

DESIGN AND MANUFACTURING OF FORGING AND DIES

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Abstract: *Manufacturing of dies/moulds and parts corresponds to a long process compared to a mechanical part obtained by chip removing machining. This manufacturing process is characterized by three design functions: design of finished part, design of stamped-part and definition of dies, and two manufacturing functions: dies machining and production (large batch) of forgings. Dies machining holds an important place in the manufacturing process of rough parts because it shows design validation and determines parts production. It is based on the manufacturing preparation which is an essential function. When realizing this function, the information required for the machining stage are generated in relation with data defined in the design stage. In this paper we propose a complex features-based model for the representation and the definition of dies which allows conceptualising all the data related to the semantic, structural and topological aspects. According to the semantic and structural point of view, we adopted a functional and hierarchical decomposition of the shape of the die represented which integrates the feature concept. Relations between elements of the model and blend primitives are defined in order to facilitate the topological comprehension and exploitation of the design results. In addition, we propose an original method to automatically generate the machining process of dies (or electrodes). This method is based on “machining state” concept and the association of machining knowledge to the sets of complex features. The machining knowledge are specified according to the know-how of mould makers. Finally, machining knowledge is associated to the complex features in order to generate machining process.*

Key words: *Complex feature, data structure, die model, process planning.*