FOUNDED 1910

DGC AFRICA

MEMBER OF DICKINSON GROUP OF COMPANIES

THE LEADING
ASSET INTEGRITY MANAGEMENT & INDUSTRIAL SOLUTIONS
COMPANY IN AFRICA

www.dgc-africa.com

MISSION

DGC AFRICA's Mission is to focus on helping our industrial customers optimising their maintenance costs and improving plant performance, by providing innovative solutions together with our market leading technologies to enhance the service life of their operating assets.

PURPOSE

We help our industrial customers optimising their maintenance costs and improving plant performance, by providing innovative solutions to enhance the service life of their operating assets.

DGC AFRICA IS CUSTOMER CENTRIC
WITH THE ADOPTION OF OUR GROUP-WIDE
"ONE PERSONALISED SOLUTION",
UNDERPINNED BY OUR RANGE OF HIGH-QUALITY
NICHE SERVICES, WITH OUR SUPERIOR TECHNICAL EXPERTISE,
DELIVERY AND CUSTOMER SERVICE.

110 YEARS IN BUSINESS

DGC AFRICA IS A MEMBER OF THE DICKINSON GROUP OF COMPANIES

2020 is a milestone for Dickinson Group of Companies, as the company celebrated its 110th anniversary having been founded in 1910.

In 1928, the company undertook the refractory installation works on one of the first blast furnaces being built in South Africa. This was the start of the company's industrial services business. Over the years the company has diversified company to provide a broad range of specialist products and services to the refractory consuming industries.

The company's vision is be recognised as a global leading asset integrity management and industrial solutions company, based on providing innovative solutions and market leading technologies, while continuing our leadership in selected geographic regions.

VALUES

Dickinson Group of Companies (DGC) has since the date it was founded in 1910 over the past 110-years been a professionally managed family-owned business.

OUR VALUES ARE THE BEDROCK OF OUR CORPORATE CULTURE.

PEOPLE

We have high standards for our exceptional employees who enjoy pushing themselves to perform at the highest levels.

INTEGRITY

We want to surround ourselves with people driven to do the right things and act with integrity in whatever they do.

TRUST

We firmly believe in our employees to act in the best interests of our customers and company.

SERVICE

We are a customer centric services business. We focus on understanding our customer's needs, ensuring that we always meet their expectations.

INNOVATION

We strive to provide our customers with innovative solutions to enhance the service life of their operating assets.

DGC AFRICA'S STRATEGIC FOCUS

DGC AFRICA has more than 50 years' experience in Africa; since the company was involved during the 1960s on a major project for GECAMINES Sarl. in the Democratic Republic of Congo. **DGC AFRICA's** focus is on the provision of the Group's range of specialist industrial services to the mining & minerals, metals smelting, sulphuric acid plants, mineral processing, oil & gas, chemical & petrochemical and power generation industries throughout Africa.

STRATEGY

The company is leveraging off its dominant presence in Southern Africa in Zambia, Namibia and Democratic Republic of Congo, to expand into the other Anglophone (English), Francophone (French) and Portuguese speaking countries throughout sub-Saharan Africa.

DGC AFRICA'S RANGE OF SPECIALIST SERVICES INCLUDE:

- Furnace & Smelter Services
- Industrial Vacuumation
- Silo Cleaning
- Catalyst Handling
- HP & UHP Water Blasting
- Sulphuric Acid Plant Services
- Corrosion Protection & Coatings
- Industrial Acid Proofing
- Fibreglass Reinforced Plastic (FRP) Systems
- Wear & Abrasion Protection Solutions
- Furnace Mechanical Projects
- Structural, Mechanical, Piping & Platework (SMPP)
- Crane Rental, Heavy Lifting and Engineered Transport
- Rotary Kiln & Mill Services
- On-Site Machining Services
- Conveyor Maintenance Services

Over the next few years, we want to continue to implement this strategy, strengthening our **"Customer Centric"** approach, to enhance the bonds with our customers, and to continue to develop high added value solutions in collaboration with our customers, in order to anticipate their future needs.

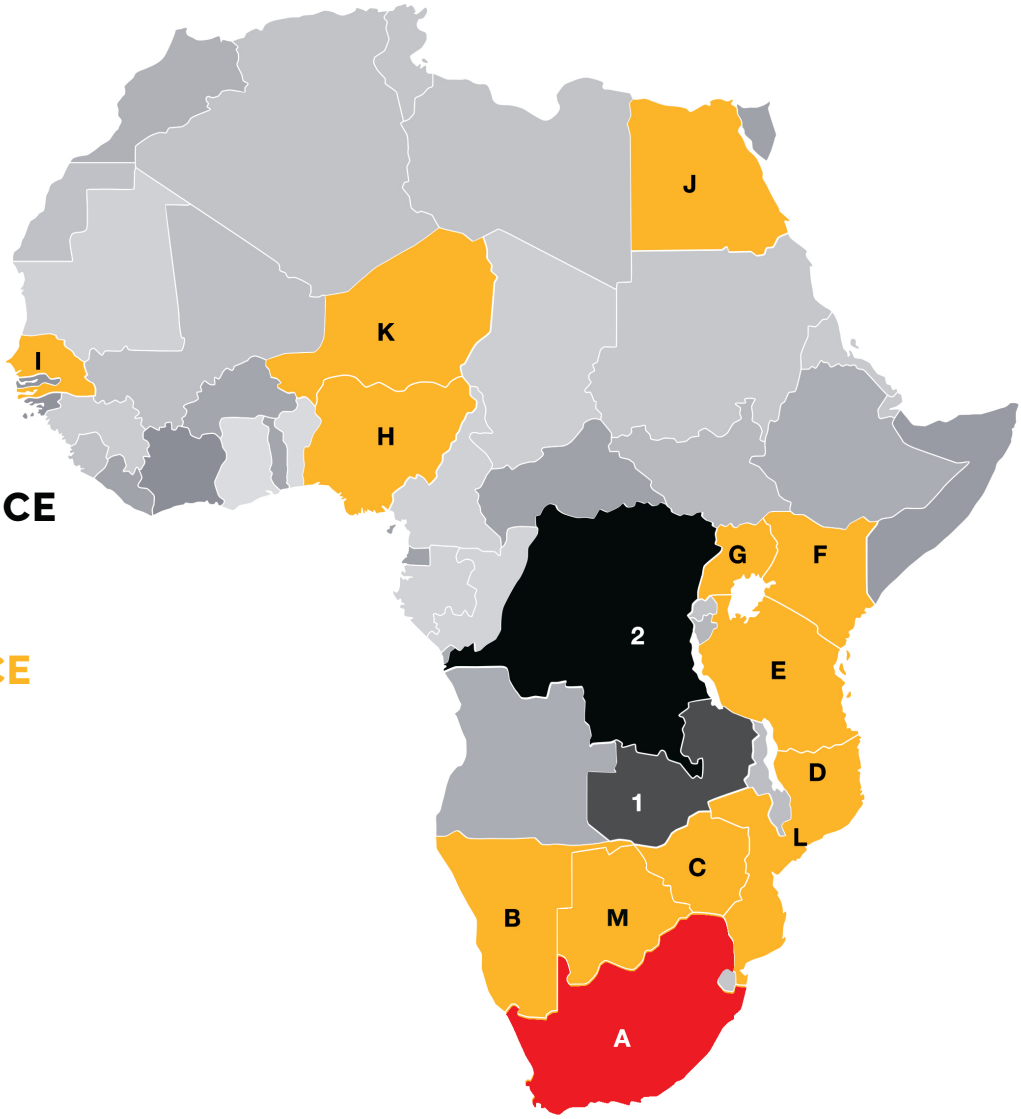
We are at the service of our customers, which is perfectly illustrated by our rebranding, involving full integration of all our subsidiaries, and our Dickinson Group of Companies **"One Personalised Solution"** slogan.

Trevor Dickinson
CHAIRMAN

AFRICA FOOTPRINT

DGC AFRICA is the leading asset integrity and industrial solutions provider to mining & metallurgy, glass, mineral processing, and manufacturing industries in Africa.

DGC AFRICA's key market focus is sub-Saharan Africa.



GEOGRAPHIC PRESENCE

1. Zambia
2. The Democratic Republic of Congo

BUSINESS EXPERIENCE

- **A.** South Africa
- **B.** Namibia
- **C.** Zimbabwe
- **D.** Mozambique
- **E.** Tanzania
- **F.** Kenya
- **G.** Uganda
- **H.** Nigeria
- **I.** Senegal
- **J.** Egypt
- **K.** Niger
- **L.** Malawi
- **M.** Botswana

FURNACE & SMELTER SERVICES

DGC AFRICA has been in the furnace business since 1928; when the company was involved in the construction of one of South Africa's first Blast Furnaces.

