Data Sheet

Adhesive tapes - electrical

The **RS** electrical tapes range includes all the common backing substrates used within industry.

The role of tape is to insulate, bond or protect the surface it is attached to. For this to be achieved it is necessary that the correct selection of backing material and adhesive is made for the working environment.

Important parameters are strength of the backing, adhesion properties, chemical, temperature and insulation resistance.

Descriptions of various types

Polyester

A tough thin, conformable film which gives high tensile strength and good dielectric properties. Its non-corrosive nature enables use on thin wire and delicate assemblies. Applications are as a replacement for traditional paper materials and for holding, capacitor and coil wrapping and wire harnessing.

Glass cloth

An extremely tough woven fibre material which exhibits excellent abrasion resistance, good adhesion (quick tack), high tensile strength and the ability to absorb impregnating varnishes.

Although it is generally used as a heavy duty product for mechanical repairs and hold down it is also useful on coil, relay and transformer wrapping, motor repair, appliance and bulkhead insulation.

Three grades are available offering different temperature stability for arduous environments. Ratings vary from 130°C to 180°C for continuous applications.

Copper foil

This 99.9% pure copper tape is easy to shape and adheres to most contact surfaces. Its high electrical conductivity allows it to be used as a conductor over insulating surfaces ie. thermoplastics, for EMI/RFI shielding, grounding and as a heat path. It may be soldered to without degrading the adhesive.

Polyimide-Kapton™

Designed for extreme environments. The thin film offers translucency and the retention of physical and electrical properties at high temperatures (310°C). It is tough, resistant to tear and punch, and also offers clean release and flame retardancy.

Applications include masking of printed circuit boards prior to soldering, gold finger contact protection, coil/capacitor wrapping and servicing/repair of dc electric motors.

™ Kapton is the trade mark of Du Pont de Nemours.

PVC

The standard electrical general purpose insulating tape available in a wide range of colours. The backing is highly conformable and adheres well to itself. Other features are its high elongation and self extinguishing capability. Besides general purpose insulation and binding the product is often used for lead identification.

Polyisobutylene PIB (self amalgamating)

This unique material not only adheres to surfaces but 'flows' into itself to form a continuous waterproof insulation. The effect is achieved by stretching the tape whilst wrapping tightly round an object with a degree of overlap.

As well as moisture resistance the material is highly resistant to ozone and is serviceable from -40°C to +90°C. It will also withstand jointing compounds being poured on it at 145°C.

Applications include telecoms, cabling, marine engineering, pump/hose maintenance and switchgear for power transmission.

Polyethylene PE (self amalgamating)

Although visually similar to PIB this material out-performs it in a number of fields. Its main advantages are its operating temperatures of -95°C to +95°C with an overload temperature of +130°C.

The tape is used on power and distribution cables up to 69kV and unlike PIB does not require a PVC over-wrap for waterproofing.

Applications are similar to above but its use is normally for more exacting tasks eg. repair of cross linked polyethylene cables.

Butyl rubber (self amalgamating)

A conformable, rubbery mastic insulating compound. The material has excellent electrical properties, ozone, water and corrosion resistance. It is permanently elastic and non hardening throughout its service life and can be used over a wide temperature range.

Applications include use as a moisture proof seal on telecommunication networks and distribution systems. Closure of joints to protect against dirt and moisture. Joints and terminations on low and medium voltage insulation work especially filling in voids and irregular shapes.

