

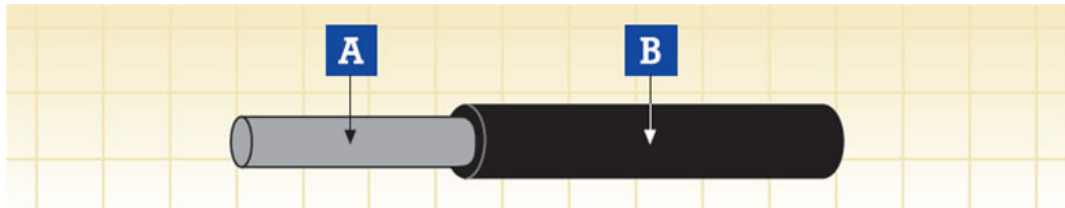


NF F 63-826 Rolling Stock Cables

FIREROL Standard Wall Single Core Unsheathed Cables

500V, 1000V, 1500V, 3000V

NF F 63-826 (FRF-SW-05SU,FRF-SW-1SU,FRF-SW-1.5SU,FRF-SW-3SU)



A. Conductor B. Insulation

Application

These cables are 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, suitable for use in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 5

Insulation

Special halogen free compound

Electrical & Mechanical Properties

Nominal Voltage	500V, 1000V, 1500V, 3000V
Maximum Conductor Temperature	90°C/105°C
Temperature Range	-25°C~90°C
Bending Radius	4 × Overall Diameter

Standards

NF F 63-826
NF F 16-101
BS 6853

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



NF F 63-826 Rolling Stock Cables

FRF-SW-05SU 500V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
1.0	32/0.20	1.3	3.8	4.5	26
1.5	30/0.25	1.3	4.1	4.8	33
2.5	50/0.25	1.3	4.5	5.2	43
4.0	56/0.30	1.3	5.0	5.8	59
6.0	84/0.30	1.4	5.7	6.5	82
10.0	80/0.40	1.5	6.9	8.1	135
16.0	126/0.40	1.5	8.2	9.2	210

FRF-SW-1SU 1000V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
1.5	30/0.25	1.5	4.4	5.2	42
2.5	50/0.25	1.5	4.8	5.6	55
4.0	56/0.30	1.5	5.4	6.2	72
6.0	84/0.30	1.6	6.1	6.9	96
10.0	80/0.40	1.6	7.0	8.3	154
16.0	126/0.40	1.6	8.3	9.4	218
25.0	196/0.40	1.7	9.8	11.0	316
35.0	276/0.40	1.8	11.2	12.5	440
50.0	396/0.40	1.9	13.0	14.3	580
70.0	360/0.50	2.0	14.7	16.3	830
95.0	475/0.50	2.0	16.6	18.4	1040
120.0	608/0.50	2.1	18.6	20.5	1310

FRF-SW-1.5SU 1500V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
1.5	30/0.25	2.3	6.0	6.8	59
2.5	50/0.25	2.3	6.4	7.2	73
4.0	56/0.30	2.3	7.0	7.8	91
6.0	84/0.30	2.3	7.5	8.3	120
10.0	80/0.40	2.3	8.4	9.7	160
16.0	126/0.40	2.3	9.7	10.8	235
25.0	196/0.40	2.3	11.0	12.2	330
35.0	276/0.40	2.4	12.4	13.7	480
50.0	396/0.40	2.5	14.2	15.5	610
70.0	360/0.50	2.7	16.1	17.7	860
95.0	475/0.50	2.7	18.0	19.8	1070
120.0	608/0.50	2.8	20.0	21.9	1340
150.0	756/0.50	2.8	21.8	23.8	1620
185.0	925/0.50	2.9	23.7	25.9	1940
240.0	1221/0.50	3.1	26.6	29.1	2550
300.0	1525/0.50	3.45	29.4	31.9	2950



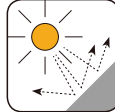
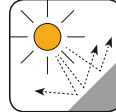
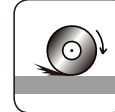

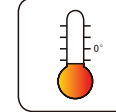











NF F 63-826 Rolling Stock Cables

FRF-SW-3SU 3000V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
2.5	50/0.25	3.1	8.0	8.8	94
4.0	56/0.30	3.1	8.5	9.5	124
6.0	84/0.30	3.1	8.8	9.9	135
10.0	80/0.40	3.1	10.0	11.3	200
16.0	126/0.40	3.1	11.2	12.4	265
25.0	196/0.40	3.1	12.5	13.8	375
35.0	276/0.40	3.2	13.9	15.3	493
50.0	396/0.40	3.3	15.7	17.2	680
70.0	360/0.50	3.4	17.5	19.1	930
95.0	475/0.50	3.5	19.5	21.4	1066
120.0	608/0.50	3.6	21.6	23.5	1530
150.0	756/0.50	3.6	23.3	25.5	1740
185.0	925/0.50	3.7	25.2	27.6	2100
240.0	1221/0.50	3.9	28.1	31.7	2460
300.0	1525/0.50	4.45	31.4	35.0	3050

