

South Africa's leader in fly ash technology and fly ash product innovation for over 40 years.



Contents

03	About Ash Resources
	Environmental benefits
04	Customer orientation
	Our markets
05	Our product range
07	Fly ash in cement and concrete
08	Our production facilities
09	Proudly South African: committed to transformation
10	Our concern for people
	Ash Resources' associations



About Ash Resources

Ash Resources is South Africa's leading manufacturer and supplier of fly ash products. Since 1979, the company's pioneering development work has turned a waste product of Eskom's pulverised coal-fired power stations into an environmentally-friendly and sustainable building material.

Our ongoing research programmes, in partnership with local and international technical institutions, are continually providing fly ash product solutions, helping to create more effective cement formulations and high performance concrete mix designs for the construction industry both locally and abroad.

Bringing customers the benefits of international resources

Ash Resources is the industry benchmark in R&D and serves from the individual homebuilder to the largest and most complex project with the widest range of value-adding products, innovative services and comprehensive building solutions. With a commitment to drive sustainable solutions for better buildings and infrastructure and to contribute to a higher quality of life, Ash Resources is best positioned to meet the challenges of increasing urbanisation.

Ash Resources is a proud subsidiary of Afrimat.
More information is available on www.afrimat.co.za

Having access to these unrivalled technical resources and best practices is one of Ash Resources' strengths, ensuring world-class quality products and leading-edge technology.



Environmental benefits

Offering the construction industry sustainable options

One of the unique features of our products is their sustainability, providing a viable alternative to non-renewable primary aggregates. Ash Resources aims to maintain its leading position as South Africa's preferred supplier of premium fly ash products and the major environmental benefits they offer the construction industry.

These environmentally-friendly attributes of fly ash products are recognised worldwide. Each ton of fly ash used in cementitious products saves approximately one ton of CO₂ emissions (the 'greenhouse' gas, carbon dioxide). In the last decade, it is estimated that the use of Ash Resources' fly ash products by the South African cement and construction industries has saved the country in excess of 15 million tons of harmful greenhouse gas emissions.

Concern for the environment

A core belief at Ash Resources is that sustainable development has to be an essential part of the search for more efficient and effective products and solutions for the construction industry.

The international trend is to develop new cement formulations that use less clinker, and consequently reduce the environmental impact of the cement manufacturing process for this most important building material.

Increasingly in South Africa, players in the built environment are having to factor in sustainability, life-cycle costing and environmental requirements to their planning and construction methodologies.

Ash Resources has pioneered the development of fly ash to be an important component of 'greener', more sustainable concrete. Our siliceous fly ash is an effective Portland cement enhancer that, when used as a binder, enhances both the fresh and hardened properties of concrete.

However, it is also an environmentally-friendly material, which is used to:

- Recycle a bituminous hard coal waste-product into a value adding cementitious by-product
- Reduce the usage of non-renewable natural resources
- Save energy
- Reduce carbon dioxide (CO₂) emissions
- Reduce the size of power station landfill sites



Ash Resources is a member of the Green Building Council of South Africa (GBCSA). It represents a commitment to assist the Green Building Council in leading the transformation of the South African property industry to ensure that all buildings are designed, built and operated in an environmentally sustainable way. The aim is to allow all people in our country to work and live in healthy, efficient and productive environments.

Customer orientation

Eskom sourced fly ash gives consistent quality material, helping Ash Resources provide a superior quality product for its customers.

We recognise that our customers are at the core of our business and that they demand high quality products with strong performance benefits.

Our customer aligned strategy aims to:

- Earn the loyalty of customers and suppliers alike through building long-term and mutually beneficial partnerships
- Reach high levels of customer satisfaction with reliable products and “best-in-class” service
- Offer a competitive and efficient fly ash supply chain
- Use our world-leading technical resources to drive product and application innovation
- Listen to and work closely with customers, architects, engineers and specifiers to guide our development work
- Continue to improve our operational efficiency and quality, and to share the value created with our customers

Our staff take pride in being customer focused. Across all departments, our people share a common commitment to meet our customers' requirements efficiently and effectively and, where possible, exceed their expectations.

We not only continually invest in modern plant and equipment but also in system and process improvements to ensure we maintain the highest levels of service to our customers.

