OUTSOURCING
TRAINING & CONSULTING
OTC Training Centre Sdn Bhd

HRD awards 2022
TRAINING PROVIDER

HYBRID TRAINING

12 & 13 Mar 2025 (Wed & Thu)

Remote Online Training (Zoom) &
Dorsett Grand Subang Hotel, Selangor (Physical)

** Choose either Zoom OR Physical Session

Plastic Material Properties & Selection Process

14 hours ZOOM & PHYSICAL Program

COURSE OBJECTIVES:

1. Polymer properties
2. Polymer additives & modifiers
3. Material selection process
4. Common polymers & their physical, thermal & chemical properties
5. Plastic injection molding do's & dont's
6. Common polymer issues faced at your workplace and a systematic way to resolve them

METHODOLOGY:

1. This course is conducted online.
2. Interactive and action based with personal examples.
3. Combination of short lectures, visual presentations, workshops, demonstrations, simulations and games. More emphasis is placed on workshops to allow the participants to learn the material presented in a fun and easy manner.
4. Participants are expected to bring along their real life issues for discussion

INTRODUCTION:

Plastic parts range from simple devices to complicated test equipment and implants. Plastics in engineering are used more and more for weight, cost, and performance purposes. This workshop will discuss plastics used in the injection molding process for medical, automotive and audio industries. The first section will review the general composition of plastic materials which will include the materials added to the basic polymers. The second section will discuss many factors that contribute to the plastic selection. The final section will review the chemistry and the application of most common plastic materials.

INTENDED AUDIENCE:

Specifically designed for participants who want to improve their knowledge in polymer technology. A variety of people will benefit from this course include:

1. Product designers
2. Mould designers
3. Quality engineers
4. SQE engineers
5. Moulding engineers
6. Process engineers
7. Project engineers
8. Manufacturing engineers
9. Purchasers
10. Material planners
11. Any personnel who wants to know more about plastic materials

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COURSE CONTENT

1) Introduction to polymers (thermoplastic and thermosets)

i. Linear, Branched, Cross-linked Polymers
ii. Isomers
iii. Molecular Weight

2) Additives

i. Fillers
ii. Impact Modifiers and Tougheners
iii. Radiation Stabilizers
iv. Pigments, Extenders, Dyes, Mica
v. Thermal Stabilizers & Antistats
vi. BaSo4

3) Material selection process

i. Physical and Mechanical Properties
   a. Fatigue
   b. Wear resistance
   c. COF (Coefficient of friction)
   d. Shrinkage
   e. Moisture absorption
   f. Strength
   g. UV resistance
ii. Flammability
iii. Thermal Properties
   a. CUT temperature
   b. ARO temperature
iv. Electrical Properties
v. Chemical Resistance
vi. Sterilization Capability
vii. Long-Term Durability
viii. Leachables and Extractables
ix. Shelf Life and Aging
x. Joining and Welding
xi. Medical Grade Plastics
xii. Food grade Plastics

4) Common polymers & their physical, thermal & chemical properties

i. The 4 documents that we must have from every polymer raw material supplier
   a. Material properties data sheet
   b. Material processing data sheet
   c. Material design guidelines
   d. MSDS
ii. Semi-crystalline resin
   a. PP
   b. PE
   c. POM
   d. PBT
   e. PPS
   f. PEEK
   g. PFA, PVDF
   h. PA
iii. Amorphous resin
   a. PS
   b. PMMA
   c. PC
   d. PVC
   e. ABS
   f. PPE
   g. PSU, PES
iv. Polyurethane (PUR)
v. Fluorinated Ethylene-Propylene (FEP).
vi. Methacrylate Acrylonitrile Butadiene Styrene (MABS)
vii. Measurements of the resin
   a. melt flow index
   b. density
   c. molecular weight distribution
   d. melting point, softening point
viii. Measurements of the converted articles
   a. dimensional stability
   b. shrinkage
   c. warpage
   d. stressed-crack
   e. surface tackiness
ix. How to measure and quantify shrinkage and warpage?
x. Common injection molding problems and troubleshooting