



Kerneos Acts as a Responsible Enterprise



As an expert manufacturer of binders, specialty Kerneos develops products for its customers to incorporate into their solutions. Our innovations protect municipal sewage systems, extend the useful life of structures in the refractory industry, help businesses in the construction sector to increase sustainability, and improve both the competitiveness and performance of our clients' products. Kerneos is truly a partner of excellence.

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SOLUTIONS

EXCELLENT SPECIALTY BINDERS

EDITORIAL



We are a 1500-strong, mid-sized business with more than 100 years of pioneering experience in the field of high-performance binders – but our primary motivation is our desire to be a pioneer for the future.

With products and services already marketed in more than 100 different countries, we are world leaders in our field. Some of our binders have proven performance for more than 25 years — but what excites us most is our next invention!

We are present in China, the United States, Europe, and Africa – our 20 subsidiaries strategically located around the world help us to work even more closely with our customers, because we know that's the best way to develop tomorrow's solutions.

Recognized experts in our field, we always keep a close eye on the indicators that tell us how well we're doing in terms of quality and performance, because these are the foundations of our business we are

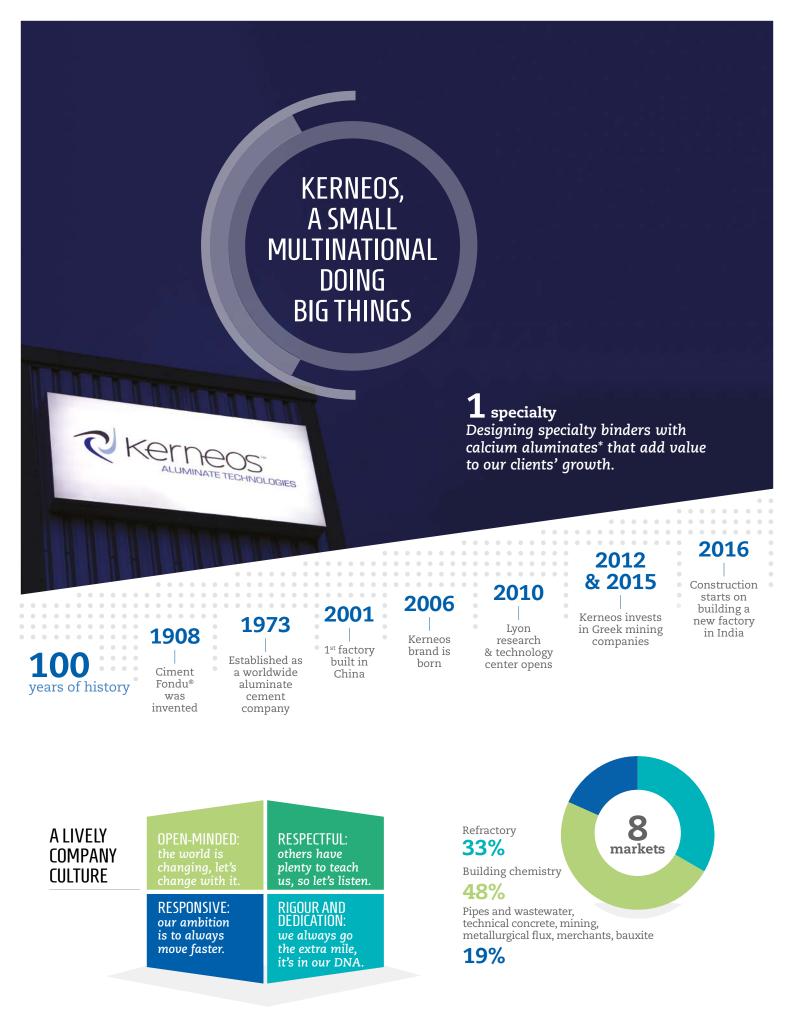
truly passionate about. Today, we want to progress even further, inspired by the demands of corporate, social and environmental responsibility.

Kerneos very much believes in Corporate Social Responsibility (CSR). It is an area in which we constantly strive for excellence. It runs through our strategy and company culture, guiding our everyday activities, from eco-design to green logistics and helping the local community.