Reliable supply partner

Our long-standing partnership with one of the biggest names in power generation, Eskom, together with our significant fly ash processing capability and geographic footprint assures customers of a reliable and versatile supply of fly ash products far into the future. Together we reduce CO₂ emissions, conserve energy and water resources helping make the world a better place for generations to come. Ash Resources is presently operational at two Eskom power stations and has an annual tonnage of over 2 million tons of “run of station” fly ash under its management.

Eskom's two new thermal power stations, Medupi and Kusile, combined with the existing thermal power grid, secure fly ash availability to the South African construction industry for decades to come. (Our premium classified fly ash was a key ingredient in the concrete mixtures used in the construction of both Medupi and Kusile.)

Our markets

Following our customer focused market segmentation approach, we supply fly ash products to a broad spectrum of the construction industry.

The main market sectors in which our customers operate are:

- Factory blended cement production
- Job-site and ‘within-mixer’ concrete batching on major civil and building projects
- Ready-mixed concrete
- Precast concrete
- Mining
- Pre-bagged product formulators
- Rubber and plastic product manufacturers (Plasfill®)

Working in conjunction with consultants, architects and civil engineers, the unique properties of our products are recognised for providing robust solutions for durable concrete in aggressive environments. Helping to build South Africa's infrastructure, our premium classified fly ash, DuraPozz®Pro™, continues to be a vital component in high performance concrete used in the transport, water and power industries.

Major construction projects that used our fly ash include:

- Neckartal Dam in Namibia
- Metolong Dam and Water Supply Programme (Lesotho)
- Gautrain
- Kusile Power Station
- Medupi Power Station
- De Hoop Dam
- Coega
- Gauteng Freeway Improvement Plan (GFIP)
- Ingula Hydro Scheme and Braamhoek Dams
- Katse Dam (Lesotho)



Our product range

Through our extensive experience and technical expertise in the fly ash business, we have developed a range of fly ash products.

The company's main grades of fly ash are divided into two broad groups: classified and unclassified. 'Classifying' refers to our investment in specialised air separation equipment to manufacture products that conform to specifications requiring particular size ranges. Our products are designed to meet the performance needs of customers' specific applications.

Classified fly ash products

Ash Resources' classified range of products comply with the chemical and physical requirements of SANS 50450-1, Category S, and carry the SABS Mark:

DuraPozz®

Ranked among the world's best fly ash for its consistent size, low LOI value and highly reactive chemical properties, DuraPozz® is the highest volume selling classified fly ash in South Africa for use in cement manufacturing and by the concrete industry.

DuraPozz® has a mean particle size of 25 micron and, complying to specification requirements, typically 90% of the product's particles pass through a 45 micron sieve. In comparison, the typical particle size distribution of general purpose cement ranges up to 100 micron with a mean particle size of 35 micron.

The product has a low residual carbon, giving a whiter fly ash plus less activated carbon, which can adversely adsorb superplasticisers and other concrete admixtures.

DuraPozz®Pro™

Closely integrated with the Eskom's Matla power station, our state-of-the-art classifiers on the Matla production site produce the premium classified fly ash product, DuraPozz®Pro™ for the cement and concrete industries. The product is the outcome of our extensive research into the performance of superfine fly ash in concrete, which enabled us to enhance the properties of DuraPozz® even further.

Where value engineering concrete performance and durability are the key requirements, DuraPozz®Pro™ offers:

- Higher reactivity from a greater concentration of the amorphous (glass) phase, leading to higher ultimate concrete strengths
- Increased fineness and particle surface area from the additional fraction of fine spheres passing a 45 micron sieve
- Reduced water requirement promoting stronger concrete
- Improved workability
- The potential for further fly ash extension of cements and concrete
- Enhanced concrete resistance to chloride ingress, sulphate and alkaline-silica reaction
- Low heat of hydration in mass concrete pours
- Increased strength gain in concrete after 28 days

Specification compliance

In addition to our fly ash products' compliance to stringent South African specifications, they also meet the exacting standards of many international specifications e.g. EN 450 'S' and 'N', ASTM C618b, BS3892: Part I and EN 197 as a constituent material.

