



Computer Integrated Manufacturing (CIM)

Computer Integrated Manufacturing, known as CIM, is the phrase used to describe the complete automation of a manufacturing plant, with all processes functioning under computer control and digital information tying them together. It was promoted by machine tool manufacturers in the 1980s and the Society for Manufacturing Engineers (CASA/SME). Quite often it was mistaken for the concept of a 'lights out' factory. It includes CAD/CAM (Computer Aided Design/Computer Aided Manufacturing), CAPP (Computer Aided Process Planning), CNC (Computer Numerical Control) machine tools, DNC (Direct Numerical Control) machine tools, FMS (Flexible Machining Systems), ASRS (Automated Storage and Retrieval Systems), AGV (Automated Guided Vehicles), use of robotics and automated conveyance, computerized scheduling and production control, and a business system integrated by a common data base.

The heart of CIM is CAD/CAM. CAD and CAM systems are essential to reducing cycle times in the organization. CAD/CAM is a high technology integrating tool between design and manufacturing. CAD techniques make use of group technology to create similar geometries for quick retrieval. Electronic files replace

drawing rooms. CAD/CAM integrated systems

provide design/drafting, planning and scheduling, and fabrication capabilities. CAD provides

the electronic part images, and CAM provides the facility for toolpath cutters to take on the

raw piece. The computer graphics that CAD provides allows designers to create electronic images which can be portrayed in two dimensions,

or as a three dimensional solid component or assembly which can be rotated as it is viewed. Advanced software programs can analyze

and test designs before a prototype is made. Finite element analysis programs allow engineers to predict stress points on a part, and the effects of loading.

Once a part has been designed, the graphics can be used to program the tool path to machine the part. When integrated with an NC postprocessor, the NC program that can be used in a CNC machine is produced. The design graphics can also be used to design tools and fixtures, and for inspections by coordinate measuring machines. The more downstream use that is made of CAD, the more time that is saved in the overall process.

(Adapted from www.rockfordconsulting.com)



ACTIVITIES

1 Answer the following questions.

- 1 What is CIM?
- 2 When did CIM develop?
- 3 What is CIM based on?

2 Match a word in the first column with a word in the second column.

- | | |
|-----------------|------------|
| 1 Manufacturing | A Files |
| 2 Numerical | B Points |
| 3 Machine | C Graphics |
| 4 Cycle | D Tool |
| 5 Electronic | E Times |
| 6 Stress | F Plant |
| 7 Design | G Control |