RAPID PROTOTYPING IN CAD

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Abstract

CAD/CAM delivers the complete solution for the entire product development cycle from early design stage to production planning. Rapid Prototyping Solutions offers instantaneous realization of the product design for verification and therefore enhances the product quality and bridges the communication between designer and manufacturer. CAD Customization tailors the platform of custom product design to ensure the design consistency and shorter design time.

CAM Customization optimizes the machining parameters ensuring the efficient and quality of the manufacturing processes.

Computer Aided Process Planning wellorganize the entire product development cycle by gathering every single information of the product design and manufacturing processes enabling accuracy capacity estimation and therefore optimize the production schedule for on-time delivery.

In the design and manufacturing industry today, there is much greater awareness than ever before for the need of design automation. This has occurred as a result of 3D CAD/CAM technology being widely used, and creates tremendous opportunities for application software developers to enter this market.

WHY IS RAPID PROTOTYPING?

• Objects can be formed with any geometric complexity or intricacy without the need for elaborate machine setup or final assembly.

• Objects can be made from multiple materials, or as composites, or materials

can even be varied in a controlled fashion at any location in an object.

• Additive fabrication systems reduce the construction of complex objects to a manageable, straightforward, and relatively fast process.

METHODOLOGY OF RAPID PROTOTYPING:-

The basic methodology for all rapid prototyping techniques can be summarized as follows:

1. A CAD model is constructed, and then converted to STL format. The resolution can be set to minimize stair stepping.

2. The RP machine processes the STL file by creating sliced layers of the model.

3. The first layer of the physical model is created. The model is then lowered by the thickness of next layer, and the process is then repeated until completion of the model.

4. The model and any supports are removed. The surface of the model is then finished and cleaned.

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ADVANTAGES OF RP:-

The advantages of the RP are as follows:-

1. RP reduces the time required for manufacturing of jig & fixture.

2. It also consumes less time for building prototype (up to one fifth of conventional machining).

3. Cost required is also less

4. Complex geometrical shapes can be manufactured easily.

5. Customize product can be manufactured.

6. They are very useful for prototyping parts that will be CNC milled, for building plastic parts that are un-machinable, and for creating plastic or wax part patterns to be investment cast in metal.

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