



EXTRUSION COMPOUNDING OF PLASTICS

PREPARED & CONDUCTED BY
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Summary

Extrusion compounding of plastics is a specialized course designed to provide the trainees with an in-depth understanding of the extrusion compounding process used in the production of plastic materials. The course covers a range of topics related to the manufacturing process, including material selection, polymer science, additive formulations for popular materials such as PVC, PP, PA, PET, etc., equipment, processing parameters, and applications.

Throughout the course, you will learn about the principles of extrusion compounding and how to effectively combine multiple materials into a single homogeneous mixture using an extruder. We shall also explore various types of additives, such as fillers, stabilizers, and pigments, and how to incorporate them into the compounding process to enhance the properties of the final product. In addition, the course provides an overview of the various types of extrusion compounding equipment, including twin-screw, single-screw, co-rotating, and counter-rotating extruders. The course also covers the applications of extrusion compounding, including the production of high-performance thermoplastics,

Summary

engineered plastics, and composite materials. Students will learn how to design and optimize the compounding process to achieve the desired properties for specific applications, such as strength, stiffness, durability, and flame retardancy.

Overall, the extrusion compounding of plastics course provides you with the knowledge and skills necessary to succeed in a range of industries, including automotive, aerospace, construction, and consumer goods. Upon completion of the course, you will be able to apply their knowledge in real-world scenarios and make meaningful contributions to the field of plastic material compound manufacture.

It is designed to serve as an advanced course in the field of plastics manufacturing that focuses on the process of combining multiple plastic materials, as well as additives and fillers, into a single homogeneous mixture using an extruder.

Who this course is for??

- Entry level technologist/science graduate who wants to enter the polymer compounding industry.
- Quality Control/ Quality Assurance/R & D technicians from the extrusion compounding industry involved in formulating and analyzing the raw material performance.
- Process experts/evaluators working in the domain of polymers.
- Marketing/Sales executives inclusive of dealers and distributors (in additives and polymers) who would want to gain a competitive edge.
- All levels of management (first line, middle and top) such as operators, technicians, supervisors, technical managers, business managers, etc. for personnel involved in some technical role in polymer compounding industry.
- Purchase department personnel enabling them for suitable buying of raw materials and additives.
- Stores personnel to understand the technology along with material handling and storage of various raw materials.

What will you learn??

- Understand the fundamentals of plastic compounding and the role of extrusion in the process.
- Identify the different types of extruders and their components.
- Understand the functions of the different zones in an extruder and the factors affecting the extrusion process.
- Understand the principles of mixing and dispersion in extrusion compounding.
- Identify the different types of additives used in plastic compounding and their functions.
- Understand the effects of different processing parameters on the properties of the compounded material.
- Understand the principles of troubleshooting extrusion processing problems.
- Understand the safety considerations involved in extrusion compounding.
- Apply the knowledge gained in the course to improve extrusion compounding processes, troubleshoot issues, and optimize material properties.

Lecture 1: Introduction to Extrusion Compounding

This lecture covers Definition, history, and basics of extrusion compounding

Lecture 2: Principles, Design and Operation of Extrusion Equipment

This lecture covers Overview of extrusion process, types of extruders, screw design and operation, and die design and operation, types of extrusion equipment, feed systems, heating and cooling systems, modular screw, screw elements, control systems, FET technology.

Lecture 3: Additives for Extrusion Compounding and their incorporation

This lecture covers Types of additives, fillers, stabilizers, lubricants, pigments, etc, basic compounding process, mixing techniques, color matching, characterization of compounds

Lecture 4: Properties and applications of Extruded Compounds

This lecture covers Mechanical properties, thermal properties, rheological properties and electrical properties, applications in injection molding, blow molding, thermoforming, extrusion coating, etc.

Lecture 5: Formulations, Quality Control, Testing, and Safety Considerations in Extrusion Compounding

This lecture covers Formulations for PVC, PET, Polyamides, PP, etc., testing methods, quality control procedures, troubleshooting techniques, hazards in extrusion compounding, safety procedures, personal protective equipment

Lecture 6: Future Trends in Extrusion Compounding

This lecture covers Emerging technologies, environmental considerations, industry trends in extrusion compounding



Dr. Prashant Gupta

B Tech. M. E. PGD – CTM. Ph.

Born on June 6th, 1987, Dr. Gupta is a Polymer Technologist and has obtained his Masters, Post Graduate Diploma and Ph. D. from Institute of Chemical Technology, Mumbai. With virtue of his excellence in PGD-CTM course, Dr. Gupta has been awarded with a Gold Medal for securing top merit in the course.

Dr. Gupta has 5.5 years of academic experience (teaching/research) along with Industrial Research & Development experience in managerial positions for around 3.5 years in polymer compounding, testing, processing, and composites. Dr. Gupta has more than 20 publications to his credit in peer reviewed journals and books with high impact international (Elsevier, Wiley, Springer, Taylor & Francis etc.) publishers.

His areas of expertise and teaching include testing and quality control, polymer additives and compounding, polymer processing technology, polymer recycling and waste management, biodegradable and oxo-degradable plastics for packaging, use of information and communication technology for effective teaching learning, pedagogy related to teaching-learning, artificial intelligence in teaching learning, content creation for virtual laboratory, its development and applications.

Dr. Gupta has offered his expertise in the form of technical presentations at more than 20 international and prestigious national conferences/events across the globe some of which include EUROTEC-France, ANTEC-Mumbai, ICERP-Hyderabad, PPS-Mumbai, APM-Lucknow, APA-Chandigarh, Rangotsav-Mumbai, AMAI-Ahmedabad, etc. and won several awards for best paper, poster, project etc. Dr. Gupta has also been recognized as a certified developer, mentor, and reviewer for Virtual Labs, Mumbai an initiative of IIT M, IIT D and IIT K under MHRD, India.

Work Experience:

Organization Name: Maharashtra Institute of Technology

Tenure: 19th Sep 2016 onwards

Assistant Professor-Plastics and Polymer Engineering Dept. (UGC Approved) Junior Scientist, MIT-Center for Advanced Materials Research and Technology

Organization Name: Loxim Industries Ltd.

Tenure: 1st Sep 2015 – 16th Sep 2016

HOD and Manager: R & D/Quality Control

Management and Customer Representative-ISO-TS 16949

Organization Name : Crest Composites and Plastics Pvt. Ltd, Ahmedabad Tenure: 21st Apr 14 – 31st Aug 15

Assistant Manager, (R & D) Application Development

THANK YOU

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