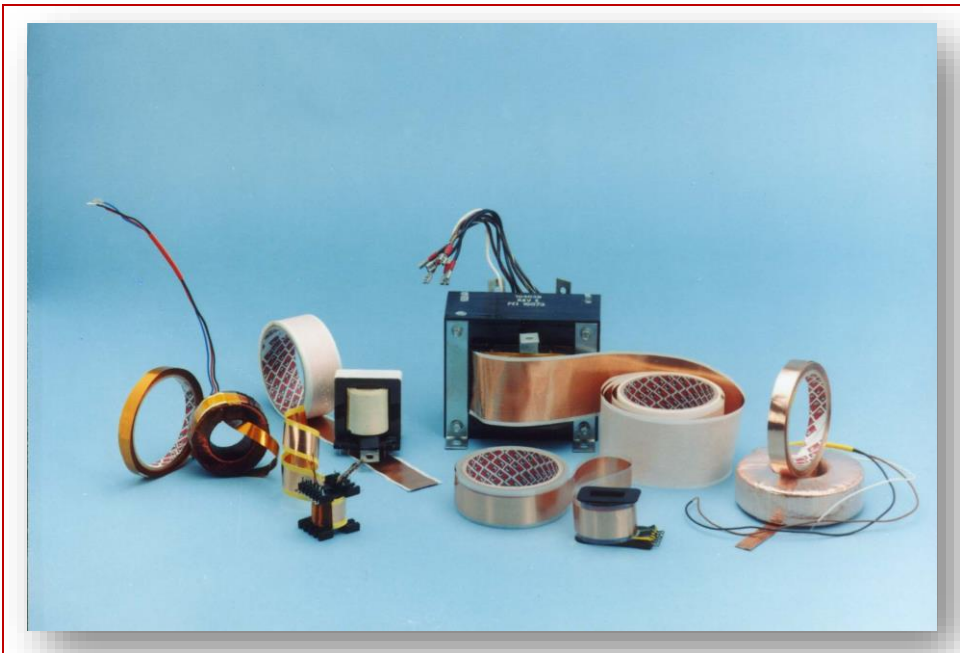




PPI FOILS FOR SHIELDING AND WINDING **ELECTRICAL & ELECTRONIC** APPLICATIONS



PPI ADHESIVE PRODUCTS LIMITED

A Brand Of Quality To Rely On...

PPI ADHESIVE PRODUCTS LTD was originally established in 1970 and commenced production at Waterford Industrial Estate in 1971. Through our commitment to continuous product improvement and production innovation, PPI have become a world-renowned supplier on a global scale of specialist metal foil based laminates and precision die cut parts. Because we can directly control all of the coating, laminating and die cutting technologies within our group of companies, we can offer our customers products specifically tailored to their requirements and produced to the highest quality standards.

The major standards organisations throughout the world are presently planning more stringent regulations and limit values for electromagnetic fields. These regulations and limits will cover all of the useable frequencies in the electrical field from zero Hz upwards, with particular emphasis on the field of 50 Hz to 60 Hz. With the harmonization of these standards worldwide, shielding has become a far more important consideration in product design and will become compulsory in the near future.

“PPI - We don't just sell tape ... we sell quality solutions...”

The company, through its own independent Research & Development Center also based in Waterford, has excelled in developing custom made products tailored to meet specific and special requirements from customers apart from providing quality solutions to engineering and technical problems.

We in the PPI group of companies have the experience and the capability to offer products and services to all of our customers, which can fulfill applications ranging from small developing niche areas to highly demanding technical challenges.

