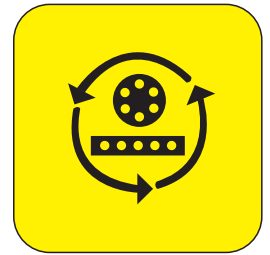


# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### AC MOTOR DATA

(approximate data for 3 phase AC motors)

HP	kW	approx. PF & EFFY	380 V line amp	500 V line amp	HP	kW	approx. PF & EFFY	380 V line amp	500 V line amp
1	0,74	58,3	1,95	1,48	25	18,6	74,6	38,0	28,9
1,5	1,1	62,0	2,75	2,09	30	22,2	75,2	45,1	34,4
2	1,48	64,0	3,55	2,70	35	27,0	75,6	52,5	39,9
2,5	1,86	65,4	4,34	3,30	40	29,6	76,0	59,6	45,3
3	2,23	66,5	5,11	3,88	45	33,3	76,2	67,0	50,9
4	2,97	68,0	6,66	5,07	50	37,0	76,5	74,1	56,4
5	3,72	69,0	8,22	6,25	60	44,5	77,0	88,4	67,1
6	4,45	69,8	9,75	7,40	70	52,0	77,4	103	77,9
7	5,1	70,4	11,3	8,59	75	55,5	77,6	110	83,0
7,5	5,6	70,7	12,0	9,15	80	59,2	77,7	117	88,5
8	5,95	71,0	12,8	9,70	90	66,5	77,9	131	99,8
9	6,7	71,3	14,3	10,8	100	74,6	78,2	145	110
10	7,46	71,8	15,8	12,0	125	93,0	78,5	181	140
12,5	9,3	72,6	19,6	14,9	150	111,7	79,0	215	163
15	11,17	73,2	23,3	17,7	175	129,2	79,2	250	190
20	14,9	74,0	30,7	23,3	200	149,0	79,5	285	217

For approximate current rating related to other voltages, multiply 380 V rating by

0,88 to obtain 430 V	0,75 to obtain 525 V	0,69 to obtain 550 V
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TABLE 1

### DC MOTOR DATA

HP	Effy. %	110 V	115 V	200 V	220 V	230 V	250 V	400 V	440 V	460 V	500 V	600 V	HP
		AMPS											
1	76	8,92	8,53	4,90	4,45	4,26	3,92	2,45	2,23	2,13	1,96	1,64	1
1,5	77	13,2	12,6	7,26	6,60	6,32	5,82	3,64	3,30	3,16	2,91	2,42	1,5
2	7	17,5	16,7	9,60	8,74	8,35	7,68	4,80	4,37	4,17	3,84	3,20	2
2,5	79	21,5	20,5	11,8	10,7	10,3	9,45	5,90	5,37	5,13	4,73	3,94	2,5
3	80	25,4	24,3	14,0	12,7	12,2	11,2	7,00	6,35	6,08	5,60	4,66	3
4	82	33,1	31,7	18,2	16,6	15,8	14,6	9,10	8,32	7,91	7,28	6,07	4
5	83	40,9	39,2	22,5	20,4	19,6	18,0	11,3	10,2	9,79	9,00	7,50	5
6	84	48,5	46,3	26,6	24,2	23,2	21,3	13,3	12,1	11,6	10,7	8,88	6
7	84	56,6	53,2	31,2	28,3	27,1	25,0	15,6	14,2	13,5	12,5	10,4	7
7,5	84,5	60,2	57,6	33,1	30,1	28,8	26,5	16,6	15,1	14,4	13,2	11,1	7,5
8	85	63,8	61,1	35,1	31,9	30,3	28,1	17,6	16,0	15,3	14,1	11,7	8
9	85	71,8	68,7	39,9	35,9	34,4	31,6	19,8	18,0	17,2	15,8	13,2	9
10	86	79,0	75,5	43,4	39,4	37,7	34,7	21,7	19,7	18,9	17,3	14,5	10
12,5	86	98,6	94,3	54,3	49,3	47,2	43,4	27,1	24,7	23,6	21,7	18,1	12,5
15	87	117	112	64,4	58,5	56,0	51,5	32,2	29,3	28,0	25,8	21,5	15
20	87	156	149	85,7	78,0	74,6	68,5	42,9	39,0	37,3	34,3	28,6	20
25	88	193	184	106	96,4	92,2	84,8	53,0	48,2	46,1	42,4	35,3	25
30	88	231	221	127	116	111	102	63,5	58,0	55,3	50,9	42,4	30
35	88	270	258	149	136	129	119	74,5	68,0	64,6	59,4	49,5	35
40	89	305	292	168	153	146	135	84,0	76,5	73,0	67,1	55,9	40
45	89	342	328	188	171	164	151	94,0	85,5	81,9	75,4	62,8	45
50	90	378	361	208	189	181	167	104	94,5	90,3	83,0	69,2	50
60	90	452	433	249	227	216	200	125	114	108	99,5	83,0	60
70	91	522	499	287	261	250	230	144	131	125	115	95,6	70
75	91	560	535	308	280	267	246	154	140	134	123	102	75
80	92	590	564	324	295	282	259	162	148	141	130	108	80
90	92	664	635	365	332	318	292	183	166	159	146	122	90
100	92	738	706	406	369	353	325	203	185	176	162	135	100
125	93	911	872	502	456	436	402	251	228	218	201	167	125
150	93	1100	1050	603	548	525	482	302	274	262	241	201	150
175	93	1280	1220	704	640	611	563	352	320	306	281	234	175
200	93	1460	1397	804	730	699	642	402	365	349	321	268	200

