

# IPI welcomes you to Corporate Learning Programme (CLP)

Indian Plastics Institute (IPI) proud to announce the introduction of our new **Corporate Learning Programme (CLP) PLASTICS FOR NON PLASTIC PEOPLE**. This is aimed for people dealing with plastic raw materials and products in the plastic industry but not familiar with the science of plastics. The aim of IPI is to familiarise these non-plastic people the basics of plastic material, its properties and end products performance.

## This programme has following modules:

- Introduction of Polymers.
  - What are Plastics?
  - How Plastics are produced
  - Basic Properties of Polymers & Plastics
- Fundamentals of Polymer Processing & Processing Methods.
- Role of Additives.
- Basic Testing of Plastics :  
Key Mechanical Properties (MFR, Tensile etc.)
- Polymer Products & Applications.
- Future of Plastics. Latest Development in Plastics.
- Group Discussion.

## Who all should attend this programme?

- New Entrepreneurs
- People in Sales & Promotion
- People in Accounts & Purchase
- People in Legal & Regulatory affairs
  - Managers & Supervisors
  - Operators

**IPI also Offer this programme to Corporates and Business Houses at their Business Locations.**

**The entire schedule will be supervised and conducted by our experts of IPI.**

Module	Content
1 History of Plastic	This display chronicles some of the key discoveries & Invention
2 Introduction of Polymers	What are Plastics, How they are made and Processed ? What are their Basic Properties ?
3 Fundamentals of Polymer Processing & Processing Methods	Rheology, Screws & Design. Common Processing Methods, Typical Properties
4 Role of Additives	Mechanism of Degradation, Additives and their Role in product Performance.
5 Testing of Plastics	Characterization Plastics. Identification Methods, Mechanical properties, Thermal Properties.
6 Polymer Products & Application	Plastics in Daily use, Typical Structures.
7 Key Drivers & Latest Developments	Key Sectors in Plastics.
8 Future of Plastics	Exciting Applications
9 Plastics and Environment	Sustainability, Recycling.

Contact for more details :



**INDIAN PLASTICS INSTITUTE**

30-Sarvodaya Industrial Estate 1st Floor, Near Paper Box Factory, Off Mahakali Caves Road, Andheri (East), Mumbai 400 093, INDIA  
Email : [indianplasticsinstitute@ipiindia.org](mailto:indianplasticsinstitute@ipiindia.org) | Tel : 91-22-66950347 / 66962601 | Fax: 91-22-66950348 | Website : [ipiindia.org](http://ipiindia.org)



## MODULE 1

# Introduction To Polymers

## Contents

<b>1.0</b>	<b>INTRODUCTION</b>	<b>07</b>
<b>1.1</b>	<b>History</b>	<b>07</b>
<b>2.0</b>	<b>POLYMER BASICS</b>	<b>09</b>
2.0.1	Monomers & Polymers	09
2.0.2	Polymer Formulation	09
2.0.3	Polymer – A Macromolecule	10
2.0.4	Polymer Structure Representation	10
<b>2.1</b>	<b>Polymerization</b>	<b>10</b>
2.1.1	Addition Polymerization	11
2.1.2	Condensation Polymerization	11
2.1.3	Polymerization Techniques/Methods	12
<b>2.2</b>	<b>Polymer Classification</b>	<b>15</b>
<b>2.3</b>	<b>Polymer Morphology</b>	<b>17</b>
<b>3.0</b>	<b>BASIC PROPERTIES OF POLYMERS</b>	<b>17</b>
<b>3.1</b>	<b>Microstructures in Polymers</b>	<b>17</b>
<b>3.2</b>	<b>Changes in Polymers due to Thermal Energy</b>	<b>18</b>
3.2.1	Creep	18
3.2.2	Heat Distortion Temperature	18
3.2.3	Glass Transition Temperature	19
3.2.4	Melting Temperature	20
3.2.5	Degradation Temperature	20
<b>3.3</b>	<b>Molecular Weight &amp; Distribution</b>	<b>20</b>
3.3.1	Melt Flow Index / Melt Flow Rate	23
<b>3.4</b>	<b>Density</b>	<b>23</b>
<b>3.5</b>	<b>Stereo isomerism in Macromolecules</b>	<b>24</b>
<b>4.0</b>	<b>POLYMER DEGRADATION</b>	<b>24</b>
4.0.1	Factors Effecting Degradation	24
4.0.2	Process of Degradation	25
4.0.3	Types of Degradation	25
<b>5.0</b>	<b>ROLE OF ADDITIVES</b>	<b>26</b>
<b>6.0</b>	<b>PLASTICS &amp; ENVIRONMENT</b>	<b>28</b>
<b>6.1</b>	<b>Recycling and Disposal</b>	<b>29</b>
<b>6.2</b>	<b>Bio-Plastics</b>	<b>30</b>
<b>6.3</b>	<b>Biodegradable Polymers</b>	<b>30</b>
<b>6.4</b>	<b>Sustainability and Carbon Foot Print</b>	<b>31</b>

## MODULE 2

# Most Commonly Used Plastics

### Contents

<b>1. INTRODUCTION</b>	<b>07</b>
<b>1.1 POLYETHYLENE TEREPHTHALATE (PET)</b>	<b>07</b>
<b>2. POLYETHYLENE (PE)</b>	<b>10</b>
<b>3. POLY VINYL CHLORIDE (PVC)</b>	<b>15</b>
<b>4. POLYPROPYLENE (PP)</b>	<b>18</b>
<b>5. POLYSTYRENE (PS)</b>	<b>23</b>
<b>6. OTHERS</b>	<b>24</b>
6.1 Nylon	24
6.2 Polycarbonate (PC)	25
6.3 Polyteterofluroethylene (PTFE)	25
6.4 Polyacrylonitrile Butadiene Styrene (ABS)	26
6.5 Polymethyl Methacrylate (PMMA)	26
<b>7. ABBREVIATIONS &amp; POLYMER NAME</b>	<b>28</b>



## MODULE 3

# Plastic Processing & Testing

### Contents

<b>1.</b>	<b>PLASTIC PROCESSING METHODS</b>	<b>07</b>
1.1	Extrusion	07
1.1.1	Single-Screw Extruders	08
1.1.2	Twin-Screw Extruders	08
1.1.3	Blown-Film Extrusion	08
1.1.4	Flat-Film & Sheet Extrusion	09
1.1.5	Profile Extrusion	09
1.1.6	Extrusion Coating & Lamination	09
<b>1.2</b>	<b>INJECTION MOULDING</b>	<b>10</b>
1.2.1	Gas-assisted Injection Moulding	11
1.2.2	Reaction Injection Moulding	12
<b>1.3</b>	<b>BLOW MOULDING</b>	<b>12</b>
1.3.1	Extrusion Blow Moulding	12
1.3.2	Injection Blow Moulding	13
1.3.3	Injection Stretch Blow Moulding	13
<b>1.4</b>	<b>COMPRESSION MOULDING</b>	<b>14</b>
<b>1.5</b>	<b>ROTATIONAL MOULDING</b>	<b>14</b>
<b>1.6</b>	<b>THERMOFORMING</b>	<b>15</b>
<b>1.7</b>	<b>CALENDERING</b>	<b>16</b>
<b>1.8</b>	<b>FOAMING PROCESS</b>	<b>16</b>
<b>1.9</b>	<b>PULTRUSION</b>	<b>17</b>
<b>1.10</b>	<b>TRANSFER MOULDING</b>	<b>17</b>