In 2014, we introduced KARE, a program designed to advance our strategy for corporate and social responsibility. We have joined the United Nations Global Compact and written our own Code of Conduct. Here is our first report on the progress we have made, with and for all our stakeholders.

Kerneos is proud to be a company that cares

Jean-Marc BIANCHI Chief Exective Officer, Kerneos



*Calcium aluminates are obtained by means of a high temperature reaction between lime (from limestone) and alumina (contained in natural minerals such as bauxite).





33% generated in emerging markets

10% generated by new products



ISO 9001 Worldwide

in innovation, all **11** production sites, and marketing



20 countries, International relevance



2 advanced research centers in France and China



development centers located close to our clients



WE'VE SET OUR COURSE

Our six ambitions based on exchanges with the various stakeholders – complete with performance indicators and targets for 2018 – cover all our areas of responsibility as an employer, manufacturer, partner and leader.

Our CEO's vision Clients KARE Partners Clients Local government & authorities Shareholders

AMBITION 1PUTTING PEOPLE FIRST: LET'S WORK TOGETHER

AMBITION 2SAFETY: ZERO ACCIDENTS IS OUR CHOICE

AMBITION 3
TO HAVE AN INDUSTRIAL FOOTPRINT
WE CAN BE PROUD OF

AMBITION 4
TO BUILD THE FUTURE WITH OUR CLIENTS

AMBITION 5TO BE EXEMPLARY FROM START TO FINISH

AMBITION 6
FULLY SUSTAINABLE INNOVATION

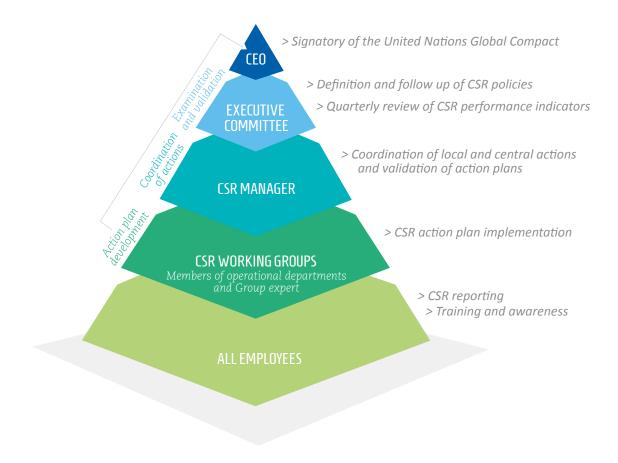


We introduced the KARE program 3 years ago and today we are proud to present the results. It isn't 100% perfect yet, of course, but we've definitely made progress. This report marks the first stage and encourages us to progress further. It recognises that we've really committed to CSR as everyone's responsibility and everybody's gain.

WE'VE MADE OUR PLEDGES

We respect the ten principles of the Global Compact, which concern human rights, labor standards, the environment and the battle against corruption. Our employees must comply with the strict ethical regulations in our Code of Conduct, and the same applies to suppliers and subcontractors, who must sign up to a specific Charter.

AND WE'VE SET UP THE ORGANIZATIONAL STRUCTURE TO ASSURE THEIR IMPLEMENTATION





PUTTING PEOPLE FIRST: LET'S WORK TOGETHER

OUR EMPLOYEES ARE OUR MOST VALUABLE RESOURCE AND OUR PRIMARY COMMITMENT: TOGETHER, THE MEN AND WOMEN WHO WORK FOR KERNEOS ARE BUILDING THE COMPANY'S FUTURE.

WE BELIEVE IN A COLLECTIVE APPROACH (COLLABORATION), HONESTY AND INTEGRITY,
AND ACHIEVING SUCCESS TOGETHER IN A FRIENDLY WORKING ENVIRONMENT.

AND IT WORKS! - AS ILLUSTRATED BY OUR LOW STAFF TURNOVER.