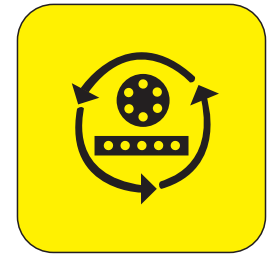
All quoted data is approximate and not binding.

TABLE 2

# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### CURRENT CAPACITY TABLE

incl. Derating Tables and Voltage Drop Calculation

#### Max. current capacity of insulated conductors

According to VDE Standards 0100 / 0298 Part 3 / 4

Explanation of groups:

Group 1: Up to 3 conductors in conduit.

Group 2: Flat underplaster and moisture-proof conductors, armoured wires, multi-core conductors in air, and for the connection of movable apparatus (incl. trailing cables). **POWERMITE**

Group 3: Single-core conductor in air with a clearance between conductors at least equal to the diameter, and for the connection of movable apparatus. **POWERMITE**

Nominal area	Group 1		Group 2		Group 3	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
0,75	-	-	13	-	16	-
1	12	-	16	-	20	-
1,5	16	-	20	-	25	-
2,5	21	16	27	21	34	27
4	27	21	36	29	45	35
6	35	27	47	37	57	45
10	48	38	65	51	78	61
16	65	51	87	68	104	82
25	88	69	115	90	137	107
35	110	86	143	112	168	132
50	140	110	178	140	210	165
70	-	-	220	173	260	206
95	-	-	265	210	310	245
120	-	-	310	245	365	285
150	-	-	355	280	415	330
185	-	-	405	320	475	375
240	-	-	480	380	560	440
300	-	-	555	435	645	510
400	-	-	660	-	770	605
500	-	-	755	-	880	690

#### Derating for POWERMITE cables: +

Ambient temperatures up to °C	30	35	40	45	50	55	60	65	70	75
FACTOR to be applied to above table values	1	0,95	0,89	0,84	0,77	0,71	0,63	0,55	0,45	0,32

Reeled and bunched cables have a derating factor of 0,77 per layer.

#### Derating for POWERMITE heat resisting cables: \*

Ambient temperatures up to °C	145	150	155	160	165	170	175
FACTOR to be applied to above table values	1	0,92	0,85	0,75	0,65	0,53	0,38

#### For the correct current rating of your conductor size, proceed as stated below:

1. Select a conductor size as per above current capacity table.
2. Check voltage drop requirements.
3. Take ambient temperature and bunching into account.
4. Consider the duty cycle of your machinery.

$$\text{Voltage drop formula: Cross section} = \frac{\text{Ampere} \times \text{length}}{40 \times \text{Volt}} = \text{mm}^2$$

- length = length in metres from feeder point to furthest end-point.
- $\frac{1}{40} = \frac{\sqrt{3} \times \text{power factor}}{\text{copper conductivity}}$
- Volt = percentage of voltage drop allowable, stated in Volt.

The above formula will give you the necessary cross-section in mm<sup>2</sup> to operate your machinery within the voltage drop limits. Please note that the conductor size chosen should not be less than the figures in the above table.

If your conductors have to feed machinery with a duty cycle of 40%, then you can multiply the table values by approx.: 1,05 for core sizes 1 - 6mm<sup>2</sup>, 1,24 for core sizes 10 - 50mm<sup>2</sup>, and calculate thereafter. 1,46 for core sizes 95 - 240mm<sup>2</sup>.

