

AfroxFac 35i

Self-contained self-rescuer

SANS 1737:2008 compliant



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Self-contained self-rescuer

AfroxPac self-contained self-rescuers (SCSRs) are closed-circuit, chemical oxygen generating, body-worn emergency breathing devices. They comply with the stringent SANS 1737 standard for SCSR which is a legislated requirement for any short duration body-worn SCSR deployed in South African mines.

Afrox was the first manufacturer of SCSR to attain compliance under the rigorous SANS 1737 standard, following which 250 000 devices have been manufactured. The AfoxPac 35i has been designed to exceed the additional demands of the 2008 revision of the standard, thus building on the already proven life-saving capability and durability of the product.

AfroxPac SCSRs generate oxygen by reacting the moisture in the breath of the user with potassium superoxide contained within the device. This produces a rapid and effective supply of oxygen. At the same time carbon dioxide is absorbed by the chemical, making the device completely self-contained with no exposure to atmospheric toxins. AfoxPacs are produced at Afox's Benoni factory according to strict quality and environmental standards (ISO 9001 and ISO 14001). Afox has designed, manufactured and marketed AfoxPac SCSR since 1996.

AfroxPac 35i

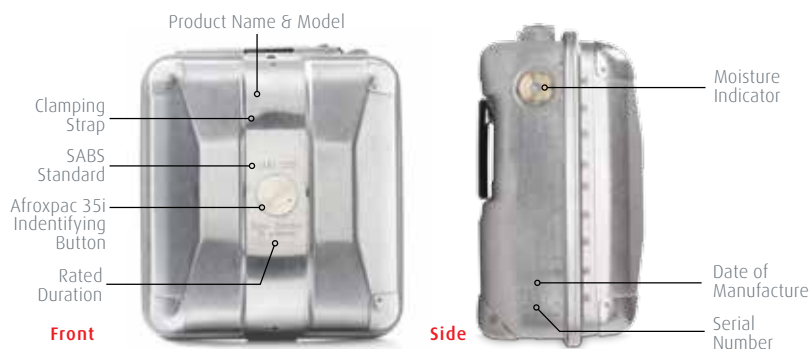
The AfoxPac 35i enhances the proven technology of the AfoxPac by improving the bag material and ensuring containment of the oxygen-generating chemical within the chemical bed. This provides added protection against inadvertent exposure to high temperatures. The AfoxPac has been proven in independent monitoring of thousands of units selected from the toughest of underground conditions to continue to deliver life-saving oxygen - on average at better than the rated duration of a new unit - even after years of exposure to harsh conditions.

Features

- Exceeds the rated duration of 30 minutes
- Rapid oxygen generation: 90% oxygen concentration after 10 minutes
- Effective CO₂ scrubbing: CO₂ average below 1% after 30 minutes deployment
- Silicone-based heat resistant breathing bag



- Internal seal ensures chemical dust containment and eliminates migration of the chemical to the breathing bag
- Comfort type mouthpiece reducing saliva and lessening user stress
- Improved foamed-silicone heat shield
- Silicone mouthpiece and breathing tube eliminates deterioration of components
- Reinforced stainless steel casing provides high level of wear protection under harsh mining conditions
- Complies to SANS 1737:2008
- Anti-catch device prevents accidental opening
- Strengthened belt loops provide extra wear protection
- A nine litre breathing bag to accommodate extraordinary tidal volumes
- Ergonomically designed with recessed belt loops and small hip-out dimension allowing for ease of wear and freedom of movement in confined spaces
- Incorporates a primary anti-tampering seal (replaceable by trained mine personnel) to protect the main or secondary seal from being inadvertently broken
- Moisture indicator is clearly observable and changes colour from blue to pink within one shift should moisture enter the container
- Individual serial number and date of manufacture.





Benefits

Historical Performance

The AfroxPac 35i maintains all the successful design features of the AfroxPac 35, yet represents significant improvements in a number of areas. It therefore builds on an established pedigree of a device which:

- Is carried underground on South African mines for more than 1 million man hours every day;
- Has resulted in many hundreds, if not thousands, of successful escapes;
- After 10 years of deployment continues, on average, to exceed its rated duration when tested under the CSIR performance monitoring programme.

