



Orano and the CEA validate high-performance magnet production on their pilot line

Grenoble, September 24, 2026

One year after its inauguration in Grenoble on September 19, 2025, the pilot line jointly operated by Orano and the CEA at the CEA's Grenoble site (Isère, France) is delivering on its ambitions. The results obtained demonstrate mastery of the process for manufacturing neodymium-iron-boron (NdFeB) permanent magnets, among the highest-performing magnets currently available on the global market. The significance of these results lies not only in the performance of the magnets produced, but also in the expertise acquired in manufacturing them. This first milestone paves the way for the future incorporation of raw materials from the circular economy.

In particular, the platform has demonstrated the reliable production of N45UH grade magnets offering some of the highest performance levels available, confirming the maturity of the process developed by Orano and the CEA. This grade meets the requirements of the most demanding applications in strategic sectors such as electric mobility, low-carbon energy, high-tech industry, robotics and defense, notably for key components including motors, generators, actuators and magnetic sensors.

Mastery of the process now makes it possible to produce other magnet grades for a variety of industrial applications, helping to secure European supply chains. This achievement demonstrates the feasibility of developing leading technological expertise and manufacturing capabilities in France and Europe in a particularly strategic industrial segment. Worldwide, only a small number of players currently possess the full range of expertise required to manufacture these high-performance magnets.

The achievement also illustrates the complementary expertise brought together by the two partners: Orano's capabilities in industrialization and the control of complex processes, combined with the CEA's longstanding scientific expertise in magnet design and advanced materials for energy applications.

Guillaume Dureau, Orano Senior Executive Vice President, Projects & Engineering, Innovation, R&D and New Activities, said: *"Beyond the performance achieved in just one year, the key takeaway is that we now have mastery of every aspect of the manufacturing process. By combining our expertise with that of the CEA, we have developed, qualified and demonstrated an integrated technology covering every stage in the production of NdFeB permanent magnets. Building on this progress, we are now in a position to offer technology and know-how, with the ambition of supporting the future development of industrial capacity for the production of high-performance permanent magnets."*

Philippe Stohr, Director of the Department of Energy at the CEA, said: *"The results achieved on this pilot line show that the ambition we set out a year ago is now close to becoming a reality with the successful production of this magnet grade. This marks an important milestone toward establishing in Europe the capability to master high-performance permanent magnet manufacturing processes, while preparing to integrate them into a circular-economy approach. This platform is a major strategic asset for France and Europe. It is fully integrated into the French industrial value chain, from rare-earth refining through to permanent magnet production. It must now help accelerate the development of this industry, particularly as part of France's national 'Rare Earths and Permanent Magnets' resilience plan."*

Orano and the CEA are now continuing their work to further optimize process performance and accelerate the incorporation of secondary raw materials from recycling.

Award winners under the "France Relance" recovery plan and the European Union's "Horizon Europe" research and innovation program, the project is supported by two complementary collaborative

consortia in Europe and France - Magellan¹ and Magnolia² - which are developing various technologies for manufacturing magnets from recycled critical metals.

About Orano

As a recognized international operator in the field of nuclear materials, Orano delivers solutions to address present and future global energy and health challenges. Its expertise and mastery of cutting-edge technologies enable Orano to offer its customers high value-added products and services throughout the entire fuel cycle. Every day, the Orano group's 18,500 employees draw on their skills, unwavering dedication to safety and constant quest for innovation, with the commitment to develop know-how in the transformation and control of nuclear materials, for the climate and for a healthy and resource-efficient world, now and tomorrow. Orano, giving nuclear energy its full value.

About CEA

Endowed with a unique model, the CEA is a public research organization whose purpose is to inform public decision-making and provide French and European companies and public authorities with the scientific and technological means to better manage major societal changes relating to energy and digital transitions, future healthcare, and global defense and security. This purpose is based on three core values that guide the actions of the CEA and its teams: curiosity, cooperation, and awareness of responsibilities.

About N45UH grade NdFeB permanent magnets

NdFeB permanent magnets offer the highest magnetic energy levels currently available on an industrial scale. They differ from ferrite magnets, the most widely used magnets on the market, and samarium-cobalt magnets, which are known for their excellent performance at high temperatures.

Among NdFeB magnets, N45UH grades fall into the high-performance category. They offer remanence of 1.34 T and coercivity of 1,915 kA/m at 20°C. They combine high magnetic strength with excellent resistance to demagnetization at elevated temperatures, making them particularly suitable for the most demanding technological applications.

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¹ The Magellan Consortium was created in 2024. It brings together 14 key players from eight European countries (with Orano acting as coordinator). Its mission is to propose a value chain for the recycling and manufacture of permanent magnets in Europe.

² The French Magnolia Consortium was created in 2022. It is based on five key, complementary players (Orano as coordinator, CEA Liten, Valeo, Paprec, and Daimantel). Its aim is to instigate the emergence of a French industrial value chain for recycling used sintered magnets and manufacturing new magnets.