

KRONOS®

Sustainability Report 2015/2016



KRONOS 2017

SUSTAINABILITY REPORT 2015/2016

Index

3 A statement from our COO

4 About this report

6 KRONOS at a glance

6 Key figures

12 Our locations

20 Products and services

23 How we do business

24 Our management approach

26 Our commitment

26 Safety first!

28 A sustainable solution to our energy demands

30 KRONOS ecochem

31 The voice of our customers

34 Photoactive pigments

35 GRI-Index

A statement from our *Chief Operating Officer Jim Buch*

The year 2016 marked a momentous anniversary for KRONOS – our 100th year. Throughout our history, KRONOS has been committed to the safety of our employees, environmental stewardship and social responsibility. We take these commitments very seriously.

With our One KRONOS initiative starting in 2016, KRONOS has begun an even greater focus on combining the many attributes of our global locations and workforce to ensure quality, consistency and excellence in everything we do. All of our production sites have health, safety and environmental policies in effect to ensure protection of employees and contractors, as well as neighbors in the communities in which we operate.

KRONOS is meticulous in the manufacture of products for use in the food and pharmaceutical applications to meet food safety regulations for the health and safety of consumers.

At KRONOS we recognize that sustainable actions are essential elements of our future success, and are therefore committed to sustainable development. We set strategic and operational goals to continually improve the quality, energy performance and safety of our plants. KRONOS has implemented technology to reduce its energy usage, and supports the purchase of energy efficient products and services. We have taken steps to reduce our environmental footprint, including developing methods to reduce waste materials and pollution. KRONOS is a Responsible Care® company.



We have a zero tolerance policy toward bribery and corruption, and we strive to demonstrate honesty and fairness in all our business activities. KRONOS respects the rights and dignity of all persons with whom we deal. In particular, we are committed to aligning our operations and strategies with the universally accepted principles followed by the UN Global Compact and the provisions of the UN Universal Declaration of Human Rights.

Through our One KRONOS initiative, we are united behind a set of guiding principles and global processes that will enable KRONOS to continue to flourish, and we are committed to maintaining a culture of continuous improvement. We remain diligent in our continuing efforts to ensure our sustainability, and are grateful for the efforts of our employees across the globe.

About this report

While KRONOS has followed sustainable principles for years, this report is the first sustainability report published by KRONOS. The report is published in response to increasing interest and awareness in sustainability topics by our customers and other stakeholders to document our approach to sustainability. This report was published in accordance with Global Reporting Initiative (GRI) G4 Sustainability Reporting Guidelines at the “Core” level. The GRI-Index, cross referenced to information provided in this report, can be found on page 35. This is an internally generated report covering years 2015 and 2016.

In applying GRI principles to define the content of our report, we focused on the issues material to KRONOS, which represent our impact on the economy, the environment and society.

Using the GRI list of material aspects, KRONOS identified those significant to our sustainability. In collaboration with our department for Safety, Health and Environment, we identified representatives of our senior management responsible for these aspects of our business. With their input, we further narrowed our focus to aspects that have a significant impact on our stakeholders, and collected the disclosures, indicators and data summarized in this report.



Aspects Material to KRONOS

	<i>Descriptions</i>	<i>Stakeholders (inside KRONOS)</i>	<i>Stakeholders (outside KRONOS)</i>
Social/Labor: Occupational Health and Safety	Safe working conditions for our employees are of utmost importance to KRONOS	All employees	Authorities and customers
Social/Human Rights: Non-discrimination	Providing a favorable working atmosphere helps our employees to be productive	All employees	Societies
Environmental: Energy	Like all producers of titanium dioxide, KRONOS consumes large amounts of energy	Shareholders and management	Societies and local communities
Social/Products: Customer Health and Safety	Our customers are a very important stakeholder group. KRONOS provides excellent service and information about safe use of its products	Management	Customers
Environmental: Supplier Environmental Assessment	The environment is important to KRONOS, therefore we review our suppliers for their environmental footprint	Management	Suppliers, customers, societies and local communities
Social/Labor: Supplier Assessment for Labor Practices	To ensure fair and legal labor practices, KRONOS reviews our suppliers against specific criteria	Management	Suppliers, customers, societies and local communities
Social/Society: Supplier Assessment for Impacts on Society	Sustainability over the whole value chain is essential to us, therefore we review our suppliers carefully	Management	Suppliers, customers, societies and local communities
Social/Human Rights: Supplier Human Rights Assessment	Similar to labor practices, KRONOS is also engaged to ensure that our suppliers respect human rights	Management	Suppliers, customers, societies and local communities



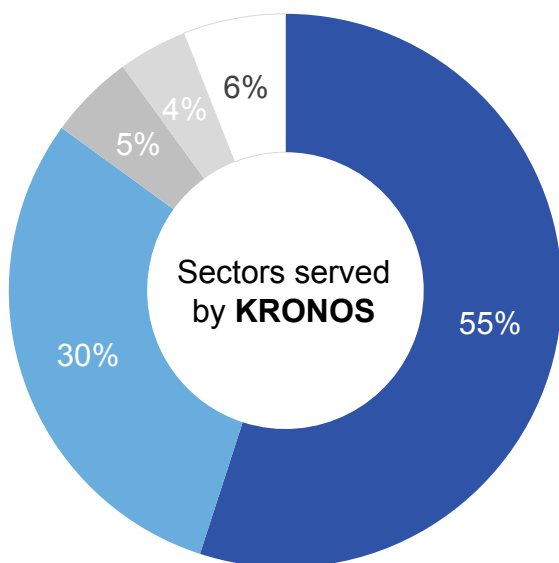
KRONOS at a glance

Key figures



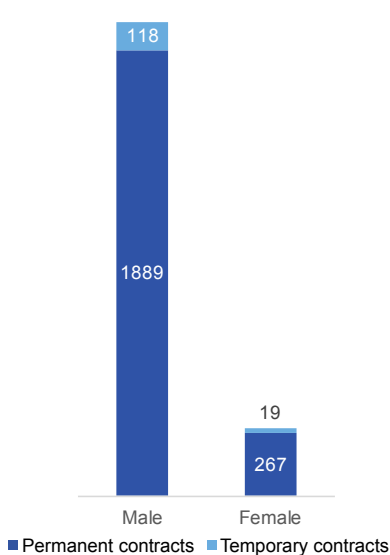
In 2015 we sold **525,000 mt** of titanium dioxide