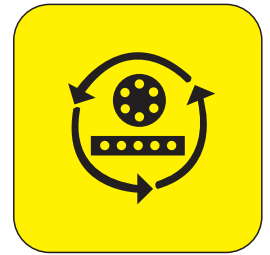
CONDUCTIVITY FACTORS: 56 Copper 34 Aluminium  
16 Zinc 7-10 Iron

40% ED means 4 min ON – 6 min OFF in a 10 min cycle

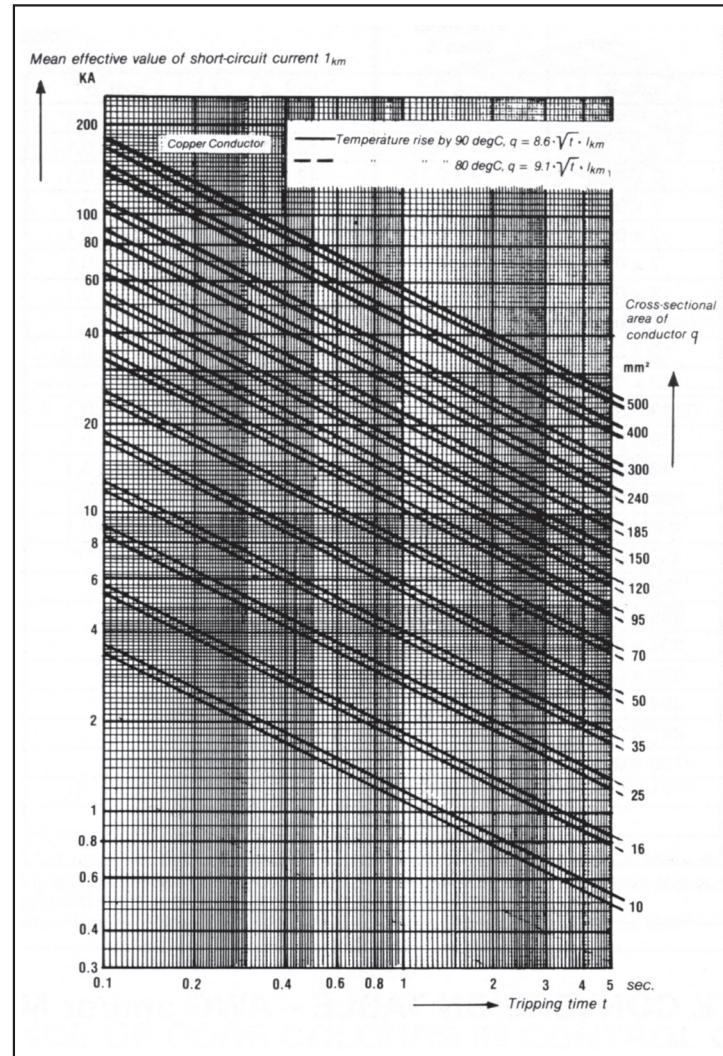
# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### PERMISSIBLE FAULT LEVEL CURRENT ON POWERMITE FLEXIBLE CABLES



CABLE SIZE	FAULT LEVEL 1 sec	FAULT LEVEL 0,1 sec
4 x 10 mm <sup>2</sup>	1,4 kA	3,7 kA
4 x 16 mm <sup>2</sup>	1,8 kA	6,0 kA
4 x 25 mm <sup>2</sup>	2,9 kA	9,0 kA
4 x 35 mm <sup>2</sup>	4,0 kA	14,0 kA
4 x 50 mm <sup>2</sup>	5,9 kA	19,0 kA
4 x 70 mm <sup>2</sup>	7,2 kA	27,0 kA
4 x 95 mm <sup>2</sup>	11,5 kA	34,0 kA
4 x 120 mm <sup>2</sup>	13,5 kA	45,0 kA
4 x 150 mm <sup>2</sup>	17,5 kA	55,0 kA
4 x 185 mm <sup>2</sup>	22,0 kA	70,0 kA

TABLE 4

A quick HRC fuse breaks in approximately 0,006 sec.  
A quick circuit breaker breaks in approximately 0,02 sec.

#### FORMULA

$I$  = Amperage in kA

$P$  = Fault level in VA

$$I = \frac{P \text{ in VA}}{\text{Volt} \times 1,73 \times 1000} = \text{kA}$$

Formula results to match graph-readings.

**NOTE:** Tinned stranded conductors have thermally less overload. Check that cables offered are within voltage range specified.

### CONVERSIONS

POWERMITE CONVERSION	POLES RELATED TO REV/MINUTE	
HORSE POWER TO KILOWATT : Multiply by 0,746	2 POLES = 3 000 R.P.M.	10 POLES = 600 R.P.M.
KILOWATT TO HORSE POWER : Multiply by 1,341	4 POLES = 1 500 R.P.M.	12 POLES = 500 R.P.M.
FAHRENHEIT TO CELSIUS : Subtract 32 and x by 5 and ÷ by 9	6 POLES = 1 000 R.P.M.	16 POLES = 375 R.P.M.
CELSIUS TO FAHRENHEIT : Multiply by 9 and ÷ by 5 and add 32	8 POLES = 750 R.P.M.	

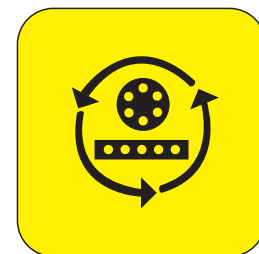
All quoted data is approximate and not binding.