% of employees benefiting from training each year



INTEGRATION = ENRICHMENT

Diversity: of professional skills, career paths, and cultures. At Kerneos we believe in learning from our differences. We adapt what we do to better meet local needs. Chinese in China, Indian in India, experts wherever we are.



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Kerneos gave me a solid grounding in calcium aluminates, in both theory and practice. It was a fantastic experience, immersing myself in a new language and culture in a harmonious and extremely open environment.

22 different nationalities

23% of managers are women

average age 42

average number of years of service:

10

LISTENING AND RESPECT

Mutual trust is in our DNA, and we are small enough to make it possible at every level. A participatory approach, constant dialogue and proactive communication all help to build a climate of trust. For example, whenever Jean-Marc Bianchi visits one of our sites, he talks about our strategy, investment projects, and shares information with total transparency.

4,6% of employee turnover rate (excl. retirement leave)

SHARING SKILLS

The aim of our training courses, whether 'on campus' or via distance-learning, is to share our skills, our passion for the profession, and the high standards of expertise. It is also the priority of our worldwide professional community.

FOCUS: Kerneos campuses, first introduced in 2011, are international events. In 2017, the Sales and Marketing Campus took place in China, and everyone who has direct customer contact (sales staff and technical developers), from all over the world, went to Tianjin (south-east of Peking) to learn how to enhance the promotion of our products and services offering.

SHARING



Lalam Krishnama, from Pudi village, handles the preparation of the tea.

Kerneos helps support communities living near its sites.

Example in India: the factory currently under construction in Vizag provides work for local villagers, from producing drinking water to making tea! The Calcutta sales office sponsors schooling for children from poorer backgrounds. Here's what the manager of the Calcutta shelter has to say: "Your (sic Kerneos) determined generosity is making these children's dreams come true. It's interesting to see how much their parents want to know if they are doing well at school. You are a light shining in the darkness, giving encouragement to us all."

hours
of education and
training dispensed
per employee in 2016

90% of employees have attended a course on our Code of Conduct

85% of managers have been introduced to our KARE policy



SAFETY: ZERO ACCIDENTS IS OUR CHOICE

PREVENTING ALL ACCIDENTS IS THE ULTIMATE OBJECTIVE, AND ONE THAT FOCUSES OUR ATTENTION AT EVERY LEVEL, IN EVERY ASPECT OF OUR BUSINESS, ON EVERY SITE AND IN EVERY MOVE WE MAKE, NO MATTER HOW TRIVIAL IT MAY SEEM. KERNEOS IS DEVELOPING A SAFETY CULTURE WHERE FAR FROM BEING AN OBLIGATION, IS A PROACTIVE CHOICE. THE PROSAFE PROGRAM INITIATIVE REINFORCES THIS COMMITMENT - WHERE SAFETY IS NO LONGER JUST AN OBLIGATION, IT IS OUR CHOICE.

SELECTION OF CONCRETE ACTIONS.

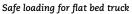
Progress on security awareness
Bradley curve



PHYSICAL SAFFTY - IN PICTURES

Safe access to roof







Grinding media being loaded into the mill



RECOGNISING THE BEST



Winner of the UK Safety Champion initiative 2016

Since 2014, our West Thurrock factory in the United Kingdom has been selecting a "Safety Champion of the Month" and a "Safety Champion of the Year" from the safety ideas and the nearmisses reported. 2016 Safety Champions Rob Drake and Tony Madge recognised that one of the furnaces posed a risk of electrocution and devised a solution. "We did it primarily to improve safety, but it's nice to be rewarded too! We can do even more and are working on communicating better and sharing best practice".

Meirion Webber, Health & Safety manager at the site, agreed: "Traditionally in safety we are good at telling people off when they do something wrong, but to build the positive safety culture we want, we have to remember to say thank you too!".

Sustainable Solutions is a company recognized worldwide for its excellence and expertise. Two major changes occurred between the initial diagnosis and the results reported in 2016: clear progress has been made in terms of safety maturity at the sites audited and there has been a reduction in the differences between sites, which means that there has been a significant improvement where performance was previously weaker.

