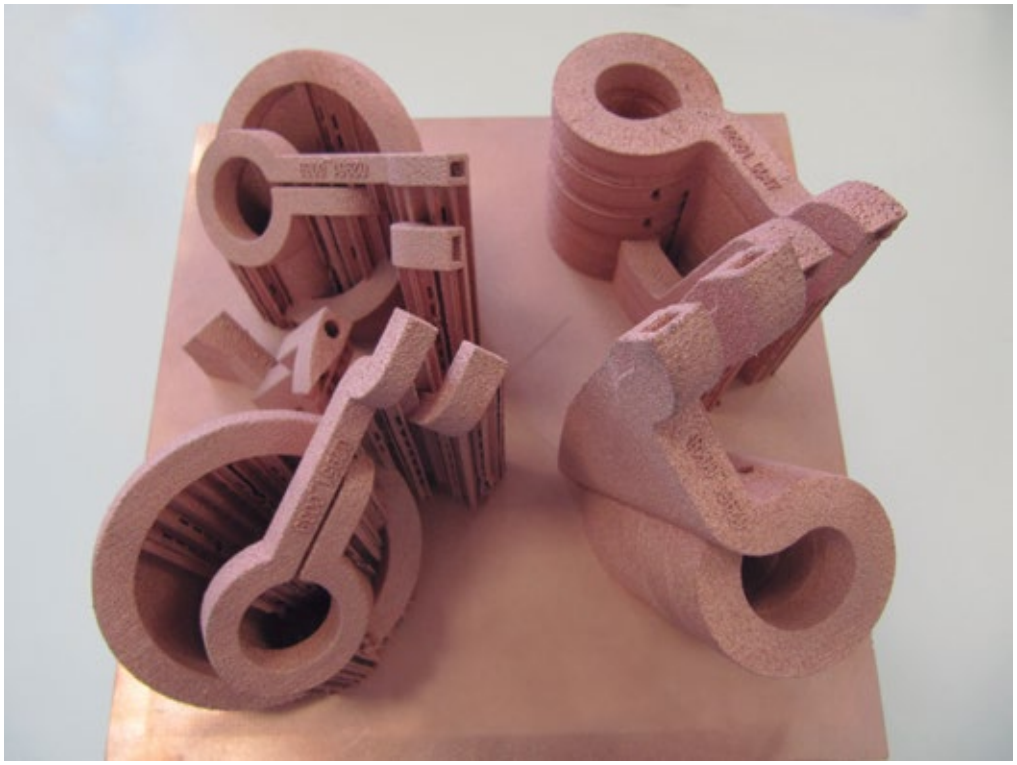
Exclusive solutions for your application



3D printed (3DPCoils) on the working plate in the EBM machine

In inductors the coil design is critical for meeting the requirements in an induction heating process.
Traditional coil manufacturing methods entail constraints which companies have had to live with until now.
New manufacturing technologies patented by GH Induction offer extraordinary possibilities for the process and operation and production.

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 achive.
- 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.

3D CAD model

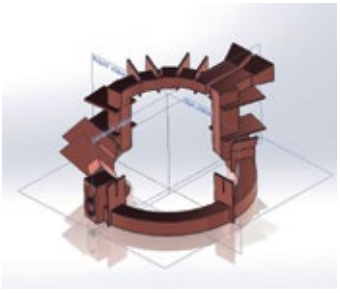
Advanced manufacturing (GH patent)

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



3D CAD model and final 3DPCoil for wheel hubs without brazed joints

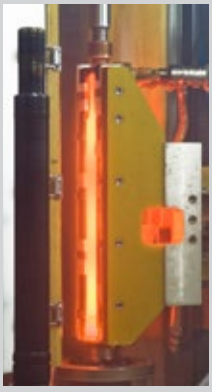
Wheel hub hardening

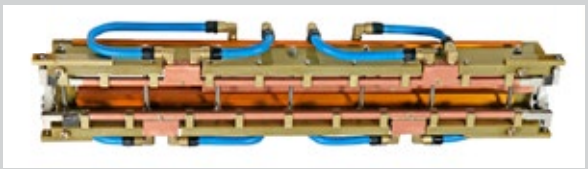
Microfusion inductors

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).

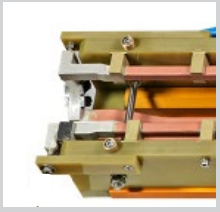
Combined technologies

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.





Tulip stem single-shot hardening inductor



Single-shot shaft hardening inductor 1050mm in length and detail of the Microfusion end

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.

Rotating inductor system with Microfusion coil

Customer Services

The following services are available:

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

shop.ghinduction.com

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.

GH GROUP induction

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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