
AUTOMOTIVE
AUTOMOTIVE SPECIAL CABLES
tecniKabel
SPECIAL ELECTRICAL AND OPTICAL CABLES
WWW.TECNIKABEL.COM

SPECIAL ELECTRICAL AND OPTICAL CABLES


Tecni Kabel

INTRODUCTION

For over forty years, Tecnikabel has been designing and manufacturing copper and fiber optic cables for a wide range of applications, ranging from underground to aerospace and submarine.

For the Automotive sector, Tecnikabel produces:
- standard copper cables in compliance with ISO 6722-1: 2011 quality standards;
- customized and hybrid cables.

To face the innovation challenge, the automotive market is going to require high performance and custom products with specific characteristics that standard cables cannot meet.

Tecnikabel's technical office uses all expertise gained in the field to design highly-customised cables tailored to specific customer applications and needs.

Flexible, multiskilled, and traceable processes ensure high quality products, unparalleled reliability and excellent customer care.

PRODUCT LINES

- TRANSPORTATION
- OIL / GAS & PETROCHEMICALS
- TELECOMMUNICATION
- OPTICAL
- AUTOMATION
- SUBSEA
- NAVAL
- DEFENSE
- BUILDING TECHNOLOGY
- GREEN ENERGY
- AUTOMOTIVE

TECNIKABEL

is focused on constant product innovation to get competitive advantages with endless commitment to research and development.

PRODUCTION

Updated production systems, stringent process procedures and expert operators carry out our production with efficiency and flexibility.

In 30 years of activity, we produced more than 26.000 different types of cables.

FINAL INSPECTIONS

At the end of every production process each cable is checked for its electrical and physical performances for a complete compliance to customer specifications.

LABORATORY TESTS

We submit our cables to the most severe tests, simulating critical applications. In addition to the tests required by current norms, we continuously invest in equipment for mechanical and electrical testing, steadily increase the standard performance of our cables.

MATERIALS RESEARCH AND DEVELOPMENT

Our thirty year experience took us to carry on research of new materials in order to improve performances, costs and fulfil the standards required by our customers.

QUALITY SYSTEM

Since 1978, constant commitment to Quality has awarded Tecnikabel approval from American and European Authorities, complying with the most demanding international manufacturing and quality standards.

CSQ IQNet ISO 9001 edizione norma: 2015 9125.TEKA

Member of CISQ Federation RINA CERTIFIED MANAGEMENT SYSTEM ISO 14001

IRIS Certification

BRITISH APPROVALS SERVICE FOR CABLES BASEC UKAS PRODUCT CERTIFICATION 0004 PRODUCT MARKING LICENCE NO: 226001

ICIM EN 9100:2018 CERTIFIED MANAGEMENT SYSTEM Certified site: Volpiano

RINA

CSV CEI - UNEL

APPROVED LR

COMPLIANT · COMPLIANT · COMPLIANT REACH

SA

TYPE APPROVED PRODUCT DNV·GL MARITIME

c UL

RoHS compliant

ABS TYPE APPROVED PRODUCT

LOSS PREVENTION CERTIFICATION BOARD LPCB UKAS PRODUCT CERTIFICATION 0007 BS 6387:2013 Cert/LPCB ref. 1352

UL LISTED

CQC

DVE

WRAS APPROVED PRODUCT

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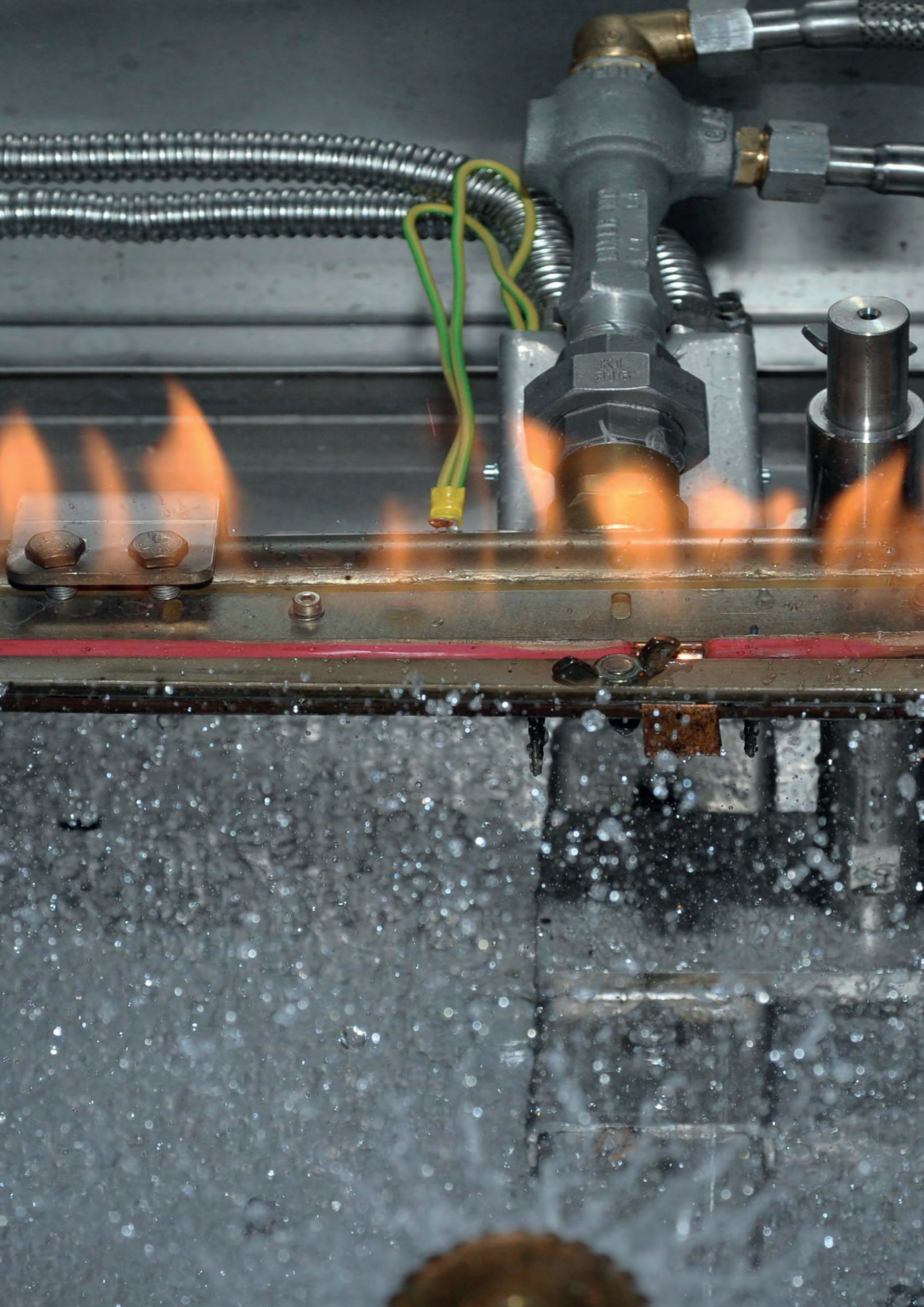


FIRE PERFORMANCE

FIRE PERFORMANCES

IEC 60332-1-2 / EN 50265 / BS 4066:
Fire propagation on a vertical single cable

The single cable is mounted vertically and flamed with a Bunsen burner.

The flame must extinguish itself, at least 50 mm below the upper fixing clamp.

Power of burner, duration and angle of flame application, are described in the reference standards.

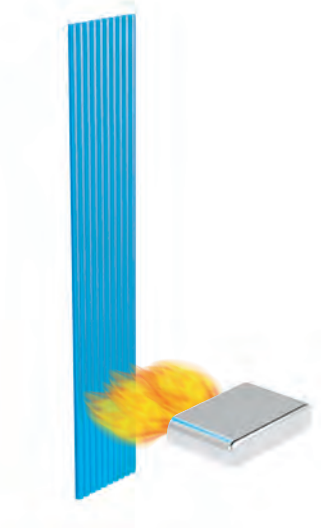
IEC 60332-3 / EN 50266:
Fire propagation on a vertical cables bundle

A certain number of cable samples are fixed on a 3.5m long ladder, and flamed with an appropriate burner.

The sample number, the duration of flame application, and the power/temperature of burner are described in the reference standards. After flame application, the visible area of fire damage must not exceed 2.5 m in height from the bottom of the burner.

