Accredited Africa Training Institute for Capacity Development
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COURSE BROCHURE

Bleached Pulp Production Process For Paper Manufacturing Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 114247 · NQF Level 3 · 29 Credits · 26 Days

COURSE OVERVIEW

This course provides learners with comprehensive knowledge and practical skills required to produce bleached pulp for paper manufacturing. It covers the complete production process from raw material preparation to bleaching and quality control, ensuring compliance with industry standards and environmental regulations.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	114247
Accreditation	SAQA Accredited · NQF Level 3 · 29 Credits
Duration	26 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Apply principles of pulp bleaching chemistry to select appropriate bleaching sequences.
- Analyze process parameters to optimize bleaching efficiency and pulp quality.
- Evaluate environmental impacts of bleaching processes and implement mitigation measures.
- Demonstrate safe operation of bleaching equipment and handling of chemicals.
- Implement quality control procedures to ensure bleached pulp meets specified brightness and purity standards.
- Design a basic bleaching process flow diagram for a given pulp type.

WHO SHOULD ATTEND

- This course is designed for production supervisors, process operators, and quality control personnel working in pulp and paper mills who need to understand or improve bleached pulp production processes.

COURSE OUTLINE

Day 1: Introduction to Pulp and Paper Manufacturing

- Overview of the pulp and paper industry
- Types of pulp: mechanical, chemical, recycled
- Raw materials: wood species, non-wood fibres
- Basic papermaking process: pulping, bleaching, forming, drying
- Environmental impact and sustainability

Day 2: Wood Yard Operations and Chip Preparation

- Wood yard layout and equipment
- Debarking methods: drum, ring, hydraulic
- Chipping process and chip quality
- Chip screening and classification
- Chip storage, reclaim, and handling systems
- Chip moisture and bulk density

Day 3: Chemical Pulping – Kraft Process Fundamentals

- Kraft pulping chemistry: active chemicals, reactions
- Digester types: batch, continuous
- Cooking parameters: temperature, time, chemical charge
- White liquor preparation and composition
- Black liquor recovery overview
- Pulp yield and kappa number

Day 4: Chemical Pulping – Sulfite and Other Processes

- Sulfite pulping chemistry
- Cooking conditions for different sulfite processes
- Equipment for sulfite pulping
- Pulp properties and uses
- Soda pulping and organosolv processes
- Environmental aspects of sulfite pulping

Day 5: Mechanical and Semi-Chemical Pulping

- Mechanical pulping: stone groundwood, RMP, TMP
- Refiner configurations and operation
- Semi-chemical pulping: CMP, CTMP
- Pulp properties: strength, brightness, opacity
- Energy efficiency and yield considerations
- Applications of mechanical pulps

Day 6: Pulp Washing and Screening

- Washing principles: displacement, dilution, pressing
- Equipment: drum washers, pressure washers, wash presses
- Screening: pressure screens, slot screens
- Cleaning: centrifugal cleaners, hydrocyclones
- Washing efficiency and chemical recovery
- Water reuse and closure

Day 7: Bleaching Chemistry and Principles

- Bleaching objectives: brightness, cleanliness, strength
- Bleaching chemicals: chlorine, chlorine dioxide, oxygen, hydrogen peroxide, ozone
- Brightness measurement: ISO brightness
- Bleaching stages: C, D, E, O, P, Z
- Elemental chlorine free (ECF) and totally chlorine free (TCF
- Environmental regulations and AOX

Day 8: Oxygen Delignification and Chlorine Dioxide Bleaching

- Oxygen delignification: chemistry, reactor design
- Process variables: temperature, pressure, alkali charge
- Chlorine dioxide generation and chemistry
- D stage operation: pH, temperature, retention time
- Extraction stages: E, EO, EP
- Pulp quality: viscosity, brightness, strength

Day 9: Hydrogen Peroxide and Ozone Bleaching

- Peroxide bleaching: chemistry, stabilisation
- Process parameters: pH, temperature, retention time
- Ozone bleaching: generation, application
- Ozone reactor design and mass transfer
- Combined stages: P, Z, OP, OZ
- Safety considerations for peroxide and ozone

Day 10: Bleaching Plant Equipment and Process Control

- Bleaching plant layout: towers, washers, pumps
- Medium consistency mixing and pumping
- Chemical metering and safety systems
- Retention towers: upflow, downflow
- Washer types: drum, pressure, wash presses
- Process control: pH, temperature, consistency, brightness sensors