FOCUS: In 2013, with the support of DuPont, Kerneos launched the Prosafe program. DuPont





It's worked really well. These 3 years have seen radical changes. Management has really taken the initiative, and the implementation of a structured safety organization and training courses have done the rest. The number of accidents has fallen and our maturity level has gone up. Employees are now leading this issue, and safety has become a key driver for operational discipline and management communication. The key to their success has been achieving a balance between on-site actions and support from head office. Kerneos has embarked on a positive, lasting safety dynamic.

5,000 days without Lost Time Accidentst at our Chinese plant in Teda

85%
of employees worldwide
undertook at least
5 hours' safety
training in 2016

GETTING OUR SUBCONTRACTORS ON BOARD

By introducing subcontractor management standards we have reduced the number of accidents involving them by a third over the past two years.

Frequency rate evolution 2012 - 2016



- FR2 Accident frequency rate with and without lost time
- FR1 Accident frequency rate with lost time



TO HAVE AN INDUSTRIAL FOOTPRINT WE CAN BE PROUD OF

KERNEOS SEES WORKING FOR THE ENVIRONMENT AS A SOURCE OF PROGRESS RATHER THAN A CONSTRAINT. IT GIVES US AN OPPORTUNITY TO INNOVATE, FINDING ALTERNATIVE ENERGY SOURCES AND INCREASING COMPETITIVENESS WHILST CUTTING COSTS, ALL THE WHILE INCREASING THE APPEAL OF OUR BRANDS, BY BEING EXEMPLARY IN THIS RESPECT. THERE ARE THREE ASPECTS TO OUR ENVIRONMENTAL POLICY: CONSUME LESS, EMIT LESS, RECYCLE MORE.

WORLDWIDE DEMONSTRATION.

Energy consumed per ton of product in 2013-2016



CASE STUDY: CHINA

Kerneos is supporting Chinese efforts to reduce emissions by making improvements to each of its key environmental indicators. In Zhengzhou, our biggest Chinese site, we have made energy savings of 10% per ton. We are achieving better control of air emissions at all our sites in China by optimizing processes, improving installation reliability and using carefully selected raw materials, such as low-sulfur coal. In addition, treatment installations at the Teda site have resulted in a 50% reduction in NOx emissions.



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In 2015, China introduced new legislation concerning cement industry air emissions. To meet these requirements, in 2016, Kerneos China invested nearly €1.2 million on a flue gas treatment project at the Tianjin factory. Measurements taken on site complied with the standards, and there was even a margin left for further developments in the standards. It's the first installation in the Chinese cement industry to meet the very highest standard, and our responsible initiative has been praised by the local authorities.

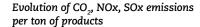
€4.6M

invested worldwide in emission-reducing technologies 2014 - 2016



CREATIVE RESOURCES

Kerneos' industrial process uses little water and generates very little waste, thanks to an internal recycling system, but resource conservation is nevertheless one of our targeted objectives, and the Group is keen to use secondary raw materials and combustibles (e.g. recycled fuel), without affecting product quality or emitting additional pollutants to the atmosphere. The percentage of recycled materials varies according to the site and the process used, but in 2016 the average was 13%.





BIODIVERSITY: KERNEOS IN GREECE



As part of Kerneos' environmental policy, Elmin Bauxites has introduced a rigorous rehabilitation program for its bauxite mines. The program has 5 phases: soil reconstitution, refertilization, fencing, reforestation (250 plants/1000 sq m) and the management and restoration of a productive ecosystem.

To ensure biodiversity, Elmin Bauxites has a nursery producing 30,000 to 50,000 plants from 22 different species every year. 1 or 2 square kilometers of land are thus rehabilitated annually.



