



Accredited Africa Training Institute for Capacity Development

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COURSE BROCHURE

Explosives Accessories Manufacturing Process Control Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116011 · NQF Level 3 · 20 Credits · 17 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to control manufacturing processes for explosives accessories, ensuring safety, quality, and compliance with regulatory standards. Participants will understand process parameters, quality control measures, and hazard management specific to explosives accessory production.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116011
Accreditation	SAQA Accredited · NQF Level 3 · 20 Credits
Duration	17 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply safety protocols and hazard identification techniques in explosives accessories manufacturing processes.
- Analyze process parameters to ensure product quality and consistency in accordance with specifications.
- Evaluate manufacturing procedures to identify deviations and implement corrective actions.
- Implement process control systems to monitor and adjust production variables effectively.
- Demonstrate compliance with relevant legislation, standards, and company policies during manufacturing operations.
- Design process improvements to enhance efficiency and safety in explosives accessories production.

WHO SHOULD ATTEND

- This course is designed for production supervisors, process controllers, and quality assurance personnel working in explosives accessory manufacturing environments.

COURSE OUTLINE

Day 1: Introduction to Explosives Accessories Manufacturing

- Overview of explosives accessories: detonators, boosters, connectors, and initiating systems.
- Legal framework: Explosives Act, SANS standards, and SAQA requirements.
- Introduction to process control principles.
- Safety culture and hazard awareness.
- Course roadmap and learning outcomes.

Day 2: Raw Materials and Quality Assurance

- Raw material types: PETN, RDX, lead azide, aluminium powder, and binders.
- Supplier qualification and incoming inspection.
- Testing methods: purity, particle size, moisture content.
- MSDS interpretation and handling precautions.
- Non-conforming material procedures.

Day 3: Manufacturing Processes – Detonator Assembly

- Detonator components: shell, base charge, primer, and fuse head.
- Assembly sequence: pressing, filling, and sealing.
- Automation vs manual assembly: benefits and risks.
- In-process inspection: crimp diameter, charge weight.
- Common defects and corrective actions.

Day 4: Manufacturing Processes – Booster and Connector Production

- Booster design: shape, density, and explosive fill.
- Connector types: shock tube, detonating cord, and relays.
- Mixing and pressing of secondary explosives.
- Quality checks: density, detonation velocity.
- Handling and storage of intermediate products.

Day 5: Process Control Fundamentals

- Process control vs quality control.
- Variable types: continuous and discrete.
- Control charts: X-bar, R, and p-charts.
- Process capability indices (Cp, Cpk).
- Practical exercise: constructing a control chart.

Day 6: Instrumentation and Measurement Systems

- Sensors: temperature, pressure, flow, and humidity.
- Calibration standards and traceability.
- Data loggers and SCADA interfaces.
- Error sources and uncertainty.
- Practical calibration exercise.

Day 7: Safety Systems and Hazard Analysis

- Hazard categories: mechanical, electrical, chemical, explosive.
- HAZOP methodology for process lines.
- Failure mode and effects analysis (FMEA).
- Safety instrumented systems (SIS).

- Emergency response procedures.

Day 8: Quality Management Systems (ISO 9001)

- ISO 9001:2015 clauses relevant to manufacturing.
- Documented procedures and work instructions.
- CAPA process flow.
- Internal audit techniques.
- Non-conformance reporting.

Day 9: Batch Production and Traceability

- Batch record design.
- Lot numbering conventions.
- Traceability software and barcoding.
- Mock recall procedure.
- Regulatory requirements for traceability.

Day 10: Electrostatic Discharge (ESD) Control

- ESD fundamentals: generation and discharge.
- ESD-sensitive components.
- Grounding and bonding techniques.
- ESD-safe workstations and garments.
- Periodic ESD audits.

Day 11: Environmental Control and Housekeeping

- Cleanroom classifications (ISO 14644).
- 5S: Sort, Set in order, Shine, Standardize, Sustain.
- Environmental monitoring: temperature, humidity, particle count.
- Contamination sources and control.
- Housekeeping audits.

Day 12: Process Validation and Change Control

- Validation master plan.
- Installation qualification (IQ).
- Operational qualification (OQ).
- Performance qualification (PQ).
- Change control request forms.
- Revalidation triggers.

Day 13: Troubleshooting and Root Cause Analysis

- Common defects: misfires, low output, premature initiation.
- 5 Whys technique.
- Fishbone (Ishikawa) diagram.
- Pareto analysis.
- Case studies: troubleshooting real incidents.

Day 14: Automation and Control Systems

- PLC basics: inputs, outputs, ladder logic.
- SCADA overview: HMI, alarms, trends.
- PID control loops.
- Automated weighing and dosing systems.

- Hands-on simulation exercise.

Day 15: Regulatory Compliance and Audits

- Department of Mineral Resources and Energy (DMRE) requirements.
- SABS and SANS standards.
- Audit types: internal, customer, regulatory.
- Audit checklists and evidence.
- CAPA for audit findings.

Day 16: Continuous Improvement and Lean Manufacturing

- Lean: 8 wastes, value stream mapping.
- Kaizen events.
- Six Sigma: DMAIC methodology.
- Key performance indicators (KPIs).
- Case study: process improvement project.

Day 17: Integrated Practical Assessment and Course Review

- Simulated manufacturing scenario.
- Process monitoring and adjustment.
- Quality checks and documentation.
- Assessment feedback.
- Course summary and certification process.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **20 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 53,800.00	R 53,800.00
1	In-House	R 69,900.00	R 69,900.00
1	On-Campus (Pretoria)	R 80,700.00	R 80,700.00

UPCOMING SESSIONS

Start	End	Method	Venue
05 Aug 2026	27 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	28 Aug 2026	On-Campus	Dubai, UAE
07 Aug 2026	31 Aug 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	31 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	01 Sep 2026	On-Campus	Durban, South Africa
10 Aug 2026	01 Sep 2026	On-Campus	Mauritius
11 Aug 2026	02 Sep 2026	On-Campus	Cape Town, South Africa
12 Aug 2026	03 Sep 2026	On-Campus	Dubai, UAE

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 116011) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call +27 12 004 8389 or WhatsApp +27 65 077 6310 and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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