Since then, the company has been extensively involved in numerous furnace Greenfield and Brownfield projects on industrial furnaces within the metals smelting, mineral process, power generation and petrochemical refining industries throughout sub-Saharan Africa, and internationally in numerous countries around the globe, including the Middle East, Scandinavia, Latin America, Russia and CIS Countries.

The company provides a comprehensive range of furnace services to support clients in various aspects of furnace projects and maintenance.

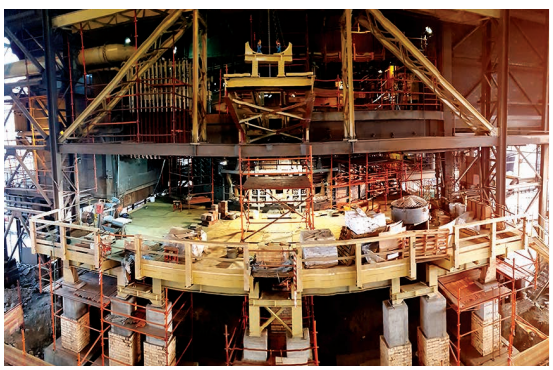
DGC AFRICA's Furnace Services comprise of the following:

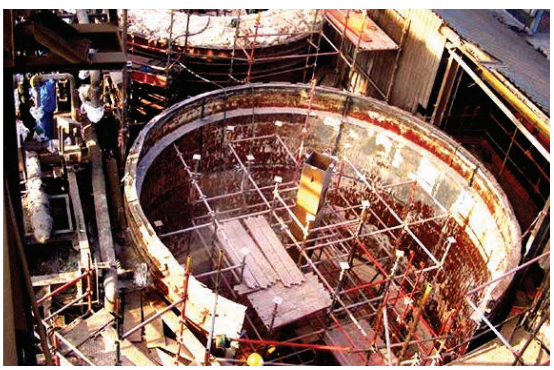
FURNACE REBUILD PROJECTS / FURNACE DEMOLITION / REFRACTORY INSTALLATION

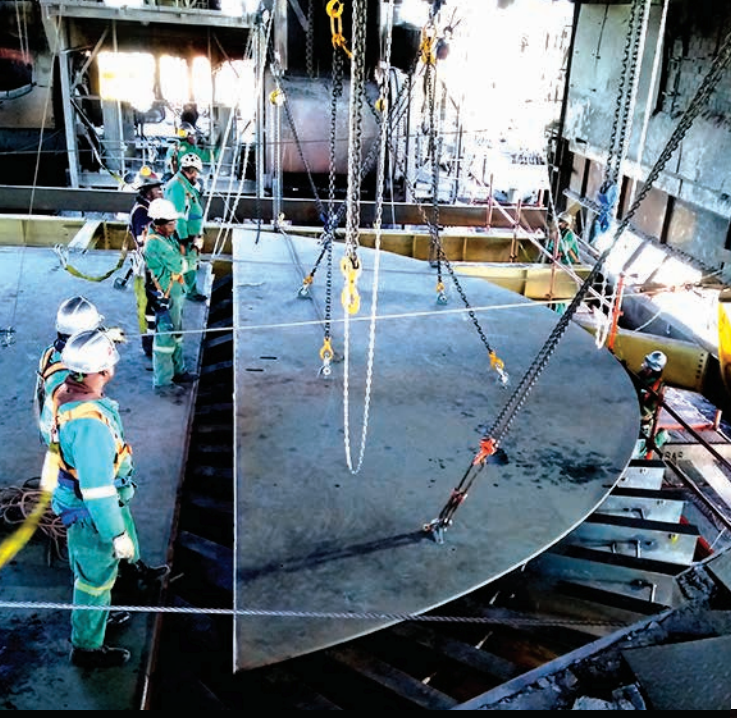
FURNACE REBUILD PROJECTS

DGC AFRICA has more than 90 years' experience in providing turnkey furnace rebuild projects. Dickinson Group of Companies was founded in 1910 as a building construction company and in 1928 the company constructed one of South Africa's first Blast Furnaces, which marked the beginning of the company's furnace business.

The company has been extensively involved in the initial construction and shutdown projects on industrial furnaces for the metals smelting, mineral process, power generation and petrochemical refining industries.







The company provides Turnkey Furnace Rebuild Project Services for major furnace outages which cover the entire scope of work including but not limited to; project and construction management services, furnace decommissioning, salamander tapping, furnace demolition and refractory installation, civil, electrical, mechanical fabrication & erection works and furnace commissioning.

At the forefront of technology, **DGC AFRICA** collaborates with leading engineering and design companies, procuring, manufacturing and installing refractory materials, which comply with stringent quality specifications, safety standards and are cost effective for the application.

WITH EXPERIENCED

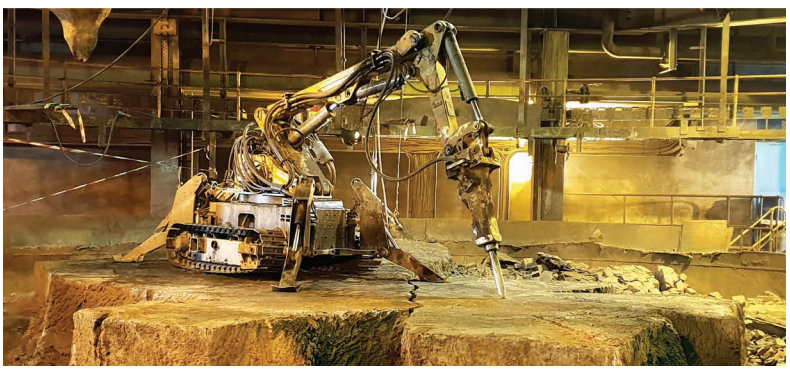
management, expert supervision, highly skilled motivated personnel, state-of-the-art equipment and standard operating procedures with a high regard for health, safety, environment and quality; the company offers clients cost-effective and tailor-made integrated solutions.

DGC AFRICA renders professional turnkey services to large, global, diversified minerals processing and metals smelting companies.

DEMOLITION

FURNACE DEMOLITION

DGC AFRICA is a leading provider of specialist Furnace Demolition Services. Over the past 25 years the company has undertaken numerous demanding furnace demolition projects throughout sub-Saharan Africa.

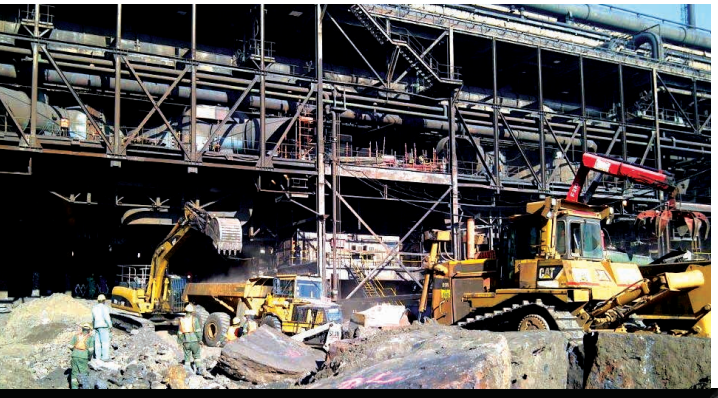


The company's extensive client base includes blue-chip companies in the mining, metal smelting, mineral processing and industrial sectors. The company has the capacity, technology, expertise and know-how to undertake complex furnace demolition projects.

DGC AFRICA utilizes equipment and methodologies which are highly innovative, modern and customised for improved and safer access to challenging sites.

SPECIALIST & INNOVATIVE EQUIPMENT

The company has modern, advanced and purpose-designed mechanical demolition equipment, capable of meeting the challenges posed by large, demanding furnace demolition projects. The latest technology and methodologies used substantially reduce the man power, project duration and improve the safety profile of projects.



The technologies utilized include:

- Remote controlled demolition equipment
- High powered crawler excavators & hydraulic breakers
- Mechanical dismantling & rigging
- Thermal oxygen lancing
- Liquid nitrogen cooling
- Controlled hot blasting

AREAS OF EXPERTISE

- Turnkey demolition of furnaces
- Demolition and removal of refractories
- Confined space demolition
- Remote controlled demolition equipment
- Technology and expertise for effective demolition of hot and cold materials
- Mechanical demolition and dismantling of equipment and structures
- Site clean-up and rehabilitation
- Fast-track shutdowns under 24/7 conditions
- Accredited with high safety standards

REFRACTORY

REFRACTORY INSTALLATION

DGC AFRICA has 90 years of experience in the specialised field of refractories. The company specialises in the installation, repair and maintenance of the refractory linings across the complete range of metals smelting, mineral processing, chemical, refining and thermal power refractory consuming industries.

