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The HL-LHC Superferric High Order Corrector Magnets: Series Production and Powering Tests Status

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INFN is developing at the LASA lab (Milano, Italy) the High Order (HO) corrector magnets for the High Luminosity-LHC (HL-LHC) project, which will equip the new interaction regions. All the HO correctors, from skew quadrupole to dodecapole, are based on a novel superferric design, never used so far in high energy colliders, which allows a relatively simple, modular, and easy way to construct a magnet. The series production is ongoing after the completion of the five prototypes program; half of the 54 series magnets have been produced in the industry and the testing at LASA is ongoing. The delivery to CERN also started. We discuss the design optimizations introduced and the lessons learned during the first half of the series production. We also focus on the quality assurance plan, which allowed us to early detect non-conformities and monitor the learning curve. The testing station at LASA is fully operational, four magnets per cool down are tested. Each magnet is powered individually, and the magnetic measurement system, supplied by CERN, provides both field quality and transfer function. We provide an overview of the performed tests and measurements, focusing on test station's performance and quality of the measurements. Finally, we provide an outlook of the production completion, test plan and delivery to CERN.

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