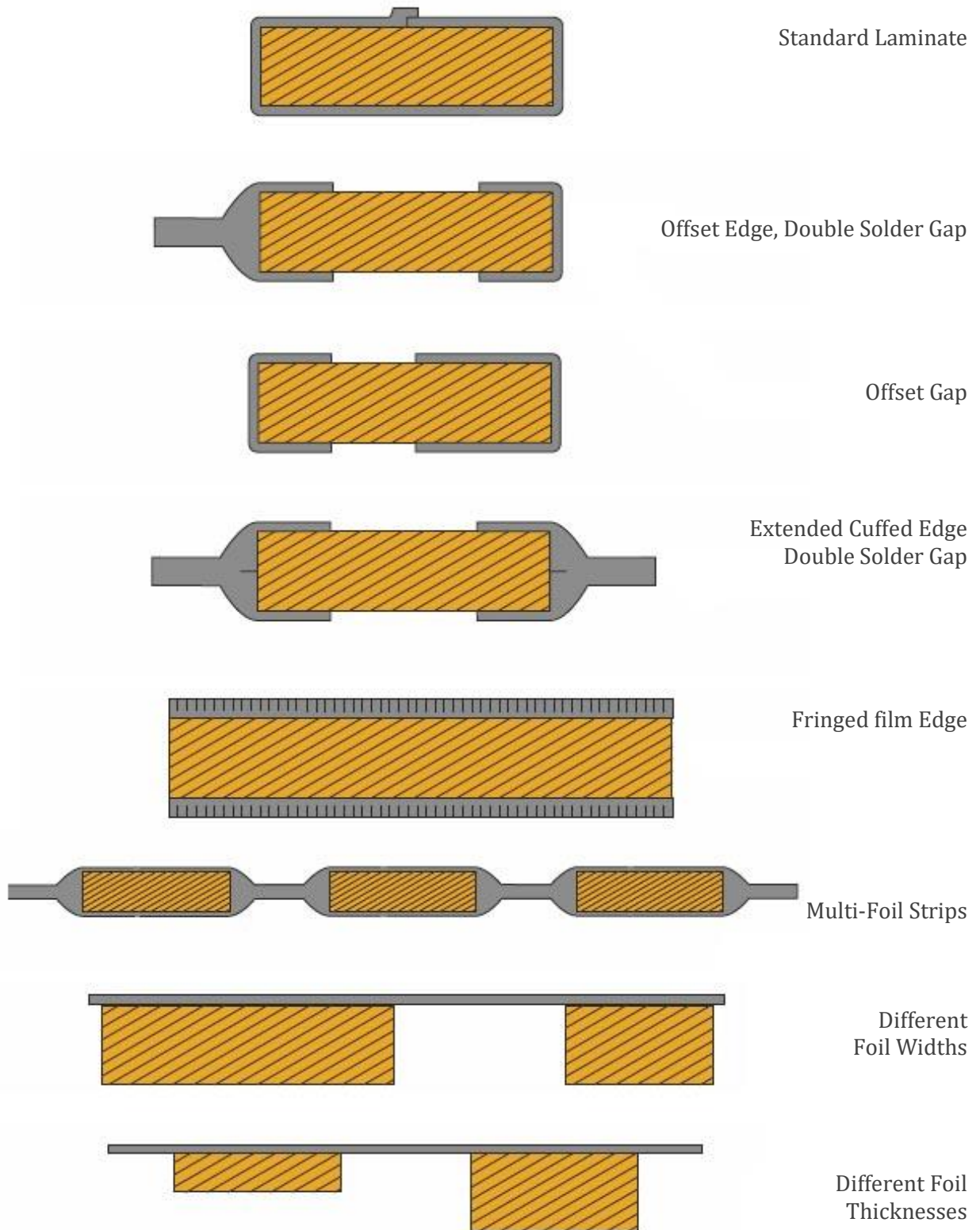


The PPI range of foils and insulated foil/film laminates for transformer windings, static shields and safety isolation shields offers the following advantages:

1. Eliminates “HI-POT” problems.
2. Eliminates the danger of “shorted turn” effects in transformers.
3. Makes it easier and more economic to satisfy international safety regulations thus reducing the cost of approvals.
4. Reduces the “skin effect” problems experienced in high frequency transformers by using several insulated copper strips in parallel.
5. Reduces the cross sectional area of copper by switching from round conductors to foil, and therefore further reducing the “skin effect” and costs.
6. Reduces the need for inter-layer insulation and therefore increases the available winding space in the transformer, leading to more economic and/or better performance.
7. Reduces the level of inspection previously required for “HI-POT” failures, shorted turns etc.
8. Reduces labour costs.
9. More complex winding designs made easier by the availability of different combinations of insulated copper foils.
10. Increases product reliability from the design stage onwards.
11. Proven reliability - UL recognition for many of our products.