TABLE 5  
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# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### STRANDING TABLE

rated cross section mm <sup>2</sup>	stranding to BS6360/ VDE 0295 class 2	multi-wire	stranding to BS6360/ VDE 0295 class 5	extra-fine wire stranding to BS6360/VDE 0295 class 6			
	col. 1	col. 2	col. 3	col. 4	col. 5	col. 6	col. 7
0,14	–	–	18 x 0,10	18 x 0,10	18 x 0,1	36 x 0,07	72 x 0,05
0,25	–	–	14 x 0,15	32 x 0,10	32 x 0,1	65 x 0,07	128 x 0,05
0,34	–	7 x 0,25	19 x 0,15	42 x 0,10	42 x 0,1	88 x 0,07	174 x 0,05
0,38	–	7 x 0,27	12 x 0,20	21 x 0,15	48 x 0,1	100 x 0,07	194 x 0,05
0,5	7 x 0,30	7 x 0,37	16 x 0,20	28 x 0,15	64 x 0,1	131 x 0,07	256 x 0,05
0,75	7 x 0,37	7 x 0,37	24 x 0,20	42 x 0,15	96 x 0,1	195 x 0,07	384 x 0,05
1,0	7 x 0,43	7 x 0,43	32 x 0,20	56 x 0,15	128 x 0,1	260 x 0,07	512 x 0,05
1,5	7 x 0,52	7 x 0,52	30 x 0,25	84 x 0,15	192 x 0,1	392 x 0,07	768 x 0,05
2,5	7 x 0,67	19 x 0,41	50 x 0,25	140 x 0,15	320 x 0,1	651 x 0,07	1280 x 0,05
4	7 x 0,85	19 x 0,52	56 x 0,30	224 x 0,15	512 x 0,1	1040 x 0,07	–
6	7 x 1,05	19 x 0,64	84 x 0,30	192 x 0,20	768 x 0,1	1560 x 0,07	–
10	7 x 1,35	49 x 0,51	80 x 0,40	320 x 0,20	1280 x 0,1	2600 x 0,07	–
16	7 x 1,70	49 x 0,65	128 x 0,40	512 x 0,20	2048 x 0,1	4116 x 0,07	–
25	7 x 2,13	84 x 0,62	200 x 0,40	800 x 0,20	3200 x 0,1	6370 x 0,07	–
35	7 x 2,52	133 x 0,58	280 x 0,40	1120 x 0,20	4410 x 0,1	9100 x 0,07	–
50	19 x 1,83	133 x 0,69	400 x 0,40	705 x 0,30	–	–	–
70	19 x 2,17	189 x 0,69	356 x 0,50	990 x 0,30	–	–	–
95	19 x 2,52	259 x 0,69	485 x 0,50	1340 x 0,30	–	–	–
120	37 x 2,03	336 x 0,67	614 x 0,50	1690 x 0,30	–	–	–
150	37 x 2,27	392 x 0,69	765 x 0,50	2123 x 0,30	–	–	–
185	37 x 2,52	494 x 0,69	944 x 0,50	1470 x 0,40	–	–	–
240	61 x 2,24	627 x 0,70	1225 x 0,50	1905 x 0,40	–	–	–
300	61 x 2,50	790 x 0,70	1530 x 0,50	2385 x 0,40	–	–	–
400	61 x 2,89	–	2035 x 0,50	–	–	–	–
500	61 x 3,23	–	1768 x 0,60	–	–	–	–
630	91 x 2,97	–	228 x 0,6	–	–	–	–

The quantity of strands stipulated above is approximate, as VDE or BS only specifies the diameter of the stranding and the resistance value of the rated cross-section!

TABLE 6

## POWERMITE CONVERSION TABLE – AWG and/or MCM to mm<sup>2</sup>

### American to metric conductor sizes

These must not be confused with the American-Steel-Wire-Gauge-Numbers.

