

PLUG AND PRODUCE COMPONENTS FOR OPTIMUM DYNAMIC PERFORMANCE MANUFACTURING SYSTEMS

> PROJECT OBJECTIVE

The main objective of this project is to develop a series of portable plug-and-produce components to improve the overall productivity and process quality of production line. With this objective in mind, **DYNXPERTS project** has focused in active spindle heads and smart fixtures proposing a new generation of plug and produce adaptive components. These components are able to improve the dynamic behaviour of machine tools in several aspects and increase their productivity introducing new features in existing machines. DYNXPERTS project's technical research and development is divided in five different work packages (Fig1).

> CEDRAT TECHNOLOGIES CONTRIBUTION

In the framework of this project, one IK4 IDEKO objective was to develop a new concept of mechatronic roughing milling head including an active damping of vibrations. This head should ensure high quality milling operations suppressing dynamic problems. This active damping should be realised with an internal active inertial drive, an accelerometer and a controller.

To meet this need, CEDRAT TECHNOLOGIES has designed and built a high power controllable magnetic actuator: the so called **MICA 500L** (Fig2). This MICA is used by IK4 IDEKO as a proof mass actuator to perform the requested active inertial drive. Particular attention has been paid on features of the MICA to get high controllability, high power to mass & volume ratios, high dynamics and low heating. With 800N and 10mm stroke the MICA 500L was compact enough to be integrated into a SOLARUCE milling machine (Fig3) and to actively damp the vibrations during milling operation in the range of 10 to 100 Hz.

As shown in a [video](#), the benefits obtained by IK4 IDEKO are multiple:

- Suppression of chatter
- Much better surface roughness
- Significant reduction of noise

This MICA500L actuator is now available as a product for different **applications** and customers.

> PARTNERS

IDEKO (the project leader), **SORALUCE**, **CEDRAT TECHNOLOGIES**, **TEKNIKER**, **RWTH AACHEN**, **CNRS**, **BME**, **MATZAT**, **PLANLAUF GmbH**, **GOIALDE**, **FIDIA SPA**, **UPV/EHU**.

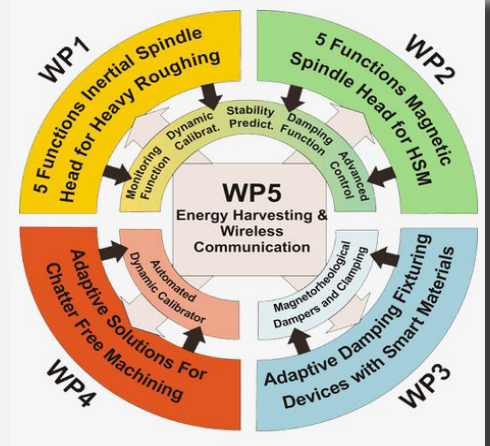


Fig1: DYNXPERTS 5 work packages

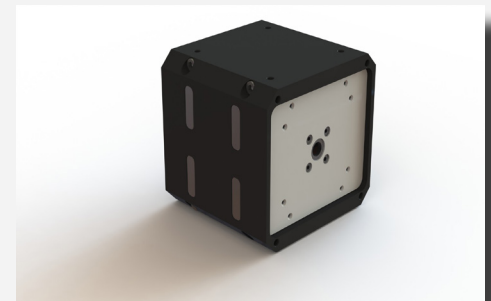


Fig2: MICA (Moving Iron Controllable Actuator) CTEC



Fig3: Active Duty Heavy Spindle / Electromagnetic inertial actuator

For more information, please contact:

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