13% average rate of recycled raw materials

95,300
m² of rehabilitated soil and more than
27,000
plants planted in 2016



TO BUILD THE FUTURE WITH OUR CLIENTS

SEWAGE SYSTEMS, BUILDING AND MINING – EVERY MARKET HAS ITS OWN PARTICULAR ISSUES REGARDING COMPETITIVENESS, REGULATIONS AND SOCIAL RESPONSIBILITY. KERNEOS IS KEEN TO DEMONSTRATE HOW THE ENVIRONMENTAL ADDED VALUE OFFER THROUGH ITS PRODUCTS CAN ASSIST CUSTOMERS ACHIEVE THEIR OWN CSR GOALS.

A WORD FROM OUR CLIENTS.

CSR Performance Indicator as evaluated by Ecovadis at the request of our clients





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CSR is an integral part of the Saint-Gobain strategy, permeating every department, from R&D to marketing, as well as our factories. Our vision for a sustainable workplace is part of everything we do and eco-innovation is in our DNA. As formulators, we want to know everything about our raw materials and we choose the ones that minimise the environmental impact. Our clients need such products if they are to achieve certification, but they are not prepared to pay for this eco-friendly advantage. The role of a market leader is to educate the market, so it's up to us to explain the effects of climate change and increasing worldwide urbanization, and the importance of quality of life on our planet.

FROM PARIS TO SYDNEY



The world is gradually realizing that water is in short supply, and, in some countries, waste water volumes have fallen significantly. A case in point is the Paris region, where a 20% reduction has been recorded in 20 years. This distinct trend has resulted in a problem with hydrogen sulfide (H2S) corrosion attacking civil engineering structures all over the world. Kerneos has a solution: SewperCoat, which has been on the market for 25 years. In 2010, Sydney Water (Australia) began using it instead of epoxy based materials, which had a tendency to deteriorate prematurely. They are very glad they did! According to François Saucier, Wastewater and Technical Concrete Business Unit Director, "Aluminate technology is beginning to establish a reputation in the waste water sector, and we have now achieved critical mass with respect to credibility, so that large cities know they can choose us with total confidence."



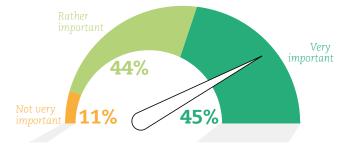
RR

In 2014, an inspection of the Paris region's oldest sewer, which had been in operation since 1924 without any major renovation being carried out, showed changes in the integrity of the structure due to extremely severe biogenic attack. After an extensive search to find the best solution, we selected Kerneos SewperCoat. Experts at the IFSTTAR research laboratory, one of SIAAP's partners, tested SewperCoat and reported favorably. This was followed by a week-long study trip to North America, where we met organizations that had been using the product for 17 years and were able to check their level of satisfaction. We then issued a call for tenders and every single response used aluminate solutions. That is how Kerneos came to be the supplier of this important test site: 160 people worked on it for 4 months, their main job being to apply the product to a 4.5 km priority area, covering a total of 24,000 sq m. In 2019 we will be checking performance and durability, and then, if all is satisfactory, we shall begin a second program of work.



FROM POLICIES TO ACTION

Eco-solutions don't always come cheap. Is the added value of CSR something that can be sold? In 2012, the answer to this question was no, CSR was a corporate matter. By 2016, things had changed significantly. Take the case of Saint-Gobain. "Working with large groups that have powerful Sustainable Development policies forces us to reinvent ourselves," says Laurent Torres, Construction Market Manager and Marketing Director.



Satisfaction survey: sustainable development, a priority issue for our customers



TO BE EXEMPLARY FROM START TO FINISH

THE RISK ASSOCIATED WITH MANAGEMENT OF MATERIALS AS THEY PASS THROUGH AND OUR PROCESSED IN OUR FACTORIES ARE MANY AND VARIED. KERNEOS MAPS THEM FROM THE MATERIALS' ORIGINS THROUGH TO DELIVERY OF THE FINAL PRODUCTS, USING A RANGE OF TOOLS (SUPPLIERS & SUBCONTRACTORS CHARTER, TRAINING, VISITS, AUDITS, ETC.)

Measuring the impact of our transport everywhere



FROM THE MINE...

