

## PU105 Introduction to the Polyurethane Process Equipment – Course Outline

### Introduction

#### Metering Machines

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

#### Metering Machine Mixing Heads

- Introduction to the variety of mixing heads
- Motionless mixers
- Design and function of low-pressure mixing heads
- Design and function of high-pressure impingement heads
- Specialty impingement mixing heads
- Nozzle flow rates and adjusting the mixing pressure
- Spray foam mixing heads

#### Electrical Control

- Basic Metering Controls
- Process information and operator interface
- Open and closed loop control
- Chronological sequence of a shot cycles
  - Low pressure
  - High pressure
- Key Process Parameters

#### Plant Design

- Continuous and discontinuous production plants
- Injection, casting, and spray applications
- Single and multiple station applications
- Rotary table systems
- Gasketing plant design
- Racetrack, carousel, and conveyor systems
- Continuous and slabstock plant design
- Pultrusion plant design