

# Quality brazing for turbine generators

Fontargen Brazing, a brand of **voestalpine Böhler Welding**, is an expert when it comes to brazing and soldering solutions for the wind-energy industry.

**E**lectric generators convert kinetic energy into electrical energy and are part of every wind tower. Generators of various designs are used, such as asynchronous and synchronous types with permanent magnet or induction generators. Copper and steel are the main base materials used for the generators, with copper used primarily for its electrical conductivity. Aluminium is also becoming more important. Electrical generators consist of a static part (the stator) and a rotating part (the rotor).

Brazing is applied in generators with a short-circuit ring rotor (end ring). The brazed joint is located between the end ring and the ends of the rotor bars; and the ring and bars are made of solid copper. With stators, brazing is often used to connect the pole coils on both sides of the stator.

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## Quality products

In addition to good electrical conductivity, copper also has good thermal conductivity. For this reason, rapid and uniform heating is elementary for successful brazing. This is achieved by means of inductive heating, as heating with a gas flame (in oxy fuel welding or flame brazing, for example) leads to longer production times and may cause damage to the insulation of the spool windings.

The structural design of the joints, end ring, bars and pole coils means that appropriate brazing solutions depend on operational experience and the performance classes of generators. Fontargen Brazing specialises in this area.

“Based on more than 50 years of experience in brazing technology, a close research network and modern production methods, Fontargen Brazing cooperates with its customers on the development of brazing solutions with a well-balanced quality/cost ratio,” explains Dr -Ing Axel Demmler, segment manager, brazing power generation. This is reflected by the wide range of product forms the company has available for the brazing of rotors:

- brazing balls, in different diameters
- brazing wire and wire sections, in various lengths and diameters



A short-circuit ring design rotor.

- brazing strips (sheets) with >0.5mm thickness
- brazing foils
- brazing wire preforms
- brazing rods for manual applications.

These different products are mainly produced by low-melting silver or silver containing copper-phosphorus brazing alloys such as FONTARGEN A 3015 (CuP 284 DIN ISO 17672; BCuP-5 AWS 5.8). Flux is not necessary for brazing copper to copper.

The brazing of the spool ends on the stator is somewhat different. Here, it is important to maintain a small brazing area, which sometimes takes more time than the brazing cycle itself. The insulation must also not be damaged during heating at soldering temperature (approximately 700°C). Fontargen Brazing has experience in the optimisation of brazing technology in relation to the constructive design of joint. For example, a solution can be found in heating with the tungsten inert gas process, with the mechanised feeding of the brazing rod.

## In-depth understanding

Through deep insight into processing and application methods, Fontargen Brazing provides quality brazing and soldering solutions based on proven products with German technology. The expertise of this brand's application engineers has been formulated over many years of experience from countless cases. ■

### Further information

voestalpine Böhler Welding  
[www.voestalpine.com/welding](http://www.voestalpine.com/welding)

