

Our silicone cables provide outstanding electrical and fire resistant properties, are extremely flexible at both low and high temperatures and are halogen free. Such designs are used in medical technology, as fire safety cable, high voltage cable, in mechanical engineering, in sensor, measurement and control technology as well as in power plants of all kinds.

High temperature cables based on fluoropolymers are, along with their resistance to constant temperatures of up to 260 °C, also resistant to oil and chemicals (acids and alkaline solutions) as well as flame retardant and low-smoke. Such cables are deployed primarily in the chemical industry, mechanical engineering and in all market segments that require maximum electrical performance with the thinnest possible dimensions.

Insulation materials made of glass fiber, mica and ceramic-based ones are exceptionally well suited to temperatures of up to 1,250 °C and boast good mechanical strength as well as high resistance to ageing. Classic areas of application for these cables involve electric heating, extrusion and drying equipment, glass and ceramics production as well as steel and metallurgical plant.

Areas where high temperature resistant cables are used:

- engine and turbine manufacture
- medical input leads
- high frequency and measurement technology
- shipbuilding, machinery and plant engineering
- electric heaters
- power plant technology
- extruders and dryers

- glass and ceramic production
- steel and metallurgical plant

Product overview:

- silicone insulated cables
- fluoropolymer insulated cables
- cables made of glass fiber, mica and ceramic-based
- hybrid cables
- high temperature cables
- heating cables
- UL & CSA cables
- thermo & AGL cables
- customised cables
- special cables
- special foils

Across our entire portfolio we can offer customised designs, in some cases starting from a production quantity of just 100 meters. Our cables also have VDE and UL/CSA approvals, among others. Extended approvals, e.g. from Germanischer Lloyd, are in preparation. We manufacture to national and international norms and standards.



Please see the following pages for details on our cable materials and properties as well as the codes and product designations.



High Temperature Cable Solutions Business Unit Industrial Solutions

The Quality Connection

LEONI Industrial Solutions

Engineering, Products, Services: benefit from maximum reliability and economy.

The Industrial Solutions business unit is among the world's leading suppliers in the field of industrial engineering. From engineering to standardised and customised cables, cable assembly and integrated system solutions through to logistics concepts, technical services and sophisticated training methods – our comprehensive portfolio always offers you consistent added value across the entire lifecycle of your products. Our flexibility is what makes us stand out. We will produce or assemble single units or complete series for you, just in time.

You are at exactly the right place with LEONI when it is a matter of exceptionally high temperatures. As one of the world's leading cable manufacturers, we have a unique range of products and services in the high temperature segment: it stretches from compound development to cable design and production on state-of-the-art extrusion, sintering and taping lines and through to the ready-to-connect cable assembly as well as fully wired modules.

Depending on your particular requirements and areas of application, we will develop and produce high temperature resistant special cables for you that are designed for safe operation at

temperatures of up to 1,250 °C. Tailored to your application, we will select the materials that in the best possible way match the property profile required by the specified temperature range of your special cable. These include silicone, fluoropolymer, glass fiber as well as ceramic-based insulation materials.

Our experts have many years of experience in this specialist field. Their sound advice on site guarantees optimum product and system solutions every time.

Our areas of expertise:

- medical technology
- mechanical engineering
- plant and process engineering
- aerospace technology
- automotive engineering
- power engineering
- automation engineering
- railway engineering
- building services engineering
- laboratory equipment
- food technology
- research, universities etc.
- wholesale trade

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HighTemp Solutions · Materials and properties