The company has extensive experience in the installation of all types of refractory materials including; bricklaying, pneumatic gunning, shotcreting, ramming, pumping, vibrocast and placement of castables, and ceramic fibre products across the complete range of furnace designs.

DGC AFRICA has carried out the installation of refractories on numerous initial construction and furnace rebuild projects throughout sub-Saharan including; South Africa, Botswana, Zimbabwe, Namibia, Mozambique, Zambia, Democratic Republic of Congo, Tanzania, Malawi, Gabon, Nigeria, Niger, Senegal, and internationally including: Israel, United Arab Emirates, Saudi Arabia, Argentina and Iceland.

SCOPE OF WORK

Whether you need repairs to current facilities or are looking to establish a new plant, we have a qualified and industry experienced team of engineers, supervisors, bricklayers, gunning crews, and carpenters who have specialized knowledge of all facets of refractory design and construction.

Our belief is that the refractory management is a partnership for the long-term, our team will be available to manage the process with you - from the pre-planning to the ongoing refractory installation and demolition works throughout the service life of the furnace.

INDUSTRIAL SERVICES

DGC AFRICA provides a wide range of world-class Industrial Services to the mining, metals smelting, mineral processing and refining industries internationally.

The company's portfolio of Industrial Services was developed as result of the company's customer centric approach; helping its large industrial customers to optimise their maintenance costs and improve their plant performance by providing innovative solutions together with market leading technologies to enhance the service life of their operating assets.

The Industrial Services are also constantly reviewed to support **DGC AFRICA's** mission; to provide an integrated and multidisciplinary **"One Personalised Solution."** Developing services that are aimed at optimising clients' productivity, safety performance and regulatory compliance while optimising the life of their assets.

DGC AFRICA's Industrial Services comprise of the following:

INDUSTRIAL VACUUMATION SERVICES / SILO CLEANING SERVICES / CATALYST HANDLING SERVICES
HP & UHP WATER BLASTING / SULPHURIC ACID PLANT SERVICES

INDUSTRIAL VACUUMATION SERVICES

DGC AFRICA offers safe, effective, fast and reliable solutions for cleaning up industrial waste or recovering partially processed material spillages in the mining, metals smelting, mineral processing and refining industries.

The company has a range of heavy-duty vacuum systems to handle the heavy industrial and mining applications. The vacuum units are suitable for suctioning, discharging and transporting fluid and hazardous substances, such as liquids, sludge, fats, oils, fuels, chemicals and industrial products.

The-state-of-the-art vacuum units handle a diverse range of industrial products including alumina, cement, chemicals, clay, coke, coal, dolomite, dust, foundry sand, grain, grit slag, lime, metal chips, mill scale, oil spills, ore, rocks and slurries.

BENEFITS

- Vacuum units for material spillage removal and recovery in industrial process plants.
- Handling of materials in a range of industries, such as copper, gold, alumina, cement, platinum, ferrochrome, iron ore, coal and others.
- It offers a safe, reliable solution for cleaning up industrial waste, recovering and recycling valuable raw materials.
- Ensures on-going production while maximizing quality and efficiency.
- The company provides a world-class service to the mining, metals smelting, mineral processing and refining industries.
- Safe and effective removal and disposal of dry and wet waste, fast and efficiently.
- Suction of products in combination with a vacuum unit, storing and bagging in a closed system (free of emissions).
- Efficient suction capacities with a maximum air displacement vacuum units.
- Large pressure and vacuum tank volume capacity.
- The company has adopted the latest technologies in compliance with environmental and safety standards.

SILO CLEANING SERVICES

DGC AFRICA offers a highly specialized service for cleaning contaminated and clogged up bulk storage containers in the manufacturing, mining and mineral processing industries.

These services, which involve the safe and efficient removal of compacted materials, are coupled with consulting services, the adoption of preventative maintenance procedures and the formulation of proper cleaning schedules.

Our Silo Cleaning Services are executed using cutting-edge equipment that is fast, efficient and safe, as the cleaning operations require no human entry into the storage vessel at any time. The company's services are designed to safely remove compacted materials from any size or shape of silos, bins, hoppers, tanks, reactors and chimneys.

SILO MANAGEMENT

- Whether it be cement, coal, soda ash, fertilizer, plaster, animal feed, salt or clay, substances kept in silos attract moisture, which causes the material to bind and adhere to the walls or form clumps.
- As the moist product dries, it can harden and starts to break up, producing lumps that can block the valve outlets. This results in the build-up of debris, which restricts the flow of material, causing capacity reduction and production stoppages (so lumps can be removed from the valve areas or air slides). This is a typical case for **DGC AFRICA**'s Silo Cleaning Services.
- Specialist expertise is critical to the success of any silo management system. **DGC AFRICA** believes that, through innovation and new technologies, the company's Silo Cleaning Services can replace the traditional unsafe methods used, by avoiding having personnel work inside the unsafe confined spaces.
- In addition to providing relevant experience and know-how, Silo Cleaning Services require highly specialised equipment. **DGC AFRICA** adopts a combination of specialist cleaning systems.

CATALYST HANDLING SERVICES

DGC AFRICA provides highly specialised Catalyst Handling Services to the mining, metal smelting and mineral processing industries across sub-Saharan Africa and beyond.

The company's heavy-duty catalyst handling equipment, experienced and well-trained personnel are capable of executing catalyst handling projects even in the most challenging confined and hazardous working environments through compliance to strict health, safety, and environmental protection procedures.

DGC AFRICA has successfully completed a number of catalyst handling projects in various countries around the world.

SCOPE OF SERVICES

DGC AFRICA TAKES FULL RESPONSIBILITY FOR THE ENTIRE CATALYST HANDLING PROCESS FROM UNLOADING, SCREENING TO RELOADING.

CATALYST UNLOADING

Through excellent project planning, monitoring, control, communication, co-ordination and management, **DGC AFRICA** ensures that catalyst layers are separated according to age and (or) type without cross contamination, harm to personnel or the endangerment of the convertor's structural integrity.

Special barriers are constructed inside convertors for personnel movements while vacuuming to avoid catalyst damage. Vacuumation suction pressure and catalyst velocity are also carefully controlled by our team of experts to avoid catalyst breakage. In addition, the teams ensures that all ceramic ball layers are vacuumed separately from the catalyst.

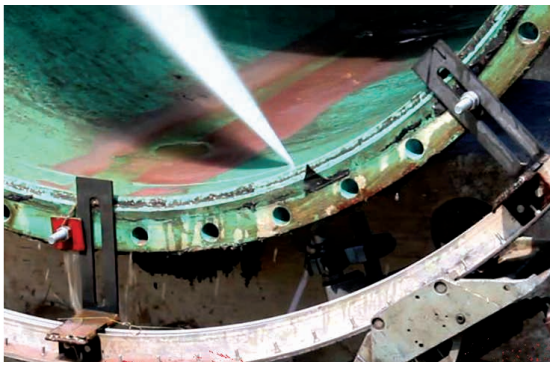
CATALYST LOADING

DGC AFRICA performs both sock and dense catalyst loading. Like in every other stage of the catalyst handling process, quality assurance is given critical attention. Given the hygroscopic nature of catalysts, exposure to the environment is minimized at all costs.

Throughout the loading process, an even distribution of ceramic balls and catalysts on each bed in accordance with the loading diagram is closely monitored and ensured. The loading team puts in place all necessary measures to minimize catalyst breakages, channelling and high pressure drops that may occur due to loading errors.

HP / UHP WATER BLASTING

DGC AFRICA provides a complete range of (High Pressure / Ultra High Pressure) HP/UHP Water Blasting services. Our state-of-the-art technologies ensure that the services are completed in the most efficient and effective manner possible. Using the company's automated systems eliminates human errors and any other operator variabilities in the process while significantly reducing the cleaning time. While improving the ergonomics.



HEAT EXCHANGER CLEANING

The company uses HP/UHP Water Blasting (Between 20000 and 40000 psi) to remove hardened process related deposits on efficient heat exchanger systems thoroughly and cost-effectively. The modern automated systems are more effective and more operator-friendly. Regular cleaning allows the ultra-efficient heat exchanger systems to maintain optimum levels of operational efficiency; ensuring efficient heat transfer and lowering operating costs.