SANS 1737:2008 Compliance

Compliance with the onerous requirements of the 2008 amendment to the stringent SANS 1737 standard for self-contained self-rescuers is a significant milestone for the AfroxPac. Designing a product capable of meeting this standard provided the opportunity for further enhancements.

Product Enhancements

- Changing the breathing bag, heat shield and other flexible components to silicone based materials, thereby reducing vulnerability when inadvertently exposed to external sources of high heat
- Removal of chemical dust from the breathing bag, thereby preventing any opportunity for heat induced oxidation
- Further stabilising the chemical bed, providing for excellent long term durability, as borne out in the SANS 1737 post durability test results
- Addition of an internal dust and moisture seal to the chemical bed which protects it even further from moisture as well as preventing dust migration
- Added wear protection to all high wear points.

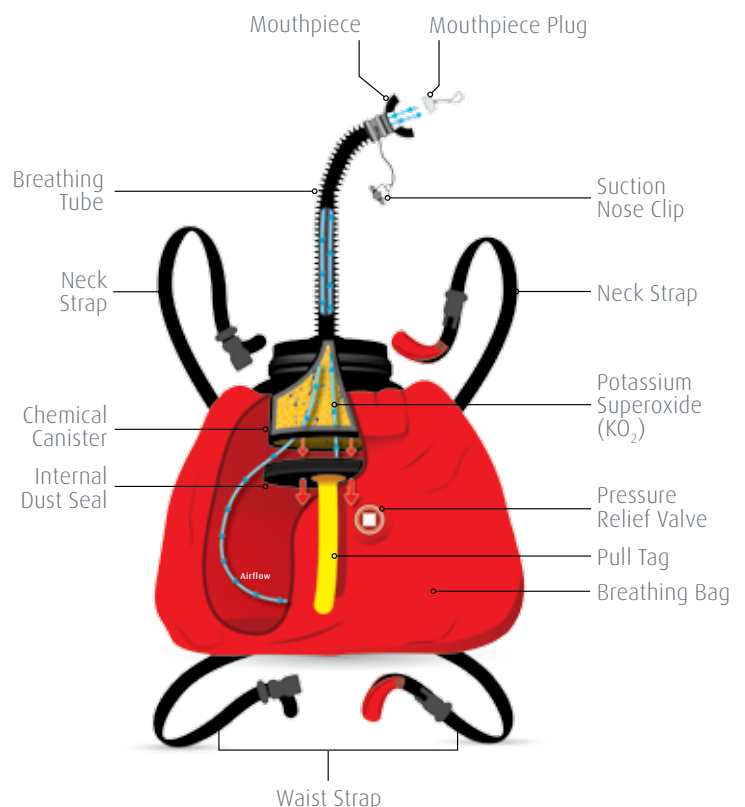
Proven Performance

SANS 1737 testing seeks to evaluate accelerated aging by subjecting the self-contained self-rescuer to extreme conditions during durability testing. This mimics the impact and vibration the device may experience during years of use.

The achievement of almost identical average breathing duration performances of 39 minutes, both pre- and post-durability during SABS testing bears testimony to the product enhancements. This provides a comfortable margin of safety over the rated duration of 30 minutes and speaks to even further-enhanced long-term durability of the device.

Home Grown

The AfroxPac 35i has been developed in close association with the South African mining industry: it is unashamedly home grown under the toughest mining conditions and is 100% locally manufactured and supported. This support includes training, repairs, leak testing, servicing and disposal.



Using Your AfroxPac 35i - The 7 Donning Steps

Step 1

Swing the AfroxPac 35i to the front and kneel

This positions you to calmly control the opening and donning of your AfroxPac 35i.



Step 2

Open the AfroxPac 35i and jerk out the mouthpiece plug

Open the unit by lifting up the lever on top of the unit. This will break both seals. The clamping strap and outer lid of the protective casing will fall away. Grasp the neck of the mouthpiece and apply a firm pull to jerk out the mouthpiece plug.



Step 3

Pull down the yellow tag

While holding the hose with one hand, grasp the yellow tag with the other hand and pull firmly straight down. This is necessary to properly deploy the bag.



Step 4

Inflate the breathing bag by blowing into it 3 to 5 times.

Hold the flanges of the mouthpiece and blow up the breathing bag by exhaling into it in order to start the chemical reaction which produces oxygen. This may take several breaths.