In 2016 we sold **559,000 mt** of titanium dioxide

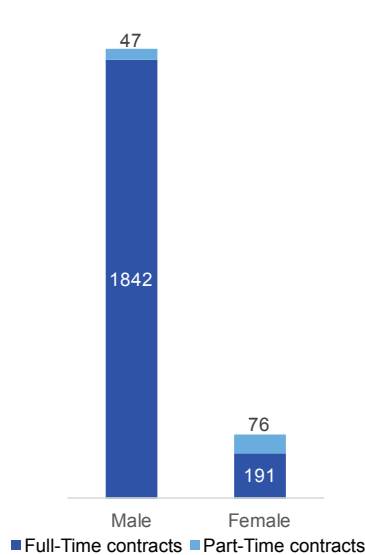


We sell our products in **131** countries

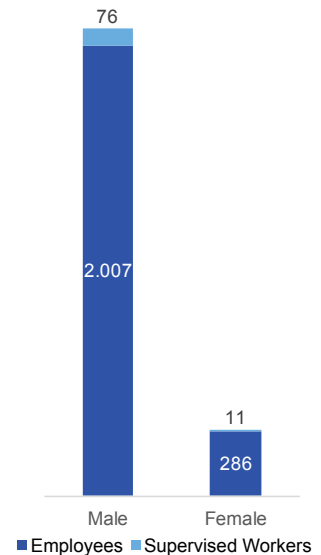
■ Coatings ■ Plastics ■ Paper ■ Inks ■ Others



Employees by employment contract and gender

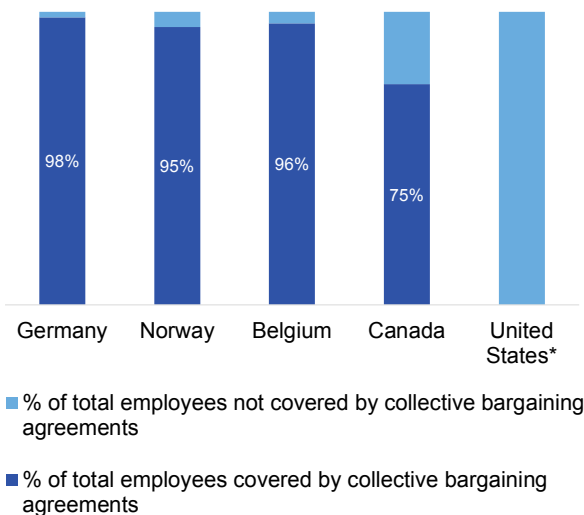


Permanent employees by employment type and gender



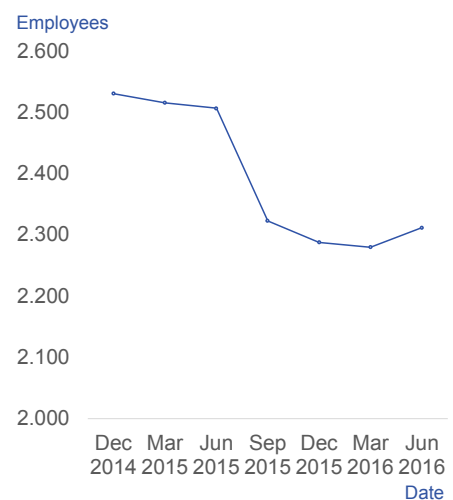
Workforce by employees, supervised workers and by gender

Three percent of all employees at KRONOS are legally recognized as self-employed or are employed as contractors



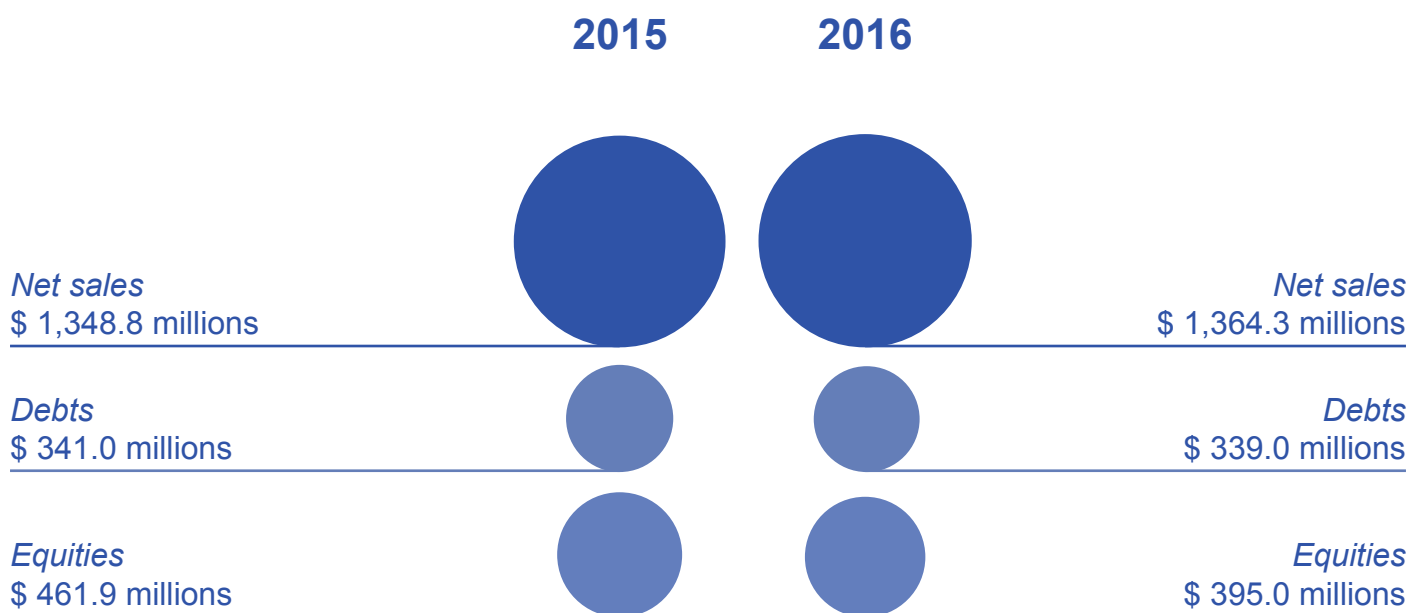
91% of all KRONOS employees are represented by collective bargaining agreements. Unions and worker councils hold significance, especially in our European facilities, where we work together to maintain and improve working conditions.

In 2015, we initiated a strategic restructuring plan designed to improve our long-term cost structure. The plan involved implementation of a voluntary leave program. The program served to align our manpower requirements with future business sustainability initiatives, which includes efficient use of resources across the company.



*Does not include the workforce of the Lake Charles, US joint venture.