Conductor size AWG or MCM	Conductor diameter mm	Conductor cross-section area mm <sup>2</sup>	Conductor resistance /km	Conductor size AWG	Conductor diameter mm	Conductor cross-section area mm <sup>2</sup>	Conductor resistance /km	Conductor size AWG	Conductor diameter mm	Conductor cross-section area mm <sup>2</sup>	Conductor resistance /km
1000MCM	29,3	507	0,035	5	4,62	16,8	1,12	20	0,812	0,519	34,5
750MCM	25,4	380	0,05	6	4,11	13,3	1,44	21	0,723	0,412	44,0
500MCM	20,7	253,4	0,07	7	3,67	10,6	1,78	22	0,644	0,235	54,8
400MCM	18,5	202,7	0,086	8	3,26	8,35	2,36	23	0,573	0,259	70,1
350MCM	17,3	177,3	0,10	9	2,91	6,62	2,77	24	0,511	0,205	89,2
300MCM	16,0	152	0,12	10	2,59	5,27	3,64	25	0,455	0,163	111
250MCM	14,6	127	0,14	11	2,30	4,15	4,44	26	0,405	0,128	146
4/0	11,68	107,2	0,18	12	2,05	3,31	5,41	27	0,361	0,102	176
3/0	10,40	85,0	0,23	13	1,83	2,63	7,02	28	0,321	0,0804	232
2/0	9,27	67,5	0,29	14	1,63	2,08	8,79	29	0,286	0,0646	282
0	8,25	53,4	0,37	15	1,45	1,65	11,2	30	0,255	0,0503	350
1	7,35	42,4	0,47	16	1,29	1,31	14,7	31	0,227	0,0400	446
2	6,54	33,6	0,57	17	1,15	1,04	17,8	32	0,202	0,0320	578
3	5,83	26,7	0,71	18	1,024	0,823	23,0	33	0,180	0,0252	710
4	5,19	21,2	0,91	19	0,912	0,653	28,3	34	0,160	0,0200	899

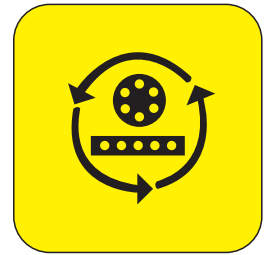
All quoted data is approximate and not binding.

TABLE 7  
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# TECHNICAL DATA

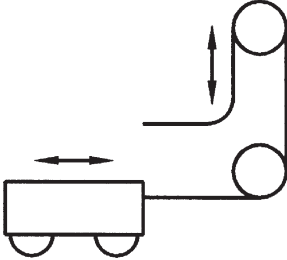
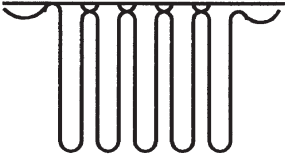
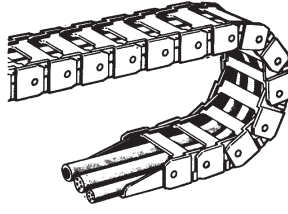
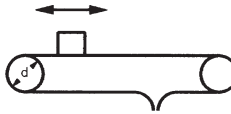
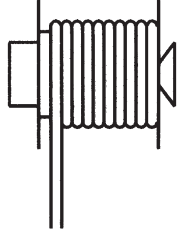
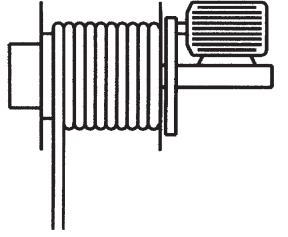
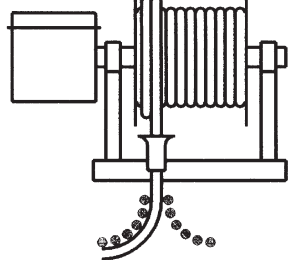
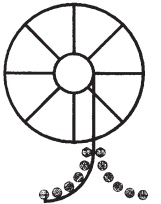
INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### BASIC RULES FOR BENDING FLEX. CABLES

UNDER FORCED GUIDED CONDITIONS  
15 x OD of cable = bending radius of cable

<p>1 FORCED CABLE GUIDING</p>  <p>LOW VOLTAGE FLEXIBLE CABLE INSTALLATION OVER SHEAVES MIN. I.D. FOR SHEAVES = 15 x O.D. OF CABLE</p>	<p>2 FESTOONING</p>  <p>LOW VOLTAGE MOBILE INSTALLATION O.D. OF CABLE FORMER = 10 x O.D. OF CABLE CABLES ARE NOT TO ACT AS BUFFERS!</p>	<p>3 ENERGY - DRAGCHAIN</p>  <p>LOW VOLTAGE FLEXIBLE CABLE INSTALLATION - MIN. BENDING DIAMETER = 12.5 x LARGEST CABLE / HOSE O.D. FITTED INSIDE THE CHAIN</p>	<p>4 CABLE KULI</p>  <p>LOW VOLTAGE FLEXIBLE CABLE INSTALLATION - MIN. I.D. FOR SHEAVES = 20 x LARGEST CABLE / HOSE OUTSIDE DIAMETER</p>
<p>5 CYLINDRICAL C. R. D. WILD WIND</p>  <p>LOW VOLTAGE FLEXIBLE INSTALLATION IF CABLE O.D. IS UNDER 21 mm MIN. REEL I.D. = 12.5 x O.D. OF CABLE</p>	<p>6 CYLINDRICAL C. R. D. WILD WIND</p>  <p>LOW VOLTAGE FLEXIBLE INSTALLATION IF CABLE O.D. IS OVER 21 mm MIN. REEL I.D. = 15 x O.D. OF CABLE</p>	<p>7 CYLINDRICAL C. R. D. SPOOLED</p>  <p>LOW VOLTAGE FLEXIBLE CABLE S BENDS AND REROUTING INTO ANOTHER PLANE MIN. I.D. OF REEL &amp; GUIDE ROLLERS = 20 x O.D. OF CABLE</p>	<p>8 MONOSPIRAL C. R. D.</p>  <p>HIGH VOLTAGE FLEXIBLE INSTALLATION MIN. I.D. OF REEL &amp; GUIDE ROLLERS = 25 x O.D. OF CABLE</p>

