COAL COOL

USER MANUAL

REV 02 2026

PRODUCT OVERVIEW

PRODUCT NAME:	Fireblock Coal Cool
FORM:	Powder (non-toxic, biodegradable)
PACKAGING:	10KG/22LBS bags
COLOUR:	Mauve
USE CASE:	Fire Suppression for Class A fires, being Coal Stockpiles, waste piles and during coal transportation.
WARNING:	Not Suitable for Electrical fires (Class C), chemical fires, or flammable liquids (Class B)

PRODUCT NAME:	Fireblock Coal Cool PLUS
FORM:	Gel (non-toxic, biodegradable)
PACKAGING:	1 000l (264 gallons) Flow Bins and 30 000l (7925 gallon) Tanker
COLOUR:	Mauve
USE CASE:	Fire Suppression for Class A fires, surface cooling for active mining
WARNING:	Not Suitable for Electrical fires (Class C), chemical fires, or flammable liquids (Class B)

PRODUCT OVERVIEW CONTINUED

PRODUCT NAME:	Fireblock Coal PREMIER
FORM:	Gel (non-toxic, biodegradable)
PACKAGING:	30 00L (7925 gallon) Tanker
COLOUR:	Mauve
USE CASE:	Fire Suppression for Class A fires, surface vertical face mining and prolonged cooling of coal.
WARNING:	Not Suitable for Electrical fires (Class C), chemical fires, or flammable liquids (Class B)

DESCRIPTION

Fireblock Coal Cool is an advanced, biodegradable, and non-toxic fire suppression gel specifically developed for use in coal mining operations. It is engineered to combat the complex and persistent challenges associated with spontaneous combustion in coal seams, stockpiles, and surface mining environments — conditions where conventional firefighting methods such as water application are often insufficient for modern safety and performance requirements.

Coal Cool operates by forming a durable, cooling, and smothering barrier that penetrates deep into burning coal masses. This action rapidly reduces the temperature of the coal, suppresses combustion, and effectively prevents re-ignition by cutting off oxygen pathways and isolating volatile gases. The gel's unique formulation ensures long-lasting fire suppression, even under extreme thermal conditions.

Designed for both shallow and deep applications, Coal Cool offers dependable results across a wide range of mining scenarios. It is easily deployed through standard firefighting equipment, tankers, or flow bins, enabling efficient and large-scale fire control operations without specialized tools or complex logistics.

Environmentally responsible and safe for personnel, Coal Cool is fully biodegradable and non-toxic, making it suitable for ongoing use in sensitive environmental areas. In addition to its superior fire suppression performance, Coal Cool significantly reduces water consumption compared to conventional methods, contributing to more sustainable mining operations.

By minimizing coal losses caused by combustion and improving operational uptime, Coal Cool not only enhances safety but also improves overall profitability for mining operations. Its proven reliability has been demonstrated in practical field applications, including successful performance in the largest coal mine in Tete, Mozambique, and local testing within Glencore Coal mines in South Africa.

Through its combination of advanced technology, environmental responsibility, and operational efficiency, Fireblock Coal Cool sets a new standard in coal mine fire management and prevention.

APPLICATIONS

01

HOTSPOTS IN COAL STOCKPILES

Deep penetration to extinguish smouldering coal and cool surrounding materials.

02

HIGHWALLS AND COAL SEAM PROTECTION

Especially with COAL COOL PLUS, which adheres to vertical surfaces for sustained cooling.

COOL COAL DURING TRANSPORTATION

03

Prevents fare-ups during material loading and handling.

EXPOSED SEAMS IN OPEN-PIT OPERATIONS

04

Controls fire-prone seams and supports fire readiness in active pits.

BLASTING OF HOT AREAS

05

Use together with Fireblock BlastCool pipe (a modular, joinable pipe system engineered to deliver Fireblock Coal Cool gel directly into blast holes) Designed for open-cast coal mining, it ensures optimal cooling and heat suppression, enhancing safety during blasting operations.

