

Energy saving of 50% during aluminium forming

Aluminium alloys are heated to 400-450 °C prior to hot working. In extrusion plants, this is mainly carried out in induction furnaces; this form of heating has the advantage that the billets to be processed can be heated with an axial temperature profile. An innovative high-temperature superconductor (HTS) induction heater takes advantage of the phenomenon of superconductivity and uses about 50% less electricity than conventional systems. In addition, there is a 20% increase in productivity. Following a successful test phase at a small extrusion plant in Germany - Weseralu GmbH & Co KG, Minden -, the users report an annual energy saving equivalent to the annual consumption of 900 people.

This saving was achieved by means corresponding reduction in the power loss. Inductive heating systems produce the necessary heat by creating eddy currents in the material by means of electromagnetic induction. In conventional systems, magnetic coils made from copper wire are used for this energy-intensive process. In the new type of heater, a magnetic coil made from high-temperature superconductors is used.

Superconductors have the ability to conduct electrical current without any resistance. The phenomenon has been known for a long time – and it has been the subject of intensive research effort because of the extraordinary opportunities it offers. The only barrier to industrial use is the fact that superconductivity is only possible at extremely low temperatures. However, in recent years it has been possible to raise this critical temperature step-by-step so that technically feasible superconductors have entered the realms of possibility. This technology now appears to have been put into practice.

The conductors used do not have any electrical resistance and conduct current densities a hundred times greater than copper. This enables extremely strong electromagnets to be produced having amazingly small power consumption. The electricity consumption of the HTS induction heater is 50% lower than in conventional equipment. With it, Weseralu achieves energy savings that result in a reduction in CO₂ emissions of 376,000 kg a year.

Your contact:

Anncathrin Wener
Public Relations

Gesamtverband der Aluminiumindustrie e.V.
Telefon: 02 11 - 47 96 282
Telefax: 02 11 - 46 96 410
E-Mail: anncathrin.wener@alinfo.de