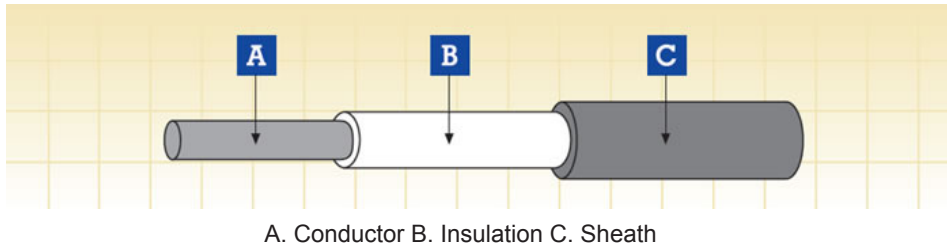


 Impact Resistant	 Highly Flexible	 UV Resistant	 Ozone Resistant	 Abrasion Retardant	 Cold-resistant	 Resistance To Soldering Heat	 Acid&Alkaline Resistant
 IRM 903 Fuel Oil Resistant	 IRM 902 Mineral Oil Resistant	 Fire Retardant NF C32-070-2.2(C2) IEC60332-3-24/EN50266-2-4	 Flame Retardant NF C32-070-2.1(C1) IEC60332-1-2/EN50265-2-1	 Low Toxicity NF X70-100/NF F63 808 TM1-04/BS 6853	 Low Corrosivity IEC60754-2/EN50267-2-2/3 NF C32-074/VDE 0472-813	 Low Smoke Emission IEC 61034-2 / EN 50268-2 NF C32-073/VDE 0472-816	 Zero Zero Halogen IEC 60754-1/EN 50267-2-1 NF C32-074/VDE 0472-815



NF F 63-826 Rolling Stock Cables

FIREROL Standard Wall Single Core Sheathed Cables
1500V, 3000V
NF F 63-826 (FRF-SW-1.5S, FRF-SW-3S)



Application

These cables are 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, suitable for use in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 5

Insulation

Halogen free compound

Sheath

Halogen free compound

Electrical & Mechanical Properties

Nominal Voltage	1500V, 3000V
Maximum Conductor Temperature	90°C/105°C
Temperature Range	-25°C~90°C
Bending Radius	4 × Overall Diameter

Standards

NF F 63-826
 NF F 16-101
 BS 6853

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;	Vertical flame spread of vertically mounted bunched wires or cables
NF C 32-070 2.2 (C1); VDE 0472 Teil 804	
EN 50268-2; IEC 61034-2; NF C 32-073 ;	Low Smoke Emission
NF C 20-902; NF F 16 101; VDE 0472 Teil 816	
EN 50267-2-1; IEC 60754-1; NF C 32-074;	Halogen Free
NF C 20-454; VDE 0472 Teil 815	
EN 50267-2-2/3; IEC 60754-2; NF C 32-074;	Low Corrosivity (Acidity & Conductivity)
NF C 20-453; VDE 0472 Teil 813	
EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853	Low Toxicity
NF F 63 808; BS6853; NF F 16 101	Smoke index



NF F 63-826 Rolling Stock Cables

FRF-SW-1.5S 1500V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter		Weight
				Min.	Max.	
mm ²	No/mm	mm	mm	mm	mm	kg/km
1.5	30/0.25	2.3	1.5	8.9	9.9	130
2.5	50/0.25	2.3	1.5	9.3	10.3	145
10.0	80/0.40	2.3	1.8	11.9	13.3	290
50.0	396/0.40	2.5	2.2	18.3	20.3	850
120.0	608/0.50	2.8	2.6	25.0	27.5	1770
150.0	756/0.50	2.8	2.6	26.7	29.3	2150
185.0	925/0.50	2.9	2.8	29.0	31.8	2530

FRF-SW-3S 3000V

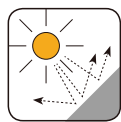
Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter		Weight
				Min.	Max.	
mm ²	No/mm	mm	mm	mm	mm	kg/km
150.0	756/0.50	3.6	2.6	28.2	30.9	2270
185.0	925/0.50	3.7	2.8	30.5	33.4	2660



