

# PU 105: Introduction to the Polyurethane Process Equipment

## Introduction

### Metering Machines

- i. Overview of polyurethane processing machines
- ii. Basic low pressure machine type and capability
- iii. Low pressure and high pressure machine comparisons
- iv. Basic high pressure machine type and capability -
  - o Pump and cylinder units
- v. Basic machine operation via flow sheets (chemical & hydraulic)
- vi. Basic components, parameters, and spare parts
  - o Tanks, filters, flow meters, agitators, heat exchangers, hydraulics, etc.
- vii. Types and function of metering pumps and cylinders
- viii. Machine output (flow rate) rate adjustment
- ix. Shaft sealing and magnetic couplings
- x. Impacts of formulation changes

### Metering Machine Mixing Heads

- i. Introduction to the variety of mixing heads
- ii. Motionless mixers
- iii. Design and function of low-pressure mixing heads
- iv. Design and function of high-pressure impingement heads
- v. Specialty impingement mixing heads
- vi. Nozzle flow rates and adjusting the mixing pressure
- vii. Spray foam mixing heads

### Electrical Control

- i. Basic Metering Controls
- ii. Process information and operator interface
- iii. Open and closed loop control
- iv. Chronological sequence of a shot cycles
  - o Low pressure
  - o High pressure
- v. Key Process Parameters

### Plant Design

- i. Injection, casting, and spray applications

- ii. Single and multiple station applications
- iii. Rotary table systems
- iv. Gasketing plant design
- v. Racetrack, carousel, and conveyor systems
- vi. Continuous and slabstock plant design
- vii. Pultrusion plant design

## Questions