

Title of Technology to be offered	Magnetic non-destructive evaluation (NDE) device for assessment of damage in service exposed steel component
Type of Technology	Indigenous
Area of Technology	A device for Non-destructive Evaluation of Engineering Materials
Details of Collaborating Agency	Nil
Approach adopted in new technology to evade technological gap in the existing one	The microstructural degradation that takes place during service is a measure of damage accumulation in materials. Metallographic techniques are available for evaluation of microstructural degradation. However, the in-situ metallographic technique used for assessing in-service component is tedious, time consuming and most of the time can not be assessed immediately. Good laboratory and expert personnel is required for interpreting the result. The present technique involve early detection of damage by significant change in magnetic property of steel structure/component
Advantage/Benefits of new technology	The developed magnetic NDE technique is suitable to use on-site to assess the extent of damage accumulation in components after extended period of service at high temperature
Constraints in technology (if any)	Not suitable for assessing nonferrous materials/components
Brief description/abstract (150 words)	The developed magnetic NDE device works by exciting magnetic sensor using an alternating current source or signal generator followed by a power amplifier. The signal generator works within the frequency range of 5mHz to 150Hz. The magnetic sensor is to be placed on test body to get signal corresponding to the characteristics of the test objects. The output signals from the sensor are the measure of the magnetisation, coercivity and magnetic noise (Barkhausen emissions) which changes with microstructure and stress state of the materials. Hence the magnetic signals from the sensor are related to the damage state of the test object.
Major raw material	NIL
Area of application	Non-destructive evaluation of materials
Details of specific application	Process heater tubes, steel undergoing magnetic transformation during service, Residual stress in components, Sorting of ferritic steel components
Status of Development	Laboratory scale
Ecological/Environmental Impact (if any, specify briefly)	No
Patenting details	2545/del/2006
Extent of Commercialisation	Under the process of commercialisation
Demand Assessment/Market Potential (Optional)	There is a good demand of this device for non-destructive evaluation of steel structures/components. This device is not commercially produced in the country & still imported at very high cost.
Technology Transferring Agent	NML/CSIR
Technology Transfer Assistance Offered (Optional)	Details of the Equipment
Key words	Magnetic evaluation, Service exposed steel structure, Damage assessment, Non-destructive evaluation
Country of origin	India