

Enamelled Wires

The enamelled resistance wires supplied by Scott Precision Wire are coated with a dual coat modified polyester enamel system which combines the excellent physical and electrical properties of a modified polyester base coat with the added chemical resistance, surface toughness, smoothness and high thermal rating of a polyamide-imide polymer topcoat. The combination of these two high quality resins produces a coating that has outstanding abrasion resistance, flexibility, chemical resistance, burnout and thermal shock resistance and dielectric strength. These properties, coupled with careful selection and processing of the wire, produces an enamelled wire which meets the exacting requirements of the electrofusion industry.

The standard coating type is Grade 2, however Grade 1 and Grade 3 are also available.

When applied to copper wire and used in conventional applications the enamel system meets the requirements of BS EN 60317-13, the primary properties being:

Thermal Properties

Temperature Index	212°C
Cut-through Temperature	340°C

Chemical Resistance

No softening apparent after 24 hours immersion at room temperature in:

Ethyl alcohol	Mild Alkali (1% KOH),
Toluene	Mild Acid (5% H ₂ SO ₄),
Ethyl Acetate,	IEC Solvent Blend,
Trichloroethylene,	Alcohol/Toluene (70:30),
Solvent Naphtha,	Xylene.

Whilst users need to carry out trials to determine the suitability of the enamelled resistance wire in their particular application Scott Precision Wire's enamelled resistance wires have been proven in a variety of electrofusion fittings by various manufacturers.

Dimensions and Breakdown voltage

The table below summarises the minimum increase due the enamel and the breakdown voltages for the most common range of wire diameters. Values for intermediate sizes are taken as those of the next largest diameter.

Table 1 - Minimum Increase and Minimum Breakdown Voltage

Conductor Diameter mm	Minimum Increase Due to the Insulation mm			Minimum Breakdown Voltage (r.m.s. value) V		
	Grade 1	Grade 2	Grade 3	Grade 1	Grade 2	Grade 3
0.25	0.017	0.032	0.048	2100	3900	5500
0.28	0.018	0.033	0.050	2200	4000	5800
0.315	0.019	0.035	0.053	2200	4100	6100
0.355	0.020	0.038	0.057	2300	4300	6400
0.40	0.021	0.040	0.060	2300	4400	6600
0.45	0.022	0.042	0.064	2300	4400	6800
0.50	0.024	0.045	0.067	2400	4600	7000
0.56	0.025	0.047	0.071	2500	4600	7100
0.63	0.027	0.050	0.075	2600	4800	7100
0.71	0.028	0.053	0.080	2600	4800	7200
0.80	0.030	0.056	0.085	2600	4900	7400
0.90	0.032	0.060	0.090	2700	5000	7600
1.00	0.034	0.063	0.095	2700	5000	7600
1.12	0.034	0.065	0.098	2700	5000	7600
1.25	0.035	0.067	0.100	2700	5000	7600
1.40	0.036	0.069	0.103	2700	5000	7600
1.60	0.038	0.071	0.107	2700	5000	7600
1.80	0.039	0.073	0.110	2700	5000	7600
2.00	0.040	0.075	0.113	2700	5000	7600

For intermediate conductor diameters the figure of the next largest diameter shall be taken

Information contained within this technical data sheet is based upon the general experience of Scott Precision Wire Ltd and is believed to be correct at the time of issue. No warranty is given or is to be implied from the details above. Customers are advised to carry out independent tests in order to determine the suitability of any Scott Precision Wire Ltd product for an application.