Scale of the organization (financially)



Entities included in the 2016 annual financial report

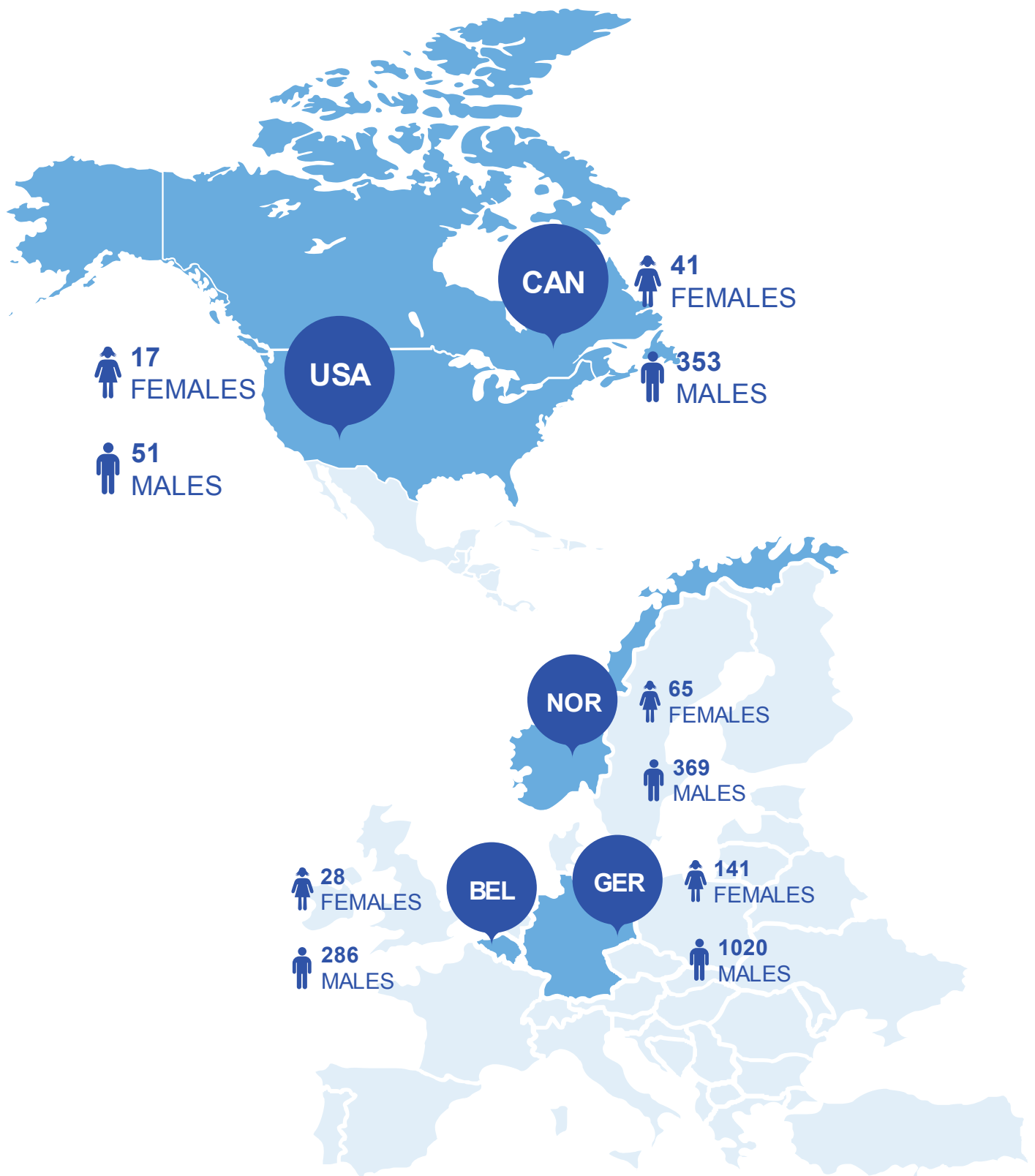
Entity	Country	Share
KRONOS Canada, Inc.	Canada	100%
KRONOS International, Inc.	USA & Germany	100%
KRONOS Titan GmbH	Germany	100%
Société Industrielle du Titane, S. A.	France	99%
KRONOS Limited	United Kingdom	100%
KRONOS Denmark ApS	Denmark	100%
KRONOS Europe S.A./N.V.	Belgium	100%
KRONOS B.V.	Netherlands	100%
KRONOS Norge A/S	Norway	100%
KRONOS Titan A/S	Norway	100%
Titania A/S	Norway	100%
Elkania DA	Norway	50%
KRONOS Louisiana, Inc.	USA	100%
KRONOS (US), Inc.	USA	100%
Louisiana Pigment Company, L.P.	USA	50%
KRONOS Worldwide, Inc.	USA	100%



All entities listed above are included in the Sustainability report.
Our annual reports can be found on our website.

www.kronostio2.com/en/investor-relations/financial-reports

KRONOS workforce by countries*

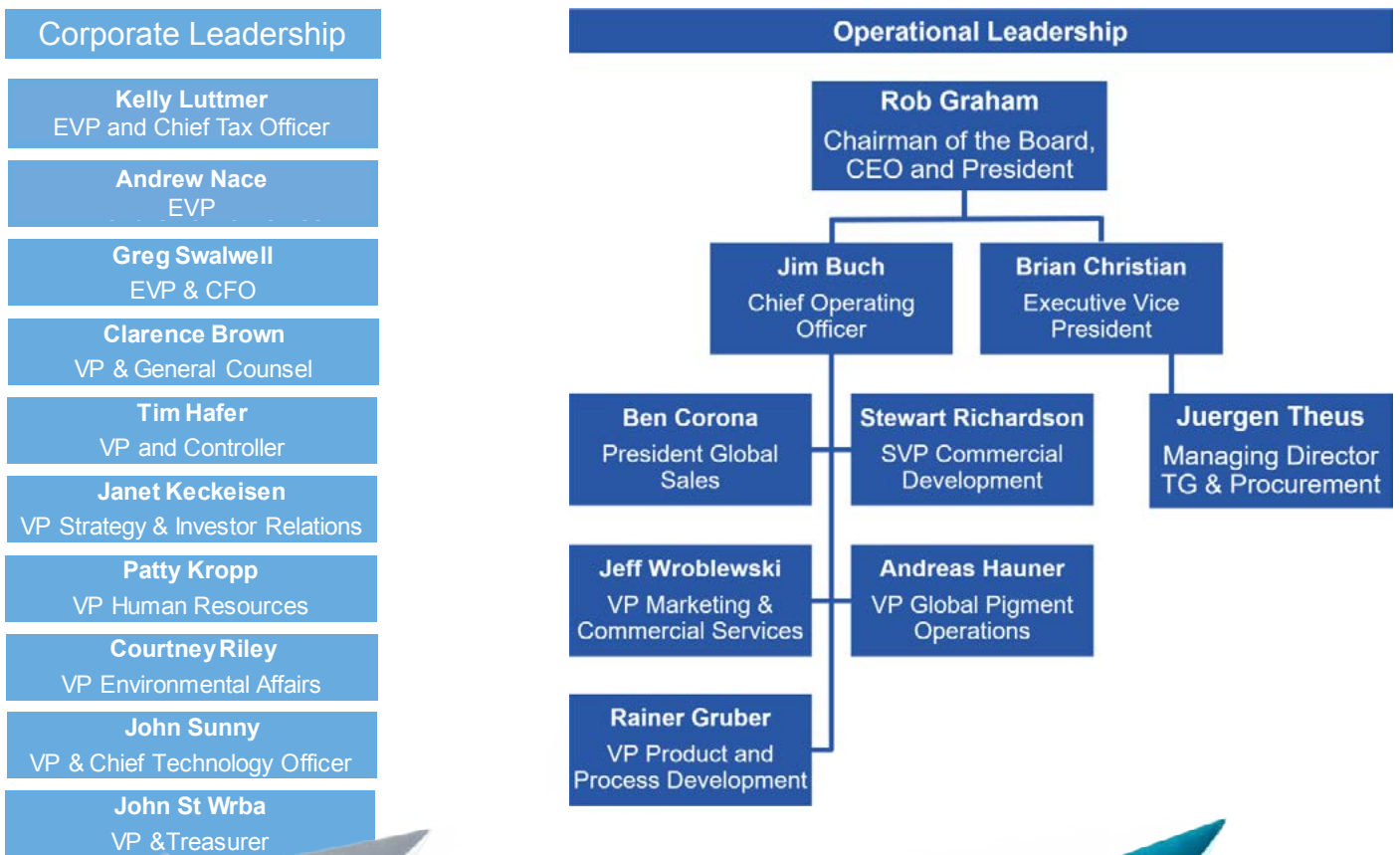


*All numbers are approximate and do not include the workforce of the Lake Charles, US joint venture.