The volume of tested material define a differentiation in categories:

A F/R Part 3-21	7 l/m
A Part 3-22	7 l/m
B Part 3-23	3.5 l/m
C Part 3-24	1.5 l/m
D Part 3-25	0.5 l/m



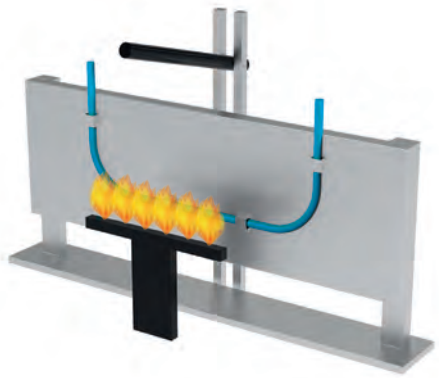
IEC 60331 / EN 50200: Fire test resistance

A sample of cable is horizontally applied supported by metal rings, or in U shape fixed on a fireproof wall.

Through using a gas burner the cable is maintained in flame contact for a certain time.

The test and the temperature of burner are described in the reference standards. In U shape test, the fireproof wall is hit every five minutes by a mechanical shock, to simulate a potential collapse during the fire.

The time of fire application, and the temperature of flame are described in the reference standards (typically 750°C or 830°C). The optical transmission of the fibers is checked and the change in attenuation is recorded during the test. and 15 minutes after flame extinction.



IEC 61034-1/2 - EN 50268-1/2: Measurement of smoke density of cables burning under defined conditions.

A few samples of cable are burnt in a cubic ($3x3x3m^3$) chamber using a flammable liquid.

The light transmittance of the resulting smoke is measured using an optical light detector. The test duration is about 40 minutes, depending on the quantity and composition of the liquid fuel. During the test the light transmittance of the smoke must be 60% minimum.

IEC 60754-1 - EN 50267-2-1: Test on gases evolved during combustion of materials from cables - Determination of the halogen acid gas content

This standard covers the general aspects of potential hazard caused from corrosiveness of smoke and combustion gases.

A small quantity of non-metallic material is heated in a tube, the resulting gases are tested for their halogen content. The flame temperature is 800 °C ± 10 °C, with a test duration of 40 ± 5 min in total.

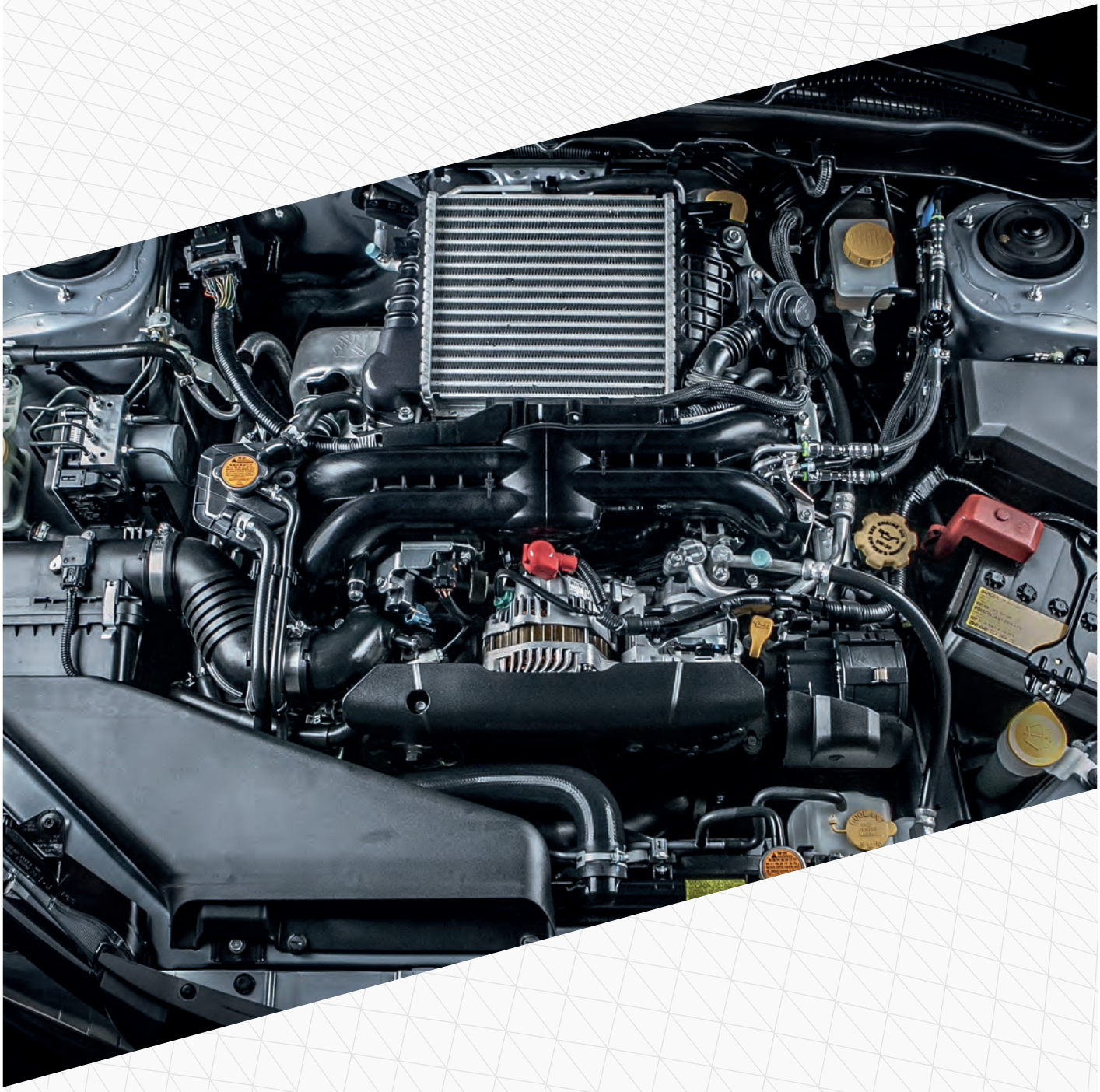
The halogen content of non-metallic materials must be less than 0.5% or 5 mg/g.

IEC 60754-2 - EN 50267-2-: Test on gases evolved during combustion of materials from cables - Determination of acidity (by pH measurement) and conductivity

A small quantity of non-metallic material is burnt in a furnace, the pH and conductivity combustion gases dissolved in water are measured.

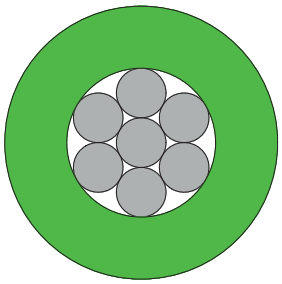
The minimum pH value of the washing water must 4.3, and the maximum conductivity must be 10 µS/mm.

NOTE



These images are solely for illustrative purposes

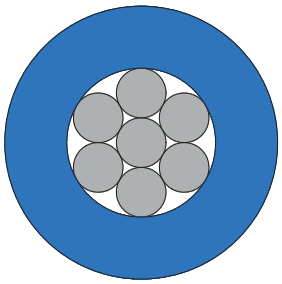
TK - FLMRY WITH THIN WALL PVC INSULATION



CONSTRUCTION	**Conductor**	Copper alloy Copper clad steel
	Insulation	Soft-PVC with properties according to ISO 6722-1, Class B
SPECIAL PROPERTIES	**Temperature range**	-40°C bis + 105°C (3,000 hrs)
		Tensile strength conductor material for crosssection reduction
		Considerable weight and material savings
REFERENCE STANDARDS		ISO 6722-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
CuAg01								
0.13	7	0.16	0.49	145	0.2	1.05	-0.1	2.0
0.17	7	0.18	0.56	105	0.2	1.1	-0.1	2.5
0.22	7	0.21	0.7	86	0.2	1.2	-0.1	3.1
0.35	7	0.27	0.8	56	0.2	1.3	-0.1	4.7
CuSn03								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
0.17	7	0.18	0.56	115	0.2	1.1	-0.1	2.5
0.22	7	0.21	0.7	102	0.2	1.2	-0.1	3.1
0.35	7	0.27	0.8	81	0.2	1.3	-0.1	4.7
CuMg02								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
CCS								
0.13	7	0.16	0.49	317	0.2	1.05	-0.1	2.1
0.22	7	0.21	0.7	210	0.2	1.2	-0.1	2.9

