

**CABLES****Type: HYDROFIRM (T)**

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**German Cathodic Protection****Application**

HYDROFIRM (T) cables are intended for continuous immersion in drinking or ground water at depths up to 500 m, for use under medium mechanical stresses, and for use as a connection cable for electrical equipment. They may also be submerged in rain, sea, or surface water, as well as in industrial process or cooling water. However, these cables have limited suitability for mixed water types as defined by DIN 4045 and 4046.

They are not suitable for use in water containing more than 0.5 mg/l of chlorine.

Suitability for continuous immersion in water is verified by a certificate that includes manufacturing supervision from the VDE Test and Certification Institute (German Institute of Electrical Engineers).

Whereas tests conducted by the Federal Authority of Materials Testing (BAM), based on the KTW recommendations (Area C, "Installation Materials"), prove the suitability of this cable's use in drinking water.

HYDROFIRM (T) cables may be used indoors and outdoors, but not in areas exposed to explosion hazards. For protected, fixed installation within equipment, pipes or wells, these cables may be operated with an AC voltage to 1000V or a DC voltage to 750V dependent on earthing.

**Technical details**

The design is based on DIN VDE 0282 Part 810. HYDROFIRM (T) cables are at least equivalent to type 07RN rubber-insulated flexible cables with respect to their electrical and mechanical properties.

Finely stranded conductor of bare copper wires, Class 5 to DIN VDE 0295 and IEC 228

Insulation and sheath consist of special EPR-based materials, adapted for use in ground water and drinking water.

Insulation: Special rubber compound, at least equivalent to compound type 3G13 in DIN VDE 0207, colour coding to DIN VDE 0293.

Inner sheath (for sizes >16mm<sup>2</sup> or more than 5 conductors): Special rubber compound at least equivalent to compound type GM1b to DIN VDE 0207.

Outer sheath: Special rubber compound, mechanical and thermal properties equivalent/identical to compound type 5GM3 to DIN VDE 0207 coloured blue.

Tensile strength: The maximum allowable tensile stress is 15N/mm<sup>2</sup>.

**Voltage rating**

Rated Voltage:  $U_0/U = 450/750$  V

Max. operating voltages in: 3 phase AC operation  $U_0/U = 475/825$  V

DC operation  $U_0/U = 619/1238$  V

AC test voltage = 2.5kV



Cores and Cross-sectional area	Approx. Number of strands	Max. Strand diameter	Approx. Core diameter	Overall diameter		Approx. Cable Weight
				min	max	
mm <sup>2</sup>		mm	mm	mm	mm	kg/km
1 x 6	75	0.31	3.2	7.5	8.8	120
1 x 10	77	0.41	4.1	9.5	11.0	180
1 x 16	123	0.41	5.6	11.5	13.5	265
1 x 25	190	0.41	6.8	13.5	15.5	380
1 x 35	268	0.41	8.1	15.0	17.5	500
1 x 50	384	0.41	9.6	17.5	20.0	690
1 x 70	545	0.41	11.2	20.0	22.5	920
1 x 95	724	0.41	13.2	22.5	25.0	1180
1 x 120	926	0.41	14.9	24.0	26.0	1470
<b>HYDROFIRM (T) round, without ground conductor</b>						
3 x 1.5	28	0.26	1.5	9.5	11.0	137
3 x 2.5	45	0.26	1.9	11.0	13.0	197
3 x 4	51	0.31	2.5	13.0	15.0	280
3 x 6	75	0.31	3.2	14.5	16.0	370
3 x 10	77	0.41	4.1	19.0	21.5	665
3 x 16	123	0.41	5.6	23.5	26.0	1000
3 x 25	190	0.41	6.8	28.5	31.0	1440
3 x 35	268	0.41	8.1	32.0	35.5	1870
3 x 50	384	0.41	9.6	37.0	41.0	2560
3 x 70	545	0.41	11.2	42.0	45.5	3370
<b>HYDROFIRM (T) round, with ground conductor</b>						
3 G 1.5	28	0.26	1.5	9.5	11.0	137
3 G 2.5	45	0.26	1.9	11.0	13.0	197
3 G 4	51	0.31	2.5	13.0	15.0	280
<b>HYDROFIRM (T) round, with ground conductor</b>						
4 G 1.5	28	0.26	1.5	10.0	12.0	175
4 G 2.5	45	0.26	1.9	12.0	14.0	250
4 G 4	51	0.31	2.5	14.0	16.0	375
4 G 6	75	0.31	3.2	15.5	18.0	475
4 G 10	77	0.41	4.1	21.0	23.5	825
4 G 16	123	0.41	5.6	25.5	29.0	1250
4 G 25	190	0.41	6.8	31.0	34.0	1800
4 G 35	268	0.41	8.1	35.0	39.0	2360
4 G 50	384	0.41	9.6	41.0	45.0	3250
4 G 70	545	0.41	11.2	46.5	50.0	4300
4 G 95	724	0.41	13.2	51.6	55.6	5650
4 G 120	926	0.41	14.9	56.1	56.1	6950

Core colour code

1 core (black)

3 cores (green-yellow, brown, blue)

4 cores (green-yellow, brown, blue, black)