


15310000	<b>DATA SHEET</b>	
Valid from: 02.08.2023	<b>ÖLFLEX® TRAIN 310 TW-P 300V</b>	

## Application

ÖLFLEX® TRAIN 310 TW-P are halogen-free, highly flame retardant cables with reduced insulation wall thickness for use in railway vehicles.

They are designed for fixed and protected installation, further for applications, where limited movement may occur.

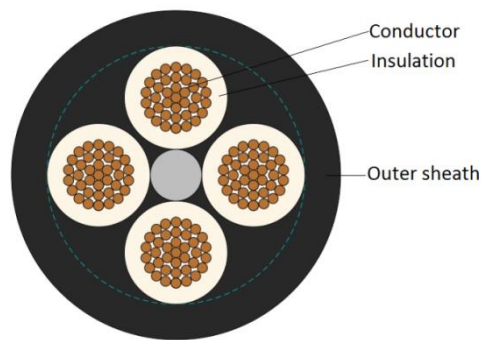
They are particularly used in areas, where human life as well as valuable property are exposed to high risk of fire hazards.

ÖLFLEX® TRAIN 310 TW-P are oil-, fuel-, acid- and alkali resistant acc. to EN 50306-2 and EN 50264-1 (EM104).

Application range:

railway vehicles, control and monitoring circuits as well as locking circuits and internal wiring of equipment in trains and locomotives.

## Design




Design	acc. to EN 50306-4, class 1P
Norm references	EN 50306-4, code designation MM MM = extra low temperature, extra oil and fuel resistant
Classification	EN 45545-2: Hazard Level HL1, HL2, HL3 NF F 16-101: only for pn 15310000 - 15310023 Internal Category A1, A2, B External Category A1, A2, B Category C for flame propagation Category F0 for smoke
Conductor	tinned- copper strand, 19 or 37 wires, SRC (Special Round Conductor) acc. to EN 50306-2
Core isolation	electron beam cross-linked polymer compound acc. to EN 50306-2
Core identification	white cores with black numbers acc. to DIN EN 50334
Outer sheath	electron beam cross-linked polymer compound, halogen free and flame retardant, EM 104 acc. to EN 50264-1 colour: Black, similar RAL 9005

## Electrical properties at 20 °C

Nominal voltage	$U_0 / U$ : 300/500 V AC acc. to EN 50306-4 $U_m$ : 550V AC acc. to EN 50355 $U_0 / U$ : 600/1000 V AC
Test voltage	core / core: 3.5 kV AC or 8.4 kV DC

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## Mechanical and thermal properties

Min. bending radius	Outer diameter $\leq$ 12.0 mm for cautions bending (one bend at end of core): 3 x outer diameter fixed installation: 4 x outer diameter occasional flexing: 5 x outer diameter
	Outer diameter $>$ 12.0 mm for cautions bending (one bend at end of core): 4 x outer diameter fixed installation: 5 x outer diameter occasional flexing: 6 x outer diameter
Temperature range	90° C max. conductor temp. acc. to EN 50306-4 110° C max. conductor temp. (20.000 h) acc. to EN 50306-4 fixed installation: -45 °C up to +120 °C max. conductor temp. (20.000h) acc. to Lapp occasional flexing: - 35 °C up to +105 °C max. conductor temp. acc. to Lapp  -50°C acc. to GOST 33326-2015 and GOST 20.57.406-81 (method 203-1 and 205-1)
Short circuit temperature	max. +160°C (5s)


## Fire protection acc. to EN 50306-4 / EN 45545-2:

Classification	EN 45545-2: Hazard Level HL1, HL2, HL3
Flammability	flame retardant acc. to IEC 60332-1-2 resp. EN 60332-1-2 no flame propagation: $\geq$ 12 mm: acc. to IEC 60332-3-24 resp. EN 60332-3-24 $>$ 6 mm und $<$ 12mm: acc. to IEC 60332-3-25 resp. EN 60332-3-25 $\leq$ 6 mm: acc. to EN 50305, clause 9.1.2
Smoke density	acc. to EN 50306-1, light transmission: min. 70% acc. to IEC 61034-2 resp. EN 61034-2
Halogen-free	acc. to IEC 60754-1 resp. EN 60754-1 (chlorine and bromine) acc. to EN 60684-2 (fluorine)
Corrosivity	acc. to EN 50306-1, pH $\geq$ 4.3 and conductivity $\leq$ 10 $\mu$ S/mm acc. to IEC 60754-2 resp. EN 60754-2
Toxicity	acc. to EN 50305 and EN 45545-2 ( $<$ 6)

## Fire protection acc. to NF only for Art. No. 15310000 - 15310023:

Classification	NF F 16-101: Internal Category A1, A2, B External Category A1, A2, B Category C for flame propagation Category F0 for smoke
Flammability	No flame propagation acc. to NF C 32-070 (Category C1+C2)
Smoke density	acc. to NF X 10-702
Toxicity	acc. to NF X 70-100

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### Fire protection acc. to NFPA 130:


Flammability Only for outer diameter 4.6 mm - 11.3 mm  
 Vertical-Tray Fire-Propagation FT4/IEEE1202 acc. to UL1685  
 Smoke release acc. to UL 1685

### Material properties

Ozone resistance acc. to EN 50306-2 and EN 50306-4, method A or B  
 Mineral oil resistance acc. to EN 50306-2 and EN 50264-1 (EM104)  
 Fuel resistance acc. to EN 50306-2 and EN 50264-1 (EM104)  
 Acid and alkali resistance acc. to EN 50306-2 and EN 50264-1 (EM104)  
 UV resistance Acc. to EN 50525-1 are cables with black sheath suitable for a permanent outdoor use.  
 Tests acc. to EN 50306-2 and EN 50306-4  
 General requirements These cables are conform to the EU-Directives 2014/35/EC (Low Voltage Directive)  
 Environmental information These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).