TK - FLMUY WITH ULTRA-THIN INSULATON

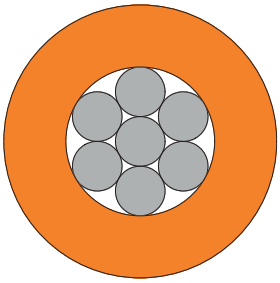


CONSTRUCTION	**Conductor**	Copper alloy Copper clad steel
	Insulation	Soft-PVC with properties according to ISO 6722-1, Class B

SPECIAL PROPERTIES	**Temperature range**	-40°C bis + 105°C (3,000 hrs) Tensile strength conductor material for crosssection reduction Considerable weight and material savings
REFERENCE STANDARDS		ISO 6722-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
CuAg01								
0.13	7	0.16	0.49	145	0.16	0.95	-0.1	2.0
0.17	7	0.18	0.56	105	0.16	1.0	-0.1	2.5
CuSn03								
0.13	7	0.16	0.49	170	0.16	0.95	-0.1	2.0
CuMg02								
0.13	7	0.16	0.49	170	0.16	0.95	-0.1	2.0
CCS								
0.13	7	0.16	0.49	317	0.16	0.95	-0.1	2.1

TK - FLMY WITH THICK WALL PVC INSULATION



CONSTRUCTION

Conductor	Copper alloy Copper clad steel
Insulation	Soft-PVC with properties according to ISO 6722-1, Class B

SPECIAL PROPERTIES

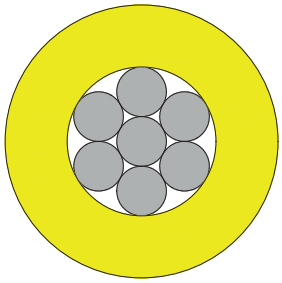
Temperature range	-40°C bis + 105°C (3,000 hrs)
	High strength conductor material for crosssection reduction
	increased outer diameter – outer diameter compatible to FLRY 0.35 mm² and FLRY 0.5 mm²

REFERENCE STANDARDS

according to ISO 6722-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm²		mm	mm	mΩ/m	mm	mm	mm	kg/km
CuAg01								
0.13	7	0.16	0.49	145	0.2	1.4	-0.2	2.8
0.13	7	0.16	0.49	145	0.2	1.6	-0.2	3.4
0.17	7	0.18	0.56	105	0.2	1.4	-0.2	2.5
0.17	7	0.18	0.56	105	0.2	1.6	-0.2	2.5
CuSn03								
0.13	7	0.16	0.49	170	0.2	1.4	-0.2	2.8
0.13	7	0.16	0.49	170	0.2	1.3	-0.2	3.4
CCS								
0.13	7	0.16	0.49	317	0.2	1.4	-0.2	2.8
0.13	7	0.16	0.49	317	0.2	1.3	-0.2	3.4

TK - FLMR2X WITH CROSSLINKED PE INSULATION



CONSTRUCTION

Conductor	Copper alloy Copper clad steel
Insulation	PE-X (Polyethylene silane crosslinked) with properties according to 6722-1, Class C

SPECIAL PROPERTIES

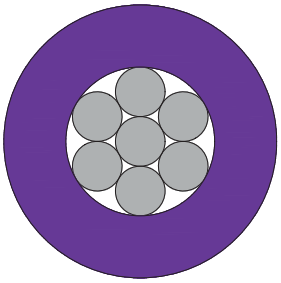
Temperature range	-40°C bis + 125°C (3,000 hrs)
	Tensile strength conductor material for crosssection reduction
	Considerable weight and material savings

REFERENCE STANDARDS

ISO 6722-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm²		mm	mm	mΩ/m	mm	mm	mm	kg/km
CuAg01								
0.13	7	0.16	0.49	145	0.2	1.05	-0.1	2.0
0.17	7	0.18	0.56	105	0.2	1.1	-0.1	2.5
0.22	7	0.21	0.7	86	0.2	1.2	-0.1	3.1
0.35	7	0.27	0.8	58	0.2	1.3	-0.1	4.7
CuSn03								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
0.17	7	0.18	0.56	115	0.2	1.1	-0.1	2.5
0.22	7	0.21	0.7	102	0.2	1.2	-0.1	3.1
	7	0.27	0.8	81	0.2	1.3	-0.1	4.7
CuMg02								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
CCS								
0.13	7	0.16	0.49	317	0.2	1.05	-0.1	2.1
0.22	7	0.21	0.7	210	0.2	1.2	-0.1	2.9

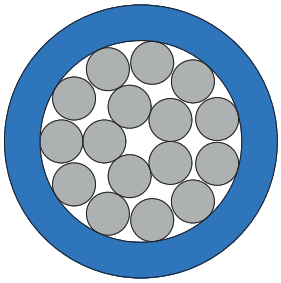
TK - FLMR9Y WITH PP INSULATION



CONSTRUCTION	**Conductor**	Copper alloy Copper clad steel
	Insulation	PP-FR (Polypropylene flame retardant), low halogen silane according to 6722-1, Class C
SPECIAL PROPERTIES	**Temperature range**	-40°C bis + 125°C (3,000 hrs)
		Tensile strength conductor material for crosssection reduction
		Considerable weight and material savings
REFERENCE STANDARDS		ISO 6722-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
CuAg01								
0.13	7	0.16	0.49	145	0.2	1.05	-0.1	2.0
CuSn03								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
CuMg02								
0.13	7	0.16	0.49	170	0.2	1.05	-0.1	2.0
CCS								
0.13	7	0.16	0.49	317	0.2	1.05	-0.1	2.1

TK - FLALRY WITH THIN WALL PVC INSULATION



CONSTRUCTION

Conductor	Aluminium 99.7 %, ≥ 1.25 mm² Aluminium alloy < 1.25 mm2
Insulation	Soft-PVC with properties according to ISO 6722-2, Class B

SPECIAL PROPERTIES

Temperature range	-40°C bis + 105°C (3,000 hrs) Cables with cross-sections > 10 mm2 can be used as battery cables Considerable weight savings compared to copper

REFERENCE STANDARDS

ISO 6722-1

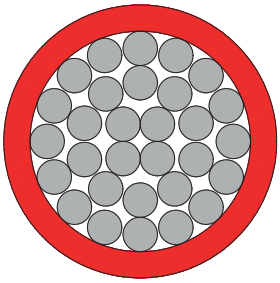
Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands*	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness** min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm²		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.75	11	0.3	1.3	43.6	0.24	1.9	-0.2	5.0
1	16	0.29	1.5	32.7	0.24	2.1	-0.2	6.0
1.25	16	0.32	1.7	24.8	0.24	2.3	-0.2	7.0
1.5	16	0.35	1.8	21.2	0.24	2.4	-0.2	8.0
2	15	0.42	2.0	15.7	0.28	2.8	-0.3	10.0
2.5	19	0.43	2.2	12.7	0.28	3.0	-0.3	12.0
3	23	0.42	2.4	10.2	0.32	3.4	-0.3	15.0
4	30	0.42	2.8	7.85	0.32	3.7	-0.3	18.0
5	36	0.42	3.1	6.57	0.32	4.2	-0.3	23.0
6	45	0.42	3.4	5.23	0.32	4.3	-0.3	24.5
8	59	0.42	4.3	3.97	0.32	5.0	-0.4	29.0
10	50	0.52	4.5	3.03	0.48	6.0	-0.7	44.0
12	60	0.52	5.4	2.53	0.48	6.5	-0.7	50.0
16	78	0.52	5.8	1.93	0.52	7.2	-0.8	65.0
20	95	0.52	6.9	1.59	0.52	7.8	-0.8	75.0
25	122	0.52	7.2	1.24	0.52	8.7	-0.8	91.0
30	141	0.52	8.3	1.08	0.64	9.6	-0.9	110.0
35	172	0.52	8.5	0.878	0.64	10.4	-1.0	132.0
40	193	0.52	9.6	0.788	0.71	11.1	-1.1	148.0
50	247	0.52	10.5	0.613	0.71	12.2	-1.2	183.0
60	289	0.52	11.6	0.525	0.80	13.3	-1.3	217.0
70	351	0.52	12.5	0.432	0.80	14.4	-1.4	253.0
85	420	0.52	13.6	0.365	0.90	15.8	-1.4	305.0
95	463	0.52	14.8	0.327	0.90	16.7	-1.4	334.0
120***	305	0.72	16.5	0.255	1.28	19.7	-2.0	456.0
160***	398	0.72	19.0	0.195	1.28	22.5	-2.0	570.0