Material	Chemical Description	LHTS Designation	VDE Designation	Thermal Properties					Resistance							Physical Properties				Electric Properties			Flammability					Density g/cm³	
				Continuous Operating Temperature for 20,000 hrs	Continuous Operating Temperature for 3,000 hrs	Thermal Over-load Capacity 20 hrs	Melt/Flow Temperature	Cold Winding Test	Oil	Acid/Alkali	Chemicals	Ozone	UV	Water Absorption	Shore/Hardness	Tensile Strength	Elongation at break	Corrosive Resistance	Specific Volume Resistance	Dielectric Strength	Relative Permittivity	LOI	Flame retardant	Low Smoke Density	Corrosive Gases	Halogen Free			
				from °C	to °C	°C	°C	°C	%					%	A/D	(MPa)	%		Ω x cm	kV/mm		% O ₂							
Fluoropolymer																													
PTFE	Polytetrafluorethylene		5Y	-190	260	300	310	327	-90	++	++	++	++	++	0.01	D55-D65	>20	>200	++	>10 ¹⁸	>20	2.0	95	++	yes	--	no	2.10-2.30	
PFA	Tetrafluorethylene-Perfluoropropylvinylether		51Y	-190	250	250	280	300-310	-90	++	++	++	++	++	0.01	D55-D60	>15	>200	+	>10 ¹⁶	>25	2.1	95	++	yes	--	no	2.12-2.17	
MFA	Tetrafluorethylene-Perfluormethylvinylether	Fp	N.a.	-100	230	250	270	280-290	-90	++	++	++	++	++	0.01	D55-D60	>20	>200	+	>10 ¹⁶	>25	2.1	95	++	yes	--	no	2.12-2.17	
FEP	Tetrafluorethylene-Hexafluoropropylene		6Y	-100	205	230	260	265-270	-80	++	++	++	++	++	0.01	D55-D60	>20	>200	+	>10 ¹⁸	>25	2.1	95	++	yes	--	no	2.00-2.30	
ETFE	Ethylene-Tetrafluorethylene		7Y	-100	135	180	200	235-270	-65	++	++	++	++	++	0.02	D70-D75	>25	>150	++	>10 ¹⁵	>30	2.6	>30	++	yes	--	no	1.60-1.80	
ECTFE	Ethylene-Chlortrifluorethylene		71Y	-100	125	150	160	250-280	-65	++	++	++	++	++	0.10	D70-D75	>25	>150	++	>10 ¹⁴	>30	2.5	>50	++	yes	--	no	1.67-1.69	
PVDF	Polyvinylidene fluoride		10Y	-100	135	135-145	160	160-190	-65	++	++	++	++	++	0.02	D75-D80	>25	>100	++	>10 ¹⁴	>25	>8.0	>30	++	yes	--	no	1.70-1.90	
Silicone																													
VMQ R	Silicone-Rubber (cross-linked by peroxide)		2G	-60	180	230	>300	cross-linked	-80	-/+	-/+	+	+	++	1.00	A40-A90	6-15	>300	+	>10 ¹⁵	20-36	>2.7	25-35	++	yes	++	yes	1.10-1.30	
VMQ Rp	Silicone-Rubber (cross-linked by addition)	Si	2G	-60	180	230	>300	cross-linked	-80	+	+	+	+	++	1.00	A30-A90	6-13	>250	+	>10 ¹⁵	>20	>3.0	25-35	++	yes	++	yes	1.07-1.31	
VM Q LR	Silicone-Rubber (cross-linked by addition LSR)		2G	-60	180	230	>300	cross-linked	-80	+	+	+	+	++	1.00	A20-A70	6,5-10	>300	+	>10 ¹⁵	>22	>3.0	25-35	++	yes	++	yes	1.10-1.18	
Thermoplastics																													
LDPE	Low Density Polyethylene		2Y	-50	70	90	100	115-125	-50	-/+	++	+	+	-	<0.01	D45	10-20	>400	+	>10 ¹⁸	>70	2.3	<17	-	yes	++	yes	0.92-0.94	
HDPE	High Density Polyethylene		2Y	-50	90	110	115	115-125	-50	-/+	++	+	+	-	<0.01	D64	15-30	>400	-/+	>10 ¹⁸	>80	2.4	<17	-	yes	++	yes	0.94-0.96	
PA	Polyamide	Th	4Y	-40	105	125	150	230-260	-30	++	-/+	+	+	-/+	1.00-1.50	D75-D80	50-60	>50	++	10 ¹³	>30	3.5-4.5	28	+	yes	++	yes	1.14	
PP	Polypropylene		9Y	-40	90	110	140	130-145	-40	+	+	+	+	-/+	0.10	D65-D70	>30	>400	+	>10 ¹⁶	>80	2.3	18	-	yes	++	yes	0.91	
