

## **PERFORMANCE CHARACTERISTICS OF THE EMEW® CELL**

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Electrometals Technologies Limited has brought from concept to commercial availability a new electrowinning technology which overcomes many of the process and cost limitations which plague conventional EW plants. Progress in its development over the period between 1996 and 2002 has been characterised by continual improvements in engineering of the technology, growing acceptance of its capabilities, and an expanding base of installed facilities in a variety of process settings.

The EMEW® cell is not a new process technology. It represents simply a modification of the hardware used in electrowinning, which achieves 'factorially' higher efficiency in mass transport of metal ions than a conventional EW cell. It is simple, modular and of relatively low unit cost. Across most applications that have been examined, tested and installed, capital and operating costs are lower than in an equivalent conventional tankhouse.

Extensive work has now been carried out on application of the patented EMEW® cell to electrowinning of a number of metals in a variety of mining and industrial settings, including:

- Copper
- Nickel
- Cobalt
- Zinc
- Gold
- Silver
- Cadmium

Established usages for the technology range from extraction of low grade metals from mine and industrial waste solutions, through treatment of metal refinery bleed streams, to primary metal production at large mining operations.

The following are some of the key operating characteristics of the cell:

1. Its very high mass transport capabilities significantly reduce metal concentration limitations in electrowinning - such that, for example, current efficiency and product quality can be maintained in electrowinning down to less than 1 g/l of metal in solution at constant current density.
2. The high mass transport achieved by the cell allows electrowinning efficiency to be sustained on high concentration solutions at current densities significantly above those used in conventional cells.
3. The inherent simplicity of the cell allows relatively inexpensive and modular

construction - a feature which, combined with its process performance, suits its application to smaller projects which have until now been unable to support the high costs of a conventional plant.

4. The closed nature of the cell, and the capability to rigidly control gaseous products from electrowinning, has specific advantage in a number of applications.
5. A number of the process features of the cell make it significantly more tolerant of liquor chemistry, both from the point of view of the solutions to which it can be applied and the potential level of impurities in the product.

The cell is now commercially available in two models – designed for either cathode or metal powder production.

The following paper provides an analysis of operating and commercial data for the EMEW® cell in a variety of mining and industrial applications. The information is presented in a comparative form with operating data from a series of established conventional electrowinning operations.