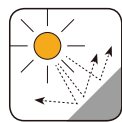
Impact Resistant



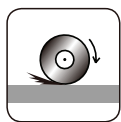
Highly Flexible



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



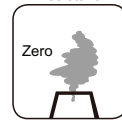
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VDE 0472-813



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/VDE 0472-816

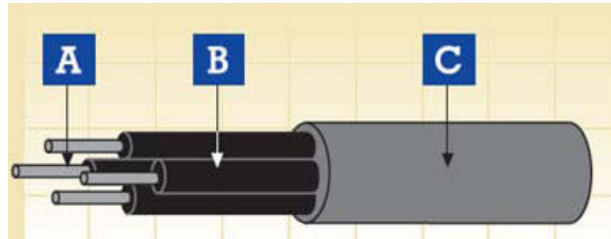


Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VDE 0472-815



NF F 63-826 Rolling Stock Cables

FIREROL Standard Wall Multicore Unscreened Cables 500V NF F 63-826 (FRF-SW-05M)



A. Conductor B. Insulation C. Sheath

Application

These cables are 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, suitable for use in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 5

Insulation

Halogen free compound

Sheath

Halogen free compound

Electrical & Mechanical Properties

Nominal Voltage

500V

Maximum Conductor Temperature

90°C/105°C

Temperature Range

-25°C~+90°C

Bending Radius

4 × Overall Diameter

Standards

NF F 63-826

NF F 16-101

BS 6853

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;

Vertical flame spread of vertically mounted bunched wires or cables

NF C 32-070 2.2 (C1); VDE 0472 Teil 804

EN 50268-2; IEC 61034-2; NF C 32-073 ;

Low Smoke Emission

NF C 20-902; NF F 16 101; VDE 0472 Teil 816

EN 50267-2-1; IEC 60754-1; NF C 32-074;

Halogen Free

NF C 20-454; VDE 0472 Teil 815

EN 50267-2-2/3; IEC 60754-2; NF C 32-074;

Low Corrosivity (Acidity & Conductivity)

