

# Heavy Foils JTC/JTCHTE/RTCHTE

Heavy Copper Foils for High Power Application, Grade 1 & 3

- Thermal properties meet high power demands of automotive and industrial applications
- Superior adhesion to substrates during thermal and mechanical stresses
- Fine and uniform grain structure with excellent etching performance
- Surface chemistry identical with thin common ED copper foils

## Overview

### Heavy Foils, Grade 1 & 3, JTC/JTCHTE/RTCHTE

are an electro-deposited (ED) copper foils with electrolytic enhanced treatment. The foil enables the realization of circuitries for high power applications with large cross-sections on a small area. Prior to the introduction of JTC, JTCHTE resp. RTCHTE Heavy Foils, the development of new applications was limited to etching and punching technologies with rolled copper on single- or double-sided paper or composite laminates. With Gould's Heavy Foil, new applications that require higher performance in severe environments are possible now. Future products that must withstand temperatures of up to +150° C and temperature cycles of - 40 to 150° C require printed circuits on suitable substrates such as modified FR-4 epoxy systems, high T<sub>G</sub> resins or polyimides.

Laminated to JTC, JTCHTE resp. RTCHTE Heavy Foils with dendritic surface morphology, the risk of track cracking or delamination due to extreme temperatures can effectively be eliminated.

Designers for high power applications in the automotive industry, in particular, will realize the benefits of the thermal properties of JTC, JTCHTE resp. RTCHTE Heavy Foils. Electrical and electronic components for convenience products are on the rise within this industry. Such applications including power distribution, fuse boxes, seat adjustment, seat heating and others demand high currents. JTC, JTCHTE resp. RTCHTE Heavy Foils offer new opportunities to designers and engineers of these applications. JTCHTE/RTCHTE have available high temperature elongation properties (grad 3) and are a good choice for thin core multilayers.

## Advantages

### ■ High Bond Strength

The dendritic base structure and approved TC treatment ensures a strong bond to a broad range of substrates during thermal and mechanical testing and processing stresses.

### ■ Provides a Barrier Layer to Minimize Bond Degradation

Gould's thermal brass barrier layer retards the thermally and chemically induced degradation of foil adhesion often associated with alternative treatments.

### ■ Resistance to Recrystallization

is formulated to resist grain growth after thermal processing which could degrade laminate dimensional stability, warp & twist and drilling characteristics (nail heading).

### ■ Excellent Etching Characteristics

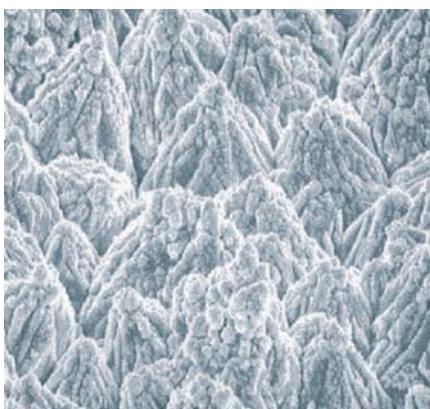
The fine and uniform grain structure guarantees excellent etching characteristics such as etchability with reduced acid undercut.

### ■ Stabilizes the Copper Foil Surface to Prevent Oxidation

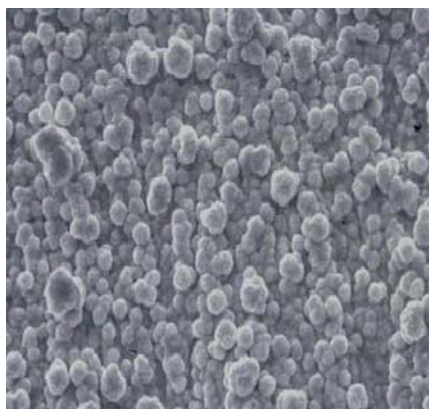
The stabilizer (anti-tarnish passivation) avoids discoloration or oxidation during storage and lamination, and minimizes laminate staining reaction with curing agents. Additionally it facilitates chemical (and mechanical) cleaning.

## Specifications

The physical characteristics of Gould's Heavy Foils meet and exceed the requirements of IPC 4562, Grade 1 resp. 3. Tolerance of area weight are comparable to rolled foils (+/- 5 %, IPC-4562,2.2.12). Foil thicknesses are available in a ranges from 140 µm to 400 µm (JTC) and 140 µm to 210 µm (JTCHTE/RTCHTE).



JTC400 µm, treated matte side



RTCHTE210 µm, eated drum side



JTC400 µm, cross-section

### Typical Mechanical Properties:

Property	Unit	JTC-Heavy Foils, Grade 1 (JTCHTE, Grade 3)								JTC-70 µm
		140	175	210	245	280	300	350	400	as reference
Area weight	oz/ft <sup>2</sup>	4	5	6	7	8	8.5	10	11.5	2
- nominal	g/m <sup>2</sup>	1160	1450	1740	2030	2320	2680	3050	3585	580
- tolerances	g/m <sup>2</sup>	1100-1220	1380-1520	1650-1830	1930-2130	2200-2440	2550-2810	2900-3200	3410-3760	570...590
Tensile strength RT	N/mm <sup>2</sup>	> 276	> 276	> 276	> 276	> 276	> 276	> 276	> 276	> 330
Elongation RT	%	> 10	> 12	> 14	> 15	> 15	> 15	> 15	> 15	> 14
Elongation 180° C, JTCHTE, RTCHTE	%	> 3	> 3	> 3	—	—	—	—	—	—
Shiny side, R <sub>a</sub> JTC, RTCHTE	µm	< 0.43	< 0.43	< 0.43	< 0.43	< 0.43	< 0.43	< 0.43	< 0.43	< 0.43
Matte side, R <sub>z</sub> JTC, RTCHTE	µm	< 15	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 10
Treated drum side, R <sub>z</sub> RTCHTE	µm	< 5.1	< 5.1	< 5.1	—	—	—	—	—	< 5.1

## Supply

Gould's Heavy Foils are routinely available in continuous rolls or sheeted formats. Roll widths range up to 1300 mm and sheet sizes up to 1300 x 2800 mm<sup>2</sup>. 7 oz/ft<sup>2</sup> and higher are available as sheet format only. All sheets are levelled to be even and flat. Other thicknesses on request. Roll products are supplied on cardboard cores with an ID of ~ 79 mm (3 1/8") or 152 (6").

GOULD Electronics is part of Nippon Mining & Metals Co., Ltd.. The company is a leading supplier of materials to the electronics industry.



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