**If HT cable is used on applications 1-7 use min. O.D. of application 8. If your application does not allow the specified I.D. please consult us!**  
The above is only applicable in ambient temperatures - 20 °C to + 80 °C and without exceeding the tensile stress of 15 N/mm<sup>2</sup> taking only the power core into consideration. **Specially designed cables can exceed above minimum data.**  
Installation instructions for forced guided cable TRD and TRHT are available, please ask for instruction No. CA00. T. 001

TABLE 8

## SEQUENCE OF CORE COLOURS IN CONTROL CABLES

similar to DIN/VDE 0293

0 green-yellow	11 red-white	22 orange-red	32 red-green	43 red-blue	53 black-yellow	
1 black	12 blue-white	23 brown-red	33 grey-green	44 white-blue	54 black-red	64 red-grey
2 blue	13 yellow-white		34 violet-green	45 orange-blue	55 black-green	65 blue-grey
3 brown	14 green-white	24 red-black	35 white-green	46 brown-blue	56 black-blue	66 yellow-grey
4 beige	15 violet-white	25 blue-black	36 orange-green		57 black-violet	67 green-grey
5 yellow	16 orange-white	26 yellow-black	37 brown-green	47 yellow-violet		68 violet-grey
6 green	17 brown-white	27 green-black		48 green-violet	58 grey-white	69 white-grey
7 violet		28 violet-black	38 red-yellow	49 white-violet	59 grey-black	70 orange-grey
8 pink	18 blue-red	29 white-black	39 blue-yellow	50 orange-violet	60 grey-yellow	
9 orange	19 yellow-red	30 orange-black	40 violet-yellow	51 brown-violet	61 grey-red	
10 white	20 green-red	31 brown-black	41 white-yellow		62 grey-blue	
	21 white-red		42 brown-yellow	52 black-white	63 grey-violet	

according to DIN 47100

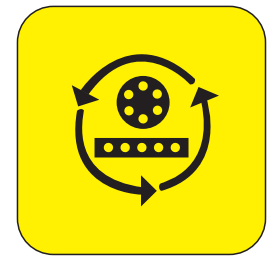
1 white	8 red	15 white-yellow	22 brown-blue	29 pink-green	36 yellow-black	43 blue-black
2 brown	9 black	16 yellow-brown	23 white-red	30 yellow-pink	37 grey-blue	44 red-black
3 green	10 violet	17 white-grey	24 brown-red	31 green-blue	38 pink-blue	45 cores and more repetition of colours
4 yellow	11 grey-pink	18 grey-brown	25 white-black	32 yellow-blue	39 grey-pink	
5 grey	12 red-blue	19 white-pink	26 brown-black	33 green-red	40 pink-red	
6 pink	13 white-green	20 pink-brown	27 grey-green	34 yellow-red	41 grey-black	
7 blue	14 brown-green	21 white-blue	28 yellow-grey	35 green-black	42 pink-black	

All quoted data is approximate and not binding.

# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### PERFORMANCE OF INSULATING AND SHEATHING MATERIALS

i.e. Fluorocarbon material such as TEFLON®

LDPE = low density polyethylene	ETFE = Tefzel®, Hostafon® ET
HDPE = high density polyethylene	FEP = Teflon®
PP = polypropylene	PTFE = Teflon®, Hostafon® TF
PA = polyamide	PFA = Teflon®
PETP = polyethyleneterephthalate	PI/F = polyimide foil / FEP Kapton®