PIPE CLEANING

Pipes used in industry often become corroded, scaled up or even completely blocked. Our HP/UHP Water Blasting Pipe Cleaning Systems are used to effectively clear blockages and remove scaling from pipes and drains using water jets at pressure ranges between 500 and 3000 bar. The spent water flushes the debris through the open end of the pipes.

SURFACE PREPARATION & REMOVAL COATING

UHP water jets penetrate the surface initially making contact with the steel surface. As they ricochet off the surface, they lift any existing coating and contaminants from the steel surface. This makes UHP far more efficient in preparing steel surfaces for lining or coating. The fact that there are no added contaminants make UHP surface preparation extremely environmentally friendly.

COLD CUTTING

DGC AFRICA's Cold Cutting systems give highly precise cuts while eliminating heat-affected zones, toxic fumes, recast layers, work hardening, and thermal stress. These systems are ideal for cutting heat-sensitive material. Addition of abrasives onto UHP water has turned the waterjet into a modern machining tool for all materials; offering added advantages of reduced dust, cutting oils, vibrations, thermal stress, mechanical stress and waste products.

HYDRO DEMOLITION

Our Hydro Demolition technologies use high pressure jetting equipment for concrete demolition tasks as an alternative to traditional mechanical methods of concrete demolition. Using HP/UHP Water Jetting for these tasks allows for more efficient and effective and safer services when compared to the other typical concrete breaking techniques. The systems also produce a better surface for concrete repair and protective coatings.

ACID PLANTS

SULPHURIC ACID PLANT SERVICES

DGC AFRICA has significant experience in the provision of sulphuric acid plant maintenance and shutdown services; including upgrades, repairs and preventative maintenance on sulphuric acid plants.

The range of services includes tower inspections, element replacement and repair, packing installation and removal, distributor repair and replacement, catalyst handling, acid tank cleaning and neutralization.

DGC AFRICA's scope of acid plant maintenance and shutdown services include:

ACID TOWER

- Welding repairs to tube sheet
- Removal and installation of new tube sheet
- Installation of raised flanges on tube sheet
- Removal and replacement of drip ring
- Fabrication of mist eliminator drain pipes
- Remove and replace hanger rods
- Remove and replace acid distribution
- Replace alloy feed pipes
- Vacuum ceramic packing and reload with new ceramic packing
- Remove and replace grid blocks and partition rings
- Remove and replace alludar beams
- Inspect & clean the gas inlet duct, tower bottom, acid outlet strainer clean or replace
- Remove and replace thimbles on acid nozzles
- Remove and replace acid nozzles
- Remove and replace MONDI piping
- Welding on acid towers Carbon steel, SX, Zecor internal
- Remove and replace ducts
- Acid & Sulfate neutralization
- Storage tank cleaning & neutralization
- Clean and inspect pump tanks

CONVERTER SERVICE

- Screening Catalyst (dust free)
- Gravity loading catalyst (dust free)
- Converter inspections & repairs
- Remove and replace grates & support posts
- Remove and replace screens
- Sampling of catalyst as per customer request
- Remove and replace man ways
- Welding repairs
- High temperature catalyst screening & reloading

HEAT EXCHANGERS (BOILERS)

- High temperature exchanger testing and plugging of tubes
- Sulfate cleaning
- Mechanical tube cleaning
- Vacuum test tubes
- Ultrasonic tube testing
- Remove and replace man ways
- Install and expand tube sleeves

INDUSTRIAL LININGS

DGC AFRICA provides a wide range of world-class Industrial Linings to the mining, metals smelting, mineral processing and refining industries internationally.

The company specialises in the supply and application of an extensive range of corrosion protection, acid resistant coatings and brick lining systems, through to wear and abrasion resistant solutions; offering superior protection for our clients' assets against corrosion, chemical and wear attacks. The company aims to reduce corrosion and deterioration related downtime and maintenance by provision of stringent specifications, high quality standards, exceptional workmanship and relentless inspections.

DGC AFRICA only applies coatings, linings and wear resistant solutions that have proven successful in various application environments within the Mining, Agricultural, Chemical, Petrochemical, Pulp & Paper, Food & Beverage, Building & Construction, Marine, Waste-Water and Power Generation along with many other industries.

The company offers solutions with products that are technically supported and manufactured to ISO 9001 standards. We provide cost effective solutions to industries throughout the African continent. **DGC AFRICA** has the required resources, as well as the global partnerships, to offer the complete range of Corrosion, Acid, Wear & Abrasion resistant solutions to all sectors of industry, irrespective of project size or difficulty.

The company supplies and applies a comprehensive range of products including:

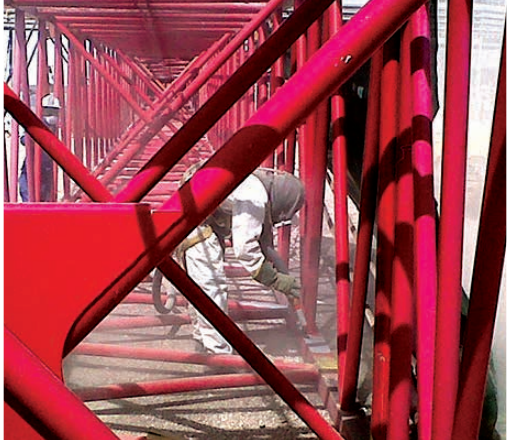
Specialist Polyurethanes
Epoxies, including Novolac & Phenolic Resins
Organic & Inorganic Zinc Coatings
Glass-Flake Reinforced Coatings
Vinyl Ester & Polyester Resins
Acid Resistant Bricks, Cements, Mortars & Grouts
Carbon Bricks, Tiles, Shapes & Sleeves
Concrete Repair Epoxies and Mortars
Fibreglass Reinforced Plastic (FRP) Systems
Wear & Abrasion Protection Solutions

DGC AFRICA's Industrial Linings comprise of the following:

CORROSION PROTECTION / ACID PROOFING / INSTALLATIONS & INSPECTIONS QUALITY / MAINTENANCE / FIBREGLASS REINFORCED PLASTIC (FRP) SYSTEMS

CORROSION PROTECTION

DGC AFRICA only specifies and utilises the best suited solution, whether it be a single, duplex or triplex system. Epoxy, Polyurethane, Alkaline or Zinc-Rich coating systems are specified in accordance with ISO 12944-5 which will ensure that the required corrosion protection requirements are met, regardless of the environmental conditions. The company offers solutions covering the entire environment corrosion spectrum from C1 to CX as described in ISO 12944-5.


The company has a range of Acid Proofing and Corrosion Protection Lining systems from Epoxy Novolac FRP Lining systems, resin screeds up to 9mm thickness and Acid Tiles and Bricks from 15, 25, 38, 51, 65 & 76mm thick. Ensuring the concrete and steel tanks are protected against corrosion to extend the life expectancy of the structure. Suitable for Precious Metal Refineries, Fertilizer plants, Acid plants, Paper Mills, Chemical Processing Plants and any area exposed to chemicals.

We also offer various aliphatic colour options that will provide protection of the specified system when exposed to extreme UV conditions.

DGC AFRICA understands the importance of a well prepared and applied lining system due to the submerged conditions the lining will be exposed to. Surface preparation is vital to ensure optimum coating performance and adhesion.

The company will prepare and install the best suited lining system for corrosion protection against acidic or alkaline chemicals, effluent or just plain potable water even when exposed to elevated temperatures.

ACID PROOFING

ACID PROOFING

Acid corrosion can be a catastrophic type of failure. Prior to the installation of high-performance acid resistant systems, **DGC AFRICA** will ensure that the substrate is sufficiently prepared and cleaned, especially if there was previous exposure to acids; such incidents leave acid salt deposits on the substrate. **DGC AFRICA** will also undertake any concrete rehabilitation work to ensure that any damaged or spalled concrete is structurally sound prior to any acid proofing installations.

Depending on the specific requirements dictated by the site; such as chemical concentrations, temperature and exposure, **DGC AFRICA** will specify and install either a high performance chemical resistant liquid applied glass flake reinforced epoxy, vinyl ester or polyester system, or acid resistant bricks and mortar.

INSTALLATION & INSPECTIONS QUALITY ASSURANCE

After the manufacturing of high-quality coating systems, the final variable in the product's usefulness is the application. Careful and proper application is key to the success of any coating. There are three vital elements to effective coating protections, the material, surface preparation and the application. The purpose of coating application is to develop a highly adherent continuous protective layer of material over the substrate in a relatively constant and even thickness.

