



# Traction cable

## RADOX TENUIS-TW 600V M

### Product description:

RADOX TENUIS- TW 600V M                      Single cores with thin wall insulation  
 Nominal voltage:                                      600 / 1000 V AC  
 Hazard level:    M    (extra low temperature resistant, extra oil and fuel resistant)

### General features:

Halogen- free electron- beam cross linked cores with improved behaviour in case of fire, easy to strip, soldering resistant and flexible. Compliant with the requirements of the EN 50306- 2 standard.

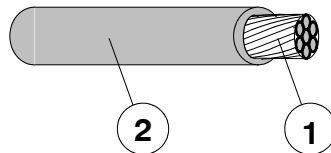
### Application:

The cores are intended for fixed installation inside railway vehicles or for installation in applications where limited alternating bending stresses occur during operation.

The requirements contained in the EN 50355 and EN 50343 standards are applicable with regard to installation.

The cores are used as sub- components in RADOX TENUIS- TW multicore cables.

### General composition of cable:



1. Conductor:    stranded tin plated copper, acc. to EN 50306- 2
2. Insulation:    RADOX EI 303  
Colors: see table

Marking: HUBER+SUHNER RADOX TENUIS- TW 600V 1X[ $\phi$ ] M [part. No.] - [batch. No.] [date of manufacture] [prod.- place]

### Technical Data:

Voltage rating cond.- earth	$U_0$	600	V AC
Voltage rating cond.- cond.	U	1000	V AC
maximum permissible Voltage rating AC cond.- earth		720	V AC
maximum permissible Voltage rating AC cond.- cond.	$U_m$	1200	V AC
maximum permissible Voltage rating DC cond.- earth	$V_0$	900	V DC
maximum permissible Voltage rating DC cond.- cond.		1500	V DC
Test voltage		3500	V AC
		8400	V DC
Temperature range		- 50 ... + 120	°C
Min. bending radius			
fixed installation		3 x D	
sporadic movement		4 x D	

### NB:

The upper temperature limit is determined by long term ageing according to EN 50305 Par. 7 and extrapolation to 20,000 hours.

The lower temperature limit is determined by bending and elongation tests according to EN 60811- 1- 4 Par. 8, respectively low temperature behaviour tests according to GOST 20.57.406- 81, method 204- 1 and GOST 17491- 80. (fixed installation)

The specified bending radii require a careful and proper handling using proven fastening technologies.

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The product fulfils the test and specification requirements described in this document for the stated areas of application and operating conditions. HUBER+SUHNER AG does not expressly or implicitly guarantee performance under additional or changed conditions. Deviations are to be agreed upon in writing.

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The cables are in conformity with:

