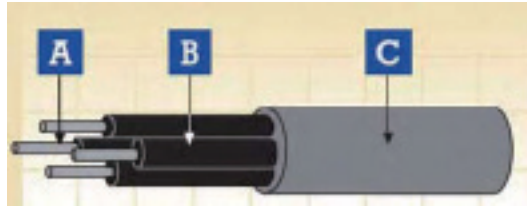


FIREROL Standard Wall Multicore Unscreened Cables

300/500 V or 0.6/1 kV
EN 50264-2-2 (FRL-SW-05M/FRL-SW-1M)



A. Conductor B. Insulation C. Sheath

Application

- Used as power and control cable for protected installations inside and outside of rail and transport vehicles, where handling and installation cost are an important factor.
- Used in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Flexible tinned annealed copper wires, stranded as per HD 383 (IEC 60228) class 5

Insulation

LSZH elastomeric compound as defined in EN 50264-1 (EI 101 to EI 105)

Outer Sheath

LSZH elastomeric compound as defined in EN 50264-1 (EM 101 to EM 104)

Electrical & Mechanical Properties

Nominal Voltage	300/500 V or 0.6/1 kV
Max. Conductor Temperature	90 °C (fixed installation)
Min. Permissible Ambient Temperature	-25 °C/-40 °C (fixed installation)
Bending Radius	3 x Overall Diameter (D<12mm); 4 x Overall Diameter (D>12mm)

Chemical & Environmental Properties

EN 60684-2	No fluorine
EN 50305; EN 60811-2-1	Resistance to mineral oil & fuel oil, acid & alkali
EN 50305	Resistance to ozone

Fire Performance for Rolling Stock Application

EN 50306-2	Hazard levels HL1, HL2/HL3, HL4
DIN 5510-2	Protection level 1/2/3/4
BS 6853	Interior use 1a, 1b, II; Exterior use 1a, 1b, II
NF F 16-101	F0

Fire Performance in General

EN 50265-2-1; IEC 60332-1-2; NF C 32-070 2.1 (C2)	Vertical flame propagation for a single insulated wire or cable
EN 50266-2-4 + EN 50305; IEC 60332-3-24; NF C 32-070 2.2 (C1); VDE 0472 Teil 804	Vertical flame spread of vertically mounted bunched wires or cables
EN 50268-2; IEC 61034-2; NF C 32-073 ; NF C 20-902; NF F 16 101; VDE 0472 Teil 816	Low Smoke Emission
EN 50267-2-1; IEC 60754-1; NF C 32-074; NF C 20-454; VDE 0472 Teil 815	Halogen Free
EN 50267-2-2/3; IEC 60754-2; NF C 32-074; NF C 20-453; VDE 0472 Teil 813	Low Corrosivity (Acidity & Conductivity)
EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853 NF F 63 808; BS6853; NF F 16 101	Low Toxicity Smoke Index

EN 50264 Rolling Stock Cables

FRL-SW-05M 300/500 V

Number and Nominal Cross-Sectional Area (a)	Conductor Diameter (a)	Min. Mean Thickness of Insulation	Diameter of Core (a)		Min. Mean Thickness of Sheath	Overall Diameter		Weight	Max. Conductor Resistance	Min. Insulation Resistance	
			Min.	Max.		Min.	Max.			EI 105	EI 101-EI 104
			mm	mm		mm	mm		mm	mm	Kg/km
n x mm ²	mm	mm	mm	mm	mm	mm	mm	Kg/km	Ω/km	MΩ x km	MΩ x km
2x1	1.2	0.6	2.4	2.8	1.4	7.2	8.5	100	20.0	140	70
4x1	1.25	0.6	2.4	2.8	1.4	8.2	9.6	130	20.0	140	70
7x1		0.6	2.4	2.8	1.4	9.6	11.2	180	20.0	140	70
9x1		0.6	2.4	2.8	1.4	11.5	13.4	220	20.0	140	70
12x1		0.6	2.4	2.8	1.4	12.3	14.4	280	20.0	140	70
19x1		0.6	2.4	2.8	1.4	14.5	16.6	400	20.0	140	70
24x1		0.6	2.4	2.8	1.5	16.7	19.6	530	20.0	140	70
32x1		0.6	2.4	2.8	1.6	18.5	21.7	660	20.0	140	70
37x1		0.6	2.4	2.8	1.6	19.2	22.4	720	20.0	140	70
40x1		0.6	2.4	2.8	1.6	19.9	23.3	750	20.0	140	70
4x1.5		1.5	0.7	2.8	3.3	1.4	9.2	10.8	170	13.7	120
7x1.5	0.7		2.8	3.3	1.4	10.9	12.8	250	13.7	120	60
9x1.5	0.7		2.8	3.3	1.4	13.1	15.3	310	13.7	120	60
12x1.5	0.7		2.8	3.3	1.4	14.0	16.4	400	13.7	120	60
19x1.5	0.7		2.8	3.3	1.5	16.5	19.4	570	13.7	120	60
24x1.5	0.7		2.8	3.3	1.6	19.5	22.8	760	13.7	120	60
32x1.5	0.7		2.8	3.3	1.7	21.5	25.2	940	13.7	120	60
37x1.5	0.7		2.8	3.3	1.7	22.4	26.2	1040	13.7	120	60
4x2.5	1.95	0.8	3.4	4.0	1.4	10.7	12.5	240	8.21	90	45
7x2.5		0.8	3.4	4.0	1.4	12.7	14.9	360	8.21	90	45
9x2.5		0.8	3.4	4.0	1.5	15.6	18.3	450	8.21	90	45
12x2.5		0.8	3.4	4.0	1.5	16.7	19.6	590	8.21	90	45
19x2.5		0.8	3.4	4.0	1.6	19.7	23.1	860	8.21	90	45
24x2.5		0.8	3.4	4.0	1.8	23.5	27.5	1150	8.21	90	45