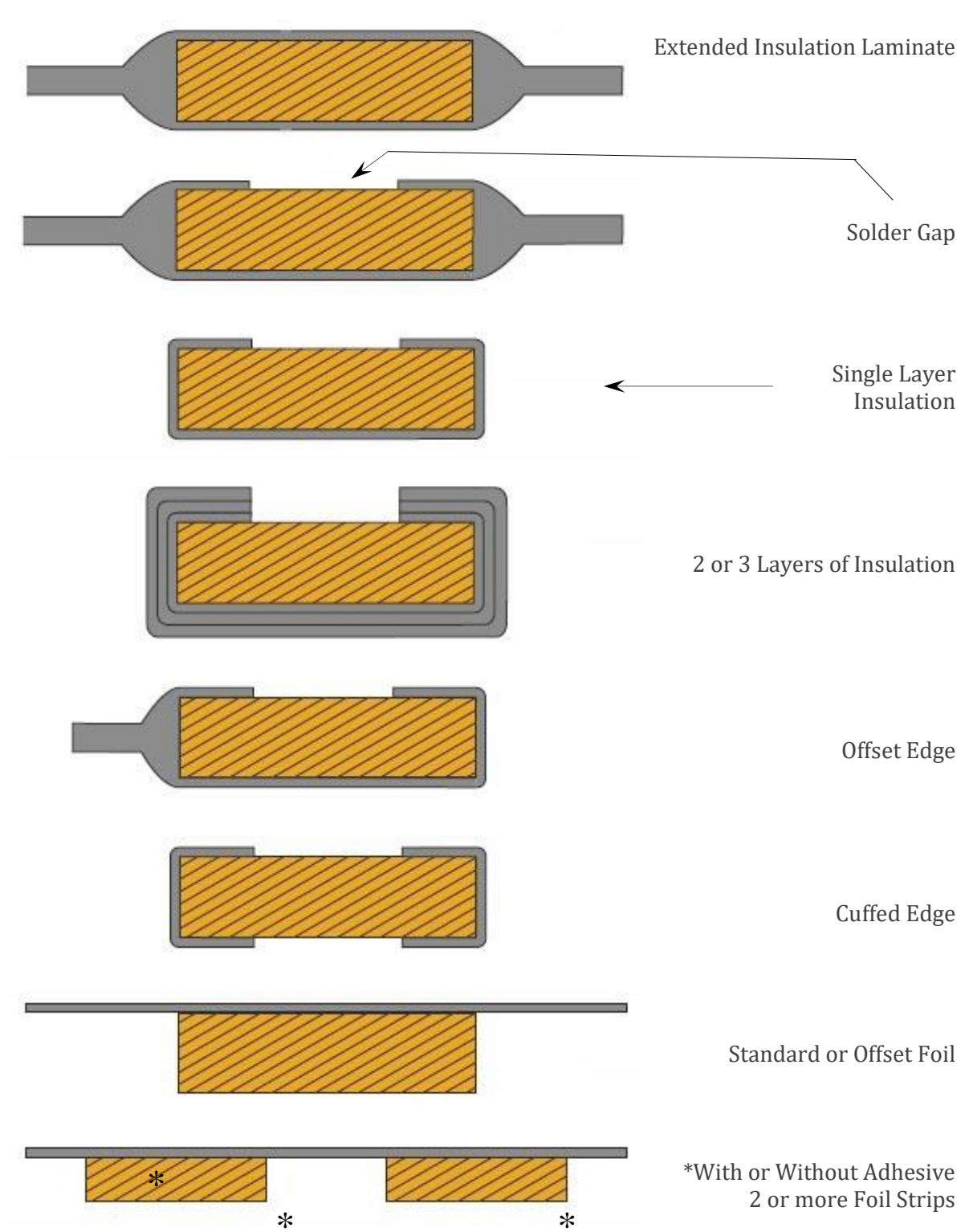


PPI FILM/FOIL LAMINATE CONSTRUCTIONS



Insulating Materials: Polyester, Polyethylenaphtalate (PEN), Polyimide, Nomex® and others.

PPI FILM/FOIL LAMINATE CONSTRUCTIONS



Standard Foils: Copper, Tin-Clad Copper & Aluminium

STATIC SHIELDING IN TRANSFORMERS

PPI 1091 / PPI 10912 Single sided Copper – Polyester Laminates

PPI 1091 and PPI 10912 are specially formulated shielding tapes comprising a **LAMINATE of polyester - copper - polyester**.

