

Date : 7 & 8 oct 2024 (Mon & Tue)  
Venue : Wyndham Grand Bangsar  
Kuala Lumpur Hotel



# PLASTIC INJECTION MOLDING DEFECTS PREVENTION & ROOT CAUSE ANALYSIS

2 Days Program



## OBJECTIVES:

- 1) How to prevent defects from occurring in the first place?
- 2) Eighty % of plastic parts problems originate from poor design.
- 3) Gap analysis between DFM (Design for Manufacturing best practices) and your actual problems
- 4) Root cause analysis
- 5) Troubleshooting injection moulding defects in a systematic manner
- 6) Implementing sustainable measures in place to prevent defects recurrence
- 7) Scientific explanations on why these problems occur.

## INTENDED AUDIENCE:

This course is recommended for those who wish to improve their preventive & problem solving skills in plastic injection moulding design and process. It is also highly beneficial to companies aiming to improve productivity and optimise their injection moulding design and process methodology. A variety of people will benefit from this course. They include:

1. Managers
2. Designers
3. Engineers
4. Executives
5. Supervisors
6. Technicians
7. Any technical personnel involved with plastic injection moulded parts

## INTRODUCTION:

Specifically designed for the practicing designer and molder.

This workshop focuses on prevention methods for defects and developing systematic root cause analysis skills. For solving molded-part defects and improving part quality problems.

## METHODOLOGY:

- 1) Interactive and action based with personal examples.
- 2) Combination of short lectures, visual presentations, workshops, demonstrations, simulations, and games.
- 3) More emphasis is placed on workshops to allow the participants to learn the material presented in a fun and easy manner.

## PREREQUISITE :

- 1) Participants must already have the basics of injection moulding technology.
- 2) Customer to provide ahead 5 top common issues that they have and the specific parts so that the trainer can use these as case studies during the training for optimum training effectiveness.

## COURSE CONTENT

### 1. Plastic drying

- i. Degradation
- ii. Drying time
- iii. Drying temperature
- iv. Types of dryers
- v. Moisture measurement
- vi. Overdrying effect

### 2. Process optimization & scientific molding

- i. Optimization of injection phase
- ii. Cavity balance
- iii. Pressure drop
- iv. Process window
- v. Gate seal time
- vi. Cooling time
- vii. Screw speed & back pressure

### 3. Surface Defects

- i. Flow lines and jetting
- ii. Splay (moisture or trapped air)
- iii. Haze, blush, and poor gloss
- iv. Mold mark
- v. Gate blush and gate splay
- vi. Ink smearing
- vii. Incomplete molding
- viii. Race tracking
- ix. Jetting
- x. Moldflow simulation errors

### 4. Burning and Contamination Problems

- i. Burn marks and black specks
- ii. Burn streaks
- iii. Contamination
- iv. Discoloration or poor color match

### 5. Physical Problems

- i. Flash
- ii. Short shots
- iii. Sink marks
- iv. Vacuum voids and bubbles
- v. Burrs
- vi. Bulging
- vii. Overweight
- viii. Ejector marks

### 6. Geometry Maintenance Problems

- i. Under- or over-sized dimensions
- ii. Poor dimensional repeatability (poor Cpk)
- iii. Warpage and bowing

### 7. Structural Defects

- i. Cracking, crazing, and brittleness
- ii. Weld lines
- iii. Stuck parts and pin push marks
- iv. Long gates and plugged gates
- v. Drag marks and mold damage
- vi. Break during assembly
- vii. Break after usage

### 8. Troubleshooting Procedures and Logic

- i. How to effectively approach, analyze, and implement troubleshooting procedures.

### 9. Exploring Root Causes

- i. Explore the root causes of the various defects from the perspective of the plastic material as it fills, compresses, and cools within the cavity.

### 10. Part Defectives and Potential Solutions

- i. How to avoid potential design-related problems?
- ii. How to optimize the part quality with process-related solutions?

### 11. Troubleshooting Guides (The Good, The Bad, The Efficient)

- i. A comparison of the different troubleshooting guide formats, including which tend to be most effective for solving molded part problems.

### 12. Evaluating Attendees' Molded Part Samples

- i. Defective part samples brought in by the participants will be discussed in a group format.
- ii. An understanding by the participants of the processing conditions or a current process set-up sheet will greatly facilitate this discussion.