

press release

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Title: GOING WITH THE FLOW IN THE MANUFACTURE OF NON-FERROUS COMPONENTS

Release Date:

Many of the advances in the manufacture of non-ferrous metal components over recent years have been through the replacement of discontinuous and batch production by continuous manufacturing processes. High conductivity copper profiles for transformer strip, commutator sections and busbars are produced conventionally by discontinuous billet extrusion, where a final draw pass is used to give the required temper in the finished product.

Complex process and high equipment cost

Preparation of the billets themselves has advanced over the years from discontinuous stick moulding, through semi-continuous casting to continuous casting, each necessarily followed by billet heating, prior to extrusion. This sequence comprises a minimum of five individual process steps and a very high equipment cost. Billet extrusion is a notably inefficient process with yields not often exceeding 80%. For very high production volumes (15,000 tonnes per year and over) a modern version of this process sequence may still be competitive, but there is now an alternative route.

The Rautomead & BWE alternative

A radically different combination of technologies, involving continuous casting of copper rod and continuous extrusion (Conform™) of profiles, is now available to produce these products and is finding increasing favour in the non-ferrous industry. Rautomead Limited and BWE, both of the UK, are leading specialists in the technology of continuous casting and Conform™ continuous extrusion respectively.

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Rautomead RS upwards process

Using grade A copper cathode as the feedstock, the copper is melted and continuously cast in a Rautomead RS upwards-vertical copper casting machine to produce rods of 8mm to 20mm diameter, according to dimensions of the finished product required. The rods are formed into coils of typically 4 tonnes. The copper rod is oxygen-free with a nominal oxygen content of less than 3ppm, and is cast with a clean unoxidised surface.

Conform™ extrusion

The cast rod is subsequently decoiled and fed directly to the Conform™ machine which continuously extrudes the selected profile of fully soft, fine grain copper section. As in the traditional extrusion route, a final draw pass may be necessary to give the required temper in the finished product.

An elegant combination

Using this elegant, modern combination of technologies, the number of process steps is reduced from five to three and a process yield of over 90% can be expected. Combined lines are available with capacities from 4,000 to 10,000 tonnes per year.

Iranian order

Rautomead Limited recently supplied a combined line to Sarcheshmeh of Iran for production of 5,000 tonnes per year of copper busbar. The copper rod casting machine is an RS 3000/5 upwards-vertical model, configured to produce 20mm diameter oxygen-free rod. The BWE Conform™ machine uses the cast 20mm rod as feedstock and is a 550i model, configured to produce a wide variety of copper profiles up to a maximum size of 130mm x 10mm.

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Photo captions:

Pic 1: Rautomead Copper Rod Casting Machine, 5 strands 16mm diameter Cu-OF rod

Pic 2: Grade A copper cathode being melted in Rautomead Copper Rod Casting Machine

Pic 3: Conform™ Continuous Extrusion of copper busbar section from 16mm Cu-OF rod

Pic 4: Conform™ extruded Cu-OF profiles