with tinned conductor

Halogen-free
Special Rubber-insulated Cables

SIENOPYR(90) (N)HXSGAFHXÖ 1,8/3 kV
acc. VDE and UL

Halogen-free cables are used for preventive fire protection in buildings, plants and installations where large numbers of people concregate and/or valuable equipment is located. The low smoke emmission facilitates rescue and fire-fighting. Special insulating and sheathing compounds prevent fire from spreading along the cables. Non-corrosive gases do not cause secondary damage.
SIENOPYR(R)-cables contribute considerably to both.

Application
These cables are intended for use in:

· rail vehicles to having fire protection grades 1 to 4 to DIN 5510. These cables may be employed both in- and outdoors, as long as they are out of hand´s reach.

The outer cover serves to mechanically protect the insulation respectively the screen during installation. The outer cover does not offer protection against electric shock. Therefore precautionary measures must ensure that the unscreened cables are not normally accessible by hand during operation above 1000 V. The screen must be connected with earth potential.
The cable ends must be protected against the ingress of water.

· conduits which are either surface-mounted, embedded on or in or under plaster, or enclosed within electrical installation ducts or within equipment housings.

· switchgear and distribution boards up to 1000 V for unfused connections (DIN VDE 0100-520).

- switch gear and distribution boards and elec. machinery for internal wiring as AWM (appliance wiring material acc. to UL 758)

In other respects, DIN VDE 0298-3 applies.

Halogen-free Special Rubber-insulated Cables

with tinned conductor

SIENOPYR(90) (N)HXSGAFHXÖ 1,8/3 kV
acc. VDE and UL

Technical details

Design

based on DIN VDE 0250 part 602

- finely stranded conductor of tinne copper wires, class 5 according t DIN VDE 0295 and IEC 60228
- Insulation made of a halogen-free cross-linked EPR compounc (Ethylene propylene rubber)
- Cover made of a halogen-free cross-linked EVA compound whicl provides mechanical protectior during installatior (Ethylene-vinylacetat-copolymer) Color of the outer cover: black

Approval

- VDE: VDE-REG-NR 9112
- UL: AWM Style 3686 acc. UL 758

Marking, e.g.:
SIENOPYR(90) (N)HXSGAFHXOE 25 1,8/3 kV

Temperatures

Maximum permissible operation temperature at conductor	20 000 h	90 °C
Maximum permissible short-circuit temperature at conductor	max. 5 s	200 °C
Lowest permissible temperatures for operation, handling, installation, transport and storage	flexing	-25 °C
	fixed	-40 °C

Current-carrying capacity

The values refer to a cable under continuous operation, the shown installation method, ambient temperature 30 °C

Special characteristics

- Burning behavio Tested to DIN EN 50265-2-1 (VDE 0482 part 265-2-1 and to DIN EN 50266-2-4 (VDE 0482 part 266-2-4
- Halogen free Tested to DIN EN 50267-2-2 (VDE 0482 part 267-2-2
- Low smoke Tested to DIN EN 50268-2 (VDE 0482 part 268-2
- Oil resistant Tested to DIN EN 60811-2-1 (VDE 0473 part 811-2-1

Minimum bending radii

	without screen
Fixed installatior	6 d
Free-flexing	10 d
Free-flexing in bogie e.g. between carriage an traction motor	8 d

d = max. outer diameter of cable

Continuous tensile stress

Max. 15 N/mm² refers to conductor´s cross sectional area

Voltages

Rated voltage of cable (AC) U_0/U 1,8/3 kV

Maximum permissible operating voltage $U_{b\,max}$

- single-phase and three-phase AC operation line-earth / line-line 2,1/3,6 kV
- DC operation line-earth / line-line 2,7/5,4 kV

AC test voltage (test duration) 6 kV (5 min.)

For other ambient temperatures, the current rating is to calculate by applying the following factors f:

°C	10	15	20	25	**30**	35	40	45	50	55	60	65	70	75	80
f	1.15	1.12	1.08	1.04	**1.00**	0.96	0.91	0.87	0.82	0.76	0.71	0.65	0.58	0.50	0.41

Halogen-free Special Rubber-insulated Cables

SIENOPYR(90)

Selection data

with tinned conductor

Conductor rated cross-section	Order-No.	Con-ductor diameter (approx.)	Outer diameter of cable		Minimum bending radii			Net weight	perm. short-circuit current (1 s)	Fire load
			min.	max.	fixed installa-tion	free-flexing	in bogie	per 1000 m approx.	*)	
mm²		mm	mm	mm	mm	mm	mm	kg	kA	kJ/m
(N)HXSGAFHXÖ 1,8/3 kV (without screen)										
1,5	5DF8	1,5	5,4	6,2	37	62	50	47	0,18	594
2,5	5DF8 053	1,9	5,9	6,6	40	66	53	60	0,31	660
4	5DF8	2,5	6,5	7,3	44	73	58	85	0,49	785
6	5DF8 073	3,2	7,1	7,9	47	79	63	103	0,73	874
10	5DF8 103	4,1	8,5	9,3	56	93	74	157	1,22	1191
16	5DF8 123	5,6	9,9	11,1	67	111	89	233	1,95	1467
25	5DF8 133	6,8	12,1	13,3	80	133	106	351	3,05	2160
35	5DF8	8,1	13,2	14,4	86	144	115	454	4,27	2451
50	5DF8 153	9,6	14,6	16,1	97	161	129	610	6,10	2847
70	5DF8	11,2	16,0	17,5	105	175	140	810	8,54	3145
95	5DF8 173	13,2	19,0	20,5	123	205	164	1065	11,59	4122
120	5DF8	14,9	20,6	22,1	133	221	177	1318	14,64	4549
150	5DF8	16,6	22,7	24,2	145	242	194	1611	18,30	5249
185	5DF8	18,0	24,5	26,0	156	260	208	1946	22,57	6107
240	5DF8	21,2	28,0	30,2	181	302	242	2540	29,28	7461

*) Permissible short-circuit currents I_{thz} for other break times t_k up to 5 s are calculated using the formula $I_{thz} = I_{thr}\sqrt{\frac{1s}{t_k}}$