The POLYESTER is available in thicknesses of both **0.025 mm (1 Mil)** and **0.050 mm (2 Mil)** so that the dielectric strength required can be achieved.

Standard COPPER thickness is **0.035 mm, 0.050 mm, 0.100 mm up to 0.500 mm**. Other copper thicknesses may be supplied subject to availability and minimum order requirements.

PPI 1091 shields the entire inner width of the transformer spool whereas **PPI 10912** offers even greater security because of its fringing on both edges which ensures complete insulation of the spool ends.

PPI 1091 and PPI 10912 are applied directly between the primary and secondary windings and the lead can be point soldered to the copper foil through the polyester film. The solder point should then be covered with a PPI self-adhesive insulating tape.



TYPICAL CONSTRUCTION

Polyester Film	0.025 mm	1.0 Mil	0.025 mm	1.0 Mil	0.025 mm	1.0 Mil
Copper Foil	0.035 mm	1.4 Mil	0.050 mm	2.0 Mil	0.100 mm	4.0 Mil
Polyester Film	0.025 mm	1.0 Mil	0.025 mm	1.0 Mil	0.025 mm	1.0 Mil
Total Thickness	0.110 mm	4.3 Mil	0.130 mm	5.1 Mil	0.180 mm	7.0 Mil
Dielectric Strength	5.0 KV	5000 V	5.0 KV	5000 V	5.0 KV	5000 V
Polyester Film	0.050 mm	2.0 Mil	0.050 mm	2.0 Mil	0.050 mm	2.0 Mil
Copper Foil	0.035 mm	1.4 Mil	0.050 mm	2.0 Mil	0.100 mm	4.0 Mil
Polyester Film	0.050 mm	2.0 Mil	0.050 mm	2.0 Mil	0.050 mm	2.0 Mil
Total Thickness	0.160 mm	6.3 Mil	0.180 mm	7.0 Mil	0.230 mm	9.0 Mil
Dielectric Strength	8.0 KV	8000 V	8.0 KV	8000 V	8.0 KV	8000 V

Delivery specification:

PPI – 1091 all widths from 6 mm (¼")
PPI – 10912 all widths from 12 mm (½")
Roll Length up to 100 metres (110 yds)



PPI 1095 AND PPI 1096

PPI 1095 Copper – Polyester Laminate with Overlap

Copper thickness: 0.035mm (1.4 Mil) 0.050mm (2.0 Mil) 0.100mm (4.0 Mil) up to 0.0500mm (20.0 Mil)

Polyester thickness: 0.025mm (1.0 Mil) 0.050mm (2.0 Mil)

The copper is COMPLETELY wrapped with the polyester with an average overlap of 2 mm (0.08”). Where an earth contact is required, it is possible to solder through the polyester insulating layer.

Available widths: from 5 mm to 100 mm (from 0.2” to 4”)

Roll length: up to 50 m (55 yds)

PPI 1096 Copper – Polyester Laminate with Solder gap

Copper thickness: 0.035mm (1.4 Mil) 0.050mm (2.0 Mil) 0.100mm (4.0 Mil) up to 0.0500mm (20.0 Mil)

Polyester thickness: 0.025mm (1.0 Mil) 0.050mm (2.0 Mil)

The copper is PARTIALLY wrapped with the polyester leaving a minimum 1 mm (0.04”) wide strip of uncovered copper in the middle of one side. The minimum overlap of polyester required on each edge of the uncovered strip of the copper is as follows:

Polyester 0.025 mm (1.0 Mil) 3 mm (0.12”)

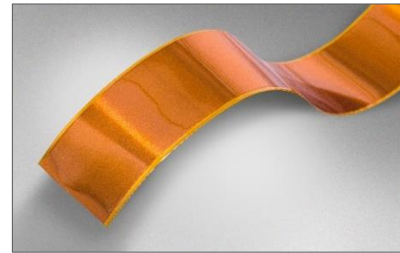
Polyester 0.050 mm (2.0 Mil) 4 mm (0.16”)

Available width:

