



# Brazing short-circuit rings

A guide to the benefits of induction heating

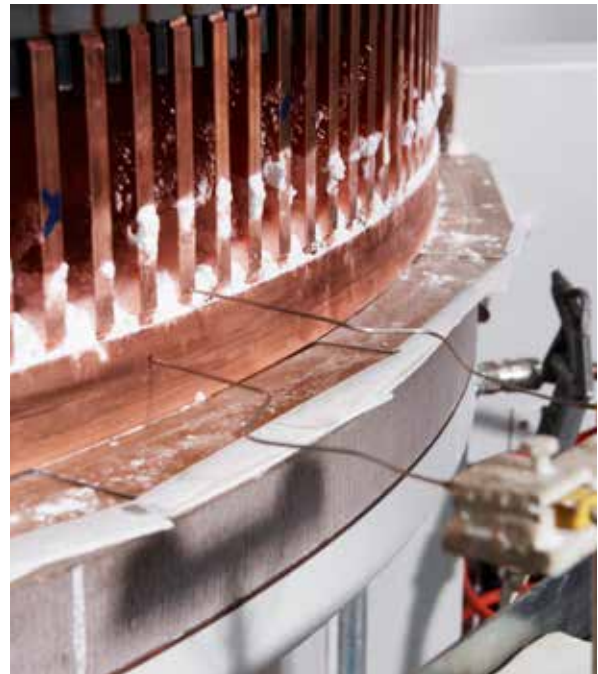
# Induction brazing. Why it's ideal for short-circuit rings.

EFD Induction's unique coil design, together with induction heating's speed and accuracy, mean minimal heat inputs. This in turn reduces the risk of shafts weakening, and minimizes heat transfer into the laminations, a common problem when using flame brazing. Induction brazing also prevents other problems associated with flame heating. For example, the accuracy of induction heating reduces the risk of ovality, and the subsequent need to re-balance squirrel cage motors.

Open flames risk overheating the flux material, compromising its capability to prevent the formation of oxides in the joint. The copper, too, risks overheating, which can lead to unwanted grain growth. But with induction heating the temperature is precisely controlled. Induction heating also has environmental and safety advantages. It's easy to remove any fumes. Noise levels and ambient temperature increases are negligible. And the operator has at all times a clear view of the workpiece.



*One-shot brazing is normally used on small- and medium-sized rings up to an OD of approximately 1,500mm, provided the rotor design is suitable. For very large rings, or when the bars pass through the ring's trench, we typically recommend segment brazing.*



*EFD Induction brazing systems usually use contact-free fibre optic temperature monitors. In this case, however, the customer used its own contact temperature monitor. The white powder is flux that removes any contaminants and prevents oxidation.*

# Heating things is easy. Keeping them cool is the hard part.

Induction brazing of short-circuit rings delivers several technical and cost benefits. To start with, induction heating boosts throughput. The actual brazing process is much faster than flame brazing. Precise heating zones and heating cycles minimize cooling times. Moreover, EFD Induction has designed a special coil for one-shot short-circuit ring brazing. This coil equalizes the temperature around the ring, minimizing energy input into laminations and helping to protect the shaft from heat.

Induction brazing ensures consistent high-quality results. Oxidation is minimized, especially when compared to flame brazing. This reduces clean-up times and the use of joint-weakening flux. And because induction is a no-contact method, there is no risk of unwanted impacts. Induction brazing is better for operators, too. The working environment is clean, quiet and safe, and the control panels on EFD Induction equipment help ensure easy man-machine interface.



*Safer for workers and kinder on the environment. Minimal ambient heat increases and efficient fume extraction mean more comfortable, more productive working conditions. High energy efficiency and targeted heating is good for the environment too.*



*Our brazing solutions are currently in use in the Americas, Europe and Asia. We have brazed a wide range of bar / ring combinations, and have designed a special one-shot brazing coil that equalizes the temperature around the ring, helping to protect the shaft from unwanted heat input.*

# Proven solutions

Two EFD Induction product ranges—Minac and Sinac—are typically used to braze short-circuit rings. Minac is usually used for one-shot brazing of small- and medium-sized rings. Exceptionally user-friendly, the Minac is compact and mobile, and thanks to its automatic electronic matching, the Minac can be used to heat virtually any workpiece shape of electrically conductive material.

The Sinac is the second EFD Induction product range used for short-circuit ring brazing. Usually employed for segment brazing of medium and large short-circuit rings, the Sinac supports stationary and handheld power outputs. The Sinac and Minac power sources are typically part of customized solutions that include coils, handling systems and process supervision software.



*Get more out of your equipment. All EFD Induction equipment and solutions are backed by our worldwide service, training and maintenance programs.*

EFD Induction has to date installed thousands of heating solutions for a vast range of industrial applications—bringing the benefits of induction technology to many of the world's leading manufacturing and service companies. EFD Induction has manufacturing plants, workshops and service centers 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](http://www.efd-induction.com)**

[www.efd-induction.com](http://www.efd-induction.com)



PUTTING THE SMARTER  
HEAT TO SMARTER USE