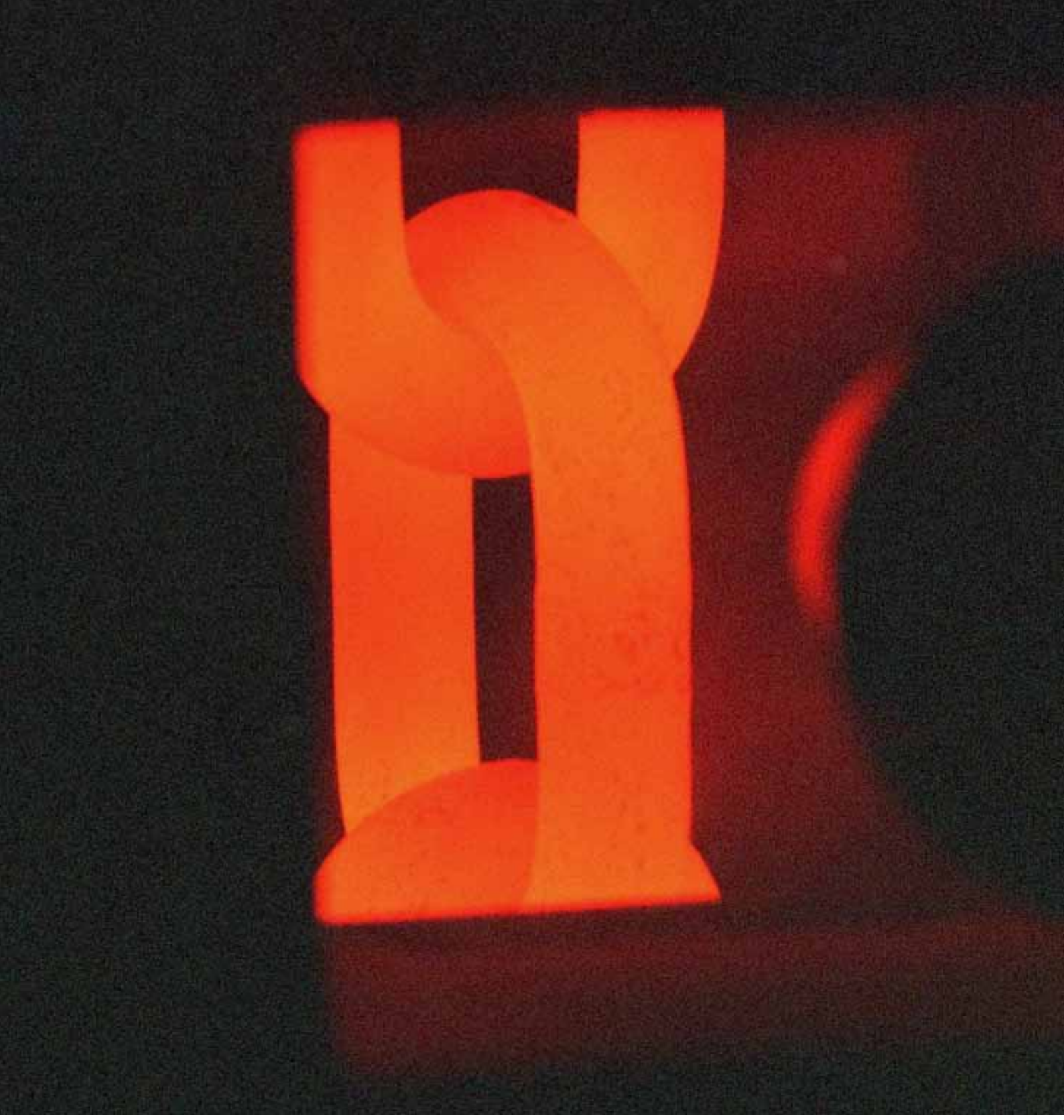


Chain heat treatment

A guide to the benefits of induction heating

EFD INDUCTION

How to make premium product. And charge premium prices.

An integrated induction hardening and tempering solution let you easily produce premium grade chain—a product that commands premium prices in international markets.

