

PRODUCTS—JTC/JTC Foil

High Reliability Foil For Innerlayers

- more resistant to delamination than oxides
- eliminates chemical oxide processing and "pink ring"
- conducive to automated optical inspection
- reduces fabrication steps for thin laminates

Gould's double treated copper foil products, designed for enhanced reliability in multilayer printed circuit boards, are uniformly treated with JTC (copper nodules, brass and stabilizer) on both the shiny and matte sides of the foil surfaces. The treatment on the shiny side surface eliminates the need for chemical cleaning or mechanical scrubbing, eliminates black oxide processing, and provides enhanced adhesion to prepreg.

Elimination of the cleaning and oxide processes is especially important for fabrication of thin laminates where handling is difficult. The stronger prepreg/copper interface enhances bond strength, increases resistance to thermal (delamination) and chemical degradation, and virtually eliminates pink ring or haloing caused by acid attack on the interface. The uniform surface appearance of the shiny side of double treated copper is compatible with AOI inspection, both reflective and fluorescent types.

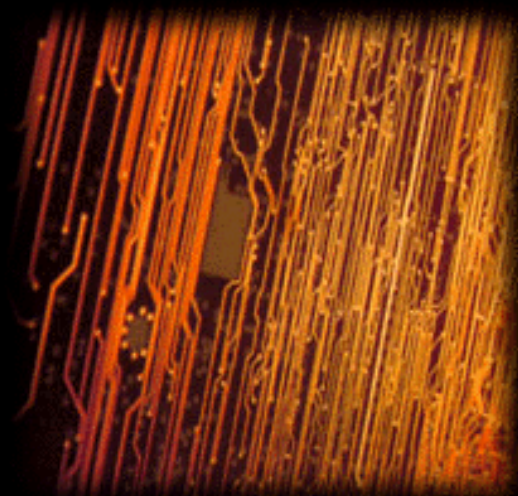
Double treated foil is available in both Grade 1 (JTC) and Grade 3 (JTCS) types. Available thicknesses range from 1/2 ounce (18 μm) to 10 ounce (350 μm), and conform to the requirements of IPC-MF-150. Typical properties of 1 ounce foils are provided:

Profile and Adhesion

Shiny Side		Matte Side JTC	Matte Side JTCS
R _{tm} , μm -mechanical	4.5	9.0	8.5
R _t , μm -WYKO	5.5	12.0	11.0
Peel Strength, lbs/in (Multifunctional, 140_C Tg)	7.0	11.0	10.5

Thermal and Chemical Resistance

Type Treatment	Double Treated Shiny Side	Chemical Oxide



As Laminated Bond Strength	6-8 lbs/in	6-8 lbs/in
180°C, 48 hrs. loss of bond strength	40%	80-90%
18% Hcl, 1 hr. loss of bond strength	30%	100%

Benefits

1. **Higher Reliability**—After thermal exposure the shiny side of doubletreated copper maintains good adhesion to a variety of prepregs, thereby increasing delamination resistance when compared to chemical oxide surfaces. Use of doubletreated copper virtually eliminates "haloing" or pink ring on innerlayers due to the excellent acid resistance of the DT surface.
2. **Reduced Fabrication Steps**—Use of doubletreated copper eliminates the need for precleaning laminates and oxide treatments utilized to promote bond strength on the shiny side of copper conductor traces. Elimination of these process steps is especially important for thin laminates which are prone to handling damage.
3. **Available for a Variety of Applications**—For more demanding applications (multilayer boards with 6 layers and above), doubletreated copper foil can be provided in conjunction with Grade 3 JTCS (high temperature elongation) base foil. The user then benefits from the advantages of doubletreated foils and JTCS, the preferred foil to combat innerlayer foil cracking. Gould treatments for specific resin systems such as polyimide and bismaleimide triazine (BT) are also available.

General Processing Guidelines

1. **Handling**—Doubletreated foil and laminates clad with doubletreated copper should be handled carefully to minimize damage due to scratches and scuffs of the treated drum side.
2. **Panel Cleaning**—Teknek™ cleaning is useful for removal of loose debris on the surface panels. A mild soap and water wash followed by a warm water rinse is a useful alternative.
3. **Dry Film Lamination**—The photoresist manufacturers' recommendations for single treat copper applications are usually followed. However, the time between photoresist lamination and develop, etch, and strip should be minimized in order to avoid difficulties in stripping.
4. **Develop, Etch, and Strip**—Proper rinsing after each step in the DES line is very critical for doubletreated foils because of the increased surface area. Most standard etchants work acceptably with doubletreat foil. However, for ammoniacal systems, an acid prewash (5-10% hydrochloric) followed by rinsing is recommended.

For information about other Foil Division products, please select the appropriate product in the box below and press "go".