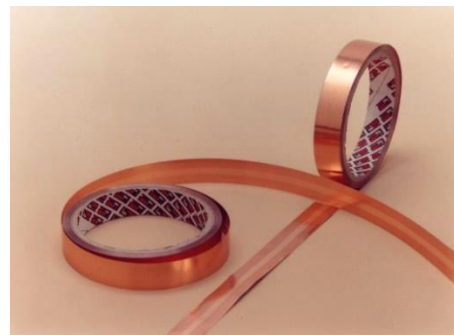
Polyester 0.025 mm (1.0 Mil): from 7 mm to 100 mm (0.28” to 4”)

Polyester 0.050 mm (2.0 Mil): from 9 mm to 100 mm (0.36” to 4”)

Roll length: up to 100 m (110 yds.)



*Other copper thicknesses may be supplied subject to availability and minimum order requirements.



OTHER FORMS OF SHIELDS, FOILS & LAMINATES



- Similar to PPI 1091 and 10912 but with two or more parallel strips of copper.
- Similar to PPI 1091, 10912, 1095 and 1096 but with a wide range of film thicknesses and other insulating materials such as Nomex® and Polyimide-Film for Classes F & H insulation.
- Metal foils with insulation laminated on one or both sides.

Standard Copper thicknesses:

0.025 mm = 1.0 Mil, 0.035 mm = 1.4 Mil,
0.050 mm = 2.0 Mil, 0.100 mm = 4.0 Mil,
0.125 mm = 5.0 Mil, 0.150 mm = 6.0 Mil,
0.200 mm = 8.0 Mil, 0.250 mm = 10.0 Mil

Non-standard thicknesses up to

0.500 mm = 20.0 Mil available on request.

Standard Tinclad copper thickness: 0.035 mm = 1.4 Mil

Non-standard thicknesses up to

0.100 mm = 4 Mil available on request.

Standard Aluminium thicknesses:

0.030 mm = 1.2 Mil, 0.040 mm = 1.6 Mil,
0.060 mm = 2.4 Mil, 0.100 mm = 4.0 Mil



- Special shapes and die-cut pieces of copper insulated in the same way as PPI 1091, 10912, 1095 and 1096 are available in a range of copper thicknesses up to 0.150 mm (6 Mil) to customer design and specification.

Insulation for Classes B, F and H available as standard

Roll length up to 100 m (110 yd)



EMI/RFI SHIELDING TAPES FOR ELECTRONIC APPLICATIONS

PPI 9110: Copper tape with non-conductive adhesive.

Base thickness:	0,035 mm	1,4 Mil
Total thickness:	0,070 mm	2,75 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	55 N/cm	31 lbs/inch
Temperature resistance:	155°C	311°F

Also available in 0.025mm, 0.050mm, 0.075mm, 0.100mm, 0.150mm, 0.200mm.

PPI 9115: Copper tape with conductive adhesive for EMI/RFI shielding, static shielding, solderable.

Base thickness:	0,035 mm	1,4 Mil
Total thickness:	0,060 mm	2,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	55 N/cm	31 lbs/inch
Temperature resistance:	155°C	311°F

Also available in 0.025mm, 0.050mm, 0.075mm, 0.100mm, 0.150mm, 0.200mm.

PPI 9116: Copper tape with conductive adhesive for EMI/RFI shielding, bonding of conductive surfaces, electrical grounding.

Base thickness:	0,035 mm	1,4 Mil
Total thickness:	0,085 mm	3,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	55 N/cm	31 lbs/inch
Temperature resistance:	155°C	311°F

PPI 9120: Embossed copper tape, conductive through adhesive, lowest contact-resistance, for EMI/RFI shielding, static shielding, solderable.

Base thickness:	0,035 mm	1,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	55 N/cm	31 lbs/inch
Temperature resistance:	155°C	311°F

PPI 9015: Aluminium tape with conductive adhesive for EMI/RFI shielding, static shielding.

Base thickness:	0,040 mm	1,6 Mil
Total thickness:	0,065 mm	2,5 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	25 N/cm	14 lbs/inch
Temperature resistance:	155°C	311°F

PPI 9020: Embossed aluminium tape, conductive through adhesive, lowest contact resistant, for EMI/RFI shielding.

