

DYNXPERTS

New machine functionalities through the process dynamic stability control

This initiative focuses on the development of active spindle heads and smart fixturing so as to offer a new generation of adaptive plug and produce components for the factories of the future.



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Current machine tools are complex mechatronic structures full of sensors and drives where control laws are implemented. However, these measurement and action points are usually far away from the cutting zone and frequently the actuation bandwidth is not wide enough to avoid self excited vibrations and assure a proper dynamic behaviour.

The DYNXPERTS project will overcome these limitations introducing plug and produce actuators and sensors as close as possible to the machining point.

This initiative will focus in the development of active spindle heads and smart fixturing, proposing a new generation of adaptive plug and produce components. Such

components will be able to improve the dynamic behaviour of machine tools in different senses and will increase their productivity introducing new functionalities on existing production equipment.

The project consortium will pursue four innovative plug and produce devices:

- A new concept of spindle head for heavy roughing operations: The so called 5 Functions Active Inertial Spindle Head, with the capability to calibrate machine dynamics, to estimate if a process may lead to an unstable response, to efficiently damp harmful vibrations, to monitor the state of the mechanical elements of the head and to feed the acceleration of the head to the control system.

- An innovative spindle head for High Speed Machining: The 5 Functions Magnetic Active Spindle Head, featuring the aforementioned five functionalities but for high speed machining operations.
- A new component for the automatic, intelligent and optimised introduction of the stability charts and process parameters into the production lines.
- New magnetorheological fixtures based on an active damper and clamping systems.

Project coordinator Dipl. Eng. MSc Joseba Perez Bilbatua from IDEKO-IK4 Research Centre said that "the DYNXPERTS project will mobilise resources from 11 partners from 5 countries, with a strong industrial involvement in the project. This strong industrial drive will ensure that DYNXPERTS meets the requirements of end users and results exploitation, as well as increasing the competitiveness of European machine tool OEM companies."

Project Number 017

START	July 2010
DURATION	36 months
TOTAL BUDGET	€5.2million
EU SUPPORT	66%
EU GRANT ID	FP7-NMP 260073
COORDINATOR	Joseba Perez Bilbatua (IDEKO IK-4)

www.dynxperts.eu