



Cycletime Tips - General

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Scientific molding is taking the plastics point of view to forming identical parts consistently with overall profitability always in mind. A scientific approach is taken to establish all molding variables, and many traditional opinions are held invalid unless substantiated with data. We start by understanding the four critical components of any successful plastics application:

Piece Part Design Material Selection and Handling Tool Design and Construction Processing

Each is equally important! Each must be done correctly. At the heart of Scientific Molding is the scientific ability to detect in which area problems lie, and document the problems with data not personal opinions. From the beginning of any new project, each component is represented and the hard compromises made early. This keeps the program on track and on time with fewer revisions in the prototype or production stages. In each area decisions are made that affect the other three; often a compromise must be made. Industry history shows that today if compromises are made in part or tool design, or the choice of plastic, often it is the molder that lives with the problem and has to compensate for it. Scientific molding holds each component accountable true concurrent engineering. No one person is expert in all areas. All designs and decisions are professionally reviewed in the early stages of a project. This lends itself to solving problems if they occur later instead of finding fault.

For processing, we emphasize the concept that a molder's profit hinges on the proper use of time. From inventory, to part quoting, to running jobs at or below quoted cycle time, no exceptions. All cavities running all the time. The time basis for comparison to others is 24 hours a day 365 days a year. Time is the common denominator for all molders foreign and domestic; we must be internationally competitive. Molders see the major trends in the industry of: thin walls, complex parts and multi-cavity molds narrowing their processing window. Therefore, process control and monitoring become critical. Through proper process monitoring you have an ultra-sound picture of the process and gain control. Universal set-up sheets are possible and can be scientifically developed for each mold. These set up sheets work on any properly functioning injection molding machine. These sheets are short and easy to write-up or print out from the process monitoring equipment and spreadsheets. Scientific molding is based on the following four key processing variables that can each be scientifically established:

Plastic Temperature Plastic Flow Rate Plastic Pressure Cooling Rate and Time

A basic premise to this strategy is that the machine adapts to changes in viscosity (on the current shot, not the next shot, and not by the operator). This forces equipment purchases to be based on world class (not necessarily expensive or closed-loop) standards that allows the processor to play in the international ballpark.

Scientific molding is not a theory waiting to be tried. Several molders making better returns than their competitors have already proven this molding strategy. *Plastics World* wrote about it in 1992 where a 50 percent gain in productivity with higher “quality” was documented. Now *Injection Molding Magazine* reports more details in their October, November and December 1997 issues.