Art. No.	Number of cores x cross section [mm <sup>2</sup> ]	Conductor [n x mmø]	Max. conductor resistance (20°C) [Ohm/km]	Conductor ø reference value [mm]	Core ø reference value [mm]	Outer ø [mm]	Fire load reference value [kJ/m]	Weight [kg/km]
15310030	2X0.5	19x0.18	40.1	0.9	1.4	4.0 ± 0.5	263	26
15310031	3X0.5	19x0.18	40.1	0.9	1.4	4.3 ± 0.5	273	31
15310000	4X0.5	19x0.18	40.1	0.9	1.4	4.6 ± 0.5	365	42
15310001	7X0.5	19x0.18	40.1	0.9	1.4	5.4 ± 0.5	484	64
15310032	8X0.5	19x0.18	40.1	0.9	1.4	6.3 ± 0.5	530	71
15310002	13X0.5	19x0.18	40.1	0.9	1.4	7.8 ± 0.5	940	120
15310003	19X0.5	19x0.18	40.1	0.9	1.4	8.6 ± 0.5	1069	157
15310004	37X0.5	19x0.18	40.1	0.9	1.4	11.4 ± 0.6	1740	285
15310033	48X0.5	19x0.18	40.1	0.9	1.4	13.0 ± 0.6	1808	342
15310034	2X0.75	37x0.16*	26.7	1.1	1.6	4.5 ± 0.5	318	34
15310035	3X0.75	37x0.16*	26.7	1.1	1.6	4.7 ± 0.5	330	42
15310005	4X0.75	37x0.16*	26.7	1.1	1.6	5.1 ± 0.5	429	55
15310036	6X0.75	37x0.16*	26.7	1.1	1.6	6.0 ± 0.5	498	74
15310006	7X0.75	37x0.16*	26.7	1.1	1.6	6.0 ± 0.5	543	84
15310037	8X0.75	37x0.16*	26.7	1.1	1.6	7.2 ± 0.5	778	106
15310007	13X0.75	37x0.16*	26.7	1.1	1.6	8.7 ± 0.5	1106	162
15310008	19X0.75	37x0.16*	26.7	1.1	1.6	9.6 ± 0.6	1249	214
15310009	37X0.75	37x0.16*	26.7	1.1	1.6	12.8 ± 0.6	2036	392
15310010	48X0.75	37x0.16*	26.7	1.1	1.6	14.7 ± 0.8	2323	489
15310038	2X1	37x0.18*	20.0	1.2	1.75	4.8 ± 0.5	339	40
15310039	3X1	37x0.18*	20.0	1.2	1.75	5.1 ± 0.5	341	50

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15310011	4X1	37x0.18*	20.0	1.2	1.75	5.4 ± 0.5	476	68
15310040	6X1	37x0.18*	20.0	1.2	1.75	6.5 ± 0.5	265	89
15310012	7X1	37x0.18*	20.0	1.2	1.75	6.5 ± 0.5	629	106
15310041	8X1	37x0.18*	20.0	1.2	1.75	8.0 ± 0.5	802	126
15310013	13X1	37x0.18*	20.0	1.2	1.75	9.3 ± 0.6	1225	200
15310014	19X1	37x0.18*	20.0	1.2	1.75	10.4 ± 0.6	1379	267
15310015	37X1	37x0.18*	20.0	1.2	1.75	13.9 ± 0.6	2310	498
15310042	48X1	37x0.18*	20.0	1.2	1.75	15.9 ± 0.8	2071	589
15310043	2X1.5	37x0.23*	13.7	1.6	2.2	5.5 ± 0.5	510	60
15310044	3X1.5	37x0.23*	13.7	1.6	2.2	5.8 ± 0.5	530	76
15310016	4X1.5	37x0.23*	13.7	1.6	2.2	6.5 ± 0.5	661	98
15310045	6X1.5	37x0.23*	13.7	1.6	2.2	8.2 ± 0.5	964	146
15310017	7X1.5	37x0.23*	13.7	1.6	2.2	8.2 ± 0.5	1126	170
15310046	8X1.5	37x0.23*	13.7	1.6	2.2	9.4 ± 0.5	1282	194
15310018	13X1.5	37x0.23*	13.7	1.6	2.2	11.3 ± 0.6	1738	295
15310019	19X1.5	37x0.23*	13.7	1.6	2.2	12.6 ± 0.6	1976	396
15310020	37X1.5	37x0.23*	13.7	1.6	2.2	17.0 ± 0.8	3161	728
15310047	48X1.5	37x0.23*	13.7	1.6	2.2	19.5 ± 0.8	3858	929
15310021	2X2.5	37x0.30*	8.21	2.0	2.8	7.2 ± 0.5	941	106
15310022	3X2.5	37x0.30*	8.21	2.0	2.8	7.6 ± 0.5	953	131
15310023	4X2.5	37x0.30*	8.21	2.0	2.8	8.4 ± 0.5	1124	165
15310048	6X2.5	37x0.30*	8.21	2.0	2.8	10.0 ± 0.5	1437	233
15310049	7X2.5	37x0.30*	8.21	2.0	2.8	10.0 ± 0.5	1370	253
15310050	8X2.5	37x0.30*	8.21	2.0	2.8	11.8 ± 0.5	1944	312
15310051	13X2.5	37x0.30*	8.21	2.0	2.8	13.9 ± 0.6	2231	450
15310052	19X2.5	37x0.30*	8.21	2.0	2.8	15.6 ± 0.8	2960	639
15310053	37X2.5	37x0.30*	8.21	2.0	2.8	21.2 ± 0.8	4817	1185

\* These cables may be supplied in 19 strand conductors.

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