Governance structure

Our leadership structure is outlined below. Sustainability is a topic of critical importance throughout KRONOS, particularly to our leadership team. We recently established an internal committee with a worldwide scope, responsible for developing tools to promote product stewardship and sustainability in economic, social

and environmental aspects. As a result, we are even better equipped to tackle risks before they arise. This new committee includes managers from key divisions of the company and is led by our Vice President of Environmental Affairs, with strong support from our Chief Executive Officer, Chief Operating Officer and General Counsel.



Associations and externally developed initiatives

KRONOS is a member of the following associations:

- CEFIC – The European Chemical Industry Council
 - TDMA (sector group of CEFIC) – Titanium Dioxide Manufacturers Association
 - INCOPA (sector group of CEFIC) – Inorganic Coagulants Producer Association
- VCI – Verband der Chemischen Industrie (Germany)
- VDMI – Verband der Mineralfarbenindustrie (Germany)
- TDSC – Titanium Dioxide Stewardship Council




Furthermore, we subscribe to the Responsible Care Initiative, which was developed by the Chemistry Industry Association of Canada (CIAC) and spread internationally. The verification report for KRONOS Canada can be found on the website of CIAC.

www.canadianchemistry.ca/responsible_care/uploads/2015_Kronos.pdf




Our locations


Leverkusen, Germany 


Langerbrugge, Belgium 

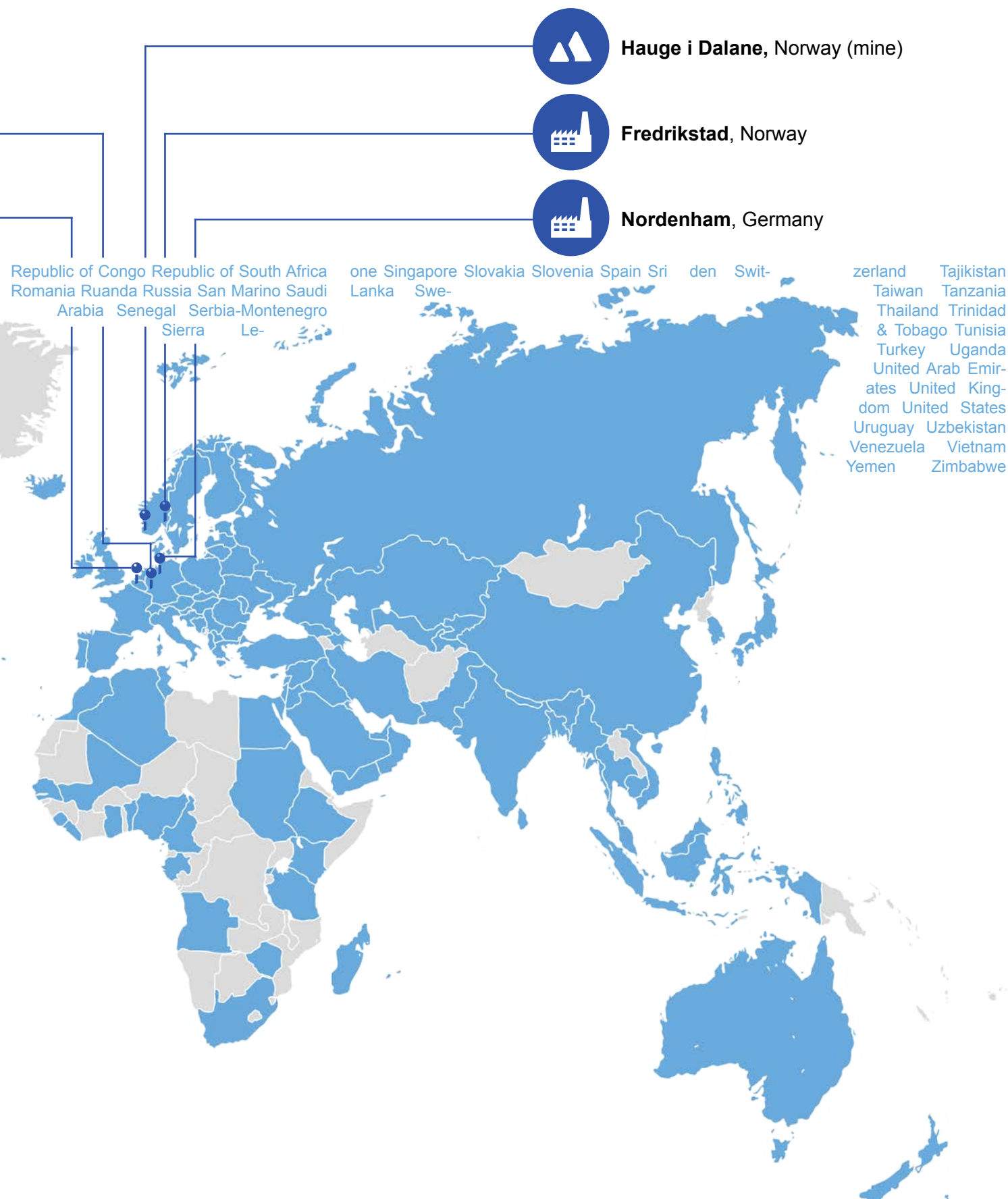
KRONOS products are available in these countries

Albania Algeria Angola Argentina Armenia Azerbaijan Bahrain Bangladesh Barbados Belarus Belgium Benin Bolivia Bosnia-Herzegovina Brazil Bulgaria Cambodia Cameroun Canada Canary Islands Chile China Colombia Costa Rica Croatia Curacao Cyprus Czech Republic Denmark Dominican Republic Ecuador Egypt El Salvador Estonia Ethiopia Faroe Islands Finland France Gabon Georgia Germany Ghana Greece Guatemala Guyana Haiti Honduras Hong Kong Hungary Iceland India Indonesia Iraq Ireland Israel Italy Ivory Coast Jamaica Japan Jordan Kazakhstan Kenya Kyrgyzstan Korea Kosovo Kuwait Latvia Lebanon Liberia Lithuania Luxembourg Macedonia Madagascar Malaysia Mali Malta Morocco Mexico Moldova Myanmar Nepal Netherlands New Zealand Nicaragua Nigeria Norway Oman Pakistan Panama Paraguay Peru Philippines Poland Portugal Puerto Rico

Dallas, USA (headquarter) 

Lake Charles, USA 

Varenes, Canada 



Hauge i Dalane, Norway (mine)



Fredrikstad, Norway



Nordenham, Germany



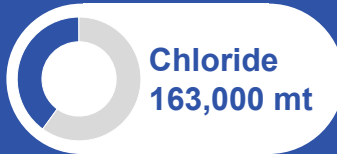
KRONOS operates five production plants in Germany, Norway, Belgium and Canada. We also own an Ilmenite mine in Norway and hold 50% of a joint venture in the United States, which produces titanium dioxide pigments. There were no openings, closings or expansions of facilities in the last two years.