* Nominal value, deviations from number of strands for cross-sections ≥ 6.0 mm² are permitted (± 5%)

** Also available with increased wall thickness

*** With increased wall thickness

TK - FLALRYW WITH THIN WALL PVC INSULATION



CONSTRUCTION	**Conductor**	Aluminium 99.7 %, ≥ 1.25 mm² Aluminium alloy < 1.25 mm2
	Insulation	Soft-PVC with properties according to ISO 6722-2, Class C
SPECIAL PROPERTIES	**Temperature range**	-40°C bis + 125°C (3,000 hrs) Suitable for applications inside the engine compartment Considerable weight and material savings
REFERENCE STANDARDS		ISO 6722-2

TK - FLALRYW WITH THIN WALL PVC INSULATION

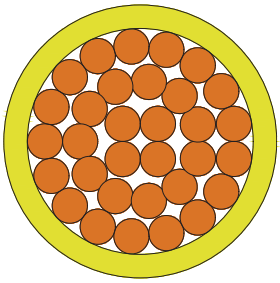
Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands*	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.75	11	0.3	1.3	43.6	0.24	1.9	-0.2	5.0
1	16	0.29	1.5	32.7	0.24	2.1	-0.2	6.0
1.25	16	0.32	1.7	24.8	0.24	2.3	-0.2	7.0
1.5	16	0.35	1.8	21.2	0.24	2.4	-0.2	8.0
2	15	0.42	2.0	15.7	0.28	2.8	-0.3	10.0
2.5	19	0.43	2.2	12.7	0.28	3.0	-0.3	12.0
3	23	0.42	2.4	10.2	0.32	3.4	-0.3	15.0
4	30	0.42	2.8	7.85	0.32	3.7	-0.3	18.0
5	36	0.42	3.1	6.57	0.32	4.2	-0.3	23.0
6	45	0.42	3.4	5.23	0.32	4.3	-0.3	25.0
8	59	0.42	4.3	3.97	0.32	5.0	-0.4	29.0
10	50	0.52	4.5	3.03	0.48	6.0	-0.7	44.0
12	60	0.52	5.4	2.53	0.48	6.5	-0.7	50.0
16	78	0.52	5.8	1.93	0.52	7.2	-0.8	65.0
20	95	0.52	6.9	1.59	0.52	7.8	-0.8	75.0
25	122	0.52	7.2	1.24	0.52	8.7	-0.8	91.0
30	141	0.52	8.3	1.08	0.64	9.6	-0.9	110.0
35	172	0.52	8.5	0.878	0.64	10.4	-1.0	132.0
40	193	0.52	9.6	0.788	0.71	11.1	-1.1	148.0
50	247	0.52	10.5	0.613	0.71	12.2	-1.2	183.0
60	289	0.52	11.6	0.525	0.80	13.3	-1.3	217.0
70	351	0.52	12.5	0.432	0.80	14.4	-1.4	253.0
85	420	0.52	13.6	0.365	0.90	15.8	-1.4	305.0
95	463	0.52	14.8	0.327	0.90	16.7	-1.4	334.0
120***	305	0.72	16.5	0.255	1.28	19.7	-2.0	456.0
160***	398	0.72	19.0	0.195	1.28	22.5	-2.0	570.0

* Nominal value, deviations from number of strands for cross-sections are permitted (± 5%)

** Also available with increased wall thickness

*** With increased wall thickness.

TK - FLUY WITH ULTRA-THIN PVC INSULATION



CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare or tinned conductor constr. acc. to ISO 6722-1
	Insulation	Soft-PVC with properties according to ISO 6722-1, Class B
SPECIAL PROPERTIES	**Temperature range**	-40°C bis + 105°C (3,000 hrs)
REFERENCE STANDARDS		LV 112-1

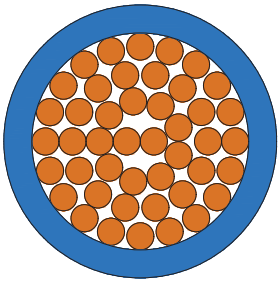
TK - FLUY WITH ULTRA-THIN PVC INSULATION

Nominal cross-section*	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter max.	Limit tolerance	Weight approx.
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.35	7	0.27	0.8	52	0.16	1.2	-0.1	4.0
0.5	19	0.19	1	37.1	0.16	1.4	-0.1	6.0
0.75	19	0.24	1.2	24.7	0.16	1.6	-0.15	8.0
1	19	0.27	1.35	18.5	0.16	1.75	-0.15	10.0
1.25	19	0.3	1.5	14.9	0.16	2	-0.2	13.0
1.5	19	0.33	1.7	12.7	0.16	2.1	-0.2	15.0
2	19	0.37	1.9	9.42	0.2	2.4	-0.2	20.0
2.5	37	0.3	2.2	7.6	0.2	2.27	-0.2	25.0

* Additional cross-sections and strand constructions on request.

TK - FLRYW WITH THIN WALL PVC INSULATION

Type A / Type B, hot-pressure resistant



CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare or tinned conductor constr. acc. to ISO 6722-1
	Insulation	Soft-PVC with properties according to ISO 6722-1, Class C
SPECIAL PROPERTIES	**Temperature range**	-40°C to + 125°C (3,000 hrs) Heat resistant cable Suitable for applications inside the engine compartment
REFERENCE STANDARDS		DBL 6312 · Ford ES-AU5T-1A348

TK - FLRYW WITH THIN WALL PVC INSULATION

Type A / Type B, hot-pressure resistant

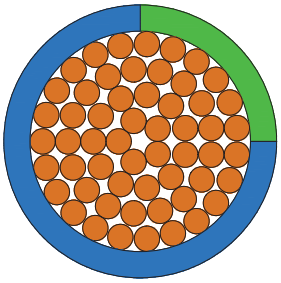
Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands*	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
FLRYW – Type A								
0.35	7	0.26	0.8	54.4 / 55.5**	0.20	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1 / 38.2	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7 / 25.4	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5 / 19.1	0.24	2.1	-0.2	11.0
1.25	19	0.30	1.7	14.9 / 15.9	0.24	2.3	-0.2	12.0
1.5	19	0.32	1.7	12.7 / 13.0	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42 / 9.69	0.28	2.8	-0.3	22.0
FLRYW – Type B								
0.35	12	0.21	0.9	54.4 / 55.5**	0.2	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1 / 38.2	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7 / 25.4	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5 / 19.1	0.24	2.1	-0.2	11.0
1.25	16	0.33	1.7	14.9 / 15.9	0.24	2.3	-0.2	12.0
1.5	30	0.26	1.7	12.7 / 13.0	0.24	2.4	-0.2	16.0
2	28	0.31	2.0	9.42 / 9.69	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6 / 7.8	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15 / 6.36	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71 / 4.85	0.32	3.7	-0.3	42.0
5	65	0.33	3.1	3.94 / 4.02	0.32	4.2	-0.3	50.0
6	84	0.31	3.3	3.14 / 3.23	0.32	4.3	-0.3	61.0
8	50	0.46	4.3	2.38 / 2.52	0.32	5.0	-0.4	82.0
10	80	0.41	4.5	1.82 / 1.85	0.48	5.8	-0.4	108.0
12	96	0.41	5.4	1.52 / 1.6	0.48	6.5	-0.7	120.0
16	126	0.41	5.5	1.16 / 1.18	0.52	7.0	-0.5	170.0
20	152	0.41	6.9	0.955 / 0.999	0.52	7.8	-0.8	192.0
25	196	0.41	7.0	0.743 / 0.757	0.52	8.7	-0.8	265.0

* Nominal value, deviations from number of strands for cross-sections ≥ 6.0 mm^2 are permitted (± 5%)

** Also available with resistance values 52.0 / 53.1 mΩ/m bare / tinned

TK - FLR4Y WITH THIN WALL PA INSULATION

Type A / Type B



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 according to DIN EN 13602, bare or tinned conductor constr. acc. to ISO 6722-1
Insulation	PA (Polyamide)