DGC AFRICA utilises the best possible method of application to achieve not only the best finish, but also the most accurate and consistent film formation based on the selected material and accessibility. The company also monitors environmental conditions before and during all applications to ensure that no external climatic conditions can influence the curing or performance of the coating system being applied.

MAINTENANCE

Coating systems are the first line of defence in the protection of structures and tanks. The upkeep of coating and lining systems are therefore vitally important to ensure adequate protection over their intended life span. Effective inspection during the life of a coating can extend its useful life numerous times by introducing coating maintenance and repair before major coating failures occur.

DGC AFRICA offers a complete preventative maintenance program, consisting of the following key strategies:

- **Site inspection and evaluation**
- **Condition monitoring**
- **Compile report and recommendations**
- **Generating maintenance works procedure**
- **Conduct pre-qualification tests to prove methodology & compatibility with existing coating systems**
- **Carry out necessary repair work to reinstate the protective coating layer**
- **Quality assurance measurements**

FIBREGLASS REINFORCED PLASTIC (FRP) SYSTEMS

DGC AFRICA manufacturers the complete range of FRP products including; piping & spooling, tanks & vessels, ducting, scrubbers, stacks & chimney liners as well as specialty and customer engineered products. Industries served include – mining & metals, chemical & petrochemical, oil & gas, pulp & paper, power & flue gas desulphurization.

Fibreglass Reinforced Plastic (FRP) is a composite material made of a polymer matrix reinforced with fibres, usually glass fibres.

The polymer provides excellent chemical resistance while the fibres provide the structural integrity. Depending of the resin type and the glass to resin type and the glass to resin ratio the material properties for individual structural layer can be optimised for corrosion resistance and physical strength.

APPLICATIONS

PIPING & SPOOLING - Fibreglass Reinforced Plastic (FRP) piping systems for corrosive applications have been used widespread within industry for more than 50 years. FRP piping has superior corrosion resistance when compared to metallic piping and can be more economical than the stainless, titanium and high nickel alloy alternatives. That is why industries such as Pulp & Paper, Mining, Chemical Processing, Water, Power & FGD have successfully chosen to utilise FRP piping in their process systems.

TANKS & VESSELS - Fibreglass reinforced plastic (FRP) tanks and vessels, including the auxiliary components can be fabricated in virtually any shape or configuration, demonstrating the flexibility inherent with FRP composites. FRP tanks are your environmentally safe answer to processing and storing corrosive gases and liquids, whether below or above ground. Tanks, vessels and scrubbers can be designed to handle a wide variety of dynamic, hydrostatic loads and chemical environments. Such processing systems also find use as absorbers, de-misters, air strippers and bleach towers.

DUCTING - Fiberglass Reinforced Plastic (FRP) Ductwork is your answer to conveying critical fumes within your facility. FRP duct systems have a long history in industries such as Power, FGD, Metals and Mining, Pulp & Paper, Chemical Processing and Odour Control.

SCRUBBERS - Industrial scrubbers/absorbers, shells and vessel internals have been manufactured using FRP for many years due to the corrosion resistance and dependability of Fiberglass Reinforced Plastic. FRP scrubbers and scrubber components have been used in a wide range of industries to include Power & FGD, Metals & Mining, Chemical Processing, Cement, Water Remediation and Odour Control. With proper material selection, FRP can provide long term corrosion resistance and low maintenance costs in applications where carbon steel, stainless steel, duplex stainless steel, coatings, linings are simply not a long-term solution. FRP material is also a more economical solution to high-nickel content alloys in scrubber environments containing elevated chloride concentrations or wet acids.

STACKS & CHIMNEY LINERS - Industries such as Pulp & Paper, Metals & Mining, Chemical Processing and Power & FGD successfully utilise FRP Stacks in process systems in which FRP has superior corrosion resistance. Compared to metallic stacks or where FRP is more economical than the stainless, titanium and high nickel alloy alternatives. Speciality & Custom Engineered Products - Fiberglass Reinforced Plastic composites naturally lend itself to unique customer requirements which do not lend themselves to standard designs, existing tooling or standard manufacturing practices.

SPECIALITY & CUSTOM ENGINEERED PRODUCTS - Fiberglass Reinforced Plastic composites naturally lend itself to unique customer requirements which do not lend themselves to standard designs, existing tooling or standard manufacturing practices.

WEAR AND ABRASION PROTECTION SOLUTIONS

DGC AFRICA's comprehensive range of industrial linings includes international leaders, Kalenborn International's wear protection solutions. Kalenborn established 100 years ago, provides protection for the environmental and heavy industries with wear-resistant linings which have excellent abrasion and impact resistance.

Kalenborn has a global network of subsidiaries around the world - Germany, USA, Canada, Brazil, France, Poland, Hungry, Singapore, Philippines, Vietnam and exclusive representation throughout sub-Saharan Africa by **DGC AFRICA.**

The company provides custom design, manufacture, delivery, and installation of its materials to meet customers' specific abrasion, impact and corrosion problems. This applies in particular to industrial plants handling raw material processing as well as, transport, storage including the processing of ores, sand, slag, coal, or recycled materials.

Kalenborn has a rich tradition characterized by competence and experience as well as durable, quality products. Our wear protection solutions protect industrial plants and equipment reliably against wear due to abrasion and impact. In steelworks and cement plants, in coal-fired power plants and recycling plants, in mining, and in environmental technology, our solutions keep production operations running.

EFFECTIVE WEAR PROTECTION IN A COMPLETE PACKAGE

From the development of our materials to the lining of pipes, plants, and equipment, we offer a complete range of products and services, all from a single source. In so doing, the quality and durability of our products stand above all else. As experts, we begin with the production of our materials. We know the raw materials and the manufacturing processes. That comprehensive expertise enables us to ensure the quality characteristics of our products at all times.

MINERAL FROM NATURAL BASALT TO FUSED CAST BASALT

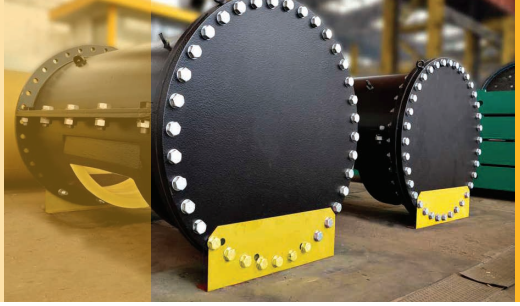
In the early 1920s, Kalenborn's fused cast basalt works successfully produced a wear-resistant material made of basalt for the first time ever – a material now known the world over under the brand name ABRESIST. Today modern furnaces, in which the rock is smelted at 1,250 °C, are the heart of the production operations. The liquid basalt is cast in moulds and subsequently heat treated in a special process in order to give the material its crystalline structure. That makes the rock especially hard and strong. Along with very good protection against wear, ABRESIST also provides an anti-friction surface.

CERAMIC FROM MINERAL TO CERAMICS KALOCER

Is a high-alumina ceramic compressed in a mould and fired at high temperatures. It is suitable for applications subject to extreme wear and temperatures of up to 1,000°C. KALCOR zirconium corundum is particularly well-suited for use in castings. In the form of plates, mosaics, moulded parts, and hollow cylinders, our ceramic materials are installed in a wide range of plant components such as pipelines, cyclones, sifters, and chutes. This ensures the reliable production of energy, raw materials, and other important products we all use in our everyday life.

METALLIC FROM SCRAP TO HARD METAL

For especially harsh operating conditions, we have developed special hard casting alloys – such as KALCAST, for example. Alloy components such as chromium and carbon ensure especially high hardness and abrasion resistance, whilst manganese provides impact strength. In our foundry, we produce cylinders, pipe bends and moulded parts weighing from 30 to 3,000 kg. Our KALMETALL material, from which we manufacture components that can weigh as much as several tons, consists of steel plates armoured with special hard metal alloys. It exceeds the service life of common steel several times over.



COMPOUND FROM HARD MATERIAL TO COMPOUND

Our hard compounds combine excellent wear protection properties with ease of use. KALCRET has especially wear-resistant hard materials such as bauxite or corundum permanently embedded in it. Its special advantage lies in its versatility. Our employees apply the material with a trowel or spray it on to create an extremely wide variety of precise components. KALPOXY is an epoxy resin-bonded compound, which can be used quickly and effectively in the seamless lining of plant and equipment components and for repairs. The material can be used in chemically aggressive environments.

PLASTIC FROM POLYMER TO ENGINEERING PLASTIC

Plates made from thermoplastic form the basis of our material KALEN. They offer corrosion-free, anti-friction wear protection in bunkers, silos, chutes, and troughs. With its especially low weight and operating temperature of up to 80°C, KALEN has proven effective all over the world for decades. It is installed on concrete or steel by means of a mounting system, which we developed specifically for this purpose. KALEA is a high-performance thermoset and is applied extremely rapidly in a thin, seamless layer by means of Kalenborn spray technology. The material features outstanding wear resistance under very high impact loading and an operating temperature of up to 120°C.


