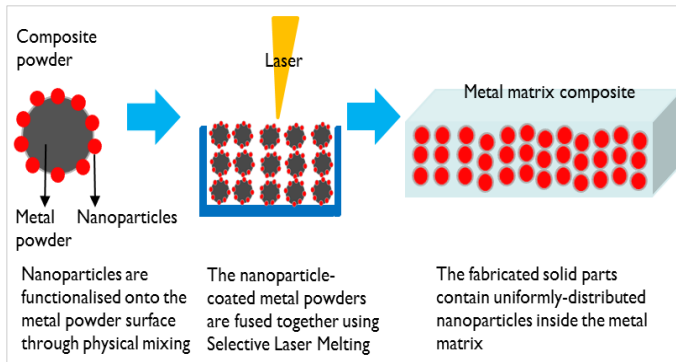
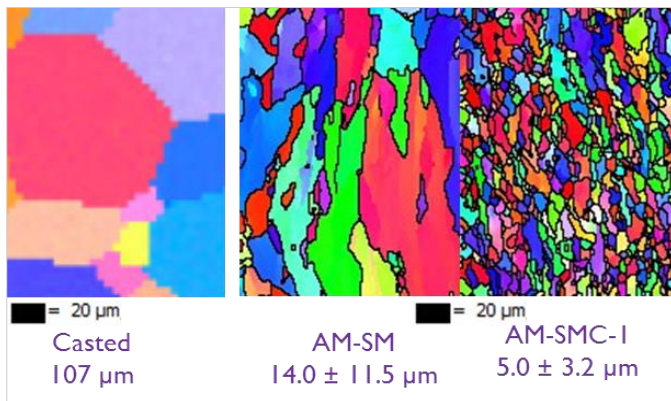


## Formulation and Fabrication Process



*Schematic diagram illustrating the methodology for making metal matrix composites using Selective Laser Melting.*

## Performance data (please turn over for more)



Microstructures of all AM-made soft magnetic materials measured by Field Emission Scanning Electron Microscopy-Electron Backscatter Diffraction (FESEM-EBSD). AM-made soft magnets (SMs) show more refined grain structure than conventional casted magnets. Nano particle-reinforced soft magnetic composites (SMC-I) show significantly refined grain sizes.

## About Additive Manufactured Soft Magnetic Materials

- Additive manufactured (AM) soft magnetic materials show improved mechanical properties and magnetic performance.
- They are one of the key material technologies for electric motor applications as they are able to perform in harsh operational environments, e.g., in hybrid electric aircraft engines where temperatures are high.

## Collaboration Opportunities

- Enhancement of the mechanical properties of existing high performing soft magnetic materials
- Further development in additive manufacturing potentially leading to new electric motor designs for transport systems (e.g., aerospace, marine, automotive)

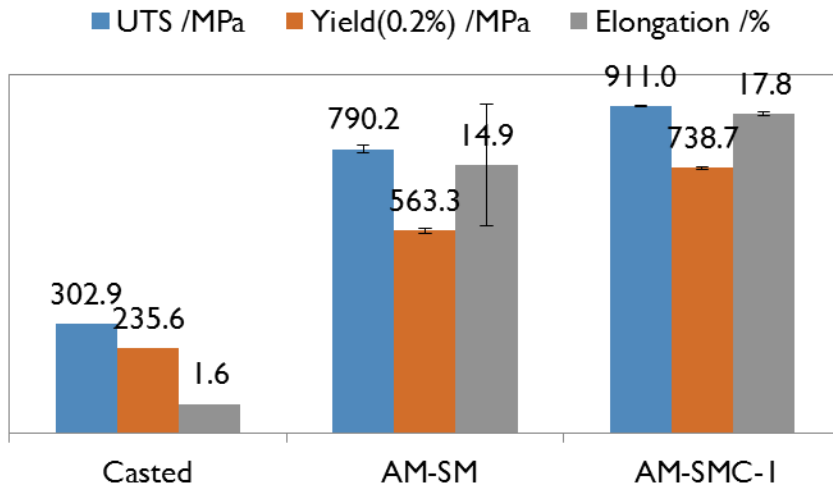


For more information, please contact :  
industry@imre.a-star.edu.sg

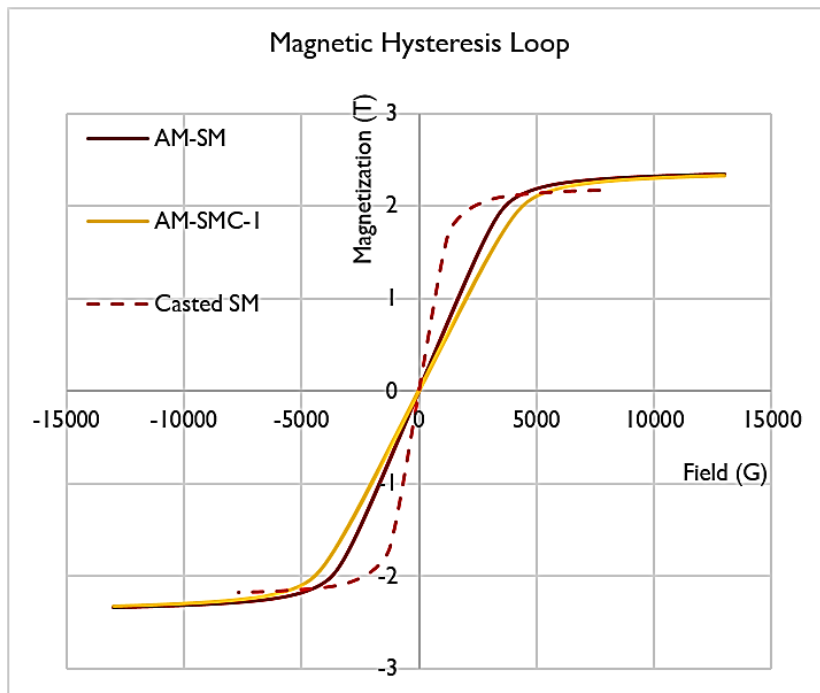


IMRE website: <https://www.a-star.edu.sg/imre/>  
A\*STAR website: <https://www.a-star.edu.sg/>

## Performance Data



Tensile properties of all AM-made soft magnets (SM) tested by MTS mechanical tester. The AM-made soft magnetic composites (SMC) show both higher tensile strength and ductility than conventional casted magnet.



Magnetic hysteresis loops of all AM-made soft magnetic materials tested by Vibrating Sample Magnetometer (VSM) at room temperature, show strong saturation magnetisations.