Sulfate
32,000 mt



Chloride
163,000 mt



Leverkusen, Germany

KRONOS TITAN GmbH
Peschstrasse 5
51373 Leverkusen

KRONOS operates Europe's largest and most versatile titanium dioxide production facility in Leverkusen, Germany. This production site was founded in 1927 and uses both the sulfate and chloride processes.

Integrated into the Leverkusen Chempark between Cologne and Dusseldorf, we benefit from a well-developed, shared infrastructure covering logistics, emergency systems and energy supply. In 2016 the site embarked on a major energy-saving effort by joining the

Chempark's energy efficiency network. Our primary research and development department operates in Leverkusen, where our employees develop advanced titanium dioxide technology. Many long-serving employees who started as apprentices have spent their entire careers at KRONOS.

KRONOS Leverkusen supports initiatives in science and engineering and is actively involved with local educational institutions at all levels.

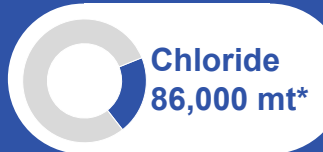
Varenes, Canada

KRONOS Canada, Inc.
3390 Boulevard Marie-Victorin
Varenes, Québec

Sulfate
19,000 mt



Chloride
86,000 mt*



The manufacturing plant in Varenes uses both the chloride and sulfate processes for its production. Founded in 1936, our titanium dioxide manufacturing facility is the only one in Canada. We are also the sole producer of food-grade (FDA compliant) titanium dioxide pigments in North America.

All our employees are well qualified and trained for their particular tasks based on

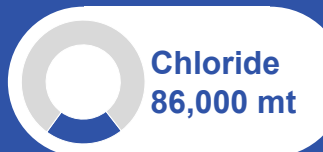
their education and professional experience. Through our continuous training programs, we ensure that our plant is operated by well-qualified chemical workers and craftsmen. As a large employer, the plant is an important part of the local community. Regular meetings with citizens of Varenes help us to sustain a dialogue, through which we cover a variety of topics that affect the community.

**Permit pending approval.*

Langerbrugge, Belgium

KRONOS EUROPE S.A./N.V.
Langerbruggekaai 10
9000 Ghent

Chloride
86,000 mt



KRONOS is the only producer of titanium dioxide pigment in Belgium. The plant commenced production in 1957 and currently uses the chloride process. Our 314 employees are highly qualified and well skilled. Thorough and ongoing in-house training is one of the core operating principles at this site. Open communications between our own personnel, authorities, neighbors, contractors and suppliers provide a balance between the social, environmental and economic aspects.

Being located on the canal that runs from Ghent to Terneuzen at the ocean, this plant benefits from easy access to raw materials. Due to well-developed infrastructure, titanium dioxide products can easily be shipped from our Belgium plant site to many European countries.

KRONOS recently invested over 15 million euro in a combined cycle power plant designed to reduce energy consumption. The new plant is highly efficient and capable of supplying the plant with both steam and electricity.



Sulfate
35,000 mt



Fredrikstad, Norway

KRONOS TITAN AS

Titangaten 1

1602 Fredrikstad

Our site in Fredrikstad was founded in 1916 and is situated at the mouth of the Glomma River. Using the sulfate process, our Fredrikstad plant is the only production facility of titanium dioxide in Norway and Scandinavia.

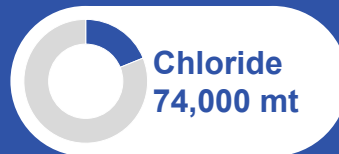
The facility in Fredrikstad provides a safe and efficient workplace for its employees to develop enhanced skills that increase productivity and product quality. The small and flexible organization enables our work force to have direct influence on improvements to

the production process. In an effort to recruit new personnel, we offer to train new employees and offer permanent contracts after a successful apprentice period.

Being a responsible member of the local community is vital to KRONOS. Therefore, in addition to our apprentice program, we cooperate with schools and welfare organizations to provide guidance to both students and people with disabilities.



Chloride
74,000 mt



Lake Charles, US

Louisiana Pigment Co.

3300 Bayou D'Inde Road

Westlake, Louisiana 70669-9638

The Louisiana Pigment Company is a joint venture between KRONOS and Venator Materials (formerly Huntsman/Tioxide). The plant uses the chloride process and is located in southwestern Louisiana on the west side of the Calcasieu Ship Channel.

The plant employs approximately 450 people who perform operational monitoring and strive for continuous improvement in all aspects. Since the plant was built in 1992, it has employed many people from the local community, most of whom are still with the

company and hold key positions today. Qualification for these positions is rigorous and training for many positions involves on-the-job and cross-organization training at the KRONOS plant in Leverkusen. Furthermore, training for all employees is conducted on an ongoing and regular basis.

The Lake Charles plant is actively involved in a number of education system related activities. Several employees serve on committees and boards that help lead community improvement efforts.

Nordenham, Germany

KRONOS TITAN GmbH

Titanstrasse

26954 Nordenham

Sulfate
60,000 mt



KRONOS operates a second German plant in Nordenham, which commenced production in 1969. Located in north Germany, the Nordenham plant benefits from short distance to both its ore supply mine in Norway and to its main sulfuric acid supplier. The sulfate process is highly integrated and produces quality products used in reliable and innovative applications in various industries. The facility employs skilled and well-qualified chemical workers and craftsmen. These employees ensure the high reliability of technical equipment and efficient performance of the chemical process. To improve

their technical and process knowledge, employees take part in on- and off-site training. To secure up-and-coming talent, every year approximately five young people start a three-and-a-half-year apprenticeship in chemical or technical education at KRONOS Nordenham. We consider this an investment in the future of our company and in the local community. A major change recently took place when we installed a highly efficient combined heat and power plant to provide the chemical process with our own steam and electricity.

Hauge i Dalane, Norway

Titania AS

4380 Hauge i Dalane



All our European sulfate plants are sourced with ilmenite from our mine in Hauge i Dalane on the southwest coast of Norway. The mine has a long history of providing employment for the local community. In the last 100 years, our employees have continually worked to improve our product, mining skills and process technology. We realize efficiencies from these improvements and implement complex processes to separate the ilmenite from the ore. The ilmenite ore deposit we are currently exploring was

discovered in 1954 and is one of the world's largest. The active mine (open pit) has an area of 1.5 square kilometers and the total production area covers approximately 18 square kilometers. The ilmenite reserves are expected to last at least 50 years, indicating sufficient supply to meet growing demand. Our former mine went into operation in 1916, but was closed and rehabilitated years ago. Today it is a beautiful area used by local recreationists.

