Grávalos

HOUSEHOLD APPLIANCES SECTOR

Common errors in the manufacture of induction coils

The manufacture of induction coils for household appliances requires a precise combination of design, materials, production processes and technical validations. These parts are at the heart of the induction heating system and their performance directly influences energy efficiency, appliance durability and the end user experience.

Below, we describe the most common mistakes in their design and manufacture, along with good practices that will help to avoid them.

1. INADEQUATE DESIGN AND MATERIAL

The design and material of induction coils must be defined with consideration for their final application, as well as the thermal, mechanical, and electromagnetic conditions to which they will be subjected.

Best practices. Validate the design with simulation software before producing the coil and have a specialised technical team in the project to provide advice from the first design phase.

2. POOR ROBUSTNESS

A coil design that does not take into account the actual conditions of use (vibrations, thermal cycles, mechanical impacts, etc.) may lead to premature failure due to lack of robustness.

Best practices. Incorporate mechanical components in the design that contribute to robustness, durability and reliability. In other words, integrate an integral vision of the design that allows reliable solutions to be offered even in the most demanding conditions.

3. WINDING AND ASSEMBLY PROCESS WITH SHORTCOMINGS

During these processes, deformations can occur in the coil due to winding with too small bending radii or excessive wire tension. Or poor soldering can lead to high resistances or leakage. Also, if the coil is not properly fixed to its support, mechanical vibrations can cause fatigue of the joints and the wire.

Best practices. Use suitable machinery and carry out quality controls during the processes. Check after winding that there are no cracks in the enamel and that the shapes match the intended design.

4. ELECTRICAL INSULATION AND FAULTY CONNECTIONS

Typical faults in induction coils can be insulation wear that leaves copper or aluminium exposed, or misaligned joints that will be a major source of future failures.

Best practices. Include quality electrical testing to ensure that the insulation is correct.

5. INSUFFICIENT QUALITY CONTROLS

The lack of quality controls increases the rate of rejected parts and a higher need for more frequent inspection of components. In fact, it can lead to the delivery of defective parts with incorrect geometry or missing material in some coils, or induction plates with cold spots or overheating.

Best practices. Implement quality protocols and keep a record of rejects to identify error trends.

6. PROBLEMS IN SCALING UP AND ADJUSTING PRODUCTION

It is common that, once a coil model has been validated, production demand increases or specifications change due to market or design adjustments.

Best practices. Work with a supplier with flexible and sustainable long-term production capacity that can adapt quickly to new technical, regulatory or logistical requirements.

WHO ARE WE?

At Grávalos, we have extensive experience in the manufacturing of induction coils. We stand out for our ability to handle the entire process, including the plastic injection required to produce the equipment in which the coils are integrated.

Thanks to our engineering department and our advantageous manufacturing centre in the free zone of Tangier, we offer a highly competitive quality production.

Our customers include leading companies in the sector such as BSH - Induction Division of the BOSCH Group, for which we are the largest supplier of induction solutions.

We are the ideal partner for induction solutions in the household appliance sector!

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