Base thickness:	0,040 mm	1,6 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	25 N/cm	14 lbs/inch
Temperature resistance:	155°C	311°F

All the above tapes are available with a removable interliner and also in DIE-CUT form.

TIN-CLAD COPPER EMI/RFI SHIELDING TAPES

Tin Clad Copper is based on Copper foil which has been tin-clad on both sides to ensure good solderability and corrosion resistance.

PPI 9510: Tin-clad copper tape with non-conductive adhesive for EMI/RFI shielding, static shielding, solderable.

Base thickness:	0.035 mm	1,4 Mil
Total thickness:	0.060 mm	2,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	40 N/cm	22 lbs/inch
Temperature resistance:	155°C	311°F

PPI 9515: Tin-clad copper tape with conductive adhesive for EMI/RFI shielding, static shielding, solderable.

Base thickness:	0.035 mm	1,4 Mil
Total thickness:	0.060 mm	2,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	40 N/cm	22 lbs/inch
Temperature resistance:	155°C	311°F

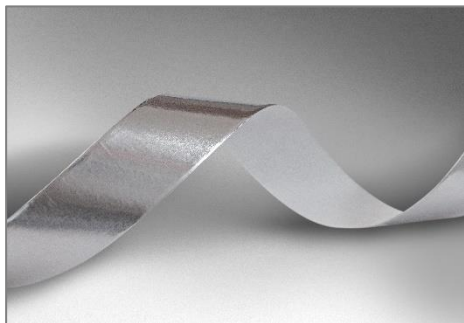
PPI 9516: Tin-clad copper tape with conductive adhesive for EMI/RFI shielding, static shielding.

Base thickness:	0,035 mm	1,4 Mil
Total thickness:	0.085 mm	3,4 Mil
Adhesive strength:	4,5 N/cm	41 oz/in.
Tensile strength:	40 N/cm	22 lbs/inch
Temperature resistance:	155°C	311°F

PPI 9520: Embossed Tin-clad copper tape, conductive through adhesive, lowest contact resistance, for EMI/RFI shielding, static shielding, solderable.

Base thickness:	0,035 mm	1,4 Mil
Adhesive strength:	4.5 N/cm	41 oz/in.
Tensile strength:	40 N/cm	22 lbs/inch
Temperature resistance:	155°C	311°F

All the above tapes are available with a removable interliner and also in DIE-CUT form.