Supply chain

KRONOS operates five plants (excluding the Lake Charles plant operated by a joint venture) to produce various types of titanium dioxide using the sulfate, the chloride or both processes. Our main raw materials for the sulfate and chloride processes are two different ores, for which we have different supply structures. These supply chains have been well established for many years.

Operating an ilmenite mine in Norway is a major advantage, allowing us to source all of our sulfate plants in Europe with our own ore raw material. The Canadian sulfate plant in Varennes is supplied locally from a mine operator in Quebec.

The ore for our chloride plants is mainly mined in South Africa and Australia, but also from Sierra Leone and Canada.

Our plants are supplied by ships on the scale of 10,000 to 12,000 metric tons. For the plants in Leverkusen and Langerbrugge, transportation is via Europe's largest harbor in the Dutch city of Rotterdam. For the plant in Lake Charles, which is jointly owned by KRONOS and Venator, each of the partners supplies its own ores into the production process.

While ore is the primary raw material, we also purchase a variety of other materials and services, which are necessary for our production such as acids, energy, machinery parts, packing materials and more.

Our suppliers are carefully reviewed for quality, reliability and other factors, including sustainability. They are screened for compliance with ethical standards, environmental precautions, occupational health and safety measures as well as energy efficiency. New suppliers must provide a self-disclosure and are subject to audits by our quality department.





Products and services

Titanium Dioxide Pigments

Titanium dioxide is the most important white pigment used in the coatings and plastics industry. Titanium dioxide is unique, as it combines a high refractive index with high scattering power in the visible region of the spectrum. It imparts superior whiteness and opacity when incorporated into coatings or plastics, as well as providing long-lasting durability.

Pigments for Coatings

The combination of superior whiteness and opacity with long-lasting durability affords the coatings formulator a route to highly opaque and bright whites and tints at minimum film thicknesses with easy dispersion.

KRONOS offers various rutile grades, each delivering excellent performance properties for the type of paint or coating being manufactured – for example, high chalk resistance with extreme weather durability for exterior paints and coatings, or low abrasion and high opacity for inks. KRONOS also offers titanium dioxide pigments for decor papers and foils. These grades deliver maximum brightness and a neutral tone in white paper laminates, as well as superior graying resistance and non-yellowing temperature stability.

Additionally, KRONOS offers slurries and rutile pigments for paper coatings and paper mass application. These grades are characterized by excellent opacity and retention, making it very economical in use.

**Specific product stewardship information by product grade is available.*

Pigments for Plastics

Titanium dioxide pigments are widely used in many plastics to whiten, brighten, and provide opacity to a range of colors. It is used in polyethylene and polypropylene to make bottles and containers, packaging fibers and agricultural wrap. It is used in PVC to make highly durable window profiles. It is used to deluster and color man-made fibers used in clothing. Due to its high thermal stability, many titanium dioxide container materials can be recycled.

Special Grades

KRONOS offers a range of products approved for coloring foodstuffs, cosmetics, pharmaceuticals and other products. Depending on the grade and end use application, they generally comply with the following product safety regulations*.

European Union

- 1223/2009/EC (cosmetics)
- 1333/2008/EC
- 231/2012/EU (food color)
- 2009/35/EC (pharmaceuticals)
- 96/335/EC (nomenclature cosmetics)
- European Pharmacopoeia
- British Pharmacopoeia
- DIN EN ISO 22000:2005 Food Safety System Certification (FSSC) 22000:2013

USA

- FDA Regulation 21 CFR 73.2575 (cosmetics)
- FDA Regulation §73.575
- US Pharmacopoeia XXIV

Other Locations

- Japanese Pharmacopoeia



Iron salts in liquid and solid form

KRONOS ecochem® is a division within KRONOS. For more than 40 years, KRONOS ecochem has marketed large quantities of iron salts in liquid and solid form. Our products are used to economically protect the environment in the water treatment industry, specifically sewage treatment, sewage sludge dewatering, and water purification. They are also used in the production of iron oxide pigments for odor control, chromate reduction in cements, and biogas desulfurization, as well as in agriculture. They are characterized by controlled quality, consistent composition, reliable availability, high purity and a favorable price/performance ratio.

KRONOS ecochem also provides comprehensive technical service, offering users practical assistance in solving a wide variety of needs.



Photocatalysts

Among the many photocatalysts in use today, titanium dioxide is one of the most widely used for industrial applications as it offers highly effective and efficient photoactivity.

Two types of photochemical reactions occur on the surface of titanium dioxide when irradiated properly: the photo-induced redox reaction of adsorbed substances and the photo-induced hydrophilicity of titanium dioxide-containing surfaces. Documentation of this photoreactivity was published by KRONOS, among others, in the 1970's resulting in many new applications for titanium dioxide, particularly in building materials.

Titanium dioxide photocatalysts impart unique self-cleaning and air purifying properties. They are most often added to building and construction materials, like concrete and paints, to clean the surrounding air and to prevent the surfaces from soiling. Special applications on paper surfaces, plastic films and fiber products reduce odors, eliminate dirt on surfaces, and improve room air quality.

- KRONOClean 7000 displays activity in UV radiation and visible light
- KRONOClean 7050 displays activity in UV radiation



Customer service

As a world-class global supplier of titanium dioxide, KRONOS is committed to providing the highest level of customer service in the industry. From the time an order is placed until final order fulfillment, a dedicated KRONOS Customer Service representative is available to answer questions and direct customers to our many resources. KRONOS is committed to providing customers with in-depth knowledge on the safe handling and use of our products in their many applications. This includes providing various documentation such as certificates of analysis, as well as product stewardship information including adherence to various laws and

standards, including product safety. In addition, various testing is performed, such as migration tests for end products containing titanium dioxide that come into contact with food material. Tests like these are often initiated by KRONOS, or performed in cooperation with the Titanium Dioxide Manufacturers Association (TDMA) or our customers. Much of this information about our products goes beyond what is mandatory according to regional laws and regulations. Product stewardship is embedded in our customer service principles and we strive for continual improvement in the information we are able to provide.

	Yes	No
The sourcing of components of the product or service		X
Content, particularly with regard to substances that might produce an environmental or social impact	X	
Safe use of the product or service	X	
Disposal of the product and environmental/social impacts	X	



Technical services

Global titanium dioxide experts, available where you are

At KRONOS, we believe to be truly exceptional at something, you must be fully committed. Our chemists, engineers and technicians are fully committed to the application technology of titanium dioxide. Our titanium dioxide specialists have worked with customers in the plastics, coatings, paper and fibers industries around the world. They regularly contribute to the industry directly by presenting at international events and by serving on national and international technical committees and standardization organizations. We are also in constant contact with raw material suppliers to ensure that we capitalize on new technologies and new trends.

