Conveyor Belt Systems and Bulk Material Handling Training Course



21 - 25 Dec 2026

Cape town

4600 € (Per Person)

Ref: #INM5468_277428

Course Introduction / Overview:

Effective bulk material handling is the backbone of numerous global industries, directly impacting operational efficiency, safety, and profitability. This comprehensive training course is meticulously designed to provide a deep and practical understanding of conveyor belt systems, from fundamental principles to advanced maintenance and troubleshooting techniques. Drawing upon established industry standards and academic insights, such as those found in the authoritative guide "Belt Conveyors for Bulk Materials" by the Conveyor Equipment Manufacturers Association (CEMA), this program moves beyond simple operational instructions. It delves into the science of material flow, component selection, and system optimization. Participants will explore the critical relationship between design, operation, and maintenance, learning how to prevent costly downtime and enhance system longevity. BIG BEN Training Center has structured this course to empower professionals with the skills to manage conveyor systems proactively, ensuring safe, reliable, and cost-effective transport of bulk materials. This training is an essential investment for any organization aiming to achieve excellence in its material handling operations and asset management strategies.

Target Audience / This training course is suitable for:

- Maintenance Technicians and Millwrights.
- Operations Supervisors and Team Leaders.
- Plant and Facility Engineers.
- Reliability and Maintenance Planners.
- Health and Safety Officers.
- Project Engineers involved in conveyor systems.
- Procurement and Supply Chain professionals dealing with conveyor components.
- Junior and Senior Level Engineers from various disciplines.

Target Sectors and Industries:

- Mining, Quarrying, and Mineral Processing.
- Cement and Construction Materials Manufacturing.
- Agriculture, Grain Handling, and Food Processing.
- Ports, Terminals, and Bulk Logistics.
- Power Generation and Utilities.
- Pulp and Paper Industries.
- Waste Management and Recycling Facilities.
- Governmental bodies and public works agencies.

Target Organizations Departments:

- Maintenance and Engineering.
- Plant and Facility Operations.
- Production and Manufacturing.
- Health, Safety, and Environment (HSE).
- Asset Management and Reliability.
- Logistics and Supply Chain.
- Project Management and Capital Projects.
- Quality Assurance and Control.

Course Offerings:

By the end of this course, the participants will have able to:

- Identify various types of conveyor systems and their key components.
- Understand the principles of bulk material characteristics and their impact on conveyor design.
- Implement comprehensive preventive and predictive maintenance programs.
- Apply correct procedures for belt tracking, alignment, and tensioning.
- Troubleshoot common conveyor operational issues like spillage, dust, and component failure.
- Conduct thorough safety inspections and risk assessments for conveyor systems.
- Select appropriate conveyor components for specific applications and operational demands.
- Master techniques for conveyor belt splicing and repair.
- Enhance the overall efficiency and reliability of bulk material handling operations.

Course Methodology:

This training course at BIG BEN Training Center employs a dynamic and interactive learning methodology designed for maximum knowledge retention and practical application. We believe that adult learning is most effective when it combines theoretical knowledge with real-world problem-solving. The methodology is centered around a blended approach, featuring expert-led presentations that break down complex engineering principles into understandable concepts. These sessions are complemented by detailed case studies of actual conveyor system failures and successes, allowing participants to analyze root causes and effective solutions. Interactive group discussions and workshops encourage peer-to-peer learning and the sharing of diverse industry experiences. Practical exercises and simulated troubleshooting scenarios will challenge participants to apply their new skills in a controlled environment. Continuous feedback is provided by the instructor to ensure concepts are fully grasped. This hands-on, participant-focused approach ensures that attendees leave not just with information, but with the confidence and competence to improve their workplace conveyor systems immediately.

Course Agenda (Course Units):

Unit One: Fundamentals of Bulk Material Handling and Conveyor Systems

- Introduction to bulk material handling.
- Characteristics and properties of bulk solids.
- Types of conveyor systems (belt, screw, pneumatic, vibratory).
- Anatomy of a belt conveyor system.
- Key components: belts, idlers, pulleys, and drives.
- Principles of conveyor operation and material transport.
- Basic safety protocols and hazard identification.

Unit Two: Conveyor System Design and Component Selection

- Principles of conveyor design and layout.
- Calculating conveyor capacity, speed, and power requirements.
- Belt selection criteria and construction types.
- Idler types, spacing, and selection.
- Pulley design, lagging, and shafting.
- Drive systems: motors, gearboxes, and couplings.
- Design of transfer points and chutes to minimize spillage and wear.

Unit Three: Safe Conveyor Operations and Spillage Control

- Comprehensive conveyor safety standards (OSHA/MSHA).
- Lockout/Tagout (LOTO) procedures for conveyor maintenance.
- Guarding, emergency stops, and warning systems.
- Controlling dust and environmental hazards.
- Understanding and mitigating sources of material spillage.
- Belt cleaning systems: types, selection, and maintenance.
- Best practices for conveyor start-up and shutdown procedures.

Unit Four: Conveyor Maintenance, Inspection, and Lubrication

- Developing a preventive maintenance (PM) program.
- Introduction to predictive maintenance (PdM) technologies.
- Detailed conveyor inspection checklists and procedures.
- Techniques for belt tracking and alignment.
- Proper belt tensioning procedures and take-up systems.
- Lubrication best practices for bearings, gears, and chains.
- Wear and tear analysis of key components.

Unit Five: Advanced Troubleshooting, Splicing, and System Optimization

- Systematic approach to troubleshooting conveyor problems.
- Diagnosing and solving issues like belt slippage, mistracking, and noise.
- Root cause analysis of component failures.
- Techniques for mechanical and vulcanized belt splicing.
- Best practices for belt repair and maintenance.
- Strategies for improving energy efficiency and system performance.
- Future trends: automation, IoT, and data analytics in conveyor systems.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Considering the rise of automation and IoT, how might the role of a conveyor maintenance technician evolve from reactive repair to proactive system optimization in the next decade?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by adopting a holistic, system-wide perspective on bulk material handling, rather than focusing narrowly on isolated components or reactive maintenance tasks. While other programs may teach basic repair, we emphasize the intricate relationship between design, operation, and maintenance, empowering participants to perform root cause analysis and implement long-term reliability solutions. The curriculum is deeply rooted in established engineering principles, such as those from CEMA, but is delivered through a highly practical, case-study-driven methodology. Participants will not only learn the "how" of maintenance but the critical "why" behind system behavior, from material spillage at transfer points to the dynamics of belt tracking. We focus on developing proactive problem-solvers who can optimize efficiency, enhance safety, and reduce operational costs. The course moves beyond a simple checklist approach to cultivate a deep, analytical understanding of conveyor systems, preparing attendees to manage the entire lifecycle of this critical industrial asset with confidence and expertise.