

Coating Unit

Further development of a cleaning and coating unit for the environmentally friendly processing of semi-finished products and determination of its suitability for practical use in zinc phosphate-free cold forging

Editor Patrick Volke M. Sc.
Duration September 2016 – August 2019
Department Tribology
Funded by DBU

Abstract

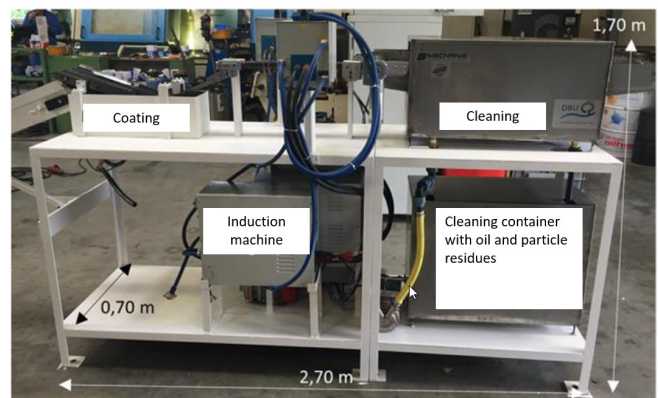
The zinc phosphate-based lubricant system used in cold forging has ecological and economic disadvantages when applied. Substituting these lubricant systems with in-line lubricants enables a more environmentally friendly process chain. In a previous project, a prototype of an inline-capable coating system has been developed which demonstrates its suitability in principle for coating with single-layer lubricants. The aim of the project is to further develop the prototype system to increase its flexibility and suitability for practical use in an industrial environment.

Project description

In order to expand the range of possible components, the transport, heating and drying units of the existing plant are being redesigned. For the optimization of the coating unit, coating tests with conversion coating-free lubricants are carried out in the laboratory. The achievable coating homogeneity will be evaluated by varying the surface topography and the type of coating application. Tribometer tests are used for further characterization of the coatings. Finally, the plant components are manufactured and assembled, and the plant is commissioned and used in an industrial environment.

Results

The newly developed system can be seen in Figure 1. Coating can take place in the press cycle, while the parts are fed to the press fully automatically. The elimination of the zinc phosphate carrier layer makes it possible to design the plant so compactly during coating that it can be integrated into the feed of a forming plant. This eliminates the need for transport journeys between different plants and the disposal of hazardous waste, and reduces the space required for intermediate storage of material.



[1] New coating stand with cleaning and heating unit [Source: LS Mechanik]

Acknowledgement

The PtU would like to thank the Deutsche Bundesstiftung Umwelt (DBU) for funding this research project under file number 30738-02. Furthermore, we would like to thank the industrial partners LS Mechanik GmbH and Schondelmaier GmbH Presswerk, who supported the research project

Funded by