PVC	Polyvinylchloride		Y	-40	80	120	140	140-160	-40	-/+	+	-/+	++	-/+	0.40	A50-D50	>10	>200	+	>10 ¹⁰	>20	4.0-5.0	>20	++	no	--	no	1.35-1.50	
Thermoplastic Elastomers																													
TPE-U	Thermoplastic Polyurethane Elastomer		11Y	-60	80	125	150	180-205	-50	++	++	+	+	+	0.80-1.50	A80-D75	>30	>400	++	>10 ⁹	>10	5.5-8.0	<30	-/+	N.a.	++	yes	1.12-1.21	
TPE-E	Thermoplastic Polyester Elastomer		13Y o. 12Y	-70	115	150	160	180-230	-50	++	-	++	+	++	0.60-1.20	D40-D78	>20	>300	++	>10 ⁹	>10	3.5-5.0	<29	-/+	yes	++	yes	1.00-1.20	
TPE-S	Thermoplastic Polystyrene Elastomer	Th	17Y	-75	115	125	140-150	>150	-40	+	+	+	+	+	1.00-2.00	A30-D50	>15	>200	+	>10 ¹⁰	>10	3.0-4.0	22-27	-/+	yes	+	yes	1.10-1.30	
TPE-O	Thermoplastic Polyolefin Elastomer		18Y	-40	90	120	130-150	>135	-40	-	++	+	+	+	1.50	A50-D40	>10	>300	+	>10 ¹⁴	>20	3.0	22-27	-/+	yes	+	yes	1.20-1.40	
TPE-V	Thermoplastic Polyolefin Elastomer		N.a.	-60	110	130	150	155-230	-40	+	++	+	++	++	2.00	A35-D50	4-26	>400	+	N.a.	>30	2.3	19 ¹⁾	- ¹⁾	no	- ¹⁾	yes ¹⁾	0.91 ¹⁾	
Elastomers																													
EPDM	Ethylen-Polypropylene-Terpolymer		3G	-40	90	100	150	cross-linked	-40	--	++	+	+	++	0.02	A60-D90	7-15	>200	+	>10 ¹⁵	30	3.0-4.0	30	-/+	yes	+	yes	1.30-1.40	
EPR	Ethylen-Polypropylene-Rubber		3G	-40	90	100	160	cross-linked	-65	--	++	+	++	+	0.20	A60-D85	7-10	>200	+	10 ¹³⁻¹⁰ 15	30	3.0-5.0	>20	-/+	yes	+	yes	1.30-1.40	
EVM	Ethylen-Vinyl Acetate-Rubber	EI	4G	-40	120	150	180	cross-linked	-50	+	+	+	+	+	0.10	>A70	>10	>200	+	10 ¹²⁻¹⁰ 14	>20	4.0-7.0	>20	-/+	yes	+	yes	1.30-1.45	
CR	Chloroprene-Rubber		5G	-40	90	120	140	cross-linked	-40	+	+	+	+	+	1.00	A55-D70	>10	>250	+	10 ¹⁶⁻¹⁰ 11	20	6.0-9.0	30-34	++	no	--	no	1.40-1.45	
FKM/FPM	Fluorubber		N.a.	-20	180	200	260	cross-linked	-20	++	++	++	++	++	>0.20	A60-D40	5-13	200	+	10 ¹⁸⁻¹⁰ 14	>15	6.0-9.0	40	++	yes	--	no	1.90-2.25	
Special Thermoplastics																													
PI	Polyimide		8Y	-190	220	260	400	no	-70	-/+	-	+	+	++	>0.25	D80-D90	>70	>70	++	>10 ¹⁷	28	3.5	40-50	++	yes	+	yes	1.45	
PEEK	Polyetheretherketone		20Y	-65	230	250	300	340	-50	++	++	+	++	+	0.50	>D80	>20	>60	++	>10 ¹⁶	>130	3.2	35	++	yes	+	yes	1.32	
PEI	Polyetherimide	So	N.a.	-40	150	170	190	>220	-25	+	-/+	+	+	+	>0.25	D80-D85	>95	>60	+	>10 ¹⁵	>180	3.2-3.5	>45	+	yes	+	yes	1.27	
PEIC	Siloxane Polyetherimide Copolymer		21Y	-40	120	150	160	>170	-65	+	-	+	+	+	N.a.	D60-D70	>30	>100	+	>10 ¹⁴	>16	2.8	46	+	yes	+	yes	1.18	
Others																													
PAR	Para-Aramid-Fibre		N.a.	-190	250	300	350	no	-40	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	>2200	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	1.45	
GLI	Mica tape	B	N.a.	-50	>900	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	>80	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	>2.70
GL	Glas fibre		N.a.	N.a.	>500	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	>80	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.	N.a.