<b>Fire protection on railway vehicles, category</b> .....	<b>Ia, Ib, II</b> .....	<b>BS 6853, GM/RT 2130</b>
Vertical flame spread .....	$50 < L \leq 540$ mm .....	EN 60332- 1-2
Vertical flame spread, bunched .....	$L \leq 2.5$ m .....	EN 50266, BS 6853 An. D.8.7
Smoke density .....	$A_0 \leq$ BS 6853 .....	BS 6853 An. D.8.7
Toxicity .....	$R \leq 1.0$ .....	BS 6853 An. B.1
<b>Fire protection on railway vehicles, hazard level</b> .....	<b>HL1 - HL3</b> .....	<b>EN 45545</b>
Vertical flame spread .....	$50 < L \leq 540$ mm .....	EN 60332- 1-2
Vertical flame spread, bunched, $D \leq 6$ mm .....	$L \leq 1.5$ m .....	EN 50305, 9.1.2
Smoke density .....	$T \geq 70$ % .....	EN 61034- 2
Toxicity .....	$ITC \leq 6$ .....	EN 50305, 9.2
<b>Fire protection on railway vehicles, hazard level</b> .....	<b>1 - 4</b> .....	<b>DIN 5510</b>
Vertical flame spread .....	$50 < L \leq 540$ mm .....	EN 60332- 1-2
Vertical flame spread, bunched, $D \leq 6$ mm .....	$L \leq 1.5$ m .....	EN 50305, 9.1.2
Smoke density .....	$T \geq 60$ % .....	EN 61034- 2
Corrosivity of combustion gases .....	$pH \geq 4.3, C \leq 10$ $\mu$ S/mm .....	EN 50267- 2- 2
Amount of halogen acid gas .....	$HCl + HBr \leq 0.5$ % .....	EN 50267- 2- 1
Content of fluorine .....	$HF \leq 0.1$ % .....	EN 60684- 2, 45.2
Toxicity, insulation .....	$ITC \leq 6$ .....	EN 50305, 9.2
<b>Fire protection on railway vehicles, category</b> .....	<b>A1, A2, B</b> .....	<b>NF F16- 101</b>
Fire protection on railway vehicles, class .....	C / F0 .....	NF F16- 101
Vertical flame spread .....	$50 < L \leq 540$ mm .....	NF C32- 070, 2.1
Vertical flame spread, bunched .....	$L \leq 300$ mm .....	NF C32- 070, 2.2
Smoke index .....	$I.F. \leq 5$ .....	X10- 702- 2, NF X70- 100- 1
<b>Fire protection on railway vehicles</b> .....	<b>Fulfilled</b> .....	<b>NFPA 130</b>
Vertical flame spread, bunched .....	$L \leq 1.5$ m .....	UL 1685, 12 (FT4 exp.)
Smoke density .....	$TSR \leq 150$ m <sup>2</sup> , $PSRR \leq 0.40$ m <sup>2</sup> /s ... ..	UL 1685, 12 (FT4 exp.)
<b>Fire protection on railway vehicles, hazard level</b> .....	<b>LR1 - LR4</b> .....	<b>UNI CEI 11170</b>
Vertical flame spread .....	$50 < L \leq 540$ mm .....	EN 60332- 1- 2
Vertical flame spread, bunched, $D \leq 6$ mm .....	$L \leq 1.5$ m .....	EN 50305, 9.1.2
Smoke density .....	$T \geq 70$ % .....	EN 61034- 2
Corrosivity of combustion gases .....	$pH \geq 4.3, C \leq 10$ $\mu$ S/mm .....	EN 50267- 2- 2
Amount of halogen acid gas .....	$HCl + HBr \leq 0.5$ % .....	EN 50267- 2- 1
Toxicity, insulation .....	$ITC \leq 6$ .....	EN 50305, 9.2
<b>Requirement of hazard level code M</b>		
Extra low temperature .....	- 40°C	
Extra oil resistance .....	IRM 902, 24h, 100°C	
Extra fuel resistance .....	IRM 903, 168h, 70°C	

### Applicable documents:

- 581 997 Current rating for single core cables



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## RADOX TENNIS-TW 600V M

Cross section mm <sup>2</sup>	Conductor nom. Construction Dia. n x mm mm		Core dia. mm	R <sub>20</sub> max. Ω/km	C <sub>H2O</sub> nom. pF/m	Fireload nom. kJ/m	Weight nom. Copper Cable kg / 100m		Colour	H+S Part No.
0.14 *)	19x0.10	0.50	1.03±0.03	133.0	238	22	0.14	0.23	WH	85 082 261
0.25 *)	7 x 0.20	0.61	1.17±0.05	84.0	255	27	0.20	0.32	WH	85 021 029
0.34	19x0.16	0.76	1.30±0.05	52.1	310	27	0.35	0.48	WH	85 027 590
0.5	19x0.18	0.88	1.42±0.03	40.1	356	37	0.45	0.60	WH GNYE BK BN BU RD GY	12 564 379 85 087 154 85 026 405 85 067 272 85 067 273 85 067 274 85 067 275
0.75	19x0.23	1.09	1.62±0.03	26.7	430	43	0.69	0.86	WH BK	12 566 838 85 026 406
1	19x0.26	1.23	1.77±0.03	20.0	470	50	0.88	1.09	WH GNYE BK	12 561 500 12 581 111 12 581 116
1.5	19x0.31	1.49	2.17±0.03	13.7	459	74	1.3	1.60	WH GNYE BK	12 564 381 12 581 112 85 026 407
2.5	19x0.40	1.96	2.75±0.05	8.21	509	113	2.16	2.62	WH GNYE BK BN GN BU	12 564 382 12 581 113 85 026 408 85 068 296 85 068 297 85 068 298
4	56x0.30	2.46	3.35±0.05	5.09	565	133	3.45	3.98	WH GNYE BK	12 581 455 12 581 487 85 026 409

R<sub>20</sub>: Conductor resistance according to EN 50306-2

C<sub>H2O</sub>: Capacity in water

\*) not covered with existing fire safety certificates