Day 11: Pulp Drying and Baling

- Pulp drying: flash drying, air drying, cylinder drying
- Drying theory: heat and mass transfer
- Baling equipment: presses, wrappers, strappers
- Bale handling and storage
- Energy consumption and recovery
- Quality control: moisture, brightness, contaminants

Day 12: Chemical Recovery Cycle – Evaporation and Combustion

- Black liquor composition and properties
- Evaporation: multiple-effect evaporators, concentrators
- Recovery boiler: design, operation, combustion
- Smelt dissolving and green liquor
- Steam and power generation
- Safety in recovery operations

Day 13: Chemical Recovery – Causticizing and Lime Kiln

- Causticizing reactions: slaking, causticizing
- Equipment: slakers, causticizers, clarifiers
- Lime kiln: design, fuel, operation
- Lime mud handling and reburning
- White liquor analysis: TTA, EA, sulphidity
- Environmental emissions from recovery

Day 14: Water and Effluent Management in Bleached Pulp Mills

- Water balance in a bleached pulp mill
- Effluent treatment: primary, secondary, tertiary
- Biological treatment: aerated lagoons, activated sludge
- AOX and BOD/COD reduction
- Water closure and zero liquid discharge
- Regulatory framework: South African water legislation

Day 15: Quality Control and Testing of Bleached Pulp

- Quality parameters: brightness, viscosity, dirt count, strength
- Testing methods: TAPPI, ISO, SANS standards
- Sampling techniques
- Brightness reversion and aging
- Strength testing: tear, tensile, burst
- Statistical process control (SPC

Day 16: Environmental and Safety Aspects in Bleaching

- Environmental impacts: effluent, air emissions, solid waste
- Pollution prevention: process modifications, chemical substitution
- Occupational health: exposure to chlorine, ozone, peroxide
- Safety systems: gas detection, PPE, emergency response
- Regulatory requirements: OHS Act, environmental permits
- Sustainability and green chemistry

Day 17: Process Optimisation and Troubleshooting

- Troubleshooting methodology: define, measure, analyse, correct
- Common problems: brightness variability, high chemical consumption, dirt
- Optimisation of bleaching sequences
- Use of process simulation tools
- Case studies: solving real mill problems
- Continual improvement techniques

Day 18: Advanced Bleaching Technologies and Trends

- Enzymatic bleaching: mechanisms, applications
- Hot chlorine dioxide (DHT) and other modified stages
- Ozone-based sequences (OZ, ZED
- Biobleaching and white rot fungi
- Impact on pulp quality and cost
- Industry trends: sustainability, closed-loop systems

Day 19: Integration of Bleaching with Paper Machine Operations

- Stock preparation: refining, blending, additives

- Paper machine wet end: retention, drainage, formation
- Impact of bleaching on fibre properties
- Paper grades: printing, packaging, tissue
- Quality specifications for different grades
- Troubleshooting paper defects related to pulp

Day 20: **Course Review, Assessment, and Future Outlook**

- Recap of major topics: pulping, bleaching, recovery, quality
- Assessment: written test and practical evaluation
- Career paths: production, quality, environmental, management
- Professional development: SAQA qualifications, industry bodies
- Future trends: digitalisation, circular economy
- Course evaluation and feedback

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 **29 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 76,800.00	**R 76,800.00**
1	In-House	R 99,800.00	**R 99,800.00**
1	On-Campus (Pretoria)	R 115,200.00	**R 115,200.00**

UPCOMING SESSIONS

Start	End	Method	Venue
31 Jul 2026	04 Sep 2026	On-Campus	Johannesburg, South Africa
03 Aug 2026	07 Sep 2026	On-Campus	Cape Town, South Africa
04 Aug 2026	08 Sep 2026	On-Campus	Dubai, UAE
05 Aug 2026	09 Sep 2026	On-Campus	Pretoria, South Africa
05 Aug 2026	09 Sep 2026	On-Campus	Lagos, Nigeria
06 Aug 2026	10 Sep 2026	On-Campus	Johannesburg, South Africa
07 Aug 2026	11 Sep 2026	On-Campus	Mauritius
10 Aug 2026	14 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 114247) 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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