Material	LDPE	HDPE	PP	PA	PETP	ETFE	FEP	PTFE	PFA	PI/F
Long-duration service temperature (°C) approx. 25 000 hours	- 50 + 70	- 50 + 100	- 10 + 100	- 30 + 105	- 100 + 130	- 100 + 150	- 100 + 205	- 190 + 260	- 190 + 260	- 190 + 220
Short-duration service temperature (°C) (hours)	+ 100	+ 120	+ 140	+ 125	+ 180	+ 180	+ 230	+ 300	+ 280	+ 400
Decomposition or heat distortion temperature (°C)	+ 110	+ 130	+ 160	+ 140	+ 200	+ 270	+ 290	+ 327	+ 310	+ 500
Breakdown voltage in kV/mm (20 °C)	70	85	75	30	15	36	25	20	25	28
Specific resistance in Ohm - cm (20 °C)	10 <sup>17</sup>	10 <sup>17</sup>	10 <sup>17</sup>	10 <sup>14</sup>	10 <sup>18</sup>	10 <sup>16</sup>	10 <sup>18</sup>	10 <sup>18</sup>	10 <sup>18</sup>	10 <sup>16</sup>
Dielectric value at 60 Hz (20 °C)	2,3	2,3	2,3	3,6-4,5	3,3	2,6	2,1	2,0	2,1	2,7
Specific gravity in 10 <sup>3</sup> kg/m <sup>3</sup> (20 °C)	0,92	0,95	0,91	1,02	1,40	1,70	2,15	2,18	2,20	1,80
Tensile strength in MPa (20 °C)	20-30	30	20-35	50-60	200-250	45	20-25	30-45	30	98-120
Elongation in % (20 °C)	500	800	500	200-300	100	150-300	250-300	350-400	300	70
Water absorption % (20 °C)	0,1	0,1	0,1	1-1,5	0,5	0,02	0,01	0,01	0,01	1,0
Weather resistance	good	fair	good	good	good	very good	very good	very good	very good	good
Inflammability	inf.	inf.	inf.	inf.	inf.	n.f.	n.f.	n.f.	n.f.	n.f.
General chemical resistance	fairly good	fairly good	fairly good	fair	fair	very good	very good	very good	very good	very good
Nuclear radiation resistance <sup>1)</sup> x 10 <sup>6</sup> rad	19	19	1	1	60	200	0,02	0,02	0,02	600

<sup>1)</sup> Values refer to high dose rates, at approx. 50% drop of initial values.

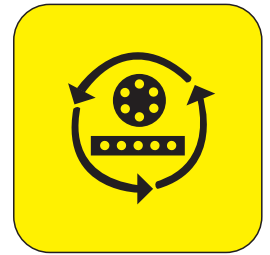
inf. = inflammable  
n.f. = non flammable (to ASTM)

TABLE 10

# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS



### CHEMICAL RESISTANCE TABLE MATERIAL: PVC

	concentration (%)	temp. °C	good	limited	unsuitable
acetone		20			x
chloroethylene		50			x
ethylene glycol		100		x	
alumen		20			x
ammonia	25	20	x		
aniline		50			x
petrol		20			x
benzene		50			x
boric acid	saturated	20	x		
brake fluid		100		x	
butane		20	x		
butter		50	x		
chlorobenzene		30			x
chloroprene		20			x
diethylether		20		x	
diethylene glycol		50	x		
glacial acetic acid	concentrated	50			x
Freon 12		20	x		
gear oil		100	x		
glycerine	all	50	x		
hydraulic oil		20	x		
potassium chloride		20	x		
potassium nitrate		20	x		

	concentration (%)	temp. °C	good	limited	unsuitable
copper salts		20	x		
magnesium salts		20	x		
machine oil		20			x
methanol		50	x		
methylene chloride	100	20			x
engine oil		120			x
sodium chloride	50	20	x		
soda lye	50	50	x		
nitrobenzene	100	50			x
olive oil		50	x		
mercury salts		20			x
dilute nitric acid		20			x
hydrochloric acid	concentrated	20			x
sulphuric acid	50	50	x		
seawater		20	x		
silver salts		20	x		
phenol from tar		20	x		
carbon tetrachloride	100	20	x		
trichlorethylene	100	50			x
detergent lye	2	100			x
distilled water		100		x	
distilled water		20	x		
citric acid		20	x		

TABLE 11

### MATERIAL: SILICONE

	concentration (%)	temp. °C	good	limited	unsuitable
acetone		20		x	
ethyl alcohol		20	x		
chloroethylene		50		x	
ethylene glycol		100	x		
alumen		20			x
aluminium salts		20	x		
ammonia	25	20	x		
aniline		50	x		
petrol		20		x	
benzene	100	50			x
boric acid	saturated	20	x		
brake fluid		100	x		
butane		20		x	
butter		50	x		
chlorobenzene		30			x
chloroprene		20			x
diethylether		20			x
diethylene glycol		50	x		
glacial acetic acid	concentrated	50	x		
Freon 12		20			x
gear oil		100		x	
glycerine	all	50	x		
hydraulic oil		20			x
potassium chloride		20	x		
potassium nitrate		20	x		
potassium permanganate	6	20	x		

	concentration (%)	temp. °C	good	limited	unsuitable
copper salts		20	x		
magnesium salts		20	x		
machine oil		20	x		
methanol		50	x		
methylene chloride	100	20			x
engine oil		120	x		
sodium chloride	50	20	x		
soda lye	50	50			x
nitrobenzene	100	50	x		
olive oil		50	x		
mercury salts		20	x		
dilute nitric acid		20			x
hydrochloric acid	concentrated	20			x
sulphuric dioxide		20	x		
sulphuric acid	50	50			x
seawater		20			x
silver salts		20	x		
phenol from tar		20			x
carbon tetrachloride	100	20			x
toluol	100	50			x
trichlorethylene	100	50	x		
detergent lye	2	100			x
distilled water		100			x
distilled water		20	x		
acidity of wine	saturated	20	x		
citric acid		20	x		

