

Niron magnetics partners with Stellantis for rare-earth-free electric motor technology

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The collaboration aims to enhance motor efficiency using iron nitride magnets and boost US energy independence

Niron Magnetics has announced a collaboration with Stellantis to develop a new generation of electric motor designs that utilize magnets free of rare-earth elements. Based on Niron's iron nitride magnet technology, the initiative aims to reduce reliance on foreign supply chains that dominate the rare-earth market.



Source: Getty Images/Bosca78

This project is supported by Stellantis Ventures' strategic investment in Niron Magnetics in 2023 and has received \$2.7 million in funding from the US Energy Department's Advanced Materials and Manufacturing Technologies Office (AMMTO) to enhance American energy independence.

Niron Magnetics' iron nitride magnets, made from abundant iron and atmospheric nitrogen, offer an alternative to traditional rare-earth-based magnets predominantly sourced from mainland China. These magnets are vital in various vehicle systems, including powertrains for internal combustion engines, hybrids and electric vehicles. The collaboration seeks to improve motor architecture across all vehicle types, focusing on performance and efficiency through iron nitride magnets.

The joint project, Variable Flux Field Intensifying Motor Using Iron Nitride Permanent Magnetics, builds on Stellantis' investment and explores applications such as traction motors and automotive audio systems. The announcement also marks the groundbreaking of Niron Magnetics' first commercial-scale manufacturing facility in Sartell, Minnesota, expected to be one of North America's largest magnet production sites, producing 1,500 tons of magnets annually and creating 175 full-time jobs.

This partnership will also involve collaboration with research institutions such as Oak Ridge National Laboratory and Illinois Institute of Technology to benefit from their expertise in advanced motor systems analysis and testing.

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