In 2012, in order to guarantee quality and quantity of raw materials, Kerneos acquired bauxite mines in Greece. In China, one of our other sources of supply, the material originates from spot deposits, which means that supplies may not be guaranteed long term.

Kerneos pays special attention to risks that might arise with its suppliers. The suppliers with the highest vulnerability are identified through a risk-mapping exercise based on site discussions, inspections, and, if it considers that a risk is particularly significant, a risk audit, conducted by an outside agency. When selecting suppliers, Kerneos follows the responsibility criteria set out in its Suppliers & Subcontractors Charter and specific safety criteria for on-site interventions. A risk awareness training program for buyers was introduced in 2016.

30%
of the most
critical suppliers
to our European
factories have
signed the
Suppliers and
Subcontractors
Charter



3 QUESTIONS FOR Pierre Billaud, geologist

Kerneos has been organizing inspections of its suppliers' mines for over 20 years, and for over 8 years now geologist Pierre Billaud has conducted them on behalf of the company. Whether it's in France, China or Greece, a surface or underground mine or a processing facility, Pierre inspects them all.

What exactly is your task?

I check that the mine operator can deliver the quantities of bauxite that have been ordered, in compliance with Kerneos' specifications and deadlines. I look at dust suppression, extraction and processing techniques, human and material resources, and the operator's financial capacity. I analyze all the administrative documents (operating permits, safety certificates, etc.) and geological, mining and environmental reports. Since Kerneos began to prioritize safety and working conditions, I have been looking at them more closely, and have sometimes cancelled a visit if I felt that safety conditions were not satisfactory.

What kind of welcome do you get?

Deposits come in all different sizes, and one single operator might have numerous extraction sites covering several square kilometers, so inspections can take quite a long time, one or more days in fact. It is really important to listen to what the owners and technical managers have to say and discuss it with them. Some organize very detailed inspections, while others are more reticent, but as a rule operators are happy to cooperate once they understand Kerneos' objectives.

So tell us about China.

Mining regulations are very strict but not always respected. As a result, the authorities are making more and more inspections to check that they are applied and stop people operating illegally. The Chinese authorities are becoming increasingly severe on safety issues. If there is a fatal accident, the mine can be closed for several months and the operators may go to jail. Workers all have personal safety equipment. I've never seen a child in any of the bauxite mines I've visited in China. In late 2016, I tested out Kerneos' maintenance guide with respect to the environment, labor law, and corruption. Chinese operators adhere to it once you explain what it is we're trying to do.

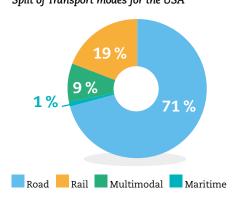
...TO THE VERY LAST MILE

At the other end of the chain, Kerneos is looking for ways to reduce the impact of its logistics. We are currently rolling out our TMS (Transport Management System), which calculates the distance travelled to make deliveries to each of our clients. Our teams carry out logistics analyses at our clients' request, to find the most suitable means of transport. In China, cement from the Teda factory travels to the main depots by boat. In the United States, 28% of deliveries are multimodal. In Europe, customers prefer bulk deliveries by truck as this makes the best use of haulage capacity which in turn means fewer trips. In 2016, 13% of deliveries in Europe were multimodal (sea, rail, road), which meant the CO₂ emissions factor per ton-kilometer was reduced by around 40%.





Split of Transport modes for the USA





FULLY SUSTAINABLE INNOVATION

WE WON'T INNOVATE WITHOUT PROVEN SUSTAINABILITY. AT KERNEOS, CSR IS LEADING IN R&D, AND ECO-DESIGN IS UP AND RUNNING. IT'S ALL ABOUT DOING MORE WITH LESS, AND MAKING SURE THAT WHAT WE DO IS BETTER FOR THE ENVIRONMENT. THIS IS NO QUICK FIX – IT'S A LONG-TERM UNDERTAKING, A WAY FOR KERNEOS TO ALIGN ITSELF WITH THE PUBLIC MOOD AND DO ITS BIT.

