

press release**A QUESTION OF HORSES FOR COURSES:****Choosing the Right Technology for Production of Oxygen-free Copper Rod**

UK-based continuous casting technology specialists, Rautomead Limited, offer two different technologies of plant for the production of oxygen-free copper wire rod. The choice is based essentially on required plant capacity.

The two technologies offered by Rautomead Limited are explained below.

Resistance heated stand-alone graphite furnaces for production of up to 5,000 to 6,000 tonnes per year

These particular machines are compact, plug-in-and-go floor standing units. Feedstock required is good quality grade A cathode or equivalent, with which up to 10% clean mill scrap can be blended. Standard machines are suitable for 8-12.5mm rod diameter production, but can be specified for up to 30mm diameter where required. Cathode feed may be automatic or by manually operated electric hoist.

Simple, safe and forgiving

The resistance-heated graphite furnace used is extremely simple, safe and forgiving in its design and operation. The copper is exposed to a massive surface area of graphite (pure carbon) as the molten metal passes through the system, thus ensuring that the product contains less than 5ppm oxygen (normally less than 3ppm), while using a feedstock which may well contain up to 80ppm oxygen content.

Rautomead Limited
Continuous Casting Technology
PO Box 100
Dundee DD1 9QY
Scotland

t: (44) 1382 622341
f: (44) 1382 622941

sales@rautomead.com
www.rautomead.com

The system is self-regulating in that sense, thus ensuring both good quality oxygen-free copper rod, reliable production and long casting die life – normally 12-14 tonnes.

Low voltage graphite resistance heating

The simplicity of this machine design is in the heating system. This is based on a low voltage graphite resistance element circuit surrounding the crucible and heating the copper by radiation through the walls of the crucible. No inductor is used, no capacitor banks and no possible problems occur from disturbance of furnace transformers caused by harmonic waves. It is the essence of simplicity for easy maintenance.

The safety aspect is through the use of three-phase secondary power at only 40 volts, making the operation inherently very safe for the operators.

The forgiving characteristic of these machines occurs particularly in the case of mains power failure. In such an event, casting dies are automatically and immediately lifted out of the melt by battery-powered motor, while the resistance heated furnace will cool only slowly and without risk of damage to the machine, giving ample time for recovery of mains power or start-up of an emergency generator.

5,000 to 6,000 tonnes per year capability

Size of these machines is limited to 5,000 to 6,000 tonnes per year by practical limitation of the economic size of graphite crucible blocks. It is a technology well-suited to the smaller producer, where oxygen content in the cathode available cannot be guaranteed to be less than 30ppm, where mains power supplies are not always reliable and where starting operator skills may be relatively low.

Induction-heated stand-alone channel furnaces for production of up to 12,000 tonnes per year

For output requirements up to 12,000 tonnes per year, the user has a choice either to install two resistance-heated stand-alone graphite furnaces side-by-side (as above), or a single stand-alone channel induction furnace. Either arrangement will have an annual capacity of 10,000 to 12,000 tonnes, depending on selection of model. Investment required is similar, whichever route is chosen.

Lower operating cost or independent failsafe

The headline operating cost of a single 12,000 tonnes channel induction machine will be about 10% lower than the same output from two resistance heated machines. In ideal conditions, that will make a strong case for selection of the channel induction approach. On the other hand, a choice of two independent resistance heated machines has something of the failsafe characteristics of an aeroplane with twin engines and should not be underrated. A lower theoretical unit cost of production disappears very quickly if a single machine is at a standstill for any reason.

Weigh up the benefits

The points made above should be carefully weighed, as the channel induction machine, with its comparably reduced ability to reduce oxygen will not perform to expectations if the cathode contains 60-80ppm oxygen, as is relatively common in the industry. Additionally, channel induction furnaces are very sensitive to mains power failures and carry real risks of inductor damage and even furnace lining damage with substantial downtime for repairs if operators do not react very quickly and correctly in an emergency.

Twin channel arrangement for greater outputs

For outputs up to 30,000 tonnes per year, Rautomead offers twin channel induction furnace arrangements, whereby the copper is loaded into a large drum-type channel induction furnace and melted under a heavy charcoal cover, before transferring into a smaller channel induction holding and casting furnace. The constraint of cathode oxygen content is removed in this arrangement and operating cost is minimised.

For more press information, please contact:

Rautomead Limited

PO Box 100

Dundee

Scotland

Tel: + 44 1382 622341

Fax: +44 1382 622941

E-mail: sales@rautomead.com

Web: www.rautomead.com

Rautomead Model Range

model	strands	tonnes output per year
Stand alone Resistance-Heated Machines		
RS 2200/3	3	2,700 - 3,000
RS 2200/5	5	4,500 - 5,000
RS 3000/6	6	5,400 - 6,000
Stand alone Channel Induction Machines		
RDG 150/10/8	10	9,000 – 10,000
RDG 150/12/8	12	10,800 – 12,000
Twin Channel Induction Furnaces		
RDG 240/20/8	20	18,000 – 20,000
RDG 360/32/8	32	28,000 – 30,000