SuperPozz®

SuperPozz® is designed to meet the need for an ultrafine or superfine fly ash to formulate high performance concretes, particularly where durability is a key consideration or to meet construction challenges brought about by architectural creativity. One of the key attributes of SuperPozz® is the significant improvement in long-term concrete performance with the resulting reduction in maintenance costs.

Applications for SuperPozz® include:

- Self-compacting or self-placing concretes
- High performance readymixed and precast concrete
- Wet sprayed concrete
- Tunnelling concretes
- Proprietary pre-bagged repair mixes, precision grouts and flowable screeds
- Marine environment concretes where durability is critical
- Filler material in the manufacture of extruded plastics and rubber compounds

Unclassified fly ash products

PozzFill®

PozzFill® is widely used in the production of general purpose concrete products and in the manufacture of cement. Other applications include structural fill, road stabilisation, grouts, mine back-filling and dry precast products. PozzFill®, like DuraPozz®, fully complies with the requirements for fly ash as a constituent in factory blended common cements in accordance with SANS EN197. DuraPozz® and PozzFill® are delivered to site in pneumatic tankers.

PozzFill®Plus™

PozzFill®Plus™ is an activated unclassified fly ash product used as a cementitious enhancer.

PozzSand®

PozzSand® is termed a 'conditioned' fly ash product in that approximately 10% potable water is added to fly ash enabling PozzSand® to be transported in tipper trucks, which are covered by tarpaulins to minimise dust. As the name suggests, the product can be used as a reactive replacement for fine sand (aggregate) in concrete and is often used by cement producers as a source of alumina (Al₂O₃) - typical value in fly ash >30% - for the 'raw' mix or kiln feed.

PozzCem®

PozzCem® is an unclassified fly ash processed to meet the needs of cement manufacturing customers.

Specialised fly ash products

SuperPozz®Pro™

SuperPozz®Pro™ is an ultrafine fly ash for high performance concrete applications where durability is a fundamental requirement.

PozzCrete®

PozzCrete® is a cementitious blend based on fly ash designed for underground concrete applications.

MinePozz®

MinePozz® is a cementitious blend used in underground concrete applications.

Plasfill®

Plasfill® is a range of tightly specified fillers developed for a wide variety of applications in the polymer and rubber industries.



Fly ash in cement and concrete

Fly ash is a pozzolan, which means it reacts with water and lime liberated during cement hydration, to form cementitious hydrates, helping to reduce permeability. Used as a partial replacement for Portland cement, classified fly ash improves the properties of concrete both in its plastic (fresh) and hardened state. A feature of using concrete containing DuraPozz® is strength gain after 28 days.

The difference between fly ash and cement is best seen under a microscope. Fly ash particles are predominantly spherical in shape in contrast to Portland cement particles which are angular. The spherical shape enables fly ash to flow and blend easily in a concrete mix. Fly ash concrete is more resistant to sulphate attack and chloride ingress, and also has a low heat of hydration, reducing the risk of thermal cracking. Chemically, the same elements exist in fly ash and Portland cement. The major difference between the two is the relative quantities of the different oxides.

Typical chemical analysis comparison

	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO
Portland Cement	66	21	5	2,5	1,5
DuraPozz® and DuraPozz®Pro™	4-10	47-57	25-40	3-4,5	0,5-2,5

Our production facilities

Ash Resources is an ISO 9001 listed company. Our regularly audited Quality Management System (QMS), together with stringent quality control, reaffirms quality as one of our core values and assures customers that quality is central to all parts of our business. Our existing production sites are situated in four provinces, next to major Eskom bituminous coal-fired power stations. Selected fly ash is recovered and conveyed to the Ash Resources' processing plants for conversion into quality products, based on the chemical and physical characteristics of the specific source of raw fly ash.

Meeting industry's needs

Our continued investment in production sites and equipment is geared to meet the needs of the construction industry. Part of our product manufacturing strategy is to ensure that we have adequate back-up plants to maintain an uninterrupted supply of our products in the event that we experience ash availability problems at one of the power stations from which we operate.

Ash Resources' installed capacity is:

- Classified fly ash product manufacture up to 1 million tons per year
- Unclassified fly ash product availability up to 1 million tons per year

Proudly South African: committed to transformation

Ash Resources believes that the diverse people of South Africa represent a strength and strives for equity in employment and commercial opportunities. For our latest BBBEE rating, please refer to our website.