Continuous Benchmarking

KRONOS titanium dioxide experts utilize internal and external laboratories equipped specifically for testing of coatings, plastics, paper, laminate and photocatalyst application. We evaluate critical titanium dioxide performance characteristics including optical properties, tinting strength, opacity and durability, as well as mechanical performance of the application system, if appropriate.

www.kronostio2.com/en/contact-us
Please contact us with application questions, testing needs, or questions about safety or efficacy. Regardless of the challenge you are facing, we are ready to help.



How we do business

KRONOS attaches great importance to a fair and responsible way of doing business, which is reflected in our Code of Business Conduct and Ethics. Everyone at KRONOS who is in a management position must acknowledge their individual commitment to this code with his or her signature.

Every manager is responsible for ensuring the Code of Business Conduct and Ethics is incorporated into daily operations at all levels and is part of our company culture. The values described in the code apply to everyone, whether they be a director, officer or any other employee. KRONOS wants to outperform our competitors through a higher quality of product, better service and superior performance altogether. All staff are expected to understand and comply with applicable laws and regulations affecting their work at KRONOS.

We encourage reporting of unethical conduct, including workplace bullying and unfair treatment, to the supervisor or manager in charge. The same applies to any violation of laws and regulations. If an employee at any time feels unsafe, or believes there has been a non-compliance event, he or she can make an anonymous complaint via the whistle blowing service of MySafeWorkPlace. All complaints are investigated by our legal department, and are followed up with appropriate actions. This service is another way KRONOS strives to establish a culture of mutual trust and support.

The whistle blowing service can be reached through:
www.mysafeworkplace.com
phone: 1.800.461.9330



Our management approach

Year 2016 marked the 100th anniversary of the first commercialization of the essential white pigment, titanium dioxide, by KRONOS. KRONOS' longevity is due in part to its focus on **Business Sustainability**. During the past 100 years, KRONOS has adapted to continuously changing market conditions. This continuous evolution and focus on improvement has given KRONOS a competitive edge. The need to sustainably evolve is at the heart of our management's focus. Working closely with our key constituencies including customers, shareholders, suppliers, employees and communities where we operate, as well as broader society, KRONOS has the focus to sustainably grow for another century.



KRONOS®

The **Economic Sustainability** of our business is rooted in being a provider of high quality products. Our proven capability of developing innovative products and production processes has enhanced our reputation with our customers and afforded us the economic success we have long enjoyed. We enter the future as One KRONOS, an initiative driving the standardization of the KRONOS image and service experience globally, which we expect will further enhance our long term sustainability.

KRONOS consistently demonstrates its commitment to **Environmental Sustainability**, which is an important component of the long term outlook of our business.


An important recent enhancement to our long-term sustainability is the installation of a cogeneration unit at our Belgium plant. Our positive experience and demonstrable reduction in energy consumption led to the installation of a similar unit at our Nordenham, Germany plant. These systems allow KRONOS to supply 100 percent of its steam requirements at these two plants and reduce purchases from outside energy sources. Projects like these support our Environmental Sustainability.



SUSTAIN

Like all producers of titanium dioxide, KRONOS' processes are energy intensive. We therefore report on the Environmental: Energy indicator G4-EN3, *Energy Consumption Within the Organization*.

Because our suppliers play a key role in our sustainability, we also carefully evaluate their commitment to corporate social responsibility. To that end, we herein report on the Environmental: Supplier Environmental Assessment indicator G4-EN32, *Percentage of New Suppliers That Were Screened Using Environmental Criteria*, which includes supplier energy aspects.

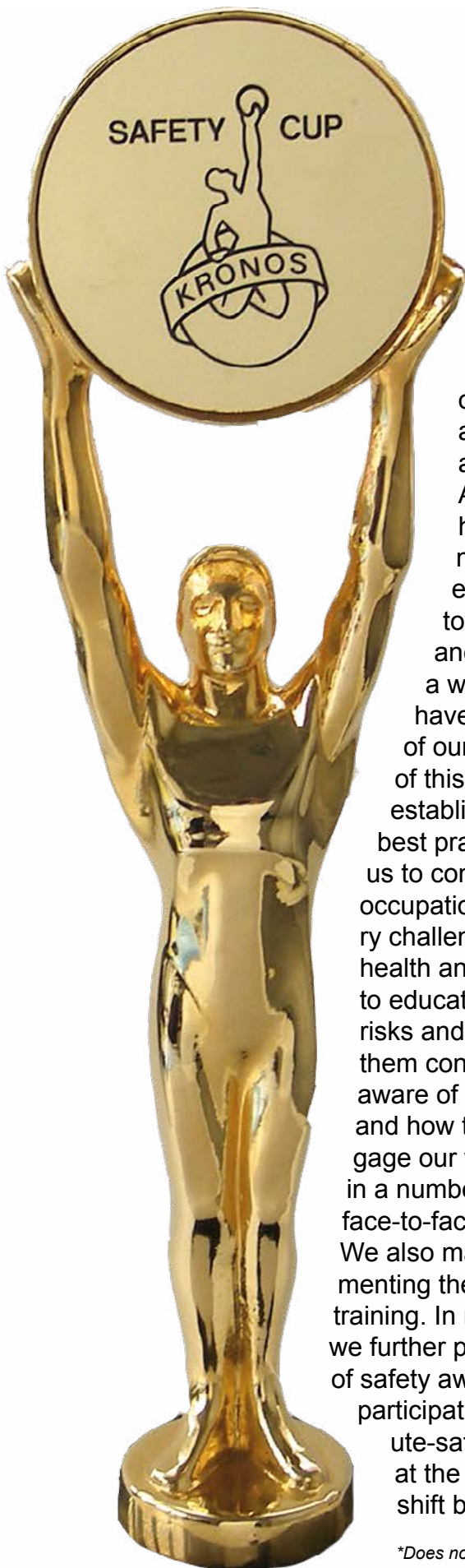


Quality and innovation can only thrive in a supportive atmosphere, which is a major component of **Social Sustainability**. At KRONOS, Social Sustainability starts with a focus on occupational health and safety. Due to its high importance, we report on the Social, Labor Practices and Decent Work: Occupational Health and Safety indicators, *G4-LA5, Percentage of Total Workforce Represented in Formal Joint Management-Worker Health and Safety Committees That Help Monitor and Advise on*

Occupational Health and Safety Programs and G4-LA6, Type of Injury and Rates of Injury, Occupational Diseases, Lost Days, and Absenteeism, and Total Number of Work-Related Fatalities, by Region and by Gender.