SPECIAL PROPERTIES

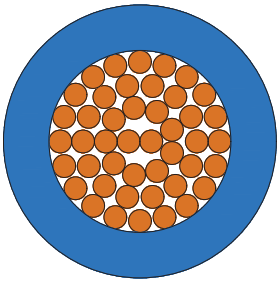
Temperature range	-40°C to + 105°C (3,000 hrs) Outstanding fuel resistance Especially suitable as fuel gauge wire

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
FLR4Y – Type A								
0.35	7	0.26	0.8	54.4 / 55.56*	0.20	1.3	-0.1	4.0
0.5	19	0.19	1.0	37.1 / 38.2	0.22	1.6	-0.2	6.0
0.75	19	0.23	1.2	24.7 / 25.4	0.24	1.9	-0.2	8.0
1	19	0.26	1.35	18.5 / 19.1	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7 / 13.0	0.24	2.4	-0.2	15.0
2.5	19	0.41	2.2	7.6 / 7.8	0.28	3.0	-0.3	24.0
FLR4Y – Type B								
0.35	12	0.21	0.9	54.4 / 55.56*	0.20	1.4	-0.2	4.0
0.5	16	0.21	1.0	37.1 / 38.2	0.22	1.6	-0.2	6.0
0.75	24	0.21	1.2	24.7 / 25.4	0.24	1.9	-0.2	8.0
1	32	0.21	1.35	18.5 / 19.1	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7 / 13.0	0.24	2.4	-0.2	15.0
2.5	50	0.26	2.2	7.6 / 7.8	0.28	3.0	-0.3	24.0
4	56	0.31	2.75	4.71 / 4.8	0.32	3.7	-0.3	40.0

* Also available with resistance values 52.0 / 53.1 mΩ/m bare / tinned

TK - FLRYH WITH THIN WALL PVC INSULATION

fine wire, highly flexible



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, fine wire, bare
Insulation	Soft-PVC, with properties according to ISO 6722-1, Class B

SPECIAL PROPERTIES

Temperature range	-40°C bis + 105°C (3,000 hrs) Flexible strand structure

REFERENCE STANDARDS

LV 112-1

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands*	Diam. of single wire*** max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.35	45	0.11	0.9	54.4**	0.2	1.4	-0.2	5
0.5	64	0.11	1.0	37.1	0.22	1.6	-0.2	6
0.75	96	0.11	1.2	24.7	0.24	1.9	-0.2	9
1	126	0.11	1.35	18.5	0.24	2.1	-0.2	12
1.5	196	0.11	1.7	12.7	0.24	2.4	-0.2	16
2.5	315	0.11	2.2	7.6	0.28	3.0	-0.3	27
4	126	0.21	2.75	4.71	0.32	3.7	-0.3	42
6	189	0.21	3.4	3.1	0.32	4.3	-0.3	68
10	324	0.21	4.5	1.82	0.48	5.8	-0.4	118
16	518	0.21	5.5	1.16	0.52	7.0	-0.5	174
25	798	0.21	7.0	0.743	0.64	8.8	-0.6	263
35	1107	0.21	8.3	0.527	0.8	10.5	-0.7	377

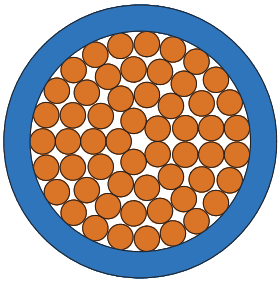
* In compliance with the electrical resistance and the max. single wire diameter, slight deviations in the number of strands are allowed (± 5 %)

** Also available with a resistance value of 52.0 mΩ/m

*** Also available in highly flexible version

TK - 125 P WITH PP INSULATION

Type A / Type B, heat-resistant



CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare conductor constr. acc. to ISO 6722-1
	Insulation	PP-FR (Polypropylene, flame retardant), low halogen
SPECIAL PROPERTIES	**Temperature range**	-40°C to + 125°C (3,000 hrs)
		Marking according to customer requirement
		Use in the engine compartment
REFERENCE STANDARDS		Ford ES-AU5T-1A348 · FIAT 91107/17 Renault 36-05-009/--N · VW 60306-1

TK - 125 P WITH PP INSULATION

Type A / Type B, heat-resistant

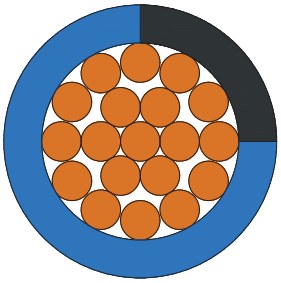
Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness* min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
125 P – Type A								
0.35	7	0.26	0.8	54.4**	0.20	1.3	-0.1	4.0
0.5	19	0.19	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	19	0.41	2.2	7.6	0.28	3.0	-0.3	24.0
125 P – Type B								
0.35	12	0.21	0.9	54.4**	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7	0.24	2.4	-0.2	16.0
2	28	0.31	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71	0.32	3.7	-0.3	42.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0
10	80	0.41	4.5	1.82	0.48	5.8	-0.4	104.0
16	126	0.41	5.5	1.16	0.52	7.0	-0.5	158.0
25	196	0.41	7.8	0.743	0.52	8.7	-0.-	243.0
35	276	0.41	9.0	0.527	1.04	11.6	-0.6	351.0
50	396	0.41	10.5	0.368	1.20	13.5	-0.6	490.0
70	360	0.51	11.6	0.259	1.20	14.6	-0.8	692.0

* Also available with increased wall thickness

** Also available with resistance values 52.0 / 53.1 mΩ/m bare / tinned

TK - 125 XS WITH CROSSLINKED PE INSULATION

Type A / Type B, heat-resistant



CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare conductor construction according to ISO 6722-1
	Insulation	PE-X (Silane crosslinked polyethylene) with properties according to ISO 6722-1, Class C
SPECIAL PROPERTIES	**Temperature range**	-40°C to + 125°C (3,000 hrs) Use in the engine compartment
REFERENCE STANDARDS		ISO 6722-1

TK - 125 XS WITH CROSSLINKED PE INSULATION

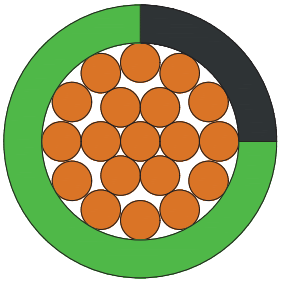
Type A / Type B, heat-resistant

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
125 P – Type A								
0.22	7	0.21	0.7	84.4	0.2	1.2	-0.1	3.0
0.35	7	0.26	0.8	54.4*	0.2	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	19	0.41	2.2	7.6	0.28	3.0	-0.3	26.0
125 P – Type B								
0.35	12	0.21	0.9	54.4*	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7	0.24	2.4	-0.2	16.0
2	30	0.31	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71	0.32	3.7	-0.3	42.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0

* Also available with a resistance value of 52.0 mΩ/m

TK - 125 XE WITH CROSSLINKED PE INSULATION

Type A / Type B, heat-resistant



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare conductor constr. acc. to ISO 6722-1
Insulation	PE-X (Crosslinked polyethylene) with properties according to ISO 6722-1, Class C

SPECIAL PROPERTIES

Temperature range	-40°C to + 125°C (3,000 hrs) Use in the engine compartment

REFERENCE STANDARDS

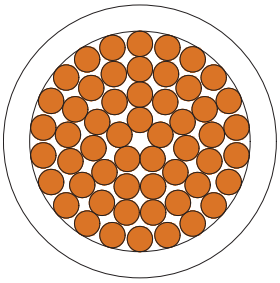
ISO 6722-1 · LV 112-1 · VW 60306-1

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
125 P – Type A								
0.22	7	0.21	0.7	84.4	0.2	1.2	-0.1	3.0
0.35	7	0.26	0.8	54.4*	0.2	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	19	0.41	2.2	7.6	0.28	3.0	-0.3	26.0
125 P – Type B								
0.35	12	0.21	0.9	54.4*	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7	0.24	2.4	-0.2	16.0
2	30	0.31	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71	0.32	3.7	-0.3	42.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0

* Also available with a resistance value of 52.0 mΩ/m

TK - 150 A WITH TPE-E INSULATION

Type A / Type B, heat-resistant



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare or tinned conductor constr. acc. to ISO 6722-1
Insulation	TPE-E (Thermoplastic polyester elastomer) with properties similar to ISO 6722-1, Class D

