

Compression Molding Body of Knowledge

Module 1: Overview of Composites (10%)
<ol style="list-style-type: none"> 1. Define composites 2. Understand what set composites apart from other materials
Module 2: Materials (2%)
<ol style="list-style-type: none"> 1. Organic vs inorganic materials 2. Material structures 3. Monomers and polymers 4. Properties
Module 3: Composite Materials (5%)
<ol style="list-style-type: none"> 1. Function of composite materials 2. Polymers-thermoplastic and thermoset
Module 4: Composites Manufacturing Processes (5%)
<ol style="list-style-type: none"> 1. Manufacturing process selection 2. Composites manufacturing processes 3. Thermoset vs thermoplastic processing
Module 5: Compression Molding Plant Safety (10%)
<ol style="list-style-type: none"> 1. Understanding and staying safe in handling the chemicals found in the compression molding plant 2. Fire safety 3. PPE 4. Compression molding press safety 5. High temperature and pressure safety
Module 6: Compression Molding Materials (15%)
<ol style="list-style-type: none"> 1. Formulations 2. Advantages and disadvantages of liquid composite molding (LCM) 3. Bulk molding compound (BMC) 4. Sheet molding compound (SMC) 5. Pre-preg and Glass mat thermoplastic (GMT)
Module 7: Compound Processes and Equipment (10%)
<ol style="list-style-type: none"> 1. Understand the various processes and equipment for producing the compounds utilized in compression molding- liquid composite; BMC; SMC 2. Understanding the preforming process; utilization of pattern cutting and placement of reinforcement 3. Knowledge of the molding process, and the use of in-mold coatings 4. Understand the Glass Mat Thermoplastic molding process 5. Saturated vs Unsaturated materials and process options
Module 8: Compression Molding Processing (25%)
<ol style="list-style-type: none"> 1. Compression press types and design 2. Compression press - controls, speeds

3. Compression tooling - materials, key design factors, heating
4. Compression molding conditions
5. General understanding of hydraulic pressure
6. New process variations, materials and hybrid methods

Module 9: Process Quality Control and Troubleshooting (10%)

1. Raw material quality control checks, in process material quality checks
2. Quality control on the shop floor, troubleshooting methodology
3. Defect identification and cause and effect corrective actions.