

Title of Technology to be offered	A process for preparation of Co-Fe based nanocrystalline ferromagnetic ribbons for high temperature soft magnetic applications
Type of Technology	Processing of nanostructured soft magnetic materials
Area of Technology	Advanced Magnetic Materials
Details of Collaborating Agency	Work carried out under DST sponsored project (GAP-0157)
Uses	The materials can be used in rotor assemblies as well as magnetic bearings of auxiliary power supplies in aircraft engines, high frequency transformers and space power systems which encounters high temperature during operation.
Salient Features	CoFeSiBNb nanostructured alloy system prepared by melt spinning in the form of ribbons, Ribbon thickness =30 -35 μ m. After nanostructured formation by suitable annealing the materials will have Curie temperature ~1000K, coercivity ~ 600 mOe.
Scale of Development	200gms-500gms
Major Raw Materials	Cobalt, Iron, Silicon, Boron and Niobium
Major Plant Equipment/Machinery	Vacuum Arc Melting system, Induction melting with melt spinning system.
Details of specification application	High frequency transformer, High temperature magnetic sensor
Status of Development	High temperature soft magnetic applications are mostly catered by CoFe-based crystalline alloys. These materials have inferior soft magnetic properties. Hence, in addition to small amount of Cobalt, the element Nb was added to restrict grain growth during amorphous to nanostructured transformation. The element Nb which stabilizes the amorphous state of the alloy demands less attention towards oxidation compared to the reported use of Zirconium.
Ecological/Environmental Impact (if any, specify briefly)	Nil
Patenting details	Patent filed : 0893/DEL/2006
Commercialisation Status	Under exploration
Techno-Economics	As the process does not involve schedules of rolling and forging, hence the preparation technique is energy efficient.
Key words	Melt spinning, ferromagnetic, Curie temperature, CoFe-based nanostructured materials