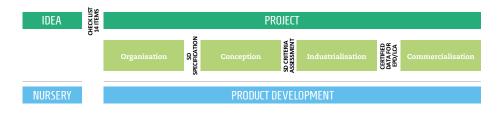
PROFUSION OF INITIATIVES.

% of R&D projects involved in the eco-design strategy in Europe



ECO-DESIGN: ONE STEP AT A TIME

Eco-design is involved in every stage of product development.



14 CRITERIA FOR SUSTAINABLE INNOVATION

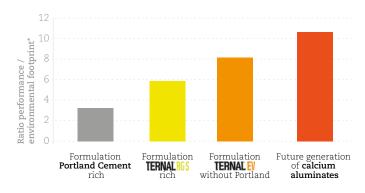
The Eco-design approach is based on 14 criteria that go beyond just environmental concerns, helping to establish sustainable production methods.

Critères		TERNAL EV	FONDAG
1	Raw materials		
2	Supply chain	+	+
3	Packaging		
4	Environmental footprint		
5	Logistic		
6	Storage		
7	Ease-to-use	+	
8	Dust and emissions in use		
9	Classification (CLP)		
10	In use properties	++	+++
11	Service life		
12	Recycling		
13	New market opportunity		
14	Long lasting offer	+	+

THE FUTURE OF BUILDING CHEMISTRY

E-technology reduces the proportion of cement used in our clients' product formulations, and their environmental footprint can be reduced by 30%. The next generation of aluminates will go one step further, offering concentrated performance that therefore requires much lower doses. Such products are the result of advanced eco-design, and are currently being piloted by some of our clients.

Study case = solution for self-leveling underlayment



^{*}Compressive strength after 24h / ${\rm CO_2}$ emissions

1ST ADVANTAGE FOR CUSTOMERS

The EPD document (environmental product declaration) provides information about the environmental profile of a product, from the extraction of raw materials to end of life. This data lets the client assess the environmental footprint of its product range based on calcium aluminates and comply with sustainable building standard.



FONDAG: THE SUSTAINABLE TECHNICAL CONCRETE



This 100% aluminate concrete for the steel industry stands up to intense heat and abrasion. It costs 20 times as much per square metre as ordinary concrete but is nevertheless great value, as it lasts 10 years rather than 3 months. Kerneos is the market leader for this product.

EXCELLENT SPECIALTY BINDERS

Kerneos solutions are inherently environmentally friendly. Being made from minerals, they have an optimal in-use footprint, which helps clients to reduce the impact of their formulas. They make it easier to renovate rather than construct new buildings, which in turn preserves resources, square meters, and even whole landscapes, thereby improving the quality of our lives and habitat.



Refractory

SECAR® - Range of cements and binders suitable for a wide range of refractory concrete applications and temperatures New: CMA72, an alumina and magnesium based binder



Building Chemistry

TERNAL® - Calcium aluminate cements that meet the requirements of formulators of innovative new building materials with respect to consistency, color and reactivity



Merchants and craftsmen

CIMENT FONDU® - Multi-purpose cement partner to craftsmen for more than one hundred year



Technical Concrete

CIMENT FONDU®, ALAG®, FONDAG® - Binders, synthetic aggregates and concretes for demanding civil engineering projects requiring short turnaround times



Mines

FONDUMINE, MINEXPRESS, ETC.- Special binders, grouts and concretes developed to meet the needs of the mining industry according to geological conditions and location.



Pipes and Wastewater

CALCOAT®, SEWPERCOAT® - Abrasion - and corrosion-resistant cements and mortars to extend a system's service-life



Metallurgical Flux

LDSF®, OPTIMET® - Calcium aluminate fluxes to improve steel quality and productivity in the secondary metallurgy sector



Bauxites

ELMIN BAUXITES provides bauxite mainly for 6 applications: Metallurgical Alumina, Calcium Aluminate Cements, Iron & Steel making, Portland Cements, Mineral Fibers and Abrasives





CREATING STAR PRODUCTS FOR MORE THAN 25 YEARS

A LONGER SERVICE LIFE IN EXTREME CONDITIONS





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