.5
EXRAD-CCR-12C14	12	14	2.5	41/30	0.071	1.80	0.108	2.75	0.531	14	299.1	45	0.571	14.5	37.4	55.8
EXRAD-CCR-25C14	25	14	2.5	41/30	0.071	1.80	0.108	2.75	0.748	19.0	623.0	92.9	0.787	20.0	77.9	116