Accredited Africa Training Institute for Capacity Development
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COURSE BROCHURE

Bituminous Materials Laboratory Testing Procedures Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 116576 · NQF Level 3 · 10 Credits · 7 Days

COURSE OVERVIEW

This course provides laboratory technicians and materials engineers with the theoretical knowledge and practical skills required to perform standardised testing procedures on bituminous materials used in road construction. It covers sample preparation, test execution, data recording, and interpretation of results in accordance with South African National Standards (SANS) and industry specifications, ensuring quality control and compliance in pavement engineering.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	116576
Accreditation	SAQA Accredited · NQF Level 3 · 10 Credits
Duration	7 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Demonstrate correct sampling and preparation techniques for bituminous materials according to SANS and TMH (Technical Methods for Highways) standards.
- Apply standardised test methods (e.g., penetration, softening point, viscosity, ductility) to characterise bitumen properties.
- Analyse test results to assess compliance with specification limits and identify material variability.
- Implement quality control procedures to ensure accuracy and repeatability of laboratory tests.
- Evaluate the suitability of bituminous materials for specific pavement applications based on test data.
- Document test results and report findings in a professional format suitable for project records.

WHO SHOULD ATTEND

- Laboratory technicians, materials engineers, and quality control personnel working in road construction, asphalt production, or civil engineering laboratories who need to conduct and interpret bituminous material tests.

COURSE OUTLINE

Day 1: Introduction to Bituminous Materials and Laboratory Safety

- Overview of bituminous materials: bitumen, cutbacks, emulsions, modified binders.
- Introduction to relevant South African specifications (SANS 4001, TMH1).
- Laboratory safety: PPE, chemical handling, waste disposal, and emergency procedures.
- Sample receipt, conditioning, and preparation protocols.
- Introduction to laboratory equipment and calibration requirements.
- Basic terminology and units of measurement in bituminous testing.

Day 2: Binder Consistency and Penetration Testing

- Theory of consistency: viscosity, penetration, and softening point.
- Detailed procedure for the Penetration Test (SANS 1311).
- Equipment setup, calibration, and operation for penetration testing.
- Sample preparation and temperature conditioning for penetration tests.
- Calculation of penetration value and determination of grade.
- Common errors, troubleshooting, and quality control checks.
- Reporting of results and comparison with specification limits.

Day 3: Softening Point and Ductility Testing

- Theory behind softening point and its relationship to temperature susceptibility.
- Step-by-step procedure for the Ring and Ball test.
- Theory and significance of ductility in bitumen.
- Detailed procedure for the Ductility test.
- Equipment operation and maintenance for both tests.
- Analysis of test data and specification compliance.
- Practical demonstrations and hands-on practice sessions.

Day 4: Viscosity and Flash Point Testing

- Viscosity fundamentals: definitions, units, and temperature dependence.
- Procedures for kinematic viscosity testing (SANS 1312).
- Introduction to absolute viscosity and rotational viscometers.
- Theory and importance of flash point for safety and classification.
- Detailed procedure for the Cleveland Open Cup Flash Point test.
- Data interpretation, graphing viscosity-temperature relationships.
- Safety protocols specific to high-temperature testing.

Day 5: Aggregate and Mix Properties: Theoretical Foundations

- Aggregate properties: gradation (sieve analysis), shape, texture, and cleanliness.
- Introduction to bituminous mix types: asphalt concrete, seals, etc.
- Principles of Marshall Mix design: stability, flow, voids analysis.
- Theoretical calculation of optimum binder content.
- Overview of South African mix design methods (e.g., TMH1).
- Sample preparation for mix testing: batching, mixing, and compaction.
- Introduction to gyratory and Marshall compactors.

Day 6: Practical Mix Testing and Performance Evaluation

- Hands-on specimen preparation: mixing, heating, and compaction (Marshall/Gyratory).

- Procedure for Marshall Stability and Flow test.
- Determination of bulk specific gravity (SANS 1316).
- Calculation of air voids, voids in mineral aggregate (VMA), voids filled with asphalt (VFA).
- Analysis of test results to assess mix suitability.
- Troubleshooting common issues in mix testing.
- Case studies: interpreting test data for quality assurance.

Day 7: **Integration, Reporting, and Quality Assurance**

- Integrating test results: creating a complete binder and mix profile.
- Report writing: structure, data presentation, and conclusion drafting.
- QA/QC in the laboratory: calibration schedules, proficiency testing, and record-keeping.
- The link between laboratory results and field performance.
- Overview of advanced tests and emerging technologies.
- Course review and summary of key learning points.
- Preparation for final practical assessment and discussion.

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 **10 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 28,200.00	**R 28,200.00**
1	In-House	R 36,700.00	**R 36,700.00**
1	On-Campus (Pretoria)	R 42,300.00	**R 42,300.00**

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	11 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	12 Aug 2026	On-Campus	Mauritius
05 Aug 2026	13 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	14 Aug 2026	On-Campus	Dubai, UAE
07 Aug 2026	17 Aug 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	17 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	18 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	18 Aug 2026	On-Campus	Mauritius

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 116576) 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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