

Plastic Injection Molding: Design & Manufacture of Plastic Parts

14 hours **ZOOM & PHYSICAL** Program

 **HYBRID TRAINING**

21 & 22 May 2025 (Wed & Thu)



Remote Online Training(Zoom) &

**Dorsett Grand Subang Hotel,
Selangor (Physical)**

**** Choose either Zoom OR Physical Session**

INTRODUCTION:

Plastic parts are found in countless big and small products today, from computers, household goods, control and instrumentation equipment, road vehicles, sporting goods to biomedical instruments, just to name a few. The quality and finishing of the plastic products depend on the choice of plastic material, product design, mould design and moulding process.

This is a course of continuing education specifically designed for people who are designing and manufacturing plastic parts.

INTENDED AUDIENCE:

1. This course is recommended for :
2. Design Manager's, Engineers
3. Quality Manager's, Engineers
4. Process Manager's, Engineers
5. Manufacturing Manager's, Engineer's
6. Purchasing Manager's, Engineer's
7. SQE Manager's, Engineer's
8. Engineering Manager's, Engineer's

COURSE OBJECTIVES:

1. Plastic material selection
2. Plastic material characteristics
3. Plastic material applications
4. Plastic material limitations
5. DFM for plastic parts
6. Measurements in plastics
7. How to process the various types of plastic resins

METHODOLOGY:

1. The course instructor will draw on his extensive experience in plastic injection molding to illustrate the subject matter with practical examples.
2. Attendees are encouraged to bring along samples of moulding defects for diagnosis and discussion.
3. Interactive and action based with personal examples.
4. Combination of short lectures, video presentations, workshops, demonstrations, simulations and games.
5. More emphasis is placed on workshops to allow the participants to learn the material presented in a fun and easy manner

COURSE CONTENT

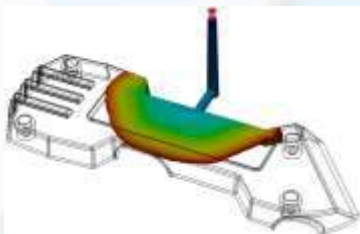
1. Introduction to plastic injection molding

2. Overview of plastic materials

- i. Molecular structure
- ii. Group of plastics
- iii. Volume versus temperature behavior
- iv. Semi-crystalline materials
- v. Amorphous materials
- vi. Viscosity
- vii. PVT diagram
- viii. Fountain and skin effect
- ix. Molecular orientation and relaxation
- x. Additives
- xi. Shrinkage & warpage of injection molded parts
 - Part wall thickness variation
 - Cooling & solidification
- xii. Material selection process
- xiii. Material characteristics
- xiv. Material applications
- xv. Material limitations
- xvi. Activity : Material selection process

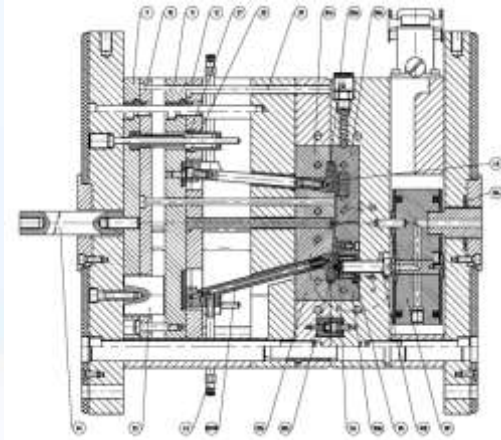
3. DFM for plastic parts

- i. Wall thickness
- ii. Corner design
- iii. Rib design
- iv. Boss design
- v. Gusset
- vi. Parting line considerations
- vii. Part ejection
 - Draft angle
 - Undercut & holes
 - Esthetic considerations
- viii. Mold filling considerations
 - Gating
 - Mold filling orientation
 - Mold filling pressure losses
 - Flow leaders and flow restrictors
- ix. Weld lines
 - Types of weld lines
 - Material considerations
 - Improving weld performance and appearance
- x. Design for manufacturing & assembly
- xi. Self tapping screw
- xii. Design for mistake proofing



4. Molding & secondary processes

- i. Molding Process cycle
- ii. Tampo printing
- iii. US welding
- iv. Laser printing
- v. Heat staking
- vi. Adhesive
- vii. Washing
- viii. Spray painting
- ix. What design detailing required for processes above?



5. Injection mould

- i. Types of mould
- ii. Two & three plate mould
- iii. Sprue and runner
- iv. Types of gates
- v. Gating and molding defects
- vi. Venting
- vii. Cam actions
- viii. Ejection

6. Measurement of plastic

- i. Dimensions
 - Contact measurement system
 - Non-contact measurement systems
- ii. Strength measurements
- iii. Melt flow properties
- iv. Flammability
- v. Fatigue
- vi. Thermal properties