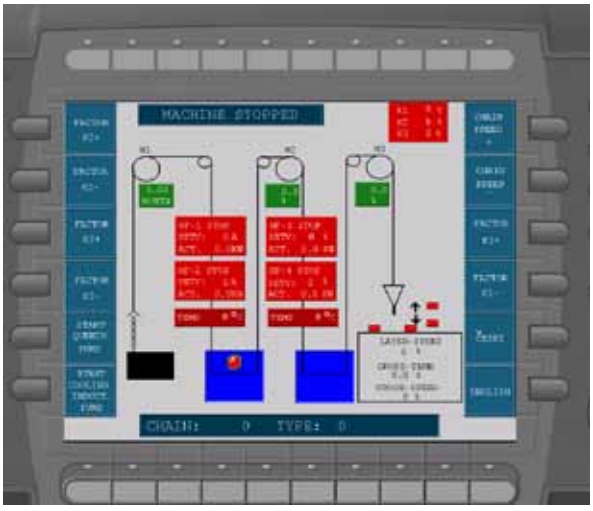
In a globalized economy full of low-priced commodities, the ability to make premium-grade products is crucial to remaining competitive. For chain makers, this means producing chain to the tough standards set by the lifting, offshore construction, logging, shipping and fisheries industries, etc.

But meeting those standards usually means having solutions that can selectively treat chain schenkels. This process heats the straight part of the link, the 'schenkel', to a higher temperature than the rest of the link. Such selective heating increases ductility in the schenkel, resulting in optimal link properties.

Only induction heating achieves localized schenkel tempering. Furnace heating, for example, cannot differentiate between the parts of a link. It also causes considerable scaling of the chain surface, and cannot ensure even heat input into the links. Induction ensures even inputs and minimal scaling.

Induction heating gives you the best of both worlds: top-quality product and a high-speed, high-throughput process. A typical EFD Induction system, for instance, usually hardens and tempers approximately 1000 kg of ø5-ø34mm chain per hour. Yet the height of the production line is only 7.5 meters.

An optical heat sensor measures chain temperature. The sensor is just one of many quality assurance features available for an EFD Induction chain treatment solution.



The control screen gives a full visual overview of the chain heat treatment process. All aspects of the process can be controlled from the control panel.

More chain.
More gain.

An in-line hardening/tempering system from EFD Induction streamlines production. The chain loads directly from its magazine into the system, and emerges at the other end as hardened and tempered chain. It then automatically unloads into a box or onto a pallet. This smooth, continuous process removes the need for chain storage and transportation. Features such as control plates and guiding cones at the coil inlets prevent knots and tangling.

The speed and quality of the induction heating process is ensured by sophisticated yet easy-to-use control software. From a single interactive panel the operator is, among other things, able to control heating parameters, line speeds and quenching systems. The control system—which features a multilingual control panel—can store data for more than 100 different chain types.

EFD Induction in-line systems are designed for operational flexibility. For example, only one coil change is needed when treating chain in the ø5-ø15mm range. Likewise, a single coil change lets you handle ø16-ø34mm. And when tempering, you can change between short-linked and long-linked chain merely by adjusting the process parameters. No coil or other equipment changes are necessary.

Our heat treatment systems typically include two cooling systems: one for the induction heaters, one for chain quenching. Both systems use normal factory water in their primary cooling circuits. The systems are low maintenance, low pressure solutions that continue to operate even in the event of a sudden pressure drop in the mains water supply. Optional filters are available that continuously remove scaling from the quench water.

Left, an EFD Induction engineer gives hands-on training at the start-up of a new chain heat treatment solution. Above, chain is extracted from its magazine. It will emerge hardened and tempered from the end of the line and be automatically fed to a waiting magazine or pallet.

In-line. Integrated. In control.

EFD Induction chain heat treatment systems are used by some of the world's leading chain manufacturers. Although each system is customized to specific demands and conditions, a complete in-line solution typically includes:

- At least two EFD Induction heaters
- Hardening and tempering coils
- Mechanical chain handling systems
- Quality and control systems
- Service platform with coil lifting device
- Quench filtering and water cooling system

A two-lined EFD Induction chain heat treatment solution. Our unique coil design means we can considerably reduce the height of the lines.

EFD Induction is Europe's no. 1—and the world's no. 2—induction heating company. In addition to our equipment we offer a range of services to ensure you get a solution best suited to your business and technical needs. We have manufacturing plants, workshops and offices in the Americas, Europe and Asia.

Learn more about EFD Induction and our solutions that are boosting productivity for companies around the world. Visit: www.efd-induction.com