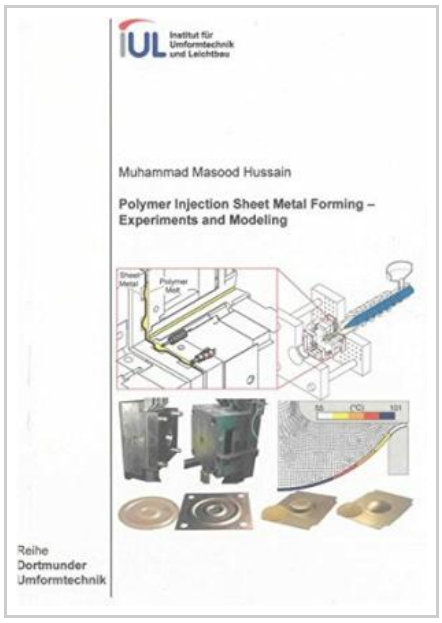


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Polymer Injection Sheet Metal Forming - Experiments and Modeling

By Muhammad Masood Hussain

Shaker Verlag Jul 2013, 2013. Buch. Book Condition: Neu. Neuware - Polymer Injection Forming (PIF) is a new production technique to manufacture plastic-metal hybrid components. The most distinctive advantage of the PIF-process is that the injected polymer melt can be simultaneously used as a pressure medium to form the sheet metal blank. Contrary to the conventional hydroforming process, the pressure and temperature in PIFprocess are non-uniformly distributed. To predict the forming behavior in PIF, it is essential to have knowledge of the local pressure and local temperature. So far, the main weakness of the previous studies is the failure to address the impact of local pressure and temperature on the forming process. The inherent complexities of the forming problem in PIF-process demand an in-depth analysis through experiments, analytical, and simulation means. In this work, experiments are conducted to realize three different forming processes namely free forming, cup forming and concentric ring forming process. Different alloys of aluminium and steel with molten thermoplastic Polypropylene as an injected medium are used as processing materials. For experiments, a special injection mold has been developed and integrated with the necessary instrumentation for the real-time observation of the process variables. The most significant contribution of...

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