

INFORMATION MODELING AND REPRESENTATION OF SHEET METAL PARTS WITH HIGHER ORDER BIFURCATIONS

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Abstract

Information models can make a large contribution to the process integration, not only the product development process, but throughout the entire life cycle of a product [1]. The new technique of linear flow splitting developed at the Technische Universität Darmstadt, Germany, makes it possible to produce integral sheet metal parts with higher order bifurcations. A new approach for integration in product development and process planning based on an information model is being developed in Collaborative Research Centre (CRC) 666 in Germany [2].

In this paper, we present an information model for modeling and representing design and manufacturing information of integral sheet metal parts with higher order bifurcations. Due to the bifurcated structure, principle solutions of integral sheet metal parts optimized by mathematical algorithms can be mapped in solution trees. Based on the solution tree, linking between conceptual design, detail design and process planning can be defined. Specific views of these phases are explicitly modeled in partial models. Consistency of the partial models and the linking to the boundary representation is made by an integration model. The information model is formalized in Unified Modeling Language (UML). A prototype system based on this information model demonstrates its application in integrated product development and process planning in integral sheet metal design.

References

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