NF C 20-453; VDE 0472 Teil 813

EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853

Low Toxicity

NF F 63 808; BS6853; NF F 16 101

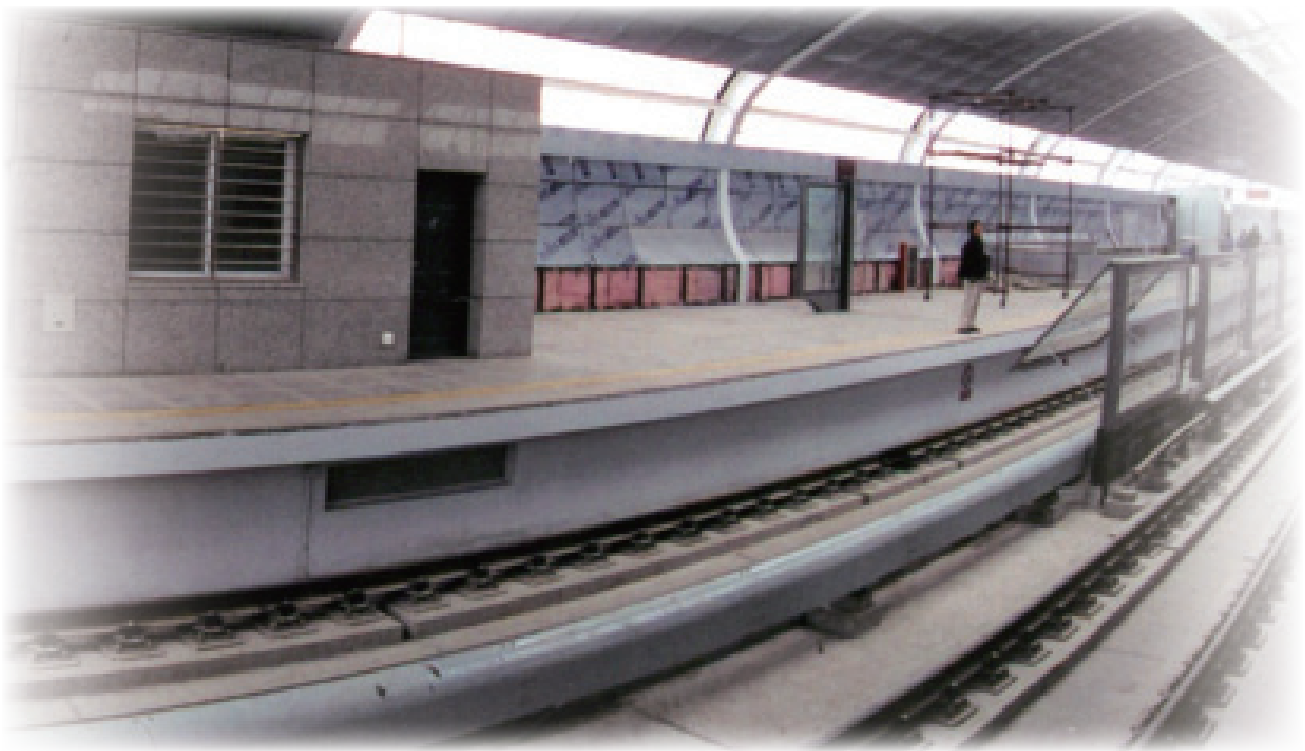
Smoke index



NF F 63-826 Rolling Stock Cables

FRF-SW-05M 500V

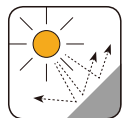
Number of Cores	Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Sheath Thickness	Overall Diameter		Weight
				Min.	Max.	
-	mm ²	No/mm	mm	mm	mm	kg/km
2	1.5	30/0.25	1.0	8.6	9.9	115
4	1.5	30/0.25	1.1	10.1	11.4	160
7	1.5	30/0.25	1.1	11.9	13.3	245
13	1.5	30/0.25	1.2	16.5	18.0	425
19	1.5	30/0.25	1.2	18.3	19.9	675
37	1.5	30/0.25	1.5	25.1	27.1	1170
2	2.5	50/0.25	1.1	10.0	11.3	185
4	2.5	50/0.25	1.2	11.7	13.1	275
13	2.5	50/0.25	1.4	19.5	21.1	750
19	2.5	50/0.25	1.4	21.6	23.4	980



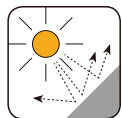
Corona Resistant



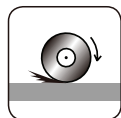
Highly Flexible



UV Resistant



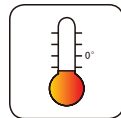
Ozone Resistant



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



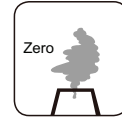
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VDE 0472-813



Low Smoke Emission
IEC 61034-2/ EN 50268-2
NF C32-073/VDE 0472-816



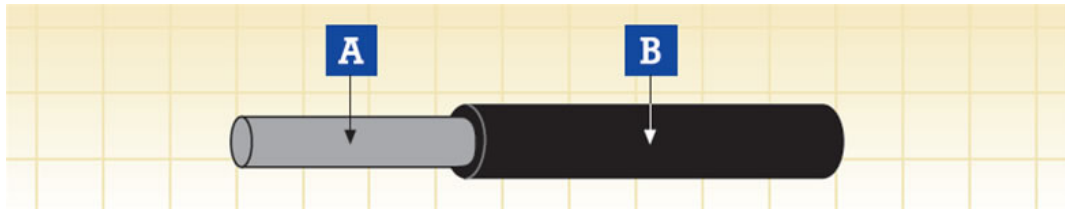
Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VDE 0472-815



NF F 63-826 Rolling Stock Cables

FIREROL Extra-Flexible Standard Wall Single Core Unsheathed Cable 1500V

NF F 63-826 (FRF-SW-1.5SU-EF)



A. Conductor B. Insulation

Application

These cables are 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, suitable for use in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 6

Insulation

Special halogen free compound

Electrical & Mechanical Properties

Nominal Voltage	1500V
Maximum Conductor Temperature	90°C/105°C
Temperature Range	-25°C~+90°C
Bending Radius	3 × Overall Diameter

Standards

NF F 63-826
NF F 16-101
BS 6853

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



NF F 63-808 Rolling Stock Cables

FRF-SW-1.5SU-EF 1500V

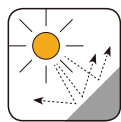
Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
10.0	320/0.20	2.3	8.4	9.5	187
16.0	512/0.20	2.3	9.7	10.8	266
25.0	800/0.20	2.3	11.0	12.2	354
35.0	1120/0.20	2.4	12.4	13.7	440
50.0	705/0.30	2.5	14.2	15.5	613
70.0	990/0.30	2.7	16.1	17.7	875
95.0	1340/0.30	2.7	18.0	19.8	1045
120.0	1690/0.30	2.8	20.0	21.9	1350
150.0	2123/0.30	2.8	21.8	23.8	1650
185.0	1470/0.40	2.9	23.7	25.9	2130



