

C615971. : MAJOR MECHANICAL ENGINEERING

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SOMBOON ANANTATHANASARN : CONCURRENT ENGINEERING IN PLASTIC INJECTION MOLD DESIGNS. THESIS ADVISOR : ASSO. PROF. VIBOON SANGVERAPHUNSIRI, Ph.D. 110 pp. ISBN 974-636-723-4.

The combined use of the program CAD/CAM/CAE in plastic injection mold designs is studied in this thesis. The purpose is to illustrate the concept of concurrent engineering. It means that each or some steps in the mold design and mold building process or product design can work simultaneously.

The product design steps involve the use of CAD (CATIA) in both the forward and the reverse engineering. For the forward engineering, the 3-D surface models for motorcycle gear shift were created and actually built. In the reverse engineering method, the pre-processor program are developed, so that the digitized coordinate data points from the CMM machine can be used for constructing 3-D surface models in CATIA. The program was tested with a shell of the automobile side mirror.

This study also shows the method of using CAM to generate the tool paths for CNC machine in the mold design and building steps. The tool paths consist of the information of core and cavity of the model in APT language. The post-processor program is developed for translating tool paths in APT language to G-code and M-code. These codes used mostly in the CNC machine controller. The method of variation geometry is used for creating some basic mold base parts for helping the designer to design the complete plastic injection molds.

The thermoplastic material flow analysis software call Moldflow is used for analysing the flow behavior in the cavity, runner and sprue. The CAD models (from CATIA) can be transformed to the Moldflow by using neutral file format.

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