

Manufacturing of the World's Most Powerful Human MRI Magnet Begins in Magdeburg

Magdeburg, September 10, 2026 – Medical technology company Neoscan Solutions has begun production of a 14 Tesla magnet, the world's most powerful MRI magnet designed for human applications and a new world record in magnetic resonance imaging.

The magnet is being developed as part of an international research project led by the Dutch DYNAMIC Consortium and is scheduled to be installed at Radboud University in Nijmegen in 2027. The system will be used for advanced medical research.

New Technology Enables a Major Performance Leap

The exceptional field strength is enabled by high-temperature superconductors (HTS). By eliminating the need for liquid helium and relying on conductive cooling instead, HTS technology enables more compact, lighter-weight magnet systems while supporting substantially higher magnetic field strengths..

Conventional MRI magnets reach their physical limits at around 12 Tesla. In clinical practice, MRI systems typically operate at field strengths between 1.5 and 3 Tesla. The world's most powerful research MRI currently in operation, with a field strength of 11.7 Tesla, is located in Paris.

Technological Pioneering from Magdeburg

Neoscan Solutions was awarded the contract to develop and manufacture the magnet following an international selection process. For the company, the project marks the beginning of a new generation of MRI technology.

High-temperature superconductors are still used in only a limited number of industrial applications and often remain at the pilot-project stage. However, Neoscan has already obtained regulatory approval for a pediatric 1.5T MRI system based on HTS technology as a medical device.

Complex Development and Global Supply Chains

Since receiving the contract, the team has developed an HTS magnet with an inner bore diameter of 844 mm and established the manufacturing processes required for production. One of the project's key challenges was sourcing suitable HTS wire, as only a small number of manufacturers worldwide can supply the necessary quality and quantities.

A total of approximately 500 kilometers of superconducting wire will be used in the magnet. The cryostat, which houses the magnet, has already been completed. With today's production launch, manufacturing of the magnet coils is now underway.

New Opportunities for Brain Research

The 14 Tesla MRI system is expected to provide unprecedented insights into the structure and function of the human brain. The higher field strength improves spatial resolution, making it possible to visualize extremely fine neural structures. It will also enable researchers to study dynamic processes in the brain with greater precision and, in the future, imaging metabolites and metabolic processes. At 14 Tesla, the system significantly surpasses previous technological limits and establishes a new world record in MRI technology.

International Funding

The DYNAMIC Consortium received €19 million in funding in 2023 through the "National Roadmap Large-Scale Research Infrastructure" initiative of the Dutch Research Council (NWO).

Stefan Röhl, Managing Director: "The start of the winding process is the result of a significant R&D effort. It includes extensive simulations, partially invasive material and sub-component testing under operating conditions, as well as construction of high end components, supplier selection, and development of the two precision winding tools. Compared with the original, highly ambitious timeline, the project is one year behind schedule. However, we have gained enormous confidence that we are building the to meet its specifications. We are especially grateful for the collaboration with the Magnet Committee of the DYNAMIC Consortium in this project."

Quote David Norris, Project Leader: "The completion of the 14 Tesla magnet marks a major milestone for the DYNAMIC project. I am deeply impressed by the outstanding work Neoscan has done in overcoming the technical challenges involved in building this pioneering magnet. We are excited to put it to use in the construction of the world's most powerful MRI scanner."

About Neoscan Solutions

Neoscan Solutions is a medical technology company headquartered in Magdeburg, Germany. The company develops, manufactures, and markets MRI systems and components, including superconducting magnets, digital consoles, and MR software.

Neoscan is certified as a medical device manufacturer under ISO 13485. In addition to clinical MRI systems, its portfolio includes specialized solutions for research applications.

The company was founded in 2017 on the initiative of the STIMULATE Research Campus. Its investors include entrepreneurs Karl Gerhold and Klemens Gutmann. Neoscan maintains close collaborations with Otto von Guericke University Magdeburg.

About the DYNAMIC Consortium

The DYNAMIC Consortium brings together leading Dutch research institutions, including Amsterdam UMC, the Spinoza Centre, Leiden University Medical Center, University Medical Center Utrecht, as well as Radboud University and Radboud University Medical Center in Nijmegen.

The consortium's objective is to develop and operate a 14 Tesla MRI system for neuroscience research.

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