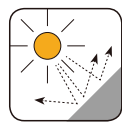
Impact Resistant



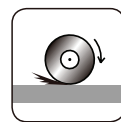
Highly Flexible



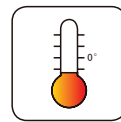
UV Resistant



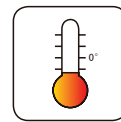
Ozone Resistant



Abrasion Retardant



Cold-resistant



Resistance To Soldering Heat



Acid&Alkaline Resistant



IRM 903 Fuel Oil Resistant



IRM 902 Mineral Oil Resistant



Fire Retardant



Flame Retardant



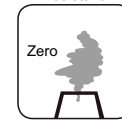
Low Toxicity



Low Corrosivity



Low Smoke Emission



Zero Halogen

NF C32-070-2.2(C2)

NF C32-070-2.1(C1)

NF X70-100/NF F63 808

IEC60754-2/EN50267-2-2/3

IEC 61034-2 / EN 50268-2

IEC 60754-1/EN 50267-2-1

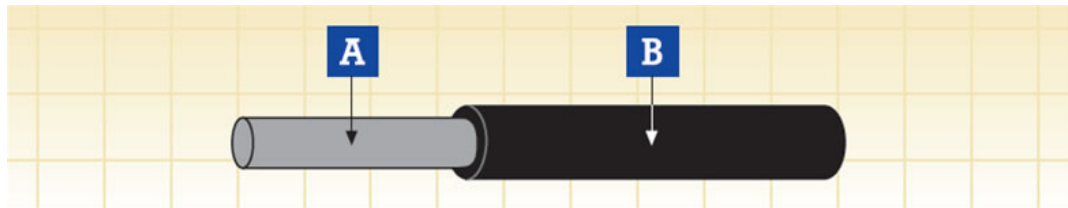
NF C32-074/VDE 0472-815

IEC 60754-2/EN50267-2-2/3



NF F 63-808 Rolling Stock Cables

FIREROL Thin Wall Single Core Unsheathed Cables 250 V NF F 63-808 (FRF-TW-025SU)



A. Conductor B. Insulation

Application

These cables are used as signal and control cable for protected installations inside and outside of rail and transport vehicles, where space and weight are an important factor, suitable for use in cable harnesses, switchboards and control panels, driver desks etc

Construction

Conductor

Stranded tinned copper wires

Insulation

Radiation crosslinkable LSZH compound

Electrical & Mechanical Properties

Nominal Voltage	250V
Maximum Conductor Temperature	105°C/125°C
Temperature Range	-40°C~+105°C
Bending Radius	5 × Overall Diameter

Standards

NF F 63-808
NF F 16-101
BS 6853
DIN 5510

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



NF F 63-808 Rolling Stock Cables

FRF-TW-025SU 250V

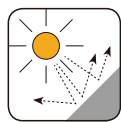
Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Overall Diameter		Weight
		Min.	Max.	
mm ²	No/mm	mm	mm	kg/km
0.38	19/0.16	1.15	1.35	4.7
0.60	19/0.20	1.30	1.55	6.5
0.93	19/0.25	1.55	1.80	9.9
1.34	19/0.30	1.80	2.00	14.0
1.82	37/0.25	2.10	2.40	18.4
2.61	37/0.30	2.50	2.80	27.8
4.32	61/0.30	3.00	3.30	44.2



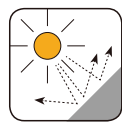
Impact Resistant



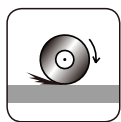
Highly Flexible



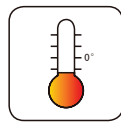
UV Resistant



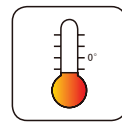
Ozone Resistant



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



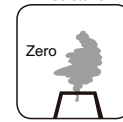
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VDE 0472-813



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/VDE 0472-816



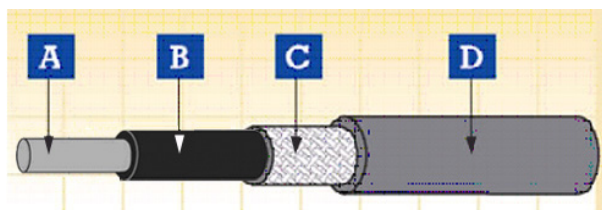
Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VDE 0472-815



NF F 63-808 Rolling Stock Cables

FIREROL Thin Wall Screened Single Core Cables With Standard Wall Sheath
250 V

NF F 63-808 (FRF-TW-025S-OS)



A. Conductor B. Insulation C. Screen D. Sheath

Application

These cables are used as signal and control cable for protected installations inside and outside of rail and transport vehicles, where space and weight are an important factor, suitable for use in cable harnesses, switchboards and control panels, driver desks etc