KEY FEATURES

FEATURE	BENEFIT
Rapid Cooling Effect	When applied, Coal Cool quickly absorbs and dissipates heat from burning or smouldering coal, reducing surface and internal temperatures to stop the fire cycle.
Oxygen Barrier Formation	The gel coats coal surfaces and penetrates voids, cutting off oxygen supply to prevent combustion and re-ignition.
Deep Penetration	Unlike water, Coal Cool seeps deep into coal piles, seams and fractures, reaching hotspots that are otherwise inaccessible and stabilising the coal mass.
Long-Lasting Residual Protection	The gel adheres to coal and surrounding materials, maintaining a cooling and insulating layer that resists evaporation and provides extended fire suppression.
Water Efficiency & Environmental Safety	Coal Cool enhances the effectiveness of water use, requiring significantly less volume to achieve fire control while remaining non-toxic and biodegradable, minimizing environmental impact in mine sites.

CORE BENEFITS

DEEP PENETRATION

Effectively reaches internal hotspots within coal seams and stockpiles to suppress fires at their source.

RAPID COOLING

Lowers coal temperatures within minutes, halting combustion and stabilizing the affected area.

RE-IGNITION PREVENTION

Forms a long-lasting smothering barrier that blocks oxygen and prevents fire reactivation.

STRONG SURFACE ADHESION

Clings effectively to vertical, sloped, and uneven surfaces for comprehensive coverage.

ECO-FRIENDLY COMPOSITION

Biodegradable, non-toxic, and environmentally safe for continuous use in mining environments.

EASY APPLICATION

Compatible with standard firefighting equipment, tankers, and flow bins for efficient deployment.

CORE BENEFITS

REDUCED WATER USAGE

Uses up to 80% less water than conventional firefighting methods while improving effectiveness.

MINIMAL RUNOFF

Creates a stable gel layer that minimizes environmental runoff and water contamination.

FIELD PROVEN PERFORMANCE

Tested and validated in large-scale operations, including the Tete coal mine and Glencore Coal facilities.

OPERATIONAL SAVINGS

Reduces coal loss, minimizes downtime, and improves overall profitability of mining operations.

VERSATILE USE

Effective for both shallow and deep coal fire applications, as well as stockpiles and spontaneous combustion zones.

APPLICATION AREAS

01

HOTSPOTS IN COAL STOCKPILES

Deep penetration to extinguish smouldering coal and cool surrounding materials.

02

HIGH WALL & COAL SEAM PROTECTION

Especially with Coal Cool Plus, which adheres to vertical surfaces for sustained cooling.

03

COAL DURING TRANSPORT OR LOADING

Prevents flare-ups during material loading and handling.

04

EXPOSED SEAMS IN OPEN-PIT OPERATIONS

Controls fire-prone seams and supports fire readiness in active pits.

05

BLASTING OF HOT AREAS

Use together with Fireblock Blast Cool Pipe (A modular, joinable pipe system engineered to deliver Fireblock Coal Cool gel directly into blast holes). Designed for open-cast coal mining, it ensures optimal cooling and heat suppression, enhancing safety during blasting operations.

FIREBLOCK COAL COOL PRODUCT COMPARISON

FEATURE / VARIANT	COAL COOL	COAL COOL PLUS	COAL COOL PREMIER
USE IN MINES	Surface & Underground	Surface & Underground	Surface & Underground
VISCOSITY	Low	Medium	High
IDEAL APPLICATIONS	Deep penetration into coal stockpiles, smouldering coal waste dumps and during transportation	Surface cooling for active mining	Maximum adherance power for vertical faces and prolonged cooling
PENETRATION DEPTH	Deep into burning coal	Moderate	Surface- level (Limited depth)
SURFACE ADHERENCE	Minimal	Good	Excellent (Adheres to vertical surfaces)
COOLING RATE	Internal cooling	Rapid surface cooling	Extended cooling over time
RECOMMENDED APPLICATION	Difficult fires to extinguish due to size and depth. Large amounts and regular applications required.	Active flames on exposed coal	High-risk seams, vertical walls, and maintenance cooling
RUNOFF CONTROL	Moderate	Good	Excellent (minimal runoff)
ENVIROMENTAL SUITABILITY	Biodegradable & non-toxic	Biodegradable & non-toxic	Biodegradable & non-toxic
PACKAGE OPTIONS	10kg bags of powder	1000L Flow bins 30,000L Tankers	30,000L Tankers