WEAR-RESISTANT MATERIALS

We produce our wear-resistant materials in our own plants and ensure their quality through material testing in our laboratories in order to find just the right solution for each customer requirement.

One of the prerequisites for effective wear protection is also a professional installation, which our employees carry out with special adhesives and fasteners.

ABRESIST fused cast basalt reliably prevents abrasive wear in plant components such as scale flumes, marl hoppers, fly ash pipelines in coal-fired power plants, and coke bunkers in the iron and steel industry. The cast ceramic material KALCOR has proven effective for lining plant components that are subject not only to extremely harsh abrasion but also to high temperatures, for example in chutes for hot sinter or clinker, in asphalt mixers and hot gas pipelines. KALOCER high-alumina ceramics are available in thin, smooth molded elements and are particularly well-suited for lining conveyor belt transfer points, concrete mixers, or cyclones in the food industry.

For the high impact wear typically found in components such as bunker inlets, spiral chutes, and crushers, we recommend metallic materials such as the armoured plates made of KALMETALL and KALCAST hard casting. The hard compound KALCRET combines easy handling with excellent wear protection properties under high-temperature loading. To line large surfaces – such as those of separators on a cement mill or of blast furnace dust catchers in an integrated steel mill – the material can be applied without joints using a trowel or sprayed on. Within 48 hours, the plant is ready for operation again.

Very different requirements arise under operating conditions that demand especially good anti-friction properties, e.g., in silos and bunkers. Such applications use not only KALEN, as a thermoplastic material with ideal anti-friction properties, but also the mineral material KALCERAM. They prevent the material which is being conveyed from building up, thereby ensuring uninterrupted material flow. For rapidly applying a thin, jointless coating to large surfaces or pipes, Kalenborn offers KALEA, a sprayable material with its own application technology.

WEAR-RESISTANT PIPE SYSTEMS

Pipes, elbows, or pipe fittings are lined with materials to make them wear-resistant. Hydraulic and pneumatic pipe systems often have to withstand extremely harsh conditions. Conveying abrasive materials such as ash, sand, or sinter dust pipelines to acute levels of stress. The right wear protection ensures the continuity of the production process.

To protect pipelines against wear, we have developed a standard that uses strong linings to extend the service life of the stressed components. The smooth surfaces of the materials promote good flow characteristics. This reduces pressure losses and lowers energy costs. In pneumatic pipelines, lining the most heavily stressed points, such as elbows, branches, or transitions, is often enough to achieve the required protection.

Moreover, we offer an intelligent system for monitoring wear protection. It reports the end of the material's service life in advance and warns the operator early about the impending failure of a pipeline. That prevents environmental pollution and hazardous operating conditions.

ENGINEERING

MECHANICAL ENGINEERING SERVICES

DGC has since 1928 significant experience in providing services asset integrity management and industrial services to the mining, metals smelting and mineral processing industries.

DGC AFRICA provides a comprehensive range of specialised mechanical engineering services including; mechanical project management, engineering, fabrication and construction.

Our company's services include the following:

Greenfield and Brownfield Mechanical Projects
Project Commissioning
Engineering Services
Structural Streel Fabrication, Erection & Cladding
Furnace Shell Fabrication, Erection & Repairs
Ducting Fabrication and Erection
Launders Fabrication and Erection
Boiler Installations
Electrostatic Precipitator Installations
Utilities Piping; Fabrication, Installation, Welding and Final Testing
Chimney Fabrication and Erection
Mechanical Project Management
Mechanical Equipment Installations and Removals including; Pumps, ID & FD Fans, Blowers, Primary & Secondary Crushers, Mills, Overhead Cranes, Drag Chain Conveyors and Conveyor Belts.
Mechanical Repairs on Convertor Furnaces, Anode Furnaces, Anode Handling Facilities, Casting Wheels, Pumps, Fans, Primary & Secondary Crushers, Overhead Cranes, Drag Chain Conveyors, Conveyor Belts and associated equipment.

DGC AFRICA's focuses on the following engineering services:

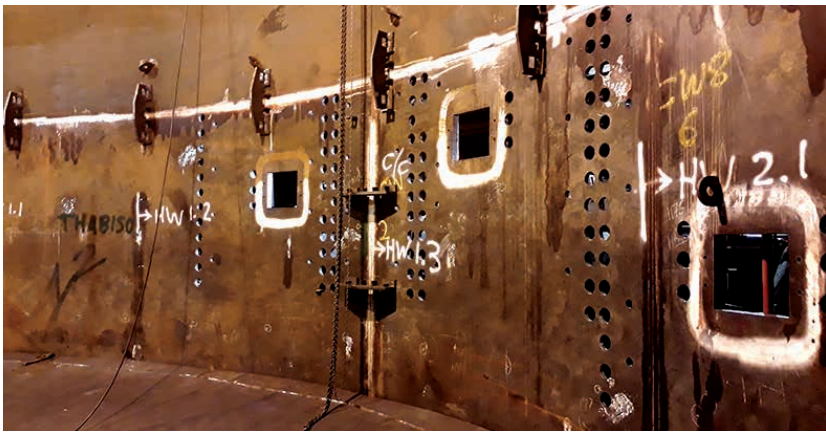
FURNACE MECHANICAL PROJECTS / FABRICATION & WELDING / ROTARY KILN & VESSEL SERVICES / ON-SITE MACHINING SERVICES / CONVEYOR MAINTENANCE SERVICES

FURNACE MECHANICAL PROJECTS

DGC AFRICA has been extensively involved in a number of mechanical construction and shutdown projects for industrial furnaces within the mining, metal smelting, mineral processing, and heavy industrial sectors.

The company also benefits from DGC's extensive experience in the furnace industry; spanning over 90 years of taking part in numerous successful Greenfield and Brownfield furnace projects around the globe.

Our furnace mechanical projects may be offered in combination with other services within the group, often with furnace demolition services, offering clients the benefit of turnkey solutions with highly effective interactive synergies and the benefits of having a single contractor responsible for project execution.



FURNACES & ASSOCIATED EQUIPMENT

DGC AFRICA ensures adequate planning, strict supervision, and meticulous continuous monitoring of critical tasks throughout the duration of Furnace Mechanical Projects.

The company's routine services include:

- Aligning furnace support structures: ensuring they comply with design integrity.
- Installation of grillage or bottom crucible: ensuring that sections are level & adequately packed to avoid warping during
- operations within allowable tolerances.
- Installation of furnace upper crucibles and copper cooling blocks: ensuring that these are installed with accurate orientations, placement elevations are intolerance, diameters are within specification, continuous shell alignment, inspections & joint analysis during construction.
- Performing mechanical upgrades or structural modifications to updated designs according to client requirements.

FABRICATION AND WELDING

FABRICATION & WELDING

PLANT INSTALLATIONS UPGRADES & RELOCATIONS

DGC AFRICA has been extensively involved in a number of plant mechanical projects for new installations, upgrades, and relocations of existing plants in various industries. We have both the capacity to fabricate install new and upgrade existing plants and structures both efficiently and safely.

SPECIALISED WELDING FERROUS & NON-FERROUS

The company offers specialised welding services for a wide range of materials including Copper, Brass, Stainless steel, and all forms of Carbon steel. We have the ability to perform a variety of different welding disciplines, from MiG, Tig, SMAW, and FCAW. DGC AFRICA also adheres to all unique requirements and procedures that may be required by clients.