Construction

Conductor

Stranded tinned copper wires

Insulation

Radiation crosslinkable LSZH compound

Screen

Tinned copper braid

Sheath

Radiation crosslinkable LSZH compound

Electrical & Mechanical Properties

Nominal Voltage

250 V

Maximum Conductor Temperature

105°C/125°C

Temperature Range

-40°C~+105°C

Bending Radius

5 × Overall Diameter

Standards

NF F 63-808

NF F 16-101

BS 6853

DIN 5510

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;

Vertical flame spread of vertically mounted bunched wires or cables

NF C 32-070 2.2 (C1); VDE 0472 Teil 804

EN 50268-2; IEC 61034-2; NF C 32-073 ;

Low Smoke Emission

NF C 20-902; NF F 16 101; VDE 0472 Teil 816

EN 50267-2-1; IEC 60754-1; NF C 32-074;

Halogen Free

NF C 20-454; VDE 0472 Teil 815

EN 50267-2-2/3; IEC 60754-2; NF C 32-074;

Low Corrosivity (Acidity & Conductivity)

NF C 20-453; VDE 0472 Teil 813

EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853

Low Toxicity

NF F 63 808; BS6853; NF F 16 101

Smoke index



NF F 63-808 Rolling Stock Cables

FRF-TW-025S-OS 250 V

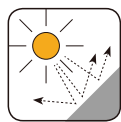
Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Overall Diameter		Weight
		Min.	Max.	
mm ²	No/mm	mm	mm	kg/km
0.38	19/0.16	2.05	2.55	11.5
0.60	19/0.20	2.30	2.80	15.0
0.93	19/0.25	2.50	3.00	18.8
1.34	19/0.30	2.70	3.20	24.2
1.82	37/0.25	3.30	3.75	32.0
2.61	37/0.30	3.60	4.20	43.0
4.32	61/0.30	4.15	4.75	63.0



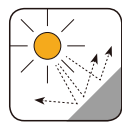
Impact Resistant



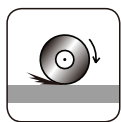
Highly Flexible



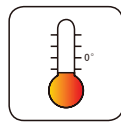
UV Resistant



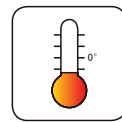
Ozone Resistant



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



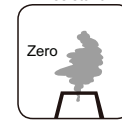
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VDE 0472-813



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/VDE 0472-816

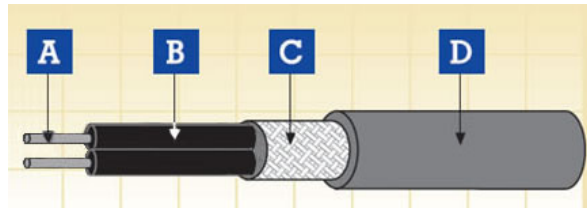


Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VDE 0472-815



NF F 63-808 Rolling Stock Cables

FIREROL Thin Wall Multicore Screened Cables With Standard Wall Sheath
250 V
NF F 63-808 (FRF-TW-025M-OS)



A. Conductor B. Insulation C. Screen D. Sheath

Application

These cables are used as signal and control cable for protected installations inside and outside of rail and transport vehicles, where space and weight are an important factor, suitable for use in cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires

Insulation

Radiation crosslinkable LSZH compound

Screen

Tinned copper braid

Sheath

Radiation crosslinkable LSZH compound

Electrical & Mechanical Properties

Nominal Voltage

250 V

Maximum Conductor Temperature

105°C/125°C

Temperature Range

-40°C~+105°C

Bending Radius

5 × Overall Diameter

Standards

NF F 63-808

NF F 16-101

BS 6853

DIN 5510

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;

Vertical flame spread of vertically mounted bunched wires or cables

NF C 32-070 2.2 (C1); VDE 0472 Teil 804

EN 50268-2; IEC 61034-2; NF C 32-073 ;

Low Smoke Emission

NF C 20-902; NF F 16 101; VDE 0472 Teil 816

Halogen Free

EN 50267-2-1; IEC 60754-1; NF C 32-074;

NF C 20-454; VDE 0472 Teil 815

Low Corrosivity (Acidity & Conductivity)

EN 50267-2-2/3; IEC 60754-2; NF C 32-074;