SPECIAL PROPERTIES

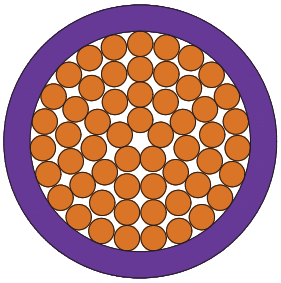
Temperature range	-40°C to + 150°C (3,000 hrs) Limited resistance to hydrolysis

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
150 A – Type A								
0.22	7	0.21	0.7	84.4	0.2	1.2	-0.1	3.0
0.35	7	0.26	0.8	54.4*	0.2	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	19	0.41	2.2	7.6	0.28	3.0	-0.3	26.0
150 A – Type B								
0.35	12	0.21	0.9	54.4*	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7	0.24	2.4	-0.2	16.0
2	30	0.31	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71	0.32	3.7	-0.3	42.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0

* Also available with a resistance value of 52.0 mΩ/m

TK - 150 C WITH TPE-E INSULATION

Type A / Type B, heat-resistant



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare or tinned conductor constr. acc. to ISO 6722-1
Insulation	TPE-E (Thermoplastic polyester elastomer) with properties similar to ISO 6722-1, Class D

SPECIAL PROPERTIES

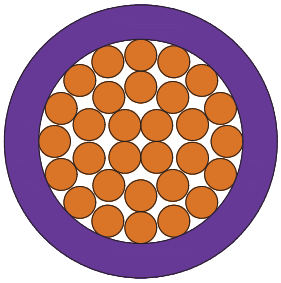
Temperature range	-40°C to + 150°C (3,000 hrs)
	Resistance to hydrolysis
	Limited resistance to battery acid
	Use in headlight application

Nominal cross-section	Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
150 C – Type A								
0.22	7	0.21	0.7	84.4	0.2	1.2	-0.1	3.0
0.35	7	0.26	0.8	54.4*	0.2	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7	0.24	1.9	-0.2	9.0
1	19	0.26	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	19	0.32	1.7	12.7	0.24	2.4	-0.2	16.0
2	19	0.38	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	19	0.41	2.2	7.6	0.28	3.0	-0.3	26.0
150 C – Type B								
0.35	12	0.21	0.9	54.4*	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7	0.24	1.9	-0.2	9.0
1	32	0.21	1.35	18.5	0.24	2.1	-0.2	11.0
1.5	30	0.26	1.7	12.7	0.24	2.4	-0.2	16.0
2	30	0.31	2.0	9.42	0.28	2.8	-0.3	22.0
2.5	50	0.26	2.2	7.6	0.28	3.0	-0.3	26.0
3	45	0.31	2.4	6.15	0.32	3.4	-0.3	33.0
4	56	0.31	2.75	4.71	0.32	3.7	-0.3	42.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0

* Also available with a resistance value of 52.0 mΩ/m

TK - 210 F WITH FEP INSULATION

Type A / Type B, high temperature resistant



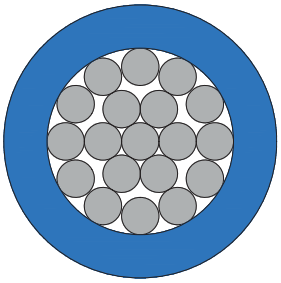
CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare, tinned, silver-plated or nickel-plated fine-wire stranded conductor according to ISO 6722-1
	Insulation	FEP (Tetrafluoroethylene hexafluoropropylene) with properties according to ISO 6722-1, Class F
SPECIAL PROPERTIES	**Temperature range**	-65°C to + 210°C (3,000 hrs) Good mechanical and thermal properties with excellent chemical resistance Suitable for applications inside the engine compartment
REFERENCE STANDARDS		LV 112-1 · VW 60306-1 · PSA B25 1110

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness* min.	Outer diameter max.	Outer diameter Limit tolerance	Weight approx.
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
210 F – Type A								
0.35	7	0.26	0.8	54.4 / 55.5**	0.20	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1 / 38.2	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7 / 25.4	0.24	1.9	-0.2	10.0
1	19	0.26	1.35	18.5 / 19.1	0.24	2.1	-0.2	13.0
1.5	19	0.32	1.7	12.7 / 13.0	0.24	2.4	-0.2	18.0
2.5	19	0.41	2.2	7.6 / 7.82	0.28	3.0	-0.3	20.0
210 F – Type B								
0.35	12	0.21	0.9	54.4 / 55.5**	0.20	1.4	-0.2	5.0
0.5	16	0.21	1.0	37.1 / 38.2	0.22	1.6	-0.2	7.0
0.75	24	0.21	1.2	24.7 / 25.4	0.24	1.9	-0.2	10.0
1	32	0.21	1.35	18.5 / 19.1	0.24	2.1	-0.2	13.0
1.5	30	0.26	1.7	12.7 / 13.0	0.24	2.4	-0.2	18.0
2.5	50	0.26	2.2	7.6 / 7.82	0.28	3.0	-0.3	29.0
4	56	0.31	2.75	4.71 / 4.85	0.32	3.7	-0.3	44.0
6	84	0.31	3.3	3.14	0.32	4.3	-0.3	61.0

* Ultra-thin wall thickness on request (ISO 6722-1)

** Also available with resistance values 52.0 / 53.1 mΩ/m bare / tinned

TK - 260 T WITH PFA INSULATION



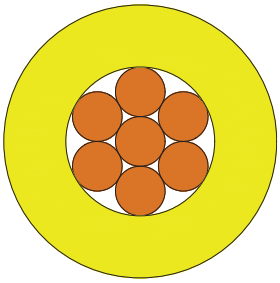
CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare, tinned, silver-plated or nickel-plated conductor construction acc. to ISO 6722-1
	Insulation	PFA (Perfluoroalkoxy copolymer) with properties acc. to ISO 6722-1, Class H
SPECIAL PROPERTIES	**Temperature range**	-80°C to + 260°C (3,000 hrs) Excellent resistance to chemicals Very good mechanical stability Due to its high temperature resistance, an equivalent alternative to PTFE
REFERENCE STANDARDS		ISO 6722-1

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness* min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
210 F – Type A								
0.35	7	0.26	0.8	54.4 / 55.5**	0.20	1.3	-0.1	5.0
0.5	19	0.19	1.0	37.1 / 38.2	0.22	1.6	-0.2	7.0
0.75	19	0.23	1.2	24.7 / 25.4	0.24	1.9	-0.2	10.0
1	19	0.26	1.35	18.5 / 19.1	0.24	2.1	-0.2	13.0
1.5	19	0.32	1.7	12.7 / 13.0	0.24	2.4	-0.2	18.0
2.5	19	0.41	2.2	7.6 / 7.82	0.28	3.0	-0.3	29.0
4	56	0.31	2.75	4.71 / 4.85	0.32	3.7	-0.3	44.0

* Ultra-thin wall thickness on request (ISO 6722-1)

** Also available with resistance values 52.0 / 53.1 mΩ/m bare / tinned

TK - TXL WITH THIN WALL, CROSSLINKED PE INSULATION



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper according to ASTM B3, conductor construction acc. to customer specification
Insulation	XLPE (Polyethylene, crosslinked), flame-retardant, halogen-free insulation material acc. to SAE J 1128 / ESB-M1 L 123-A / MS-8288 / UTMS 12501

SPECIAL PROPERTIES

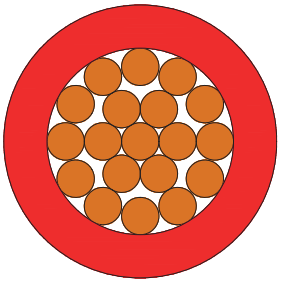
Temperature range	-40°C to + 125°C (3,000 hrs) Also available as SXL, GXL type and tinned

REFERENCE STANDARDS

American standards: SAE J1128

Size	0.Conductor construction				Insulation	Cable		
	Nominal cross-section	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
AWG	mm^2		mm	mm	mm	mm	mm	kg/km
22	0.35	7	0.25	0.76	0.40	0.33	1.7	5.0
20	0.5	7	0.32	0.97	0.40	0.33	1.9	8.0
18	0.8	16	0.25	1.17	0.40	0.33	2.2	11.0
18	0.8	19	0.23	1.17	0.40	0.33	2.2	11.0
16	1.3	19	0.28	1.45	0.40	0.33	2.4	15.0
14	2	19	0.36	1.8	0.40	0.33	2.7	22.0
12	3	19	0.45	2.29	0.46	0.38	3.3	34.0
10	5	19	0.57	2.87	0.50	0.43	4.0	53.0