Step 5

Fit mouthpiece and nose clip

Insert the mouthpiece into your mouth so that it is positioned between the teeth and lips. Bite onto the mouthpiece lugs and close your lips tightly around the flange. Begin to breathe through your mouth immediately.



Squeeze the nipple on either side of the nose pads between the fore-finger and thumb of each hand. This creates a suction. Pull the spring apart and position the nose clip behind each nostril on your nose ensuring that when released the nose clip is firmly attached and will not allow you to breathe any contaminated air.

Step 6

Fit and adjust neck and waist strap

Lift your hard hat, fit the neck strap around the neck and replace hard hat. Tilt your head back and adjust the strap to shorten it so that when you return your head to the normal position it creates a bend in the breathing tube.



Wrap the waist strap which hangs from the bottom of the breathing bag around your waist, clip the buckle and adjust it so that it is firm but not tight.



Step 7

Walk in an orderly brisk and calm manner to a place of safety.

Stand up and proceed in an orderly manner to a place of safety.



Product Support

Afrox has a team of fully trained and qualified technicians to inspect and leak test AfroxPacs on customers' sites. Service contracts are available for quarterly inspections and testing or monthly maintenance servicing. Afrox's comprehensive database stores all service data and detailed reports are provided to mine management.

Training

Afrox has a training programme which comprises the following modules:

- Train-the-Trainer
- Lamproom Maintenance of AfroxPacs
- Annual Re-Training
- Leaktester Training.

Training aids include:

- Training SCSRs for trainer and trainee
- Disposable mouthpieces for hygienic use
- Eight station heat simulators to simulate breathing warm dry air
- Training DVDs
- User and training manuals.

Ancillary Products

In order to assist in the deployment and maintenance of AfroxPac SCSRs, the following are available:

- Storage racks
- Leak testers
- Vehicle anti-vibration storage boxes
- Chest harnesses
- Miners' belts
- Kidney support harnesses.

Technical Specifications

AfroxPac 35i is a self-contained, closed-circuit, chemical oxygen-generating body-worn emergency breathing apparatus.

Rated Duration
30 minutes at a ventilation rate of 35 l.min ⁻¹

Resting Duration
>120 minutes at a ventilation rate of 10 l.min ⁻¹

Oxygen Generation		
At Start-Up (1-2 minutes)	Spec: 19%	Typical: >20%
In Use (10 minutes to termination)	Spec: 21%	Typical: >90%

Carbon Dioxide ¹		
Maximum	Spec: 3%	Typical: < 2%
Average	Spec: 1,5%	Typical: 1% at 30 min

Maximum Temperature of Inhaled Gas
50°C

Breathing Resistance		
Inhalation/Exhalation	Spec: 1 kPa	Typical: < 0,7 kPa
Sum of Resistance	Spec: 1,6 kPa	Typical: < 1,3 kPa

Functional Performance
Post-durability testing breathing duration >30 minutes

Standards
Complies with SANS 1737:2008
Afrox Safety Self-Rescue Division is ISO 9001, TÜV ISO 9001, ISO 14001 and ISO 18001 certified

Container
• Stainless steel • Outside-corner wear-protection caps • Rear cover base wear-protection reinforcing • Belt-loop wear-protection • Moisture indicator, visible for on-the-rack inspection • Dual tamper-seal system, primary seal replaceable by owner • Anti-catch protection on release lever

Container Leak Rate	
New	<5 Pa/s at -60 kPa
In Service	<200 Pa/s at -20 kPa

Mass	
Full set (Including case)	2,2 kg
Breathing Apparatus	1,2 kg

Dimensions	
Height	195 mm
Width	172 mm
Hip-Out	101 mm

Oxygen Source
Potassium superoxide (KO ₂)

Activation
Oxygen generation is initiated by moisture in the exhaled breath of the user. No 'self-starter' is required

Breathing Bag
• 9 l volume • Silicone coated, heat resistant • Chemical containment: internal seal on chemical canister prevents chemical migration to the breathing bag • Comfort mouthpiece design reduces irritation and salivation

Shelf-Life
Exceeds 10 years on the storage rack. Specific conditions of use may reduce functional performance

Identification
Individual serialisation and month of manufacture

Batch Testing
Samples for independent functional performance batch testing by CSIR Consulting and Analytical Services are independently selected and tested at a rate of 0,5 – 1% of new production

¹Input CO₂ at 4,5% in exhaled gas

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