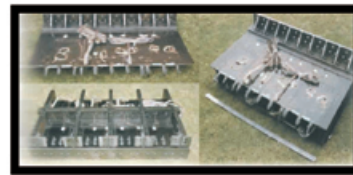


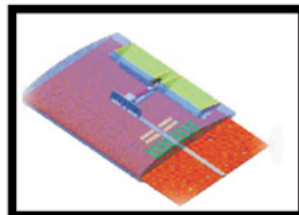


Ceramics to control, memory alloys to morph

Smart materials are extremely attractive candidates for sensors and actuators. CSIR has developed the knowledgebase and the infrastructure to fabricate shape memory alloy (SMA) products and piezo-actuators. Besides appropriate methods and technologies have been developed to integrate the sensors with the structure.



A typical aircraft composite structure with embedded fibre optic sensors



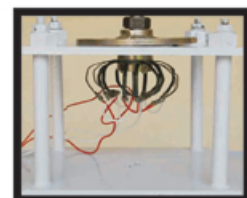
CSIR is developing active flutter and vibration control mechanisms using piezos, and shape morphing and energy absorption applications using SMA.



Smart aeroelastic wing model with an active control surface and an SMA-actuated rudder model.



SMA 'flower' for repair of polymer composites



SMA elements in cold (martensite) condition