

## **Abstract of the doctoral dissertation**

# **Systematic for the development of mechatronic systems in the Technology MID (Molded Interconnect Devices)**

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Mechatronic assemblies in the MID technology are spatial plastic parts whose surface is selectively metallized. Thus, traces, antennas and sensors appear directly on a spatial circuit carrier. The advantages of the MID technology are a high design freedom, higher functionality, lower number of parts and reduced manufacturing costs. The potential benefits of the MID technology is obvious, yet it could not enforce sustainable. The main barriers are the complexity of the MID-parts and interactions between the product and manufacturing. This leads to the need for the systematical support of the development of MID parts.

The *systematic for the development of mechatronic systems in the MID technology* consists of three core elements:

- A Generic Process Model structures the development process of an MID part in phases and milestones. For each phase the necessary input documents and results are defined as well as development methods and specification techniques recommended.
- Specific Process Models are specifically shaped for certain MID procedures. The development activities are described in detail and interactions between product and production system identified. In this dissertation, the interaction of the MID process *laser direct structuring LDS* are further investigated. In addition, guidelines are recommended.
- The systematic and the information contained in this dissertation is stored in a knowledge base. As part of this dissertation, the knowledge base is conceptually developed.

The evaluation is based on a miniature robot, a research project of the Heinz Nixdorf Institute of the University of Paderborn. Its MID-housing integrates over 100 electronic components and is the most complex MID part worldwide.