



## HYBRID MULTI-COMPONENT INJECTION MOULDING FOR ELECTRO- AND ELECTRONIC APPLICATIONS

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Nowadays various technologies are capable to produce hybrid plastics/metal-hybrids. However, they all share disadvantages due to several manufacturing steps and limitations in the achievable complexity of the part geometry. An innovative approach to produce plastics/metal-hybrids is to combine the injection moulding of plastics and the die casting of metals to a new hybrid multi-component process.

The new technology, the “hybrid multi-component injection moulding” is based on a standard injection moulding machine that is equipped with an additional, newly developed metal injection unit which allows the pressure die casting of low melting metal alloys. The materials plastic and metal are combined in a specially designed multi-component injection mould. In a first step the plastic preform is moulded. The surface of this preform features a fine groove that defines the path in which the low melting metal alloy is injected in a subsequent step. The injection of the liquid tin-zinc metal alloy on the heat sensitive thermoplastic component is possible due to the low melting point of the metal alloy of 200 °C.

Combining the primary forming techniques plastic parts with integrated electrically conductive tracks can be produced using just one machine and one injection mould. In this context the achievable bonding strength between the thermoplastic and the metal component, the flow behaviour of the metal alloy, the electrical conductivity and the ampacity are verified to qualify the new process for the production of parts used in high power electronic devices. The ampacity defines the maximum amount of current a conductive track can carry before sustaining immediate or progressive deterioration. Furthermore the new process enables the simple integration and contacting of electrical connectors as plugs or electrical functional elements such as batteries, ICs and LEDs into the mould. Hence, the production of multifunctional parts for electric and electronic applications in high volumes becomes possible.