

Electrical Transition Joints

DMC Nobelclad Division manufactures explosion bonded transition joints for making fully welded electrical connections between dissimilar metals. In aluminum and magnesium reduction cells aluminum-steel transition joints (ETJ) permit making welded connections between aluminum buss systems and steel anodes and cathodes. Where make-break connections are needed, aluminum-copper and steel-copper ETJ's provide copper contact surfaces. Nobelclad's ETJ's are designed to perform in all cell operating conditions, including high-temperature environments. Our strength is:

Reliability in Quality and Delivery

Large Range of Products

- Several types of joints:

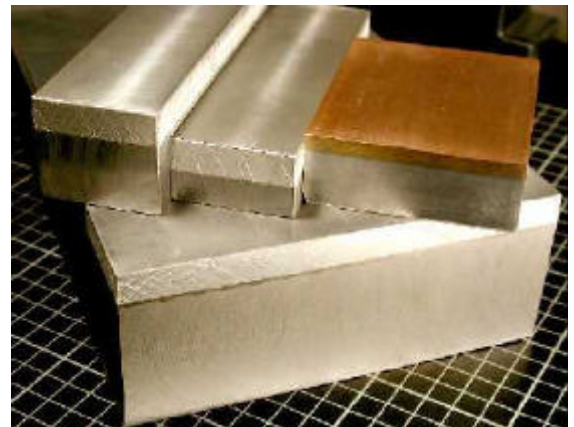
Biclad ETJ: Aluminium 1050 - Steel AISI 1008 or eq.
Performs well below 300°C (570°F)

ETJ 2000: Aluminium 1050 - Steel AISI 1008 or eq.
with Titanium interlayer.
Reliable up to 600 °C (1110 °F)

Copper - Aluminum: For copper contact surfaces on Al.

Copper - Titanium - Aluminum: For welded connections or high temperature conditions.

- Standard thicknesses: 12.5 to 62 mm - 0.5-inch to 2.5-inch.
- Standard sizes: 32 x 76 mm to 200 x 220 mm - 1.25 x 3.0-inch to 7.875 to 8.625-inch.
- Non-standard thickness or size combinations can be manufactured when needed.



Typical saw cut ETJ clad blocks

Industry Leaders Use Nobelclad ETJ



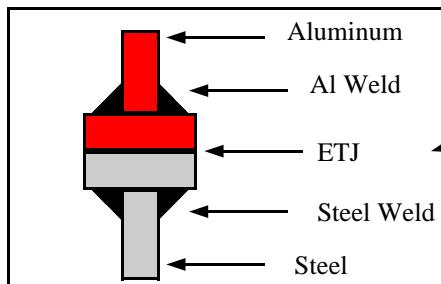
PECHINEY AP30 Pots (photo by courtesy of PECHINEY)

Alcan
Alcoa
Aluar
Alusuisse
Comalco
Nalco
Pechiney
Etc..

Reliable Solutions for Fusion Welding of Dissimilar Metals

Electrolytic reduction cells for manufacture of aluminum and magnesium typically require a high current density electrical connection between copper or aluminum buss systems and steel anode and cathode components. Bolted connections exhibit high electrical resistance, which further deteriorates over time due to oxide buildup, corrosion, and arcing. The concept of an electrical transition joint (ETJ) was introduced as a practical solution for this problem.

Since its introduction in the 1960's, the ETJ concept has become commonly accepted for making fusion welds between aluminum-steel, aluminum-copper, and copper-steel.



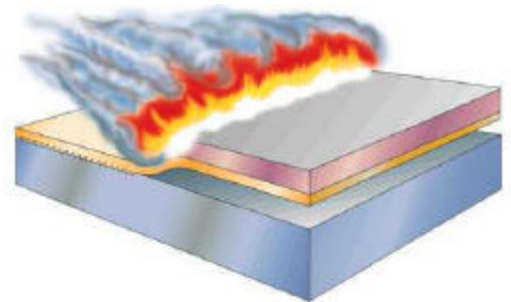
PECHINEY AP30 New Anode Setting

Dedicated and Efficient New Workshop

Nobelclad's ETJ's manufacturing workshop is located in the south of France. In year 2001, new automatic sawing equipment has been installed to improve our capacity, delivery times and dimension control. Nobelclad maintains many sizes of Electrical Transition Joints in stock. Delivery times for stock materials are typically under three weeks.

The Explosion Bonding Process

Explosion bonding process uses the energy of detonating explosives to produce a solid-state weld between dissimilar metals. One of the metals is accelerated by explosive detonation at very high rate over a short distance resulting in progressive collision of the materials. The metals are forced together under several billion Pascal (million psi) creating an electron-sharing bond that is typically stronger than the weaker of the parent metals. There is no significant bulk heating of the materials, consequently metals which can not be welded by normal fusion welding, such as aluminum and steel, can be easily and reliably joined.



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