APPLICATIONS METHODS

Fireblock Coal Cool is a specialized fire suppression product designed for use in coal mining environments. To ensure optimal safety, effectiveness, and compliance, the following conditions for use must be met:

1. APPLICATION ENVIRONMENT

- Permitted Areas: Surface coal mines, coal stockpiles, and pillar mining operations.
- Environmental Conditions: Suitable for use in ambient temperatures ranging from 5°C to 50°C.
- Timing of Application: Final application should be done in the late afternoon to minimize UV exposure and heat degradation from direct sunlight.
- Weather Conditions: Avoid application during rain or if rain is expected, as rainwater will dilute and wash away the product, reducing its effectiveness.

2. PREPARATION AND MIXING

- Powder Form (if applicable): Mix according to manufacturer's instructions (e.g: 10kg to 3300L water).
- Gel Form: Use as supplied; do not dilute unless specified.
- Water Quality:
  - Use clean, non-saline, and non-contaminated water.
  - Do not use contaminated water, as it may alter the chemical properties of the product and reduce its fire suppression capabilities.
  - Note: Mixing strength may vary depending on the quality and mineral content of the water used. Always test small batches when uncertain.

3. APPLICATION METHODS

- Delivery Systems: Apply using standard firefighting systems such as tankers, high-pressure hoses, or spraying rigs.
- Equipment Compatibility: Ensure hoses, nozzles, and tanks are cleaned before use to avoid chemical interaction.
- Surface Contact: Ensure the product has full contact with coal surfaces or burning material for effective suppression.
- Use a Cone Nozzle as it gives an even coverage, fine spray allows for deep penetration.
- Avoid using jet spray, as it can displace the product and hinder performance.

APPLICATION TECHNIQUES

- The coverage and penetration all depend on the heat and depth of the fire.
- Apply continuous spray for 10 minutes, allow to penetrate, and reapply. Continue as required.
- Begin application from the outer edge inwards to prevent fire spread. Focus on heat pockets and visible flames.
- Spread the burning or smouldering coal using earth moving machinery, as necessary, to reach the core of the fire, if penetration is not effective.
- This staged approach is critical for ensuring that the area is sufficiently cooled and maximum penetration is obtained.

HIGH WALL APPLICATION

PRODUCT: Fireblock Coal Cool Plus

USE CASE: Exposed heated coal seams

METHOD:

1. Gel Application:

- Spray evenly
- A 15,000 L tank covers approximately 7,500 m^2 (80,730 ft^2)

2. Excavation & Monitoring:

- Identify heat pockets via thermal imaging
- Excavate while applying gel continuously
- Reapply based on temperature feedback

COAL STOCKPILE APPLICATION

PRODUCT: Fireblock Coal Cool

USE CASE: Mined or processed coal in storage

METHOD:

1. PREVENTATIVE SPRAYING:

- Apply generously over stockpile surfaces
- Repeat application to maximize depth of penetration
- Spread burning or smouldering coal using earth-moving machinery if safe
- Spray Fireblock Coal Cool directly into exposed coal
- The gel will penetrate between coal particles, absorbing heat and forming a cooling barrier