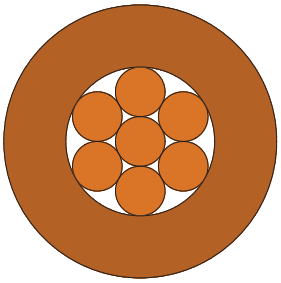
TK - WTA WITH ULTRA-THIN WALL PVC INSULATION



CONSTRUCTION	**Conductor**	Soft-annealed electrolytic copper acc. to ASTM B3, conductor construction acc. to customer specifications
	Insulation	PVC, ultra-thin wall insulation material acc. to SAE J 1678 / Ford WSB M1L134-A / Chrysler MS 9532 / Lear UTMS 12501 / SAE J1678
SPECIAL PROPERTIES	**Temperature range**	-40°C to + 85°C (3,000 hrs) Also available in UTA version
REFERENCE STANDARDS		American standards: SAE J1678

Size	Conductor construction					Insulation	Cable		
							Outer diameter		
	Nom. cross-section	No. of strands	Diam. of single wire max.	Diam. of conductor max.	Electr. resistance at 20 °C bare/tinned max.	Wall thickness min.	max.	Limit tolerance	Weight approx.
AWG	mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
22	0.35	7	0.25	0.76	53.9 / 57.8	0.20	1.35	-0.15	5.0
20	0.5	7	0.32	0.97	34.3 / 36.4	0.20	1.55	-0.15	7.0
18	0.8	19	0.23	1.17	23.0 / 24.7	0.20	1.75	-0.15	9.0
16	1.3	19	0.28	1.45	15.5 / 16.6	0.20	2.03	-0.15	13.0
14	2	19	0.36	1.8	9.44 / 10.0	0.20	2.39	-0.15	21.0
12	3	19	0.45	2.3	6.0 / 6.37	0.24	3.00	-0.15	31.0

TK - WXC WITH ULTRA-THIN WALL XLPE INSULATION



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper acc. to ASTM B3, conductor construction acc. to customer specification
Insulation	XLPE, ultra-thin wall, flame-retardant, halogen-free insulation material acc. to SAE J 1678 / Ford WSS M1L-135-A / Lear UTMS 12501

SPECIAL PROPERTIES

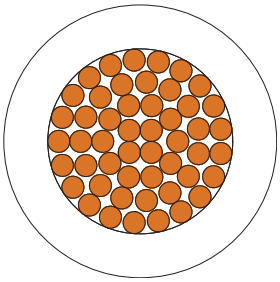
Temperature range	-40°C to + 125°C (3,000 hrs) Also available in UXC version

REFERENCE STANDARDS

American standards: SAE J1678

Size	Conductor construction					Insulation	Cable		
							Outer diameter		
	Nom. cross-section	No. of strands	Diam. of single wire max.	Diam. of conductor max.	Electr. resistance at 20 °C bare/tinned max.	Wall thickness min.	max.	Limit tolerance	Weight approx.
AWG	mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
22	0.35	7	0.25	0.76	53.9 / 57.8	0.20	1.35	-0.15	5.0
20	0.5	7	0.32	0.97	34.3 / 36.4	0.20	1.55	-0.15	7.0
18	0.8	19	0.23	1.17	23.0 / 24.7	0.20	1.75	-0.15	9.0
16	1.3	19	0.28	1.45	15.5 / 16.6	0.20	2.03	-0.15	13.0
14	2	19	0.36	1.8	9.44 / 10.0	0.20	2.39	-0.15	21.0
12	3	19	0.45	2.3	6.0 / 6.37	0.24	3.00	-0.15	32.0

TK - AV WITH PVC INSULATION



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 nach D 609-90, bare conductor construction according to JASO D 611:2009
Insulation	PVC, insulation material according to JASO D 611:2009

SPECIAL PROPERTIES

Temperature range	-40°C to + 80°C (3,000 hrs)

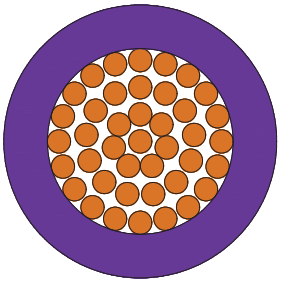
REFERENCE STANDARDS

Japanese standards:
JASO D 611:2009 · JASO D 618:2008 · JIS C 3406

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.5	7	0.32	1.0	32.7	0.60	2.4	-0.2	10.0
0.85	11	0.32	1.2	20.8	0.60	2.6	-0.2	13.0
1.25	16	0.32	1.5	14.3	0.60	2.9	-0.2	17.0
2	26	0.32	1.9	8.81	0.60	3.4	-0.3	26.0
3	41	0.32	2.4	5.59	0.70	4.1	-0.3	40.0
5	65	0.32	3.0	3.52	0.80	4.9	-0.3	62.0
8	50	0.45	3.7	2.32	0.90	5.8	-0.3	92.0
10	63	0.45	4.5	1.84	1.00	6.9	-0.4	120.0
15	84	0.45	4.8	1.38	1.10	7.4	-0.4	160.0
0.5 f*	20	0.18	1.0	36.7	0.60	2.4	-0.2	9.0
0.75 f*	30	0.18	1.2	24.4	0.60	2.6	-0.2	12.0
1.25 f*	50	0.18	1.5	14.7	0.60	2.9	-0.2	18.0
2 f*	38	0.26	1.8	9.5	0.60	3.4	-0.4	25.0
3 f*	61	0.26	2.4	5.76	0.70	4.1	-0.3	40.0

* The “f” in the nominal cross-section column indicates a flexible conductor with a finer wire diameter

TK - AVS WITH THIN WALL PVC INSULATION, TYPE 1



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 nach D 609-90, bare conductor construction according to JASO D 611:2009
Insulation	PVC, insulation material according to JASO D 611:2009

SPECIAL PROPERTIES

Temperature range	-40°C to + 80°C (3,000 hrs)

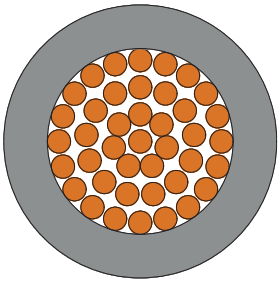
REFERENCE STANDARDS

Japanese standards:
JASO D 611:2009 · JASO D618:2008

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.3	7	0.26	0.8	50.2	0.50	1.9	-0.1	6.0
0.5	7	0.32	1.0	32.7	0.50	2.1	-0.1	8.0
0.85	11	0.32	1.2	20.8	0.50	2.3	-0.1	12.0
1.25	16	0.32	1.5	14.3	0.50	2.6	-0.1	16.0
2	26	0.32	1.9	8.81	0.50	3.1	-0.2	25.0
3	41	0.32	2.4	5.59	0.60	3.8	-0.2	39.0
5	65	0.32	3.0	3.52	0.70	4.6	-0.2	60.0
0.3 f*	15	0.18	0.8	48.9	0.50	1.9	-0.1	6.0
0.5 f*	20	0.18	1.0	36.7	0.50	2.1	-0.1	8.0
0.75 f*	30	0.18	1.2	24.4	0.50	2.3	-0.1	11.0
1.25 f*	50	0.18	1.5	14.7	0.50	2.6	-0.1	17.0
2 f*	37	0.26	1.8	9.5	0.50	3.1	-0.2	24.0

* The “f” in the nominal cross-section column indicates a flexible conductor with a finer wire diameter

TK - AVSS WITH THIN WALL PVC INSULATION, TYPE 2



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 nach JIS C 3102, bare conductor construction according to JASO D 611:2009
Insulation	PVC, insulation material according to JASO D 611:2009

SPECIAL PROPERTIES

Temperature range	-40°C to + 80°C (3,000 hrs)

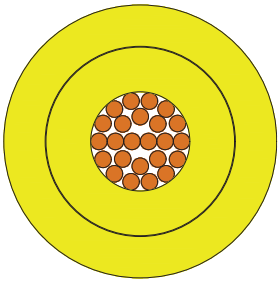
REFERENCE STANDARDS

Japanese standards:
JASO D 611:2009 · JASO D618:2008

Nominal cross-section	0.Conductor construction				Insulation	Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Outer diameter		Weight approx.
						max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	kg/km
0.3	7	0.26	0.8	50.2	0.30	1.5	-0.1	5.0
0.5	7	0.32	1.0	32.7	0.30	1.7	-0.1	7.0
0.85	19	0.24	1.2	21.7	0.30	1.9	-0.1	10.0
1.25	19	0.29	1.5	14.9	0.30	2.2	-0.1	14.0
2 (f)*	37	0.26	1.8	9.5	0.30	2.7	-0.1	22.0
0.3 f*	19	0.16	0.8	48.8	0.30	1.5	-0.1	5.0
0.5 f*	19	0.19	1.0	34.6	0.30	1.7	-0.1	7.0
0.75 f*	19	0.23	1.2	23.6	0.30	1.9	-0.1	10.0
1.25 f*	37	0.21	1.5	14.6	0.30	2.2	-0.1	14.0

* The “f” in the nominal cross-section column indicates a flexible conductor with a finer wire diameter.