NF C 20-453; VDE 0472 Teil 813

EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853

Low Toxicity

NF F 63 808; BS6853; NF F 16 101

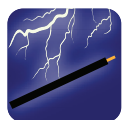
Smoke index



NF F 63-808 Rolling Stock Cables

FRF-TW-025M-OS 250 V

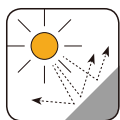
Number of Cores	Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Overall Diameter		Weight
			Min.	Max.	
-	mm ²	No/mm	mm	mm	kg/km
2	0.38	19/0.16	3.20	4.00	20.0
2	0.60	19/0.20	3.70	4.50	32.0
2	0.93	19/0.25	4.25	5.05	39.5
2	1.34	19/0.30	4.80	5.60	54.0
2	1.82	37/0.25	5.55	6.35	66.0
2	2.61	37/0.30	6.35	7.15	87.0
2	4.32	61/0.30	7.50	8.30	128.0
3	0.38	19/0.16	3.55	4.35	30.0
3	0.60	19/0.20	4.00	4.80	39.0
3	0.93	19/0.25	4.50	5.30	55.0
3	1.34	19/0.30	5.10	5.90	66.0
3	1.82	37/0.25	4.80	6.60	84.0
3	2.61	37/0.30	6.80	7.60	117.0
3	4.32	61/0.30	8.10	8.90	182.0
4	0.38	19/0.16	4.05	4.85	39.0
4	0.60	19/0.20	4.50	5.30	51.0
4	0.93	19/0.25	5.00	5.80	70.0
4	1.34	19/0.30	5.70	6.50	89.0
4	1.82	37/0.25	6.45	7.25	109.0
4	2.61	37/0.30	7.65	8.45	157.0
4	4.32	61/0.30	9.05	9.85	237.0



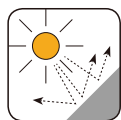
Corona Resistant



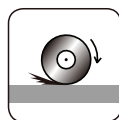
Highly Flexible



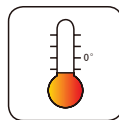
UV Resistant



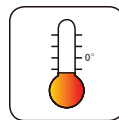
Ozone Resistant



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



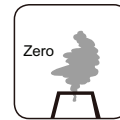
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VE 0472-813



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/VE 0472-816



Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VE 0472-815



NF F 63-827 Rolling Stock Cables

FIREROL High Temperature Single Core Unsheathed Cables 3000V NF F 63-827 (FRF-HT-3SU)



A. Conductor B. Insulation

Application

These cables are 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, suitable for use in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 5

Separator

Polyester tape

Insulation

Halogen free silicone rubber

Electrical & Mechanical Properties

Nominal Voltage	3000V
Maximum Conductor Temperature	120°C/140°C
Temperature Range	-40°C~+135°C
Bending Radius	4 × Overall Diameter

Standards

NF F 63-827
NF F 16-101

Fire Performance in general

EN 50265-2-1; IEC 60332-1-2; NF C 32-070 2.1 (C2)
 EN 50266-2-4 + EN 50305; IEC 60332-3-24;
 NF C 32-070 2.2 (C1); VDE 0472 Teil 804
 EN 50268-2; IEC 61034-2; NF C 32-073 ;
 NF C 20-902; NF F 16 101; VDE 0472 Teil 816
 EN 50267-2-1; IEC 60754-1; NF C 32-074;
 NF C 20-454; VDE 0472 Teil 815
 EN 50267-2-2/3; IEC 60754-2; NF C 32-074;
 NF C 20-453; VDE 0472 Teil 813
 EN 50305; NF X 70-100; NF F 63 808; TM1-04; BS6853
 NF F 63 808; BS6853; NF F 16 101

Vertical flame propagation for a single insulated wire or cable
Vertical flame spread of vertically mounted bunched wires or cables

Low Smoke Emission

Halogen Free

Low Corrosivity (Acidity & Conductivity)

Low Toxicity
Smoke index



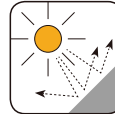
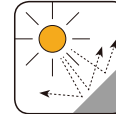
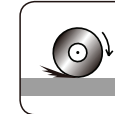

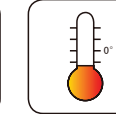








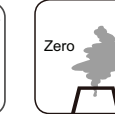


NF F 63-827 Rolling Stock Cables

FRF-HT-3SU 3000V

Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
2.5	50/0.25	2.3	6.4	7.2	65
4.0	56/0.30	2.3	7.0	7.8	85
6.0	84/0.30	2.3	7.5	8.3	108
10.0	80/0.40	2.3	8.4	9.5	160
16.0	126/0.40	2.3	9.7	10.8	230
25.0	196/0.40	2.3	11.0	12.2	310
35.0	276/0.40	2.4	12.2	13.5	420
50.0	396/0.40	2.5	14.2	15.5	580
70.0	360/0.50	2.7	16.1	17.7	790
95.0	475/0.50	2.7	18.0	19.8	1030
120.0	608/0.50	2.8	20.0	21.9	1250
150.0	756/0.50	2.8	21.8	23.8	1560
185.0	925/0.50	2.9	23.7	25.9	1880
240.0	1221/0.50	3.1	26.6	29.1	2420