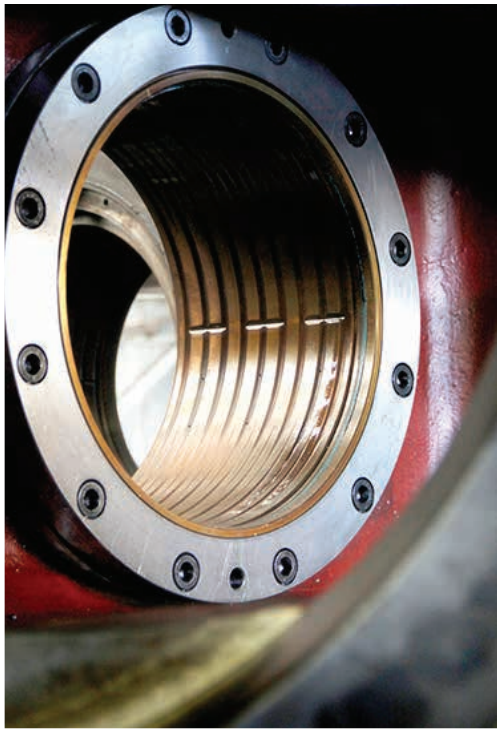
STRUCTURAL REPAIRS & REPLACEMENTS

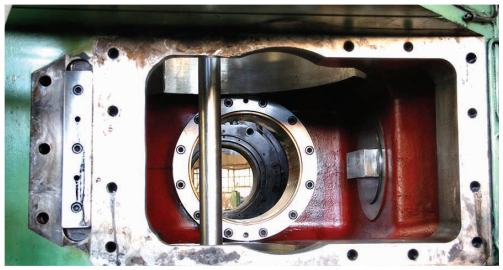
Asset integrity is directly linked to the productivity of a plant. Down time due to compromised structural integrity leads to many additional costs to restrict or mitigate risks while trying to keep plants running safely. **We offer the client an option of for repairs in-situ or explore alternates to reduce lead times and provide viable solutions to limit down time on production.**

ONSITE MACHINING & REPLACEMENTS

DGC AFRICA provides a range of onsite/in-situ solutions as part of several innovative engineering solutions the company offers to clients in various industries. The onsite/in-situ machining solutions make use of highly specialised portable precision machinery; alleviating the need for stripping, rigging, and transporting items from their site positions. This translates to substantial savings and significant reductions in downtown for customers.

Our experienced technicians are able to work to very close tolerances and provide the necessary precision and finishes required. We also have capabilities to solve unique site-based machining problems by applying redesigning techniques or manufacturing machinery or components to suit clients' individual needs.





ONSITE MILLING

Our onsite in-situ milling equipment and expertise allow us to perform a **range of services like milling of base plates, sealing surfaces, grooves, sole plates, key slots, heat exchanger divider plates, etc.**

ONSITE JOURNAL & KEYWAY CUTTING

Our Onsite Journal and Keyway Cutting services are employed to remedy damaged or worn shafts using in-situ machining. The damages may include loss of circularity, burrs, damaged key-ways or the need for completely new keyways.

The Journal Cutting Services generally involve machining of the outside diameter of a shaft to bring it within desired tolerances of circularity and surface finish. This can be done in situ on shafts from an outside diameter of 50mm up to 500 mm and for up to a length of 1 metre.

ONSITE LINE BORING

DGC AFRICA provides a portable solution to accurately repair shaft coupling holes without having to dismantle damaged fixed machinery or to remove damaged surface mobile equipment from clients' sites. This can be done with an extremely high degree of precision in the fraction of the time compared to removing equipment from site for repairs. Thus, resulting in the reduction of equipment downtime.

KILN ALIGNMENT

HOT KILN ALIGNMENT

The majority of problems associated with rotary kilns and vessels can be attributed to misalignment. As such, comprehensive hot kiln alignment significantly contributes towards rotary kilns' and vessels' ability to achieve maximum efficiency throughout their service life, whilst eliminating unforeseen breakdowns.

DGC AFRICA's Hot Kiln Alignment Services in association with our Routine Inspection Services are tailored to increase plant availability, reduce maintenance related costs and provide more optimal plant efficiency. Some of the consequences of not timeously doing routine or planned alignment are summarised below:

- Plant operating outside optimal conditions
- Excessive and unnecessary forces on the vessel/kiln shell
- Metal fatigue and cracking of tyre and shell
- Deformation of vessel/kiln
- Excessive stress on tyres and rollers
- Undue wear on tyres and rollers
- Unnecessary loads on the drive mechanism
- Damage to end seals
- Premature bearing failure
- Frequent premature failure on the refractory lining

DGC AFRICA has established a strategic alliance with GEOSERVEX (Poland), for the past 40 years the world leaders in the development and implementation of the technology of kiln alignment in dynamic conditions (during normal operation). Geoservex are pioneers of the hot kiln alignment method and worldwide leader of this service in the global market.

Kiln alignment has to be carried out during the normal operation of the kiln in order to obtain the most realistic information and data on the condition of the kiln without disturbing the clinker production. As a part of a preventative maintenance, kiln alignment identifies the actual cause of problems and provides recommendations for appropriate solutions.

Our alignment approach is based on advanced measuring techniques and customised hardware and software. It is evaluated by experienced alignment specialists. Based on our experience and considering major root causes to all kiln failures, our alignment method aims to improve and ensures kiln availability by optimization of Kiln Axis, Kiln Shel Ovality, Kiln Crank and Kiln Axial Balance.

SUPERVISION AND TROUBLESHOOTING SERVICES

DGC AFRICA is well placed with specialists who can deal with most of the key mining, cement, steel and fertiliser plant's rotary kilns and rotating vessels.

We can provide technical guidance and assistance for troubleshooting, overhaul, repair, maintenance and operation of ATOX VRM, Grate Coolers, Kiln and Ball Mills.

If you have a problem in your kiln, mill, high vibrations in mill / kill drive, problem in grate coolers, or would like to undertake mechanical repairs during your shutdown, you may consult us and employ our trouble-free supervision services.

FIELD SERVICES

We offer Machining, Repair and or Modification services in respect to machinery used in a range of industries such as Earthmoving, Mining, Marine, Transport and Agricultural Machinery and Systems including:

- Modern Line Boring machines capable of welding and boring in the field and available at short notice supplied with or without an operator.
- Flange facing options include Ring Type Joint and Raised Face Flanges for a large range of sizes supplied with or without an operator.
- Pipe cutting and bevelling machines are simple to operate and available in multiple sizes to suit your specific circumstances supplied with or without an operator.
- Portable Shaft Lathes give the ability to repair damaged shafts on heavy equipment in the field to minimise both down time and costs.
- Either gantry [3 axis] or linear [2 axis] style milling machines available to suit your circumstances supplied with or without an operator. Suitable for resurfacing of Motor and Pump Bases, Machine Track Pads, and many other machine surfaces including vertical or inclined faces. We also offer onsite welding of pads to enable machining back to original specifications.
- Tyre & roller grinding helps maintain surface contact minimising wear and power usage.

RESURFACING OF TYRE & SUPPORTING ROLLERS

DGC AFRICA provides Resurfacing of Tyre & Supporting Rollers (RTAR) services for all our esteemed rotary kiln and rotary vessel customers. We have specifically designed machines to accommodate and suitable for various OEMs of rotating vessels including different dimensions of tyre and rollers. All work is completed by experienced **DGC AFRICA** Grinding specialists.

When **DGC AFRICA** conduct in-situ grinding of tyre and support rollers, no kiln downtime is needed and our company employs internationally trained grinding engineers to undertake the work. Our grinding engineers constantly monitor axial thrust and bearing temperature throughout the grinding process, carrying out roller adjustments where required to stabilize axial movement and temperature.

Our company utilises state-of-the-art portable belt grinding SM 400 Kiln Tyre Grinding Machine and SMF 1000 Kiln Rollers Grinding Machine, from Vetroresina Engineering Development S.r.l. Italy, which are built for heavy duty applications.