Table 1 **Typical properties**

RS stock no.	340-9860 340-9876 340-9882	340-9898 340-9905 340-9911	340-9927 340-9933 340-9949	340-9955 340-9961 340-9977	512-187 512-266 512-272	109-769 109-775 109-781	494-225 494-275 494-304 494-354 494-405 494-411 494-376 494-297 494-382 494-398	494-427 494-449 494-433	494-455	494-461	494-708 494-691 494-685	176-523	176-539	176-545 176-551	176-567	176-573	193-770	193-786
Backing	Polyester	Glass cloth 130°C	Glass cloth 155°C	Glass cloth 180°C	Copper foil	Polyimide	PVC	PIB (self amal-gamating)	PE (self amal-gamating)	PE (self amal-gamating)	Butyl rubber	PVC	PVC	Polythene cloth	Aluminium foil	Aluminium foil	PVC	–
Colour	Yellow	White	White	White	–	Amber	Various	Black	Black	Black	Black	Black	Black	Silver	Silver	Silver	Black Copper	
Adhesive	Rubber TS	Rubber TS	Acrylic TS	Silicone TS	Acrylic TS	Ailicone TS	Rubber	–	–	–	–	Rubber	–	–	–	–	Rubber	Acrylic (silver filled)
Thickness (mm)	0.05	0.165	0.18	0.19	0.076	0.06	0.14	0.5	0.5	0.75	1.0, 2.0, 3.0	0.19	0.15	0.3	0.08	0.07	0.2	0.076
Tensile strength kg/cm²	-	240N/cm	150N/cm	240N/cm	5.8	5.3	260	200	120	120	250	-	-	-	-	-	-	-
Elongation at break (%)	60-100	5	5	5	5	70	180	600	600	600	1000	250	150	30	5	5	125	–
Adhesion to steel (N/10mm)	5.0	4.5	3.0	4.0	5.0	2.6	2.6	N/App	N/App	N/App	N/App	2.5	3.6	5.0	3.0	3.0	7	-
Electric strength (kV/mm)	-	-	-	12.5	–	120	55	35	40	40	20	–	–	–	–	–	–	
Breakdown voltage (kV)	5	1.7	1.7	3.5														
Temperature classification (°C)	130(B)	130(B)	155(F)	180(H)	130(B)	180(H)	90(Y)	90(Y)	90(Y)	90(Y)	90(Y)	–	–	–	–	–	–90(Y)	–
Insulation resistance (megaohms)	- 1x10⁶	1.5x10³		1.5x10³	Conducts	10⁷	10⁷	10⁷	10⁷	10⁷	10⁷	–	–	–	–	–	–	–
Electrolytic corrosion factor	1.0	0.95	0.9	0.95	–	1.0	–	–	–	–	–	–	–	–	–	–	–	–
Specifications	UL recognised ONAZ2	UL recognised ONAZ2	UL recognised ONAZ2	UL recognised ONAZ2	– recognised	UL recognised	BS4J10 BS 3924 part no. type 31/90Tp BS 3887: 1991	BTM128 071309 –	–	–	–	UL510 BS 3924 31/90Tp BS3887:1991 IEC454-3-1	VDE0340 Part 1 PIN 40633 Part 1 BS3924 type 31/90 Tp BS 3887: 1991 IEC 454-3-1	DEF-STAN 81/25/2 BS 3887: 1991 British Gas PRS10	BS 476 part 6 & part 7 Category 1 BS 3887: 1	BS 476 part 6 & part 7 Category 1 BS 3887: 1	–	–
Flame retardancy	–	–	–		–	UL recognised OAN Z2	Self extin—guishing as per BS 3924	–	–	–	–	Self extin-guishing as per BS 3924	–	–	–	–	–	–
Temperature range (short term extremes)					0°C to +150°C	–20°C to +310°C	–5°C to +70°C	–35°C to +90°C	–95°C to +95°C	–95°C to +95°C	–30°C to +80°C	–18°C to +80°C	-5°C +105°C	–	-20°C +110°C+110°C	-20°C	–	–
Cures 2hr at	1hr at 150°C 2hr at 130°C	1hr at 150°C 2hr at 130°C	1hr at +155°C	2hrs at 250°C	0.5hr at +150°C +135°C or 2hrs at +120°C	24hr at +230°C	_	–	–	–	–	–	–	–	–	–	–	–

Note: TS indicates thermosetting adhesive. Curing will improve the chemical and physical properties of the adhesive.

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