On-line Control of Drawing and Blanking Processes and of Quality of the Product by Fusion of Sensors and Artificial Vision Techniques

Fact Sheet

Project Information

PRO2CONTROL
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Objective

Forming processes and, in particular, sheet metal punching and deep drawing are inherently quite unstable manufacturing processes. On one hand, a slight change in the production parameters or in the material quality are usually enough to get the process out of its stability condition and to produce bad parts. On the other hand, when a tooling breakage or excessive wear occurs, the resulting parts are also bad. This situation is specially difficult to detect when producing small size parts, often manufactured in large quantities using high speed and production rate equipment. As a result, production of bad parts goes on until a statistical control is able to detect this and to stop the machine. The main objective of this project is to develop a complete control system to be fitted on the ensemble press - tooling in order to assure a zero-defect in forming industries consecrated to the manufacturing of small size
The aim is to get a complete diagnosis and control over the quality of the production and of the state of the production goods. As a result, the control system has to be able to integrate the capabilities of state-of-the-art control systems for forming processes and to fulfil the new objective of complete control of the quality of the part. Two complementary methods are considered: use of Acoustic Emission (AE) and load measurement technologies, which includes a sensor set mounted on the press and the tooling, the electronic needed for the conditioning and a monitoring system installed on a PC, and Artificial Vision (AV) system, which is composed by a set of cameras and a flexible image processing system for the detection of defects in real time. The information of both systems is analysed by a software based control system, installed on the same PC, which has to decide the changes in the press state, the tooling condition or the process parameters needed to avoid the occurrence of defects.
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