TK - FLYY WITH CORE INSULATION AND PVC SHEATH



CONSTRUCTION

Conductor	Soft-annealed electrolytic copper Cu-ETP1 acc. to DIN EN 13602, bare conductor construction acc. to ISO 6722-1
Insulation/sheath	Plasticised PVC with properties according to ISO 6722-1, Class B

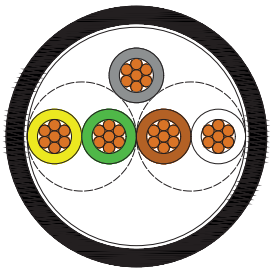
SPECIAL PROPERTIES

Temperature range	-40°C to + 105°C (3,000 hrs) Sheath options: adherent or separable from inner core

Nominal cross-section	0.Conductor construction				Insulation*			Cable		
	No. of stands	Diam. of single wire max.	Diam. of conductor max.	Electrical resistance at 20 °C max.	Wall thickness min.	Core diam.	Sheath wall thickness min.	Outer diameter		Weight approx.
								max.	Limit tolerance	
mm^2		mm	mm	mΩ/m	mm	mm	mm	mm	mm	kg/km
0.5	16	0.21	1.0	37.1	0.60	2.1	0.4	3.1	-0.4	104.0
0.75	24	0.21	1.2	24.7	0.60	2.3	0.4	3.3	-0.3	17.0
1	32	0.21	1.35	18.5	0.60	2.5	0.4	3.6	-0.4	20.0
1.5	30	0.26	1.7	12.7	0.60	2.8	0.5	4.1	-0.4	28.0
2	40	0.26	2.0	9.42	0.60	3.0	0.5	4.3	-0.4	33.0
2.5	50	0.26	2.2	7.61	0.70	3.5	0.5	4.8	-0.5	41.0

* All cross-sections can also be supplied with reduced insulation thickness (FLRYY)

TK - PROBE DATA TRANSMISSION



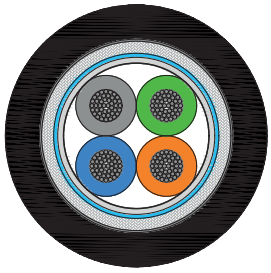
CONSTRUCTION

Conductor	Bare, tinned or copper alloy
Insulation	Thermoplastic compund

SPECIAL PROPERTIES

Temperature range	-20°C to + 105°C

Cable structure	Conductor diameter	Core diameter	Shield type	Outer diameter	Weight
	mm	mm		mm	kg/km
2x2x0.35+(0.35)	0.8	1.30	PETP-AL	6.20	52.0
2x2x0.35+(0.35)+(0.35)	0.8	1.30	PETP-AL	6.20	52.0
1x0.35+(0.35)	0.8	1.25	PVC-AL	4.10	22.0
2x0.35+(0.35)	0.8	1.30	PVC-AL	4.30	25.0

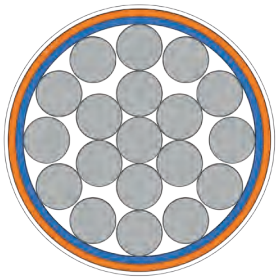


SPECIAL PROPERTIES

Temperature range -20°C to + 105°C

Cable structure	Conductor material/ shield type	Outer diameter	Insulation material		Impedance	Weight
		mm				kg/km
LVDS						
4x2x0.22+0.22	Cu bare/PETP-AL/C-shield	6.80	PE	-	100	56.0
4x2x0.22+0.22	Cu bare/PETP-AL/C-shield	6.80	PP	-	100	55.0
4x2x0.22	Cu bare/PETP-AL/C-shield	6.80	cellular PP	-	100	56.0
4x2x0.22+(0.22)	Cu bare/AL coated foil/C-shield	6.30	PE	-	100	51.0
4x2x0.22+(0.22)	Cu tiinned/AL coated foil/C-shield	6.30	FEP	-	100	61.0
5x2x0.22	Cu bare/PETP-AL/C-shield	7.40	PE	-	100	63.5
5x2x0.22	Cu bare/PETP-AL/C-shield	7.40	PP	-	100	71.0
5x2x0.22	Cu bare/PETP-AL/C-shield	7.00	cellular PP	-	100	69.0
2x0.14	Cu tinned/PVC-AL/C-shield	4.60	PP	-	100	27.0
4x.014	Cu tinned/PVC-AL/C-shield	4.60	PP	-	100	34.0
CAN						
2x0.35	Cu bare/PETP	4.90	cellular PP	-	120	22.0
2x0.35	Cu bare	5.00	TPE-O-X	-	120	28.5
2x0.5	Cu bare/PETP	5.40	TPE-O-X	-	120	31.0
2x0.75+(0.75)	Cu bare/PETP-AL	8.00	cellular PP	-	120	62.0
FLEXRAY						
2x0.35+(0.35)	Cu bare/PETP-AL	4.80	cellular PP	-	100	28.0
FIRE WIRE						
4x0.14	Cu tinned/PVC-AL	4.60	cellular PP	-	110	32.0
USB						
(2x0.089)+2x0.24+(0.089)	Cu tinned/PVC-AL	4.30	PP	PVC	90	29.0
(2x0.35)+2x0.35+(0.35)	Cu bare/PVC-AL	5.80	cellular PP	PVC	90	54.0

TK - SINGLE CORE - NICKELCOATED COPPER WIRE



CONSTRUCTION	**Conductor**	Copper Nickel coated or Copper Nickel alloy according to EN2083
	Insulation 1st layer	PTFE tape
	Insulation 2nd layer	PI616/Kapton tape
	Identification tape	PTFE colored tape: white or colored on request
SPECIAL PROPERTIES	**Temperature range**	-40°C to + 150°C
OTHER CHARACTERISTICS	**Nominal Electrical Resistance**	See table one
	Nominal Insulation Resistance	500 MΩ/1000m +20°C 1000 MΩ/1000m +95°C
	Operating Voltage	600 Vrms Max
	Test Voltage (Dry)	5 kVrms
	Minimum Bending Radius/Pliability	BS 2 G230 test 6.39 38
	Wire/Wire Abrasion	BS 2 G230 test 37
	Stripping	BS 2 G230 test 6.39 38
	Resistance to fluids	Fuel ISO 1817/B – Cleaing Fluid ASTM D 4376 – Propane-2-Oil BS1595 De-icing fluid DTD 900/4907 Hydraulic Fluid DEF.Stan 91-48/1
	Toxicity and smoke assessment	ATS-1000-001 test 7.2/7.3 - ATS-1000-001 test
	Cold Bend	4h at -65°C without craking/crazing

Size AWG	No. of strands	Strands nominal diameter	Nominal conductor diameter	Nominal insulation diameter	Conductor resistance max.	Weight
		mm			Ω/km	kg/km
24	19	0.12	0.57	0.98	114	2.75
22	19	0.15	0.72	1.13	60	4.05
20	19	0.2	0.96	1.35	33.2	6.7
18	19	0.25	1.21	1.6	21,1	9.9
16	19	0.3	1.45	1.84	14.5	13.8
14	37	0.25	1.69	2.09	10.9	18.3
12	37	0.32	2.17	2.54	6.8	29

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