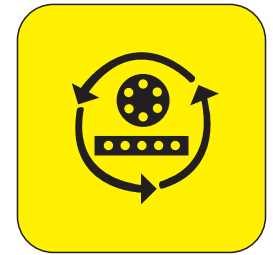
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TABLE 12  
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# TECHNICAL DATA

INFORMATION TABLES RELATED TO THE WORLD OF CABLES

## A GUIDE FOR FLEXIBLE CABLE USERS AND DESIGNERS

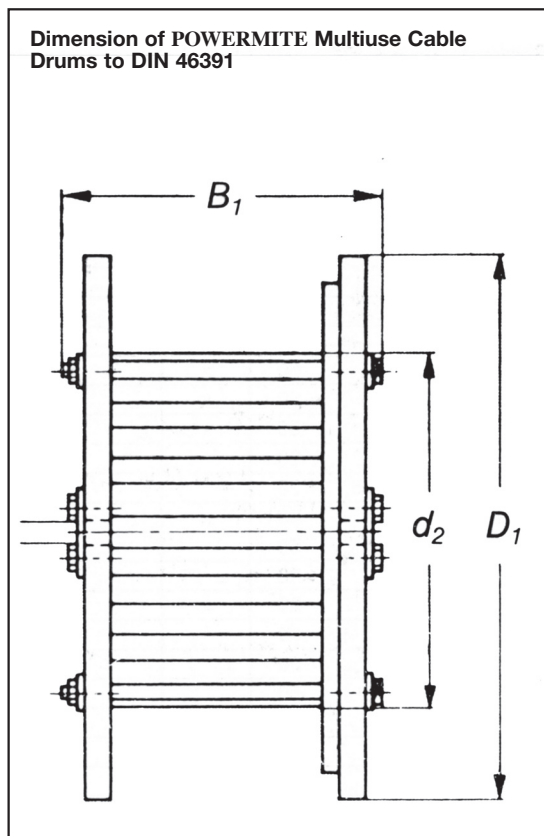


### CHEMICAL RESISTANCE TABLE MATERIAL: POLYURETHANE

	concentration (%)	temp. °C	good	limited	unsuitable		concentration (%)	temp. °C	good	limited	unsuitable
acetone		20			x	copper salts		20	x		
chloroethylene		50			x	magnesium salts		20	x		
ethylene glycol		100			x	machine oil		20	x		
alumen		20	x			methanol		50			x
ammonia	25	20		x		methylene chloride	100	20			x
aniline		50			x	engine oil		120			x
petrol		20	x			sodium chloride	50	20	x		
benzene	100	50			x	soda lye	50	50	x		
boric acid	saturated	20	x			nitrobenzene	100	50			x
brake fluid		100			x	olive oil		50	x		
butane		20	x			mercury salts		20			x
butter		50		x		dilute nitric acid		20			x
chlorobenzene		30			x	hydrochloric acid	concentrated	20			x
chloroprene		20			x	sulphuric acid	50	50			x
diethylether		20	x			seawater		20	x		
diethylene glycol		50	x			silver salts		20	x		
glacial acetic acid	concentrated	50			x	phenol from tar		20			x
Freon 12		20	x			carbon tetrachloride	100	20			x
gear oil		100		x		trichlorethylene	100	50			x
glycerine	all	50	x			detergent lye	2	100			x
hydraulic oil		20	x			distilled water		100		x	
potassium chloride		20	x			distilled water		20	x		
potassium nitrate		20		x		citric acid		20		x	

TABLE 13

### GENERAL DRUM SIZE AND WEIGHT INDICATIONS



Drum Nominal sizes	Diameter $D_1$ mm	Diameter $d_2$ mm	Width $B_1$ mm	Weight without planking approx. kg
051	500	150	460	8
061	630	315	390	13
071	710	355	475	17
081	800	400	515	33
091	900	450	700	46
101	1000	500	700	71
121	1250	630	890	143
141	1400	710	890	172
161	1600	800	1100	256
162	1600	1000	1100	271
181	1800	1000	1100	334
182	1800	1250	1100	352
201	2000	1250	1350	524
202	2000	1400	1350	544
221	2240	1400	1475	704
222	2240	1600	1475	738
250	2500	1400	1475	839
251	2500	1600	1475	872
252	2500	1800	1475	909
281	2800	1800	1635	1121
282	2800	2000	1635	1166

Weight tolerance  $\pm 20\%$  according to moisture content

TABLE 14

All quoted data is approximate and not binding.