Scenario	Recommended Product	Method	Nozzle required	Coverage Rate	Notes
Hot Stockpiles	Coal Cool	Tanker or hose spray.	Cone Nozzle	2–5 L/m²	Deep penetration
Burning Transport Loads	Coal Cool	Hose spray	Cone Nozzle	2–5 L/m²	Fast cooling
Coal Conveyors	FFG	Fine Mist application	Cone Nozzle	0.5-1L / m²	Stong flame knockdown
Hot Spots / Spontaneous Fires	Coal Cool	Hose Spray	Cone Nozzle	2–5 L/m²	Isolates and suppresses early stage fires
Coal Seams	Coal Cool Plus	Portable/fixed spray	Cone Nozzle	3–6 L/m²	Better adhesion on angles
Vertical Faces	Coal Cool Premier	Directed hose/cannon	Cone Nozzle	5–8 L/m²	Strongest cling
Preventive Coating	Coal Cool or Plus	Light surface coat	Cone Nozzle	1–2 L/m²	Risk reduction
Post-Rainfall Reapplication	Same as initial	Re-spray	Cone Nozzle	As needed	Maintains protection
Hot Spots / Spontaneous Fires	Coal Cool	Hose Spray	Cone Nozzle	2–5 L/m²	Isolates and suppresses early stage fires
Pre-spray before loading onto dumpers	Coal Cool	Hose Spray	Cone Nozzle	As needed	Reduces risk of ignition and protects equipment

METHODOLOGY

Fireblock Coal Cool suppresses coal fires using hydrogel-based suppression science:

1. HEAT ABSORPTION
Endothermic gel absorbs latent heat, rapidly lowering temperatures and halting combustion.

2. OXYGEN ISOLATION
Forms a surface-sealing film that blocks oxygen diffusion and volatile gas escape.

3. SUBSURFACE PENETRATION
Capillary and gravitational action enables the gel to reach internal smoulder zones.

4. PERSISTENT BARRIER

High-viscosity gels maintain coverage and adhesion, repeat if required.

5. ENVIRONMENTAL CHEMISTRY
Formulations are non-toxic and biodegradable.

MONITORING AND REAPPLICATION

MONITORING:

- Inspect visually every 12–24 hours
- Use thermal imaging for internal heat detection (using a thermal camera), if temperature starts to increase and a temperature exceeds 100°C–start spraying as previously immediately
- Monitor after weather events
- Evaluate coal properties, storage conditions and surrounding environmental factors
- Map and record thermal abnormalities regularly

REAPPLICATION:

- Repeat as needed based on environmental wear
- Follow original coverage rates
- Reapply after heavy rain, or visible degradation

COOLING AND CONTAINMENT

- Once extinguished, form a protective layer over treated area
- Prevent windborne embers spread and isolate smouldering materials
- Use earthmoving equipment to contain treated coal in a separate cool zone if feasible

STORAGE AND HANDLING

- Storage Conditions: Store in a cool, dry, shaded area. Keep sealed in original packaging
- Shelf life: Use within 12 months of manufacture for best performance
- Incompatibilities: Avoid contact with strong acids, bases and oxidizers
- Extremely slippery take care if spillage

OPERATIONAL BENEFITS

- Reduces need for continuous stockpile movement, cutting costs on diesel, manpower, and equipment wear.
- Minimises cost loss due to combustion, preserving product for commercial use.
- Requires less frequent applications, compared to water, with longer lasting cooling effects.

FURTHER INFORMATION
SUPPORT

For copies of techinical data sheets or certificates visit our website: www.fireblock.co.za

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Product Code:	FBCC, FBCC+, FBCCD

Material Safety and Data Sheet

Contact FIREBLOCK ® for SDS Safety Data information sheet or click here.

Warranty Information

Fireblock Coal Cool comes with a 1 year warranty against manufacturing defects. This warranty does not cover misuse, improper storage or accidental damage.
For assistance or claims, contact our customer support team at Fireblock (Pty) Ltd: sales@fireblock.co.za

Emergency Contact Information

In case of a fire emergency beyond the capacity of this product, immediately evacuate and contact your local fire department.

Liability Disclaimer

Use of Fireblock Coal Cool constitutes acceptance of the following:
Fireblock (Pty) Ltd disclaims liability for indirect damages, operational losses, or environmental penalties arising from improper use. Users must confirm suitability and regulatory compliance for their specific application.
Always follow manufacturer guidelines and local legislation. The manual serves as a guidance based on field tested application procedures. Site conditions may require adaption of the outlined practices. Users must ensure compliance with local safety regulations, environmental legislation and site-specific risk assessments..

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