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All data is based on statistical values and must be verified in each case.

¹⁾ without fire protection agent

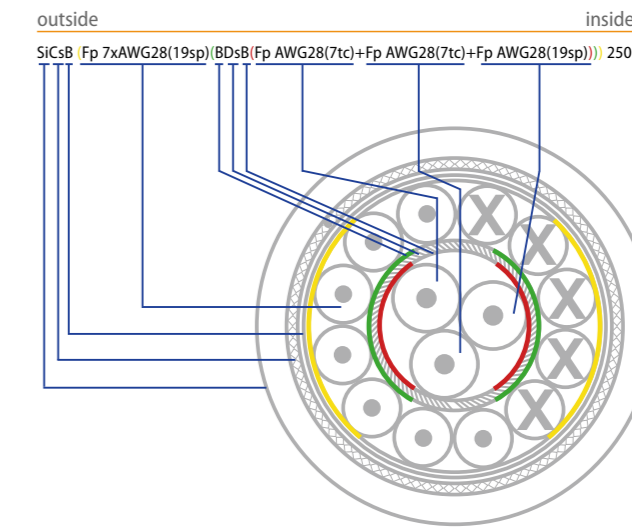
²⁾ with fire protection agent

++ optimal / + good / - moderate / -- insufficient

N. a. = Not available

Example of decoding the product designation of a temperature resistant special cable

As a basic rule, our product designations describe the cable's construction from the outside in.

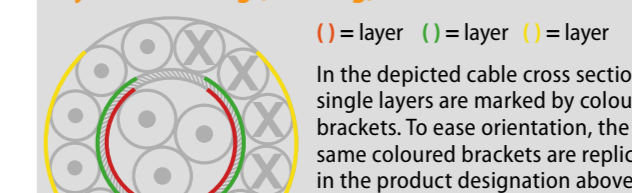


Based on the adjoining product designation, the depicted cable may be described as follows:

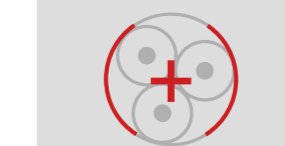
Si	Silicone sheath
Cs	Braid with electrical properties
B	Tape
Fp 7xAWG28(19sp)	Cores: 7 Fluoropolymers AWG28 Conductor: 19 sp
B	Tape
Ds	Serving with electrical properties
B	Tape
Fp AWG28(7tc)	Cores: 7 Fluoropolymers AWG28 Conductor: 7 tc
Fp AWG28(7tc)	Cores: 7 Fluoropolymers AWG28 Conductor: 7 tc
Fp AWG28(19sp)	Cores: 7 Fluoropolymers AWG28 Conductor: 19 sp
250 V	Voltage rating

Single construction elements

Layers/stranding (twisting)

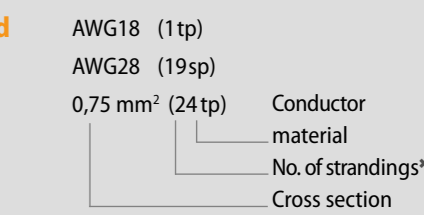


In the depicted cable cross section, single layers are marked by coloured brackets. To ease orientation, the same coloured brackets are replicated in the product designation above.

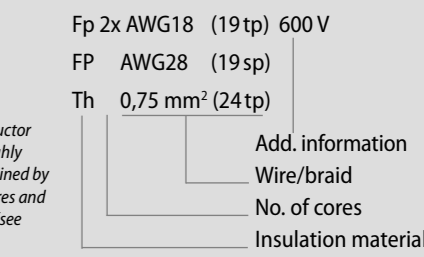


If different components are used within a strand/layer, the codes are linked with a "+" sign.

Wire/braid



Core



Codes at LEONI HighTemp Solutions

Insulation material, sheath material

Fluoropolymer	Fp
Thermoplastics/Thermoplastic elastomers	Th
Silicones	Si
Elastomers	EI
Cross linked	X
Special Thermoplastics	So
Others	PAR, GLI, GL
Braiding, Servicing, Taping	
Braid	C
Serving	D
Foil, Tape	B

Conductor material

Copper bare	co
Copper tin plated	tp
Copper silver plated	sp
Copper nickel plated	np
Nickel pure	ni
Aluminium	al
Silver pure	ag
Gold pure	au
Thermo couple, compensating	tc
Resistance material	rm
V2A, V4A	va
Copperweld	cw
Alloy	Alloy

If these components have power shielding properties the code is suffixed with a small "s". A shielding braid made of copper wires, for instance, is therefore abbreviated "Cs".

Additional Information
Example: Voltage rating, Approval, ...