inductor manufacturing
Beyond the limits of induction

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Common benefits with advanced manufacturing methods, 3DPCoil and Microfusion:

- **Increase in inductor durability.** Production stoppages for tooling changes are reduced due to the coil's longer lifespan. The cost per part is significantly reduced in medium and high production volumes.

- **Dimensional repeatability** of coils ensures that heating profile is maintained when tooling is changed. The labour time required for such changes (including cutting and laboratory time) is also reduced.

- **Total adaptation to the work piece** improving process quality. This enables producing shapes that traditional methods are unable to achieve.

- **Cost saving:** changeover time shorter and inductor extended life that allows a cost per piece reduction.

### Common characteristics

The coil is created as a single **3D piece** without brazed joints. The design is modelled through the 3D CAD software optimizing both outer and inner design:

- reducing the points with higher current density (hot spots)
- improving coil cooling by changing the geometric characteristics of the inductors

Manufacturing process carried out in a vacuum atmosphere in order to avoid porosity and rusting. High dimensional accuracy process that allows identical coil copies.

These inductors can be repaired just like the traditional ones.
Advanced manufacturing (GH patent)

3DPCoil solution

Standard technology in GH inductors.

Such coil is manufactured with the fastest and the most efficient method existing today: additive manufacturing based on “Electron Beam Melting (EBM)”. The coil is directly made of copper according its 3D CAD model and controlling an electron beam for melting the copper powder material layer by layer and creating the final design (see cover image). Maximum coil dimension as single piece: 200mm (L) x 200mm (W) x 100mm (H).

3D direct printing
99,99% copper purity
100% density
Repeatability

Microfusion inductors

Adapted to coil requiring narrow wall thickness. It allows complex and/or small sizes of inductors.

The manufacturing method is based on 3D printed wax and microfusion process using silver or silver alloy.

Maximum coil dimension as single piece:
150mm (L) x 150mm (W) x 150mm (H).

Combined technologies

For inductors exceeding the maximum dimensions possible for advanced manufacturing.

The traditional brazing solution can be combined with it. For example it could be used for the areas with more complex geometry. The figure shows an example with Microfusion ends and copper body minimizing brazed joints and improving design.

Rotating inductor system (GH patent)

This system enables the inductor to rotate based on an output transformer that transmits the energy between the primary and secondary circuits without any physical contact.

There are cases where keeping the work piece stationary improves and simplifies the hardening process.
Customer Services

Advisory services
GH experience, references and testing laboratory are available to support the customer in developing applications and selecting inductors.

Technical Assistance
GH technical engineers support the customer in its daily operation.

Inductor shop
All types of complete inductors for the industry (automobile, industrial parts, brazing, etc.) can be supplied ready to be installed in a customer system. GH Induction is the unique worldwide sales point for 3D printing and Microfusion Technology inductors.

Simulation & laboratory
For induction application test and development hub.

On-line shop
365 days x 24 hour service for technical, budgetary information and on-line payment

Repair & Spare inductors
A repair service and spares are offered for GH inductors. For advanced manufacturing inductors, the industrialized process allows high dimensional accuracy in the copies and shorter delivery times for 3DPCoils.

Inductor training
A set of training programs to understand GH induction solutions and the induction heating technology are available.

About GH Group
GH Group is one of the leading induction heating technology group of companies serving different industries using medium and high frequency induction worldwide.

Since 1961, more than five thousand customers around the world rely on the quality of the GH Group. Automotive, off-road, wind power, tube, electrotechnical and even industries making pieces used in everyday life form part of GH solutions.

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