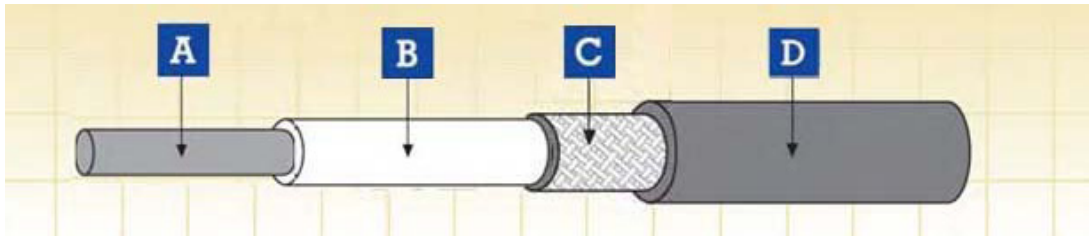


 Impact Resistant	 Highly Flexible	 UV Resistant	 Ozone Resistant	 Abrasion Retardant	 Cold-resistant	 Resistance To Soldering Heat	 Acid&Alkaline Resistant
 IRM 903 Fuel Oil Resistant	 IRM 902 Mineral Oil Resistant	 Fire Retardant NF C32-070-2.2(C2) IEC60332-3-24/EN50266-2-4	 Flame Retardant NF C32-070-2.1(C1) IEC60332-1-2/EN50265-2-1	 Low Toxicity NF X70-100/NF F63 808 TM1-04/BS 6853	 Low Corrosivity IEC60754-2/EN50267-2-2/3 NF C32-074/VDE 0472-813	 Low Smoke Emission IEC 61034-2 / EN 50268-2 NF C32-073/VDE 0472-816	 Zero Halogen IEC 60754-1/EN 50267-2-1 NF C32-074/VDE 0472-815



NF F 63-827 Rolling Stock Cables

FIREROL Extra-Flexible High Temperature Single Core Screened & Sheathed Cables 3000V NF F 63-827 (FRF-HT-3S-EF)



A. Conductor B. Insulation C. Reinforcement D. Sheath

Application

These cables are 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, suitable for used in control, auxiliary and main circuit wiring such as cable harnesses, switchboards and control panels, driver desks etc.

Construction

Conductor

Stranded tinned copper wires to IEC 60228 Class 6

Insulation

Halogen free silicone rubber

Reinforcement

Textile braid

Sheath

Halogen free silicone rubber

Electrical & Mechanical Properties

Nominal Voltage	3000V
Maximum Conductor Temperature	+120°C/+140°C
Temperature Range	-40°C~135°C
Bending Radius	3 × Overall Diameter

Standards

NF F 63-827
NF F 16-101

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



NF F 63-827 Rolling Stock Cables

FRF-HT-3S-EF 3000V

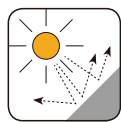
Nominal Cross Sectional Area	Number & Nominal Diameter of Strands	Nominal Insulation Thickness	Overall Diameter		Weight
			Min.	Max.	
mm ²	No/mm	mm	mm	mm	kg/km
25.0	800/0.20	2.8	12.0	13.2	390
35.0	1120/0.20	2.8	13.2	14.7	500
50.0	705/0.30	3.0	15.2	16.7	680
70.0	990/0.30	3.2	17.1	18.8	930
95.0	1340/0.30	3.2	19.0	21.0	1150
120.0	1690/0.30	3.3	21.0	23.1	1470
150.0	2123/0.30	3.3	22.8	25.0	1800
185.0	1470/0.40	3.4	24.7	27.1	2240
240.0	1905/0.40	3.6	27.6	31.2	2820



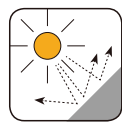
Impact Resistant



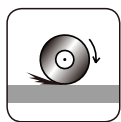
Highly Flexible



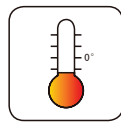
UV Resistant



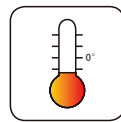
Ozone Resistant



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(C2)
IEC60332-3-24/EN50266-2-4



Flame Retardant
NF C32-070-2.1(C1)
IEC60332-1-2/EN50265-2-1



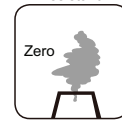
Low Toxicity
NF X70-100/NF F63 808
TM1-04/BS 6853



Low Corrosivity
IEC60754-2/EN50267-2-2/3
NF C32-074/VDE 0472-813



Low Smoke Emission
IEC 61034-2 / EN 50268-2
NF C32-073/VDE 0472-816



Zero Halogen
IEC 60754-1/EN 50267-2-1
NF C32-074/VDE 0472-815