INTEGRATED APPROACH OF THE DIMENSIONAL CONTROL IN TURNING PROCESSES

Ionut Clementin Constantin, Alexandru Epureanu, Mihaela Banu, Vasile Marinescu & Florin Bogdan Marin

"Dunarea de Jos" University of Galati, Department of Manufacturing Science and Engineering

Corresponding author Ionut Clementin Constantin, ionut.constantin@ugal.ro

Abstract: Reducing the machining errors is necessary in the actual global context that requires the production of more precise mechanical products while maintaining low cost. The classical approach consists in using more precise tools and machines and dividing the allowance in order to perform roughing and finishing operations. This approach brings the price to a higher level, thus affecting the competitiveness.
In this paper an integrated dimensional control method is proposed. This method is based on integrated measuring equipment for on-machine inspection of manufactured part and a sensor fusion system. The measuring equipment is used for inspecting the initial surface (in order to asses the machining allowance), the final surface (in order to asses machining errors) and the reference surface (in order to asses fixturing errors). Using the obtained data, a mathematical model is built. Further, the model is used for prediction and compensation of the manufacturing and fixturing errors
Key words: small batch manufacturing, process error, error compensation, predictive control, dimensional control