New Innovations in Magnetizing Stations and Magnetic Measurement from Laboratorio Elettrofisico

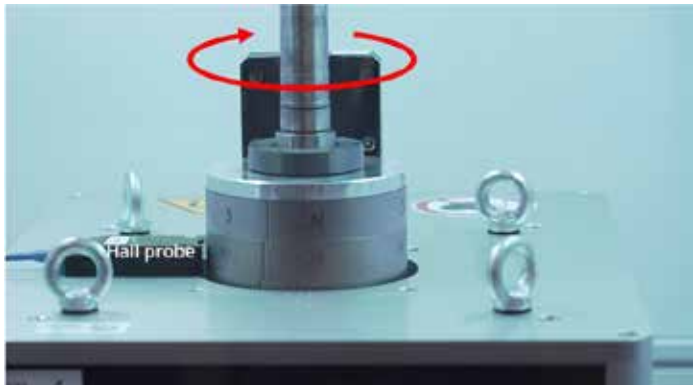
By Andrea Del Prete, VP of Magnetics Technology, Laboratorio Elettrofisico

Fourth-generation magnetizing station from Laboratorio Elettrofisico

Every day we are facing new customers' demands that are more challenging than ever. Thanks to the experience gained in 60 years of playing a central role in this market and to the continuous research and development on innovative products, we are able to offer the best state-of-the-art technical solutions. We are now firmly focused on the car electrification market but always thinking about new solutions that can be applied to all industrial sectors.

To serve the automotive industry, currently the company is manufacturing a fourth generation of magnetizing station (the first one was developed in 2016), with a handling system and two levels of magnetic quality control. Such a magnetizing station is generally used for magnetization of step-skewed rotors with rare earths magnets embedded. Customer's product requirements are typically related to full magnetic saturation and low torque ripple.

From the industrial point of view, we are always asked for: low cycle time, high performance level, compatibility with 4.0 industry, high reliability, accuracy and flexibility. Our magnetic solutions fulfill all these requirements mentioned, as evidenced by the fact that several European OEMs and Tier 1 suppliers are using our equipment in their production lines.

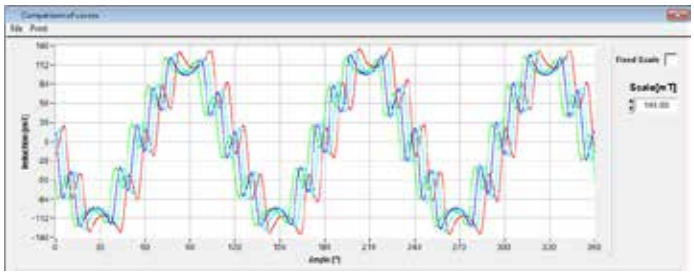


From magnetizing equipment to magnetic measuring equipment.

Magnetizing equipment plays a central role in the daily activity of the company, and its R&D department is continuously working on innovative solutions. Laboratorio Elettrofisico is focused both on magnetizing equipment as well as magnetic measuring equipment, for which it covers one of the most complete range of magnetic measuring systems available on the market. This is fundamental, because customers' requirements are now moving towards magnetic quality control 100% in the production lines.

The main controls on the rotor are the total flux measure and the magnetic scanning. For this reason, we are integrating into our magnetizing station the possibility to check the induction at the rotor's surface through a magnetic scan, usually performed by a single (or multiple) gaussmeter(s) and Hall probe(s). The acquired signal is then elaborated by a dedicated software and displayed on an HMI panel of an industrial PC. In this way, full magnetic quantities are available for a complete qualification of the product: level of magnetization, skewing angle, harmonics, etc., for each pole.

Since the necessary handling, such as rotation and axial displacement, are already provided by the bench, the addition of a magnetic scanner is often a very convenient option. The scansion and elaboration take only few seconds, without any impact in the production capability.



Different stacks scans and skew-angle determinations

The data produced are very complete so, after giving primary indication of the quality of a part during production, they can also be elaborated offline by other stations, even in a second time, to provide statistic or other deeper information.

We would also like to mention that we have under advance development stage an automated system for the magnetic quality control of stator cores. With such equipment, the customer will be able to check 100% on-line the magnetic properties and losses of complete stator cores, in which final magnetic behavior is usually affected by mechanical and thermal processes.

Main page – Parameters Scanner

In conclusion, we are available to evaluate all specs, especially the most challenging and demanding ones, and customer satisfaction is our first priority. We never say “this is not feasible”, we always make it possible.

For more info, see www.laboratorio.elettrifisico.com.

About the Author:

Andrea Del Prete graduated in nuclear engineering in 1993 from Politecnico di Milano, Italy. Since 1995 he has worked for Laboratorio Elettrofisico, Nerviano, Italy. He has held several key positions within the company, from director of the measurement laboratory to the head of the development of measuring equipment. Currently he is the VP of Magnetic Technology, covering all the magnetic aspects of the products, supporting with his expertise both the Sales Team and the Design & Testing Team.