

Ferrstron Powertrains demonstrates 98% efficient rare-earth-free heavy-duty motors – Demonstrator achieves TRL6

Achieves TRL6 of its core technology – Heavy-Duty Powertrains with Ferrite Magnets

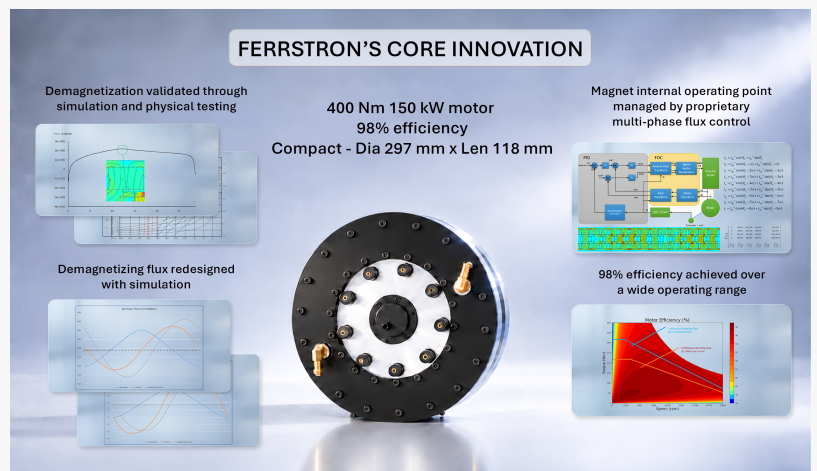
PUNE, MAHARASHTRA, INDIA, October 5, 2026 /EINPresswire.com/ -- Ferrstron is developing electric powertrain technology for electric propulsion in High-Speed Trains, Marine Vessels, Heavy-Duty Trucks and Buses, as well as Megawatt scale power generation in direct-drive Wind Turbines and Data Centre Gensets. Such heavy-duty applications demand high efficiency and ultra-compact form factor, only achieved through rare earth magnets till now.

Ferrstron Powertrains breaks that constraint. Ferrstron's motors, emerging from strong electromagnetic physics simulation, achieve 98% efficiency with high power density while using ferrite magnets that are abundantly available at low cost.

Earlier this month, Ferrstron recorded a key milestone that substantiates its simulation capability through real-world validation. Ferrstron tested a physical prototype of its 150kW, 400Nm powertrain in a 2.3-ton Multi Utility Vehicle. Driving a vehicle of this category with ferrite magnets has been an elusive target for auto companies worldwide. The on-road testing of the vehicle validates the performance of the motor in full system integration in a real-world environment.



Ferrstron Powertrains Founder & Innovator Vishal Sharma



From Simulation to Physical Prototype

[Video of On-road testing](#)

CORE FOUNDATION: PHYSICS SIMULATION

Under founder Vishal Sharma's leadership, a veteran of advanced engineering simulation who spent his career at the heart of global engineering innovation — in product development at Dassault Systèmes and MSC Software, a NASA spin-off renowned for pioneering simulation technology — Ferrstron began with a proprietary electromagnetic physics simulation technology that powers every aspect of its innovation, from dual airgap motor design to the creation of a multi-phase flux control algorithm formulation.

[Founder and Innovator Vishal Sharma](#)

INNOVATION: ACHIEVING HIGH PERFORMANCE WITH FERRITE MAGNETS

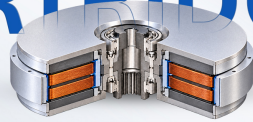
Ferrite magnets are significantly weaker in comparison to rare earth magnets, both in terms of its magnetic strength as well as in its ability to withstand demagnetization. Ferrstron's technology compensates the same through

- Creation of high overall magnetic flux
- Creation of higher armature reaction, thus requiring less flux from the magnet
- Reduction of demagnetization effect of armature reaction
- Multi-phase electromagnetic flux control to shift magnet internal operating point away from the demagnetization limit

"This unique electromagnetic balance has been achieved by a combination of innovations in multiple areas – architecture defining magnetic circuit, geometry and placement of key elements within the magnetic circuit, winding with in-coil cooling and finally a proprietary multi-phase flux control algorithm," explained Vishal Sharma, Founder and CEO of Ferrstron. "Each of these innovations are an outcome of hundreds of simulations, followed by multiple physical prototypes and advanced tests over a period of last seven years."

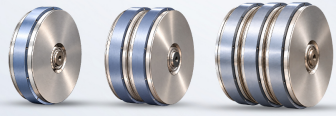
[From Simulation to Physical Prototype](#)

Ferrstron's Upcoming Stackable **CARTRIDGES**



● 400 Nm ● 1100 Nm ● 8500 Nm ● 1850 kNm

Stacking of up-to **10 Cartridges**
on same shaft



For all heavy-duty applications



Stackable Cartridges and Applications

TECHNOLOGY ROADMAP BASED ON STACKABLE CARTRIDGES

The entire range of applications that Ferrstron plans to target will be addressed through few core torque categories of stackable cartridges. The concept designs have already been validated with extensive simulation.

1. 400 Nm Cartridge

Configurations – stacking single and double cartridges for powertrains of up-to 800 Nm

Applications – passenger vehicles and light commercial vehicles

2. 1100 Nm Cartridge

Configurations – stacking up-to 5 cartridges for powertrains from 1100 Nm to 5500 Nm

Applications – Medium & heavy-duty trucks and buses, Distributed Traction High Speed Trains

3. 8500 Nm Cartridge

Configurations – stacking up-to 10 cartridges for motors and generators from 1 MW to 10 MW

Applications – Electric & Hybrid Marine Propulsion, High Speed Onshore Wind Turbines, Data Centre Gensets

4. 1850 kNm Cartridge

Configurations – stacking up-to 11 cartridges for 10 MW to 21 MW direct drive wind generators

Applications – Offshore Wind Turbines

NEXT PHASE: RAISING INVESTMENT TO ACHIEVE TRL 8

Having achieved a Technology Readiness Level 6 after the latest on-road testing with full system integration, Ferrstron is embarking on the next phase of its development program.

“Ongoing discussions with global Tier 1 and OEMs show the desire to eliminate the use of rare earth materials; we are spot on.” said Randolph Toom, Head of Global Strategic Partnerships at Ferrstron. “We are talking to investors to raise our next round of investment to achieve TRL 8 and start production.”

ABOUT FERRSTRON

Ferrstron Powertrains is a Pune based deep tech company engaged in research & development of high efficiency ultracompact rare earth free electric powertrains for heavy-duty electric propulsion and power generation. Ferrstron was founded by Vishal Sharma with Neha Jain Sharma, husband and wife, who earnestly committed last seven years in building Ferrstron core competence. The team is led by engineers based in India and Switzerland, having an experience of working with global giants like Dassault Systems, Renault, Michelin, NVIDIA, Samsung and AMD. The leadership team has been trained at institutions of global repute like IIT Kharagpur, IIT Mumbai, IIT Kanpur, Penn State University, AIT Bangkok, ESCP Paris and Rotterdam

Polytechnics.

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