



## Penclad™ G1910 Copper PEN Laminates Clear Flame-Retardant Modified Epoxy Adhesive

### Description

Sheldahl Penclad G1910 products use our proprietary flame-retardant, high temperature, clear, modified epoxy adhesive to bond PEN film and copper foil, creating a single or double sided composite. G1910 laminates are engineered for use in thin flex circuitry applications where soldering and high end use temperature are key. Sheldahl materials are able to be processed in rolls.

### Features

- **Dielectric:** High stability PEN films.
- **Adhesive:** Flame-retardant, clear, modified polyester epoxy.
- **Available Coppers:** Rolled-Annealed (RA), Electro-Deposited High-Ductility (EDHD) or As-Rolled Untreated (ARNT). EDHD foils are suited for general use and flex to install applications. RA foils are suitable for dynamic flexing applications. ARNT foils are valuable for high frequency applications that require a smooth copper surface on both sides.
- **Stability:** Sheldahl's superior manufacturing process ensures consistent dimensional stability.
- **Processing:** High quality flexible circuits can be produced using standard manufacturing procedures.

### Storage

Material stored in original packaging, at temperatures of 40-80°F (4-26°C), and below 70% RH will retain their properties for a minimum of 1 year. Excessive exposure to heat and moisture may cause copper oxidation.

### Quality

Sheldahl products are manufactured using quality systems that conform to ISO, QS, and TS quality standards. Key product characteristic are tested and monitored in accordance to IPC standards.

Certifications are available with product shipments.

### Constructions

- **Film Thickness:** 1, 2, or 5 mils (25, 50, 125 µm)
- **Copper Thickness:** ½, 1, 2 oz/FT<sup>2</sup> (17, 35, 70 µm)
- **Adhesive Thickness:** Standard thickness is 0.9mil (23µm)
- **Width:** Standard roll width is 24" (610mm)

Specialty thickness and widths available please contact your Sheldahl representative.

### Contact Information:

USA: Telephone – 507-663-8344

Europe: Telephone – 33-387-847-477

Worldwide: Telephone – 507-663-8344

Come visit us at [www.Sheldahl.com](http://www.Sheldahl.com)

### Ordering Information:

When ordering please specify:

- Film thickness
- Adhesive type (flame-retardant or non flame-retardant)
- Adhesive thickness
- Copper type (ED or RA)
- Copper on one side or both
- Roll width

PROPERTY TO BE TESTED AND TEST METHOD	IPC Test Requirements	Sheldahl Typical Mean Value*
Dimensional Stability, maximum, percentage, IPC-TM-650, 2.2.4 Method B Method C	0.30 0.30	0.05 0.09
Peel Strength, minimum, lb./in. - width, IPC-TM-650, 2.4.9 Method A as received Method B as received Method F after temperature cycling	4.0 4.0 4.0	8.0 8.0 9.0
Chemical Resistance percentage, IPC-TM-650, 2.3.2, A	70%	90%
Solderability, J-STD-003, Test A	Pass	Pass
Dielectric constant, maximum (at 1MHz), IPC-TM-650, 2.5.5.3	3.5	3.0
Dissipation factor, maximum (at 1 MHz), IPC-TM-650, 2.5.3	0.020	0.015
Volume Resistivity, minimum megohm-cm, IPC-TM-650, 2.5.17	$10^7$	$10^6$
Surface resistance minimum, megohms, IPC-TM-650, 2.5.17	$10^5$	$10^4$
Dielectric strength, minimum volts/mil, ASTM-D-149	2000	3000
Fungus Resistance, IPC-TM-650, 2.6.1	Non-Nutrient	Non-Nutrient
Moisture Absorption, maximum, percent, IPC-TM-650, 2.6.2	2.0	1.0
Flammability, minimum, UL-94 VTM-0	Pass	Pass
Moisture and Insulation Resistance, minimum, megohms, IPC-TM-650, 2.6.3.2	$10^4$	$10^5$

\*The information contained herein is based upon typical data, Sheldahl makes no warranties expressed or implied as to its accuracy and assumes no liability arising out of its use by others. The user should determine suitability of Sheldahl materials for each individual application.