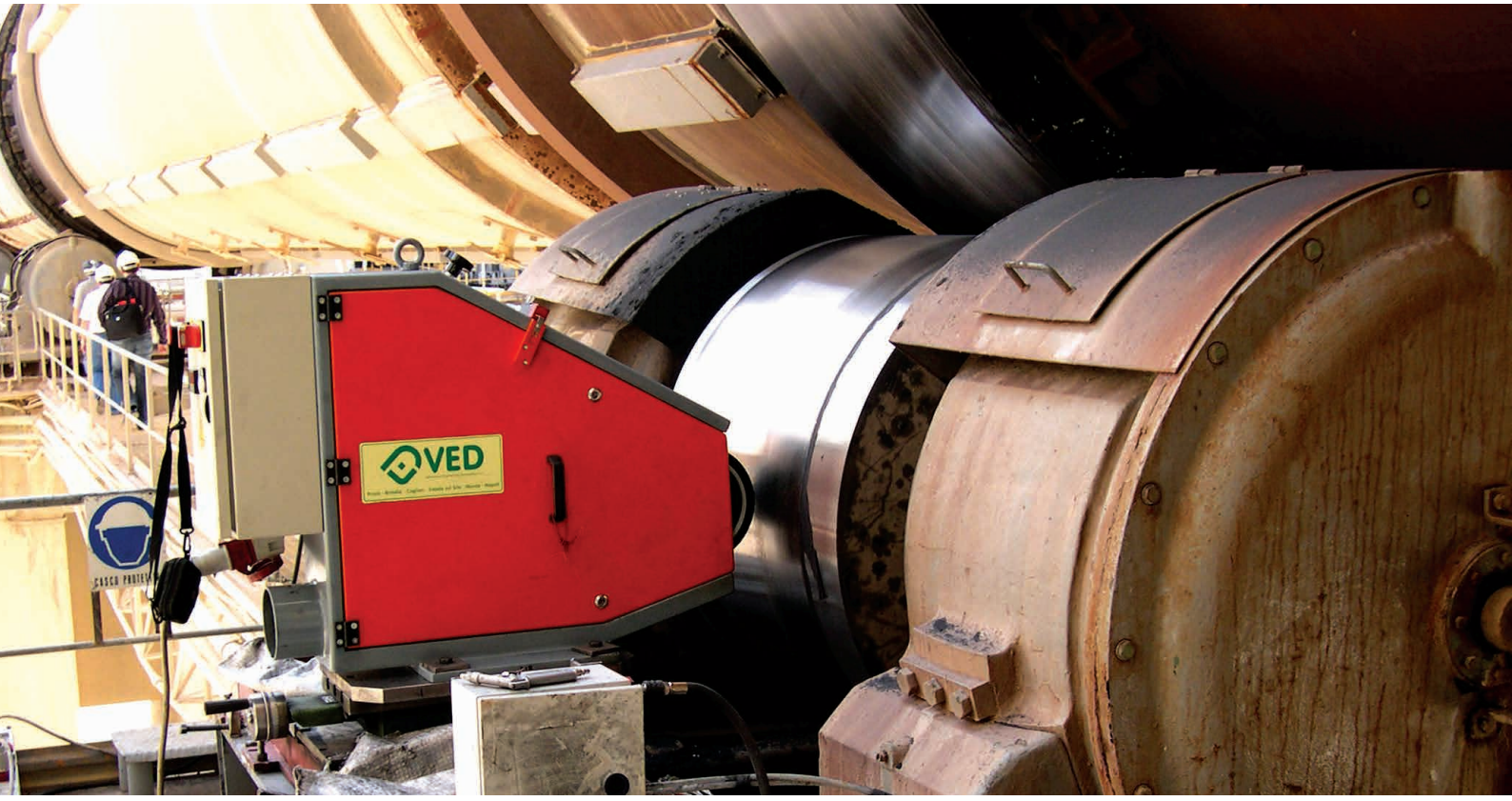
CAPITAL REPAIR PROJECTS

DGC AFRICA delivers a production focused approach to Capital Repair Projects where we can perform any type of maintenance, repair or installation services in the shortest possible safe completion times and to OEM standards.

We have an experienced field service team to assist with your company's scheduled or emergency maintenance shutdown in order to limit production loss. We can perform any type of maintenance, repair or installation services to process equipment.

BALL MILL SERVICES

DGC AFRICA in conjunction with GEOSERVEX are well experienced in various design of OEM makes ball mills in order to evaluate the condition of ball mill. An inspection to be executed by our Mill specialists with in-depth knowledge of complete mill components for ensuring optimal, trouble-free operation.



PARTS & EQUIPMENT

At some point, regardless of how well your kiln has been maintained throughout its life, expensive parts like girth gear, rollers, kiln shell sections, etc. will need to be replaced or repaired. We help you find the most cost-effective solution and scheduling to perform the works.

We can supply new machinery and equipment or spare parts to suit your existing machinery including;

- New Kilns, Calciners, Dryers or Coolers
- Replacement Kiln Tyres & Shell Sections
- New Mills & Mill Parts
- Kiln Seal Assemblies or Parts
- Trunnion Rollers & Bearings
- Girth Gears & Pinions & Associated Parts
- Slew Bearings & Specialised Bearing
- Gearboxes & Parts
- Mining Machinery

CONVEYOR MAINTENANCE SERVICES

DGC AFRICA offers comprehensive installation and conveyor maintenance services to all our customers. An integral part of our conveyor belt maintenance service is carrying out inspections and making recommendations for preventative maintenance measures that help minimize the risk of breakdowns.

We offer conveyer belt service packages to ensure that you optimize the working time of your conveyors so that your production can run non-stop if necessary. In this way, we can help you to achieve the best possible operational lifetime out of your conveyor belts.

CONVEYOR BELT INSPECTIONS & DIAGNOSTICS

As part of the conveyor belt maintenance service, we will carry out inspections and make recommendations for preventative maintenance to help minimize the risk of further breakdowns.

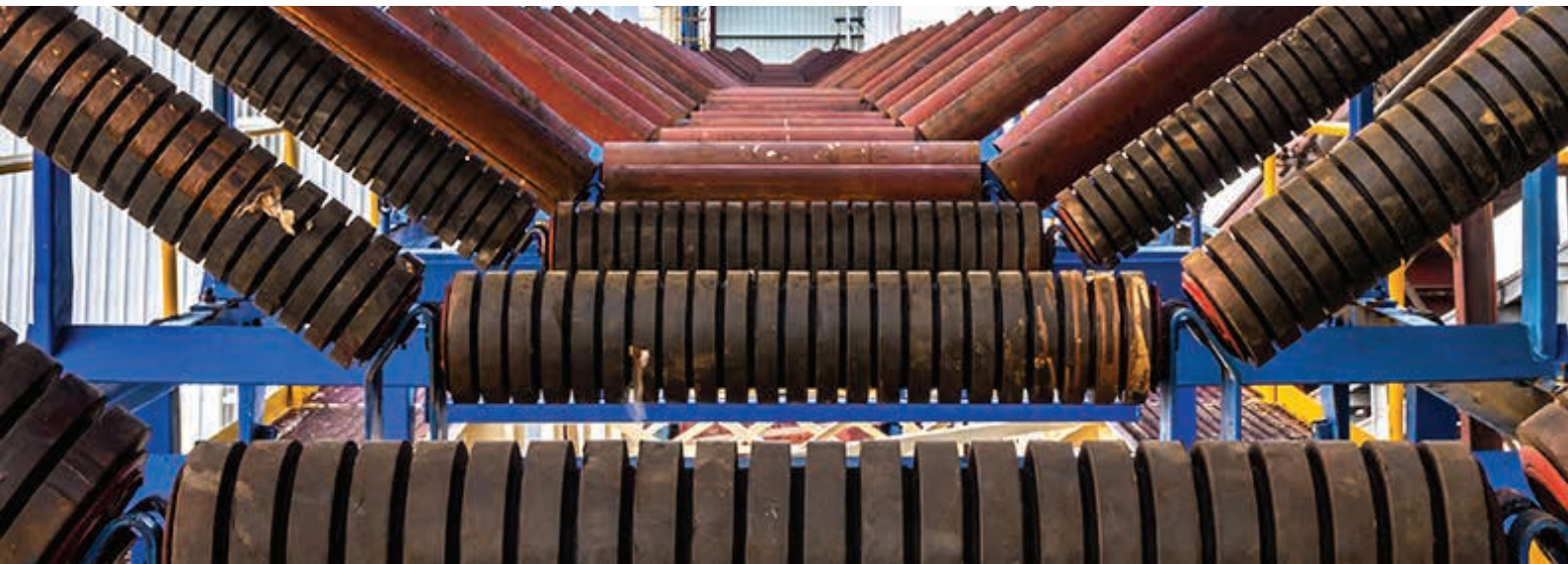
To ensure continuous monitoring of your belt and on-spot damage detection, we can provide you with belt diagnostics systems. Thanks to this new technology, the system will detect a problem before it becomes serious. In this way, a small timely repair can help to avoid a much bigger repair or even the loss of an entire conveyor belt and all of the costs associated with a major stoppage.

CONVEYOR BELT SPLICING

DGC AFRICA provides conveyor belt splicing services. Conveyor belt splicing is a cost-effective solution for all mining sectors, aiming to keep conveyors running smoothly. Our conveyor belt splicing process accelerates the mining industry with a solution for breakdowns of conveyor belts, as well as repairs. Our aim is to provide you with a stable belt splicing, making it ideal for moving various materials across the conveyor. Furthermore, we do quality control checks on all essential components.

Conveyor belt splicing is the process of joining two pieces of a conveyor belt. Usually, this is done to either elongate the original conveyor belt or to repair a torn or damaged one. Conveyor systems are employed in various industries, meaning that there are many types of conveyor belts and components.

To properly splice a belt, we ensure that the type of belt, speed of conveyor belt system, materials traveling on the belt and conveyor belt environment are considered. If a splice is not done properly, the integrity of the belt, and the entire conveyor system is compromised.



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