

# Pure Copper & Aluminum Filmic Base Substrates

## Preliminary Information Sheet

### Background

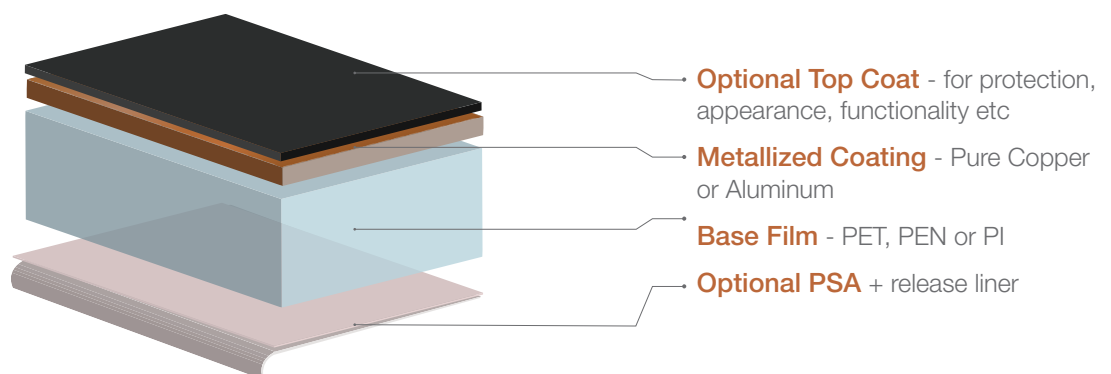
The demand is increasing for filmic base substrates for functional electronic materials that are thin and flexible, highly conductive, environmentally friendly, and yet low cost. The existing solutions of laminated Copper or Aluminum foils require the use of adhesive, with the consequent challenges of additional thickness, flexibility, cracking, and, in the case of Aluminium foil, soldering. An adhesiveless base substrate ensures a better match for overall thermal expansion coefficient, providing a thinner, more flexible and thermally stable product.

### Solution: Pure Copper, Pure Aluminium

Leveraging 35 years of experience in the vapor deposition of conductive materials on polymeric films, Avery Dennison Hanita offers a range of adhesive-free filmic substrates coated with pure Copper or pure Aluminium.

A proprietary system for manufacturing adhesive-free metallized film uses state-of-the-art roll-to-roll processes to apply thin layers of Copper (10-500 nm) or Aluminium (10-800 nm) on various flexible films (PEN, PI, or PET) and substrates (NW, membranes).

Due to their levels of metal adhesion and flexibility, these highly conductive substrates can replace expensive silver ink or plated copper in applications where electrical conductivity is required, or to replace Al or Cu foils where thickness or flexibility are important.



### Applications

Avery Dennison Hanita Pure Copper and Pure Aluminium film applications could include:

- > Wearable electronics
- > EMI for electronic devices
- > Sensors
- > Mobile applications
- > RFID antennas
- > Battery indicators

# Capabilities

Base Film	
Type	Thickness of Base Film
PET	As available, 6 µm - 250 µm
PEN	As available, typically 50 µm
PI	As available, typically 25 µm

Metallized Coating	
Type	Thickness of Coating
Copper (adhesiveless)	10 nm - 500 nm
Aluminum (adhesiveless)	10 nm - 800 nm

- Optional Top Coating for protection, appearance, functionality
- Optional Pressure Sensitive Adhesive + release liner
- Optional finishing to tape

# Benefits

- > **Low cost alternative** - Economic alternative to foil products, manufactured using a proprietary, high volume manufacturing process
- > **Flexibility of product construction** - Wide selection of conductive layer thicknesses to match conductivity demands of application
- > **Excellent mechanical properties** - High heat stability, flexibility, metal adhesion and overall durability to flaking or cracking
- > **Ready for mass production** - Available in a range of widths, lengths and thicknesses.
- > **Wide range** - Choice of base films or substrates with various thicknesses, to match application requirements

## About Avery Dennison

Avery Dennison (NYSE: AVY) is a global materials science and manufacturing company specializing in the design and manufacture of a wide variety of labeling and functional materials. Its products include labels, radio frequency identification (RFID) solutions, tapes and fasteners, and medical applications. Avery Dennison serves customers in a wide range of industries, including non-durable consumer goods, retail apparel, logistics and shipping, durable goods, and healthcare. Headquartered in Glendale, California, the company employs over 30,000 employees in more than 50 countries. Reported sales in 2017 were \$6.6 billion.

Learn more at [www.averydennison.com](http://www.averydennison.com)

For further information contact [avi.amar@eu.averydennison.com](mailto:avi.amar@eu.averydennison.com)

DISCLAIMER: All Avery Dennison statements, technical information and recommendations are based on tests believed to be reliable but do not constitute a guarantee or warranty. All Avery Dennison products are sold with the understanding that purchaser has independently determined the suitability of such products for its purposes. All Avery Dennison's products are sold subject to Avery Dennison's general terms and conditions of sale, see: [terms.europe.averydennison.com](http://terms.europe.averydennison.com)

©2018 Avery Dennison Corporation. All rights reserved. Avery Dennison and all other Avery Dennison brands, this publication, its content, product names and codes are owned by Avery Dennison Corporation. All other brands and product names are trademarks of their respective owners. This publication must not be used, copied or reproduced in whole or in part for any purposes other than marketing by Avery Dennison.