

ELEKTRISOLA

Enamelled Wire

Enamelled Wire Types

IEC

Europe

Enamelled Copper Wire acc to IEC - Europe

General

Product-Code	P155	P180	E180	A200	AI210	I220	ML240
Product-Name	Polysol155	Polysol 180	Estersol 180	Amidester 200	Amidester210		
General Description	mod. Polyurethane	mod. Polyurethane	Polyesterimide	Theic-mod. Polyesterimide	A200 + Polyamidimide	Polyamidimide	aromatic Polyimide
IEC (including the following norms)	IEC 60317-20, IEC 60317-4	IEC 60317-51, IEC 60317-20	IEC 60317-23, IEC 60317-3/8	IEC 60317-8	IEC 60317-13	IEC 60317-57, IEC 60317-26	IEC 60317-46, 60317-7
NEMA (including the following norms)	MW 79, MW 2, MW 75	MW 82, MW79, MW75	MW 77, MW 5, MW 26	MW 74, MW 5, MW 30	MW35, MW73	MW 81	MW 16
UL-approval	yes	yes	yes	yes	yes	yes	no, JW 1177
Diameters available	0,010 - 0,50 mm	0,010 - 0,50 mm	0,010 - 0,50 mm	0,010 - 0,50 mm	0,015 - 0,50 mm	0,020 - 0,50 mm	0,015 - 0,50 mm, ex USA
Properties	Very good solderability and high thermal properties.	Good solderability at 370°C and elevated thermal values	Solderable at high temperatures, high thermal properties and good chemical resistance.	Very high thermal properties and good chemical resistance.	Very high thermal properties and high mechanical resistance	High thermal properties, good chemical resistance	Excellent thermal properties, excellent chemical and high radiation resistance
Applications	Small transformers, linear motors, relays, solenoids, small motors, clock coils, watch coils, transformers, magnetic heads, instruments	Automotive coils as relays and ignition coils, transformers and solenoids	Small motors, small transformers, automotive coils.	Motors, small motors, transformers.	Motors	Small motors, automotive sensors, solenoids, transformers	Extreme loads and space applications

Thermal Values

Product-Code	P155	P180	E180	A200	AI210	I220	ML240
Temperature index 20.000 h acc. to IEC 60172	158°C	192°C	195°C	210°C	212°C	230°C	245°C
Cut through temperature							
0.05mm: acc. to IEC 60851-6.4	≥ 200°C	≥ 230°C	≥ 265°C	≥ 300°C	≥ 320°C	≥ 350°C	≥ 400°C
Elektrisola typical value	225°C	260°C	315°C	350°C	365°C	390°C	450°C
0.25mm: acc. to IEC 60851-6.4	≥ 200°C	≥ 230°C	≥ 265°C	≥ 300°C	≥ 320°C	≥ 350°C	≥ 400°C
Elektrisola typical value	230°C	265°C	325°C	360°C	380°C	410°C	450°C
Heat Shock							
0.05mm: acc. to IEC 60851-6.3	≥ 175°C	≥ 200°C	≥ 200°C	≥ 200°C	≥ 220°C	≥ 220°C	≥ 240°C
Elektrisola typical value	190°C	210°C	260°C	230°C	250°C	250°C	300°C
0.25mm: acc. to IEC 60851-6.3	≥ 175°C	≥ 200°C	≥ 200°C	≥ 200°C	≥ 220°C	≥ 220°C	≥ 240°C
Elektrisola typical value	180°C	200°C	250°C	220°C	240°C	≥ 240°C	300°C

>> [Click here to see a Thermal Stability Chart](#)

Electrical Values

Product-Code	P155	P180	E180	A200	AI210	I220	ML240
Low voltage continuity for Grade 1 wires							
0.05mm: acc. to IEC 60851-5.1	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40
Elektrisola typical value	0	0	0	0	0	0	0
High voltage continuity for Grade 1 wires							
0.05mm: acc. to IEC 60851-5.2	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40	≤ 40
0.05mm: Elektrisola typical value	2	2	2	2	2	2	2
0.25mm: acc. to IEC 60851-5.2	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Elektrisola typical value	1	1	1	1	1	1	1
Breakdown voltage (at 20 °C, 35% humidity)							
0.05mm: Elektrisola typical value	220 V/μm	220 V/μm	220 V/μm	220 V/μm	210 V/μm	210 V/μm	210 V/μm
0.25mm: Elektrisola typical value	180 V/μm	180 V/μm	180 V/μm	180 V/μm	170 V/μm	170 V/μm	170 V/μm
Decrease of breakdown voltage for Grade 1 wires							
0.05mm: Elektrisola typical value	25% / 155°C	20% / 180°C	20% / 180°C	20% / 200°C	20% / 205°C	20% / 205°C	15% / 220°C
0.25mm: Elektrisola typical value	25% / 155°C	20% / 180°C	20% / 180°C	20% / 200°C	20% / 205°C	20% / 205°C	15% / 220°C

>> [Click here to see the Calculation Method for Breakdown Voltage](#)

Mechanical Values

Product-Code	P155	P180	E180	A200	AI210	I220	ML240
Elongation for Grade 1 wire							
0.05mm: acc. to IEC 60851-3 Part 3.1	≥ 14%	≥ 14%	≥ 14%	≥ 14%	≥ 14%	≥ 14%	≥ 14%
Elektrisola typical value	23%	23%	23%	23%	23%	23%	23%
0.25mm: acc. to IEC 60851-3 Part 3.1	≥ 25%	≥ 25%	≥ 25%	≥ 25%	≥ 25%	≥ 25%	≥ 25%
Elektrisola typical value	40%	40%	40%	40%	40%	40%	40%
Tensile strength for Grade 1 wires							
0.05mm: Elektrisola typical value	57 cN	57 cN	57 cN	57 cN	57 cN	57 cN	57 cN
0.25mm: Elektrisola typical value	1370 cN	1370 cN	1370 cN	1370 cN	1370 cN	1370 cN	1370 cN

>> [Click here to see the Stress-Strain-Diagram](#)

Chemical Compatibility

Product-Code	P155	P180	E180	A200	AI210	I220	ML240
Compatibility to standard solution							
Pencil Hardness acc. to IEC 60851-4.3 with treatment	4H	4H	4H	4H	4H	4H	6H
Pencil Hardness acc. to IEC 60851-4.3 without treatment	4H	4H	4H	4H	4H	4H	6H

Decrease of breakdown voltage in % after treatment	5%	0%	0%	5%	0%	5%	0%
RoHS laboratory analysis	view	view	view	view	view		

Solderability

Product-Code	P155	P180	E180	A200	Al210	I220	ML240
Solderability for Grade 1 wires							
0.05mm: max. acc. to IEC 60851-4.5	2.0s / 390°C	2.0s / 390°C	2.0s / 470°C	not solderable	not solderable	not solderable	not solderable
Elektrisola typical value	0.3s / 370°C	1.8s / 370°C	1.8s / 470°C				
Elektrisola typical value	0.2s / 390°C	0.7s / 390°C					
0.25mm: max. acc. to IEC 60851-4.5	2.0s / 390°C	2.0s / 390°C	2.0s / 470°C	not solderable	not solderable	not solderable	not solderable
Elektrisola typical value	0.7s / 370°C	2.8s / 370°C	2.8s / 470°C				
Elektrisola typical value	0.5s / 390°C	1.1s / 390°C					

>> [Click here to see the Solderability of different wire types](#)