



المركز العالمي للتدريب والتطوير  
International Centre For Training & Development



# ME172

## Maintenance and Troubleshooting of Conveyors and Chutes



**ACTVET**  
Abu Dhabi Centre for  
Technical and Vocational  
Education and Training

**GInI** GLOBAL  
INNOVATION  
INSTITUTE  
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**PM** Project  
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International Association  
for Health and Occupational Safety  
and the Environment

**EFQM**  
Member



## Course Introduction:

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This course is designed for engineers and technicians from a wide range of abilities and backgrounds and will provide an excellent introduction to troubleshooting, maintenance and basic design rules of conveyors and chutes. It is intended to cover the fundamentals of belt conveying and would be useful for those with little experience in this area.

Before commencing a detailed course on conveyors it is important to have a solid practical knowledge of the material to be conveyed. A basic knowledge is provided of the bulk materials characteristics and properties.

This will enable you to have a far stronger ability to troubleshoot and design workable conveyor systems.

Numerous tips throughout the course make it practical and topical. You will also engage in problem solving and case studies to absorb the materials as quickly and effectively as possible.

## Course Objectives:

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**Upon successful completion of this course, the delegates will be able to:**

- Gain knowledge on maintenance and troubleshooting of conveyors and chutes
- Apply troubleshooting on conveyor problems
- Apply splicing techniques
- Recognize safety management
- Use design and installation on maintenance
- Determine capacity, sizing and power of equipment
- Explain the fundamentals of belt conveyor, chute and feeder design

## Who Should Attend?

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This course is intended for maintenance engineers, mechanical engineers, design engineers, plant engineers, electrical engineers, consulting engineers, operation, maintenance, inspection and repair managers, supervisors and technicians.

## Course Outline:

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### **Day 1:**

#### **Introduction**

- Fundamentals of bulk materials handling

- Nature of bulk solids
- Characteristics of generally used bulk materials
- Conveyors and chutes overview Practical Exercise

### **Belt Conveying**

- Introduction
- Layout
- Basic Configuration
- Components of a standard conveyor
- Capacity of belt conveyors and selection of belt width
- Selection of other components (belt, idlers, pulleys and take-ups etc.)
- Simple calculation of belt tension
- Selection of drive
- Troubleshooting tips
- Take-ups
- Operation and maintenance of belts
- Tips for cost savings Practical Exercise

### **Day 2:**

#### **Safety of Conveyors**

- Conveyor safety standard
- General background on AS 4024.1
- (RA and hazard recognition)
- Hazard recognition
- History of accidents
- Key conveyor safety issues
- Demonstration of unsafe conveyors
- AS 1755 conveyors
- Chute doors hazards and controls Case Study Practical Exercise

#### **Maintenance and Troubleshooting of Conveyors**

- Troubleshooting conveyor problems
- Types of joints
- Splice failures
- Splice inspections
- Splice repairs
- Typical problems
- Root cause process
- Systematic approach for tracking

- Site specific problems Case Study Practical Exercise

### Day 3:

#### **Chute Maintenance and Troubleshooting**

- Transfer chutes theory
- Laser scanning applications
- Best practice design
- Boosting flow
- Troubleshooting chutes
- Spillage and buildup
- The awkward marriage of conveyor and chutes Practical Exercise

#### **Feeders Maintenance and Troubleshooting**

- Belt, apron, screw and other feeders
- Optimum draw down
- Troubleshooting typical problems Practical Exercise

### Day 4:

#### **Storage and Flow**

- Flow properties of materials
- Funnel - flow and expanded flow
- Flow rate analysis
- Gravity reclaim
- Bin wall pressures Practical Exercise

#### **Practical Conveyor Design**

- Review of bulk material characteristics
- Layout
- Component selection
- Lump size limitation
- Capacity
- Minimum pulley diameters
- Burden cross sectional area calculations
- Volumetric capacity
- Velocity calculations
- Idler spacing and load rating
- Belt tension calculations
- Drive arrangements
- Power demand capacity

- Starting and stopping
- Start-up current calculations
- Vertical curves
- Gearbox and drive selection
- Safety factors
- Bearing types and selection Conveyor design calculations Exercises

### Day 5:

#### **Chute Design**

- Liner selection
- Use of solid works
- DEM and application to transfer design
- Stress analysis using cosmos Chute Design Exercise

#### **Feeder Design**

- Calculation of loads/drive torques and power
- Feeder selection Feeder Design Exercise

#### **Applications and Future Trends**

- Case studies
- Future trends in conveyors, feeders and chutes

## **Course Certificate:**

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**International Center for Training & Development (ICTD)** will award an internationally recognized certificate(s) for each delegate on completion of training.

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## **Course Methodology:**

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**A variety of methodologies will be used during the course that includes:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires

- Group Work
- Discussion
- Presentation

## Course Fees:

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**To be advised as per course locations.** This rate includes participant's manual, Hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

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### Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

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