(a) = One earth conductor (green/yellow) can be included upon request

(b) = For information, indicative only



FRL-SW-1M 0.6/1 kV

Number and Nominal Cross-Sectional Area (a)	Conductor Diameter (a)	Min. Mean Thickness of Insulation	Diameter of Core (a)		Min. Mean Thickness of Sheath	Overall Diameter		Weight	Max. Conductor Resistance 20 °C	Min. Insulation Resistance	
			Min.	Max.		Min.	Max.			EI 105 20 °C	EI 101-EI 104 20 °C
mm ²	mm	mm	mm	mm	mm	mm	mm	Kg/km	Ω/km	MΩ x km	MΩ x km
TWO CORES											
1.5	1.5	0.8	3.0	3.5	1.4	8.5	9.9	140	13.7	150	75
2.5	1.95	0.8	3.4	3.9	1.4	9.3	10.9	180	8.21	130	65
4	2.5	0.8	3.9	4.6	1.4	10.3	12.1	230	5.09	110	55
6	3.0	0.9	4.6	5.4	1.4	11.8	13.9	300	3.39	90	45
10	3.9	1.1	5.8	6.8	1.4	14.3	16.7	480	1.95	85	45
16	5.0	1.1	7.2	8.5	1.5	16.5	19.4	630	1.24	70	35
25	6.4	1.3	8.6	10.0	1.6	20.1	23.5	920	0.795	65	35
35	7.7	1.3	10.2	11.5	1.7	22.7	26.6	1200	0.565	60	30
50	9.2	1.5	11.6	13.5	1.9	26.7	31.2	1670	0.393	55	30
THREE CORES											
1.5	1.5	0.8	3.0	3.5	1.4	8.9	10.5	160	13.7	150	75
2.5	1.95	0.8	3.4	3.9	1.4	9.9	11.6	210	8.21	130	65
4	2.5	0.8	3.9	4.6	1.4	11.0	12.9	270	5.09	110	55
6	3.0	0.9	4.6	5.4	1.4	12.5	14.6	360	3.39	90	45
10	3.9	1.1	5.8	6.8	1.5	15.3	17.9	600	1.95	85	45
16	5.0	1.1	7.2	8.5	1.6	17.8	20.8	790	1.24	70	35
25	6.4	1.3	8.6	10.0	1.7	21.6	25.3	1170	0.795	65	35
35	7.7	1.3	10.2	11.5	1.8	24.4	28.6	1530	0.565	60	30
50	9.2	1.5	11.6	13.5	1.9	28.2	33.3	2120	0.393	55	30
FOUR CORES											
1.5	1.5	0.8	3.0	3.5	1.4	9.7	11.3	190	13.7	150	75
2.5	1.95	0.8	3.4	3.9	1.4	10.7	12.5	250	8.21	130	65
4	2.5	0.8	3.9	4.6	1.4	11.9	14.0	330	5.09	110	55
6	3.0	0.9	4.6	5.4	1.4	13.7	16.1	450	3.39	90	45
10	3.9	1.1	5.8	6.8	1.5	16.9	19.8	740	1.95	85	45
16	5.0	1.1	7.2	8.5	1.6	19.6	22.9	980	1.24	70	35
25	6.4	1.3	8.6	10.0	1.8	24.1	28.2	1460	0.795	65	35
3X35+25	7.7/6.4	1.3/1.3	10.2/8.6	11.5/10.0	1.9	28.5	34.2	1610	0.565/0.795	60	30
3X50+25	9.2/6.4	1.5/1.3	11.6/8.6	13.5/10.0	2.0	33.4	40.0	2230	0.393/0.795	55	30

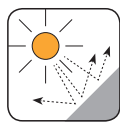
(a)= For information, indicative only



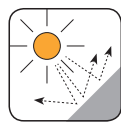
Corona Resistant



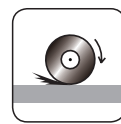
Highly Flexible



UV Resistant



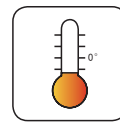
Ozone Resistant



Abrasion Retardant



Cold Resistant



Resistance To Soldering Heat



Acid & Alkaline Resistant



IRM 903
Fuel Oil Resistant



IRM 902
Mineral Oil Resistant



Fire Retardant
NF C32-070-2.2(C1)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C2)
IEC60332-1-2/EN50265-2-1



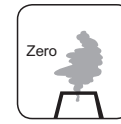
Low Toxicity
EN 50305; NF X70-100/NF
F63 608/TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/NF C20-453



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/NF C 20-902



Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C20-454