It continues to work with audit rating agency Empowerdex to establish our level of economic empowerment contribution and performance with Equity ownership now added to our other scorecard pillars of Employment Equity, Preferential Procurement, Skills and Enterprise Development and Socio-Economic initiatives.

Where performance is a priority over cost

Fly ash has a high volume for a given weight resulting in transport costs playing a major role in the product's competitiveness. This means that the location of our plants generally aims to provide optimum service to customers situated within an economically viable distance from the source of fly ash. However, engineers engaged in projects requiring high performance concrete specify our fly ash irrespective of distance. Where durability, impermeability, resistance to chemical attack and high strength are key concrete requirements, Ash Resources' fly ash products have provided the solution. Project references include:

- Metolong Dam in Lesotho
- Lesotho Highlands Water Project
- Saldanha Steel Works and Quay extensions
- in the Western Cape
- Mozal Aluminium Smelter in Mozambique
- Richards Bay Coal Berth extensions
- Gateway 'Shoppertainment' Centre in KwaZulu-Natal
- Coega Project in Eastern Cape
- Hidd Port in Bahrain, Middle East
- Naga Hamadi Barrage on Nile River, Egypt





Strategically placed geographic footprint

Lethabo plant

Lethabo, close to Vereeniging in Gauteng, is the company's flagship plant with the largest installed capacity. Commissioned in 1989, it is able to produce over 1,5 million tons per year of fly ash products.

These include: DuraPozz®, SuperPozz®, SuperPozz®Pro™, Plasfill®, PozzFill®, PozzFill®Plus™, PozzSand®, PozzCem®, MinePozz® and PozzCrete®. Lethabo is equipped to handle road and rail tankers, tipper trucks and also has facilities for bagging ranging from 10 kg bags to 1,5 ton bulk bags.

Matla plant

Sited at the Matla Power Station near Kriel in Mpumalanga, our Matla plant's four classifiers can produce over 750 000 tons per year of our premium classified fly ash, DuraPozz®Pro™. At Matla and Lethabo, we convey ash from each of the six generation units at the Power Station. This ability enables us to maintain production levels when Eskom undertakes its unit maintenance programme.

Integrating Genuine Transformation

Afrimat is committed to integrating genuine transformation that permeates the organisation, and understands this to be critical for the sustainability of its business in South Africa. Each subsidiary has a dedicated BEE Committee which actions the plans and recommendations of the Social, Ethics & Sustainability Committee in this regard, and further proactively drives improvements in all B-BBEE categories.

Our concern for people

We treat our people as the most important resource of our company:

- Health & Safety is our No. 1 priority: the well-being of our employees and the people who work with us on our sites and transport our products is our first priority. We continually strive to achieve the safety benchmarks set by leading international players in our industry. Our "Committed, Open and Uncompromising" campaign exemplifies this.
- Our HIV/AIDS Prevention and Care programme, supported by Lifeworks, is highly regarded in South Africa as an effective ongoing employee support intervention.
- People development: our people have a wealth of experience and knowledge in their respective fields with strong credentials. Ash Resources aims to develop its employees to their full potential. Our continuous goal is to attract, develop and retain the best talent.
- Our concern for local communities: Ash Resources believes that businesses in South Africa have a shared responsibility with government and society in general, to help develop strong and sustainable communities and, to this end, we continue to support local businesses wherever possible as part of our enterprise development drive.

Ash Resources' associations

- Founder member of the South African Coal Ash Association (SACAA) and instrumental in SACAA becoming a member of the European Coal Combustion Products Association (ECOPA)
- Associate Member of the Concrete Manufacturers Association (CMA)
- Associate Member of the South African Readymix Association (SARMA)
- Company Member (Silver) of the Concrete Society of Southern Africa
- Green Building Council of South Africa (GBCSA), Member Company
- Associate Member of the South African National Committee on Large Dams (SANCOLD)



Sharecall: 0860 FLYASH (359274)

Tyger Valley Office Park Building 2, Cr Old Oak Road & Willie Van Schoor Ave
Bellville, Cape Town, 7530, Tel: 021 917 8840, www.afrimat.co.za
www.ashresources.co.za

A SUBSIDIARY OF AFRIMAT