



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Explosives Manufacturing Initiating Devices Process Control Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116012 · NQF Level 3 · 20 Credits · 17 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to control processes involved in the manufacturing of initiating devices for explosives. It covers safety protocols, quality assurance, and regulatory compliance to ensure safe and efficient production. Successful participants will be able to monitor and adjust manufacturing processes to meet industry standards.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116012
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 procedures and regulations in the manufacturing of initiating devices.
- Monitor and control process parameters to ensure product quality and consistency.
- Evaluate potential hazards and implement corrective actions during production.
- Demonstrate compliance with relevant South African explosives legislation and standards.
- Analyse process data to optimise manufacturing efficiency and safety.
- Implement quality control measures for initiating device components.

WHO SHOULD ATTEND

- This course is designed for process controllers, production supervisors, and quality assurance personnel working in explosives manufacturing environments.
- It is also suitable for safety officers seeking specialised knowledge in initiating device production.

COURSE OUTLINE

Day 1: Introduction to Explosives Manufacturing and Initiating Devices

- Overview of the explosives industry in South Africa
- Classification of explosives and initiating devices
- Legal framework: Explosives Act and relevant regulations
- Introduction to process control principles
- Safety culture and hazard awareness

Day 2: Fundamentals of Initiating Devices

- Types of initiating devices: detonators, detonating cord, boosters
- Electric detonators: construction and firing characteristics
- Non-electric detonators: shock tube and other systems
- Electronic detonators: programmability and precision
- Primary and secondary explosives used in initiators

Day 3: Raw Materials and Quality Assurance

- Raw materials: lead azide, PETN, RDX, and others
- Incoming material inspection: purity, particle size, moisture
- Storage conditions: temperature, humidity, segregation
- Sampling and testing procedures
- Supplier qualification and certification

Day 4: Manufacturing Processes for Initiating Devices

- Process flow: from raw materials to finished device
- Assembly of detonator shell, base charge, and primer
- Filling and pressing operations
- Insertion of bridgewire or shock tube
- Quality checks during production

Day 5: Process Control Fundamentals

- Principles of process control: setpoints, deviations, corrections
- Sensors and actuators in explosives manufacturing
- Control loops: open vs closed loop
- Statistical process control (SPC) basics
- Implementing control charts for critical parameters

Day 6: Instrumentation and Measurement

- Temperature measurement: thermocouples, RTDs
- Pressure measurement: transducers, gauges
- Flow measurement: mass flow meters
- Weighing and dosing systems
- Calibration procedures and frequency

Day 7: Safety in Initiating Device Manufacturing

- Hazard identification and risk assessment (HIRA)
- Personal protective equipment (PPE) requirements
- Static electricity control: grounding and bonding
- Housekeeping and contamination prevention

- Emergency response plans and drills

Day 8: Quality Management Systems

- QMS principles: customer focus, continuous improvement
- Documentation: procedures, work instructions, records
- Non-conformance handling and root cause analysis
- Internal audit planning and execution
- Management review meetings

Day 9: Process Optimization and Troubleshooting

- Data collection and analysis techniques
- Root cause analysis tools: fishbone, 5 whys
- Common defects: misfires, timing errors, sensitivity issues
- Process capability studies (Cp, Cpk)
- Lean manufacturing principles in explosives production

Day 10: Regulatory Compliance and Documentation

- Explosives Act and regulations: key clauses
- Record keeping: batch cards, logbooks, certificates
- Traceability: from raw material to finished product
- Regulatory inspections: preparation and response
- Environmental compliance: waste disposal, emissions

Day 11: Advanced Initiating Devices and Technologies

- Electronic detonators: programmability and accuracy
- Wireless initiation systems
- Smart blasting systems with delay timing
- Integration with digital blast design software
- Case studies of advanced applications

Day 12: Process Control Automation

- Programmable logic controllers (PLCs) in explosives manufacturing
- Distributed control systems (DCS) architecture
- HMI screens: alarms, trends, data logging
- Safety interlocks and emergency shutdown systems
- Automation troubleshooting and maintenance

Day 13: Environmental, Health, and Safety (EHS) Management

- Environmental aspects: air emissions, wastewater, solid waste
- Waste minimization and treatment
- Occupational health: noise, dust, chemical exposure
- Medical surveillance programs
- EHS management systems (ISO 14001, OHSAS 18001)

Day 14: Human Factors and Training

- Human error types and prevention strategies
- Competency assessment methods
- Training design: theoretical and practical components
- On-the-job training and mentoring
- Behavior-based safety (BBS) programs

Day 15: Maintenance and Reliability of Equipment

- Maintenance types: reactive, preventive, predictive
- Lubrication, cleaning, and inspection schedules
- Condition monitoring: vibration, temperature, wear
- Spare parts management
- Reliability centered maintenance (RCM)

Day 16: Incident Investigation and Root Cause Analysis

- Incident reporting and classification
- Investigation process: gather data, analyze, recommend
- Root cause analysis techniques: fault tree, event tree
- Corrective action plans and follow-up
- Lessons learned and sharing

Day 17: Integration, Assessment, and Course Review

- Case study: end-to-end process control scenario
- Practical assessment: control loop tuning, troubleshooting
- Written examination covering all days
- Course evaluation and feedback
- Certification and next steps

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	Johannesburg, South Africa
06 Aug 2026	28 Aug 2026	On-Campus	Mauritius
07 Aug 2026	31 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	01 Sep 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	02 Sep 2026	On-Campus	Abu Dhabi, UAE
12 Aug 2026	03 Sep 2026	On-Campus	Durban, South Africa
12 Aug 2026	03 Sep 2026	On-Campus	Mauritius
13 Aug 2026	04 Sep 2026	On-Campus	Cape Town, South Africa

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 116012) 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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