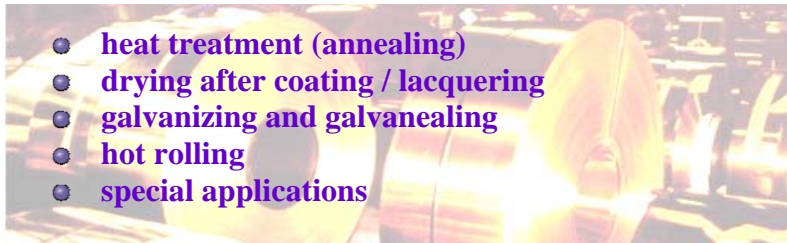


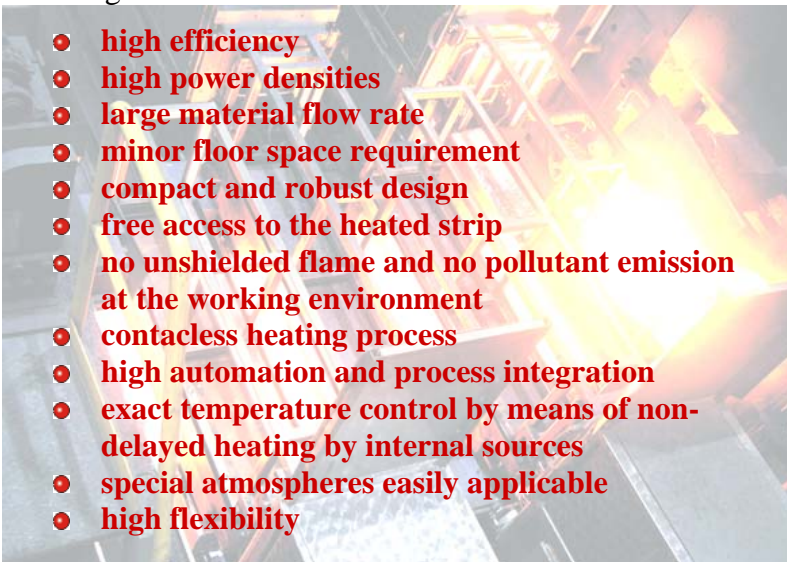
Induction Heating of Metal Strip

While processing metal sheets, strips and thin slaps heating is needed for many technologies.

For example:

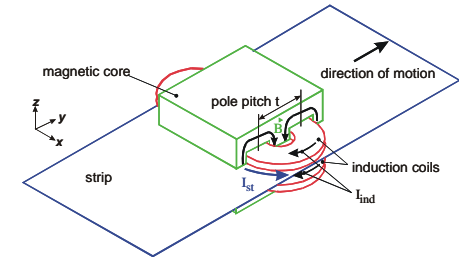


An advanced method to heat thin metal products (aluminium, brass, copper, iron, stainless steel, special alloys) is the **induction heating in transverse magnetic flux**. In contrary to conventional heating techniques it has considerable advantages :



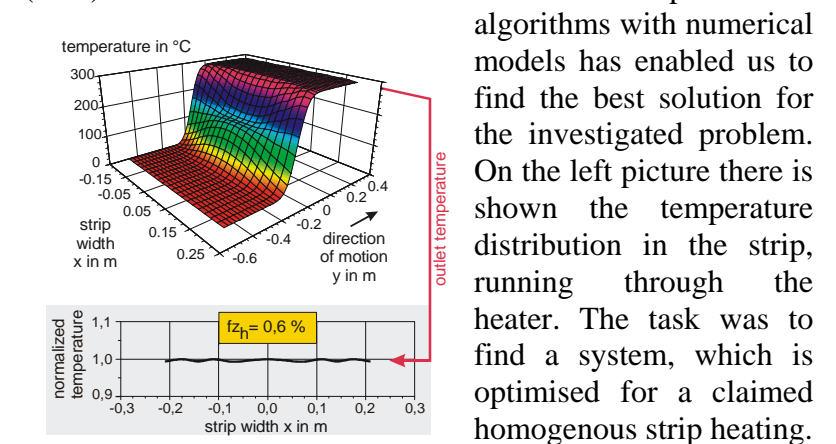
Physical principle of transverse flux induction heating

A strip which is going to be heated is driven through two inductors that are located above and underneath the strip. These inductors generate a magnetic field normal to the strip surface. Thus a current flow is evoked in the strip which leads to its heating.



Numerical simulation

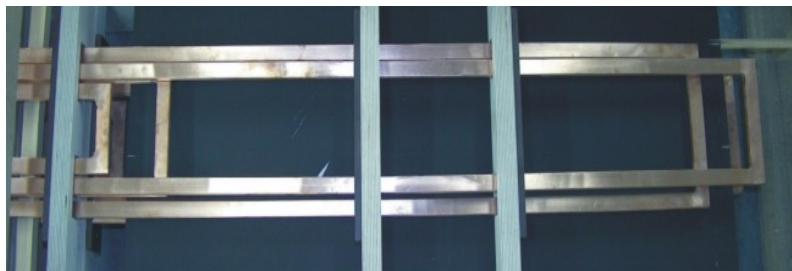
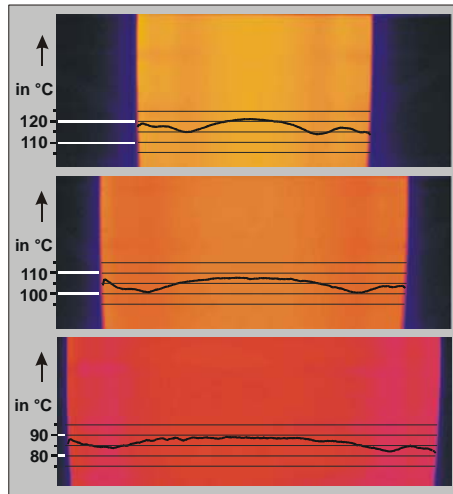
The advantages of induction transverse flux heating can only be realised by a correct design. This cannot be achieved by traditional means, as a 3D-model with numerous parameters must be investigated taking into consideration several physical effects. A software package has been developed and accurately tested at the Institute for Electrothermal Processes (ETP). The combination of automated optimisation algorithms with numerical models has enabled us to find the best solution for the investigated problem.



New development of flexible heaters

The industry request mainly high flexible, compact as well as robust installations, which provide a high availability. Therefore a new heater concept has been developed, overcoming the disadvantages of existing concepts. This variable-band-width induction coil system (VABID) is a one induction coil system consisting from several parts. This parts can be adjusted individual to adapt the system to the needs of modern productions with small lots.

Different width of the strip, variable strip thickness and several materials can be processed by the same induction coil system. Furthermore the innovative induction coil concept allows to vary the temperature profile in the strip according to the needs of the process.



References

By the help of the numerical simulation and the possibility to verify the results experimentally with a laboratory set-up already several installations have been investigated and successfully designed.

To develop a induction heater for an annealing line for brass strip was one task for fixed strip width. With the design the production rate could be increased significant. This installation has been successfully checked in the laboratory under real conditions.

For the reheating of steel strip to temperatures above 1000 °C a 10-MW-heating-installation has been designed based on the transverse flux induction concept. The installation is oriented for variable width and thickness of the strip. It is working satisfying in a thin strip casting line.

The induction transverse flux heating

has a large number of advantages in contrary to conventional processes. Furthermore this method opens up the possibility to develop a new generation of production lines as well as to create totally new products.

Especially the patented concept for variable induction coils (VABID) fulfills the needs of modern processes and allows to react flexible on changing parameters of the strip.

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