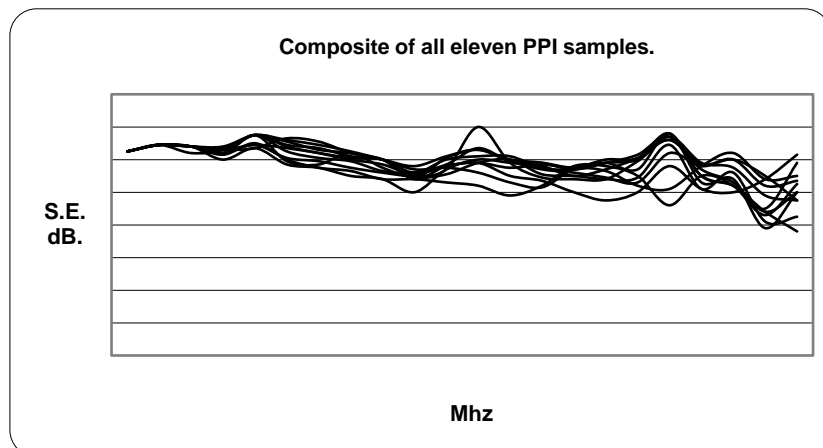


FREQUENCY	SHIELDING EFFECTIVENESS										
	1	2	3	4	5	6	7	8	9	10	11
20	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
30	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5
40	64	64	64	64	64	64	62	64	64	64	64
50	60	62	61.5	63.5	63	62	63	64	62	63	63
60	63.5	64.5	65	67.5	64.5	67.5	67.5	67.5	67.5	67.5	63.5
70	58.5	60.5	60	65.5	63.5	59.5	64	66	62.5	64.5	66.5
80	57.5	59.5	57.5	63	62	58.5	62	64.5	60.5	63.5	65.5
90	55	57.5	56.5	62	60.5	62	60	62.5	59.5	61	62
100	54	56	54	60	60	57.5	58.5	60	56.5	60	60
150	50	55	54	58	56	54.5	55.5	57	56	54.5	54
200	57	57	53	61	60	55.5	58	57.5	58.5	60.5	58
250	60	70	52	63	61	59	59	56	63.5	63	59
300	59	59	49	59.5	61	60	55	53	59.5	60	57.5
350	58	54.5	52	57	57.5	55.5	53.5	51.5	59	59	58.5
400	55	54	58	56	57	55	50	57	57.5	57	57.5
450	57	54	58	54.5	59	54	47.5	56.5	59	59	60
500	60.5	59.5	55	53	60	54.5	50	52	57	61.5	60.5
600	66	66	46	62	67	64.5	58	51	68	67	68
700	58.5	57	55	58	59	51	51	58	53	55	55
800	60	53	52	60	57.5	56	50	62	54	52	52
900	52	44	43	55	49	41	54	54	39	45	44
1000	53.5	50	52.5	47.5	47.5	42.5	61.5	55	50	59	38
Mhz.	dB.	dB.	dB.	dB.	dB.	dB.	dB.	dB.	dB.	dB.	dB.

SAMPLES:

- 1. Plain copper foil 0.035 mm
- 2. PPI 9110
- 3. PPI 9115 Conduct. adhesive
- 4. PPI 9116 Conduct. adhesive
- 5. PPI 9120
- 6. PPI 9510

- 7. PPI 9515 Conduct. adhesive
- 8. PPI 9516 Conduct. adhesive
- 9. PPI 9520
- 10. PPI 1091 0.035 mm
- 11. PPI 1091 0.150 mm



PCB EMI/RFI SHIELDING

Within the PPI Group we have our rotary die cutting division, Technical Adhesive Products Ltd. (TAP). As part of TAP's continuing development we have had extensive experience of producing EMI/RFI shields for many different PCB sizes. We have a worldwide reputation for the manufacture of smaller designs used by the light/movement sensor industry and also for large shields recommended for motherboard protection. Similarly, because we have all of the required materials and technologies within our group, we can offer our customers shields based on copper, tin clad copper, aluminium, polyester & polyimide substrates, all available in a multitude of thicknesses and shapes.

TECHNICAL DATA:

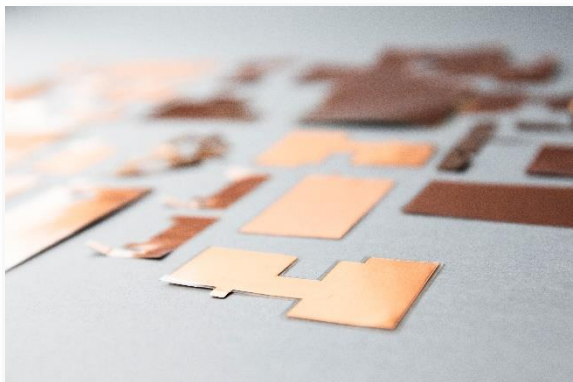
Copper foil thickness: 0.025, 0.035, 0.050mm, 0.075 mm, 0.100mm, 0.125mm, 0.150mm, 0.200mm.

Tin clad copper foil: 0.025 mm, 0.035mm, 0.125mm.

Aluminium foil thickness: 0.030, 0.040, 0.060 & 0.100 mm

Polyester film thickness: 0.025, 0.036, 0.050, 0.075, 0.100 mm

Polyimide film thickness: 0.025, 0.050, 0.075, 0.0125 mm



Our group of companies

PPI ADHESIVE PRODUCTS LTD.

Manufacturer of self-adhesive tapes for the electrical and electronic industries, for use in printed circuit board assembly, for shielding and winding transformer applications, for a wide range of industrial and specialty applications.

TECHNICAL ADHESIVE PRODUCTS LTD.

Producer of precision die-cut adhesive components for electrical, electronic and general industrial applications. T.A.P. can offer experienced technical know-how on all aspects of product die-cutting and design.

WATERFORD RESEARCH & DEVELOPMENT LTD.

Continuously develops self-adhesive products for our own group and for our interested customers. R&D develops new production techniques and market know-how on all aspects of adhesive products.

VALENTIA INDUSTRIES LTD.

Producer of single and double-sided siliconised polyester films.

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