KRONOS strives to produce titanium dioxide pigments of the highest quality, but we do so while ensuring our products are made under fair working conditions. Therefore, suppliers are critically reviewed and carefully selected. In addition to screening our suppliers for environmental criteria, we also screen labor practices criteria, human rights criteria and criteria for impacts on society. We therefore report on the indicators of Supplier Assessment for Labor Practices, Supplier Human Rights Assessment and Supplier Assessment for Impacts on Society by reporting the respective indicators G4-LA14, G4-HR10 and G4-SO9

KRONOS further commits to supporting workers by providing a service through which employees can report incidents of discrimination anonymously. The aspect of Non-Discrimination is therefore included by reporting on indicator G4-HR3, *Total Number of Incidents of Discrimination and Corrective Actions Taken*. Another key element of sustainability and quality involves providing our customers with necessary information about our operations and products. These aspects are addressed via reporting on the Customer Health and Safety and the Product and Service Labeling indicators, G4-PR1, *Percentage of Significant Product and Service Categories for Which Health and Safety Impacts are Assessed for Improvement* and G4-PR3, *Type of Product and Service Information Required by the Organization's Procedures for Product and Service Information and Labeling and Percentage of Significant Product and Service Categories Subject to Such Information Requirements.*



Our commitment

Safety first!

Employee safety at KRONOS

When it comes to safety in the workplace, it is our first priority to ensure that everyone leaves work just as healthy as they arrived that morning. As an employer we have a responsibility not only toward our employees, but also toward their families and communities as a whole. Our goal is to have zero incidents in all of our facilities. In pursuit of this target, we have established many tools and best practices, which help us to continuously improve occupational safety. A primary challenge in occupational health and safety is not just to educate employees about risks and hazards, but to keep them constantly trained and aware of what can happen and how to respond. We engage our workforce regularly in a number of ways including face-to-face safety workshops. We also maintain records documenting the frequency of safety training. In most of our facilities, we further promote a high level of safety awareness through participation in five-minute-safety talks conducted at the beginning of each shift by our supervisors.

These safety talks highlight potential risks, how to avoid associated incidents, and how to respond should an incident occur. Although incident rates are low, we track incidents and investigate the causes. This ensures continuous improvement of our safety measures. We also keep track of near misses and noted unsafe conditions, as this facilitates continuous improvement as well.

All our facilities are equipped with the necessary safety features and established structures to promote safe working conditions. Every KRONOS site has a local safety officer who monitors and implements measures, appropriate for that site, to minimize risks and protect our employees from hazards in the workplace. Facility safety officers meet regularly to collaborate on best practices so they can be implemented across the company. We further improve safety measures by involving workers in joint health and safety committees so others can benefit from their first-hand experience. These committees generally consist of representatives of the worker's councils as well as the site safety officers. Such joint management-worker health and safety committees have been implemented at our plants in Europe and Canada, which comprise the majority of our workforce*.

**Does not include the workforce of the Lake Charles, US joint venture.*

We are proud of the culture of safety we have established at KRONOS, which is supported by all our employees. We encourage continued diligence and enthusiasm by rewarding our best performers. Each year, the facility with the lowest injury rate is identified and awarded with a special trophy – the KRONOS Safety Cup. The competition for this award is fierce among the

sites, as all our facilities maintain low numbers of incidents and injuries. Therefore, receiving the Safety Cup continues to be a huge honor for the respective facility each year. The Safety Cup currently resides at the Leverkusen facility, but other KRONOS facilities are anxious to become home to this coveted award.

97.5 lost days per 1,000 full-time workers**

0 reported occupational diseases**

283 lost days per 1,000 full-time workers in the German chemical sector*

7 injuries for independent contractors working at **KRONOS** sites**

7.4 injuries per 1,000 full-time workers at **KRONOS****

0 fatalities**

14.7 injuries per 1,000 full-time workers in the German chemical sector*



*calculation methodology by BGRCI - employers' liability insurance association for the chemical sector in Germany. 2015 data
** 2016 data

A sustainable solution to our energy demands

With evolving economies and ongoing industrialization, the world is facing growing energy demands. Due to the mostly fossil source of energy carriers these demands go hand in hand with the emission of carbon dioxide, for which there is a worldwide focus on reduction.

KRONOS recognizes its responsibility and the need to reduce energy use, where possible, to increase operating efficiencies and contribute to global efforts in this field. This is a challenging task due to the amount of energy required to produce titanium dioxide, even in the most efficient plants. During recent years, we have made major improvements in our use and consumption of energy. These improvements have already yielded efficiencies and reductions, and we continue to seek additional opportunities to achieve further improvements in the coming years.

KRONOS monitors energy consumption carefully to ensure we apply effective technology. For example, our mine in Norway has its own power station and uses carbon-free hydropower as an energy source.

During the last several years, we reconsidered our energy supply in our chemical plants and realized better solutions are available that provide advantages for KRONOS and the environment.

We equipped both our Langerbrugge and Nordenham facilities with dedicated combined heat and power plants, or cogeneration plants.

Before their installation, we used separate steam generators and purchased electricity from third party utilities at both plant sites. Because heat, steam and electricity are the primary types of energy required in the manufacture of titanium dioxide, it was a logical step to utilize on-site cogeneration technology at these sites. This has major advantages compared to the former conventional technologies, including capturing heat, which can be put to more efficient use at these sites.

More than 99 percent of the electricity produced in Québec comes from hydropower. This means that Hydro-Québec (the government corporation providing electricity in Québec) supplies Varennes with electricity generated almost exclusively from renewables. Also, we produce our own steam almost exclusively from natural gas. In 2015, we commissioned a new boiler, replacing two older and less efficient boilers at our Canadian facility.

In our plant in Leverkusen we chose a different path based on unique opportunities afforded by our location. The plant in Leverkusen is embedded in one of Europe's largest chemical industrial parks, supplying the plant centrally with various services, including energy.



In May 2016, KRONOS joined other companies within the chemical industrial park to form a local Energy Efficiency Network. Within the network, we have been exchanging information on how efficiency measures can be implemented and how to benefit from each other's experience. This is a beneficial way to achieve energy savings and to reduce our carbon dioxide emissions.

In addition to these common efforts, the Leverkusen plant took steps in the beginning of 2016 to lower its allocated amount of provided power by 10 percent. Achieving such a goal requires the commitment of not only management, but all facility personnel. Engineers are developing operation modes with lower power demands. Plant operation personnel switch on machinery only when needed and every crew tries to outpace the crew before. These techniques have resulted in notable decreases in energy consumption, setting Leverkusen on a path to not only achieve their goal to reduce energy consumption, but to creating a more sustainable future.

Energy demand is not only closely linked to production costs, but also to greenhouse gas emissions. KRONOS is committed to raising the bar within the industry and is a significant contributor in developing new standards within the Titanium Dioxide Manufacturers Association (TDMA) to measure greenhouse gas emissions and the environmental footprint of our industry. TDMA recently undertook an extensive effort to publish a titanium dioxide industry average carbon footprint based on data provided by all TDMA companies for baseline year 2012. This information can be used by our customers to calculate the emissions of their end products. The baseline industry average is 5.3 metric tons of carbon dioxide for every metric ton of titanium dioxide manufactured. The TDMA, with KRONOS' participation, continues to enhance data in this area and is currently developing an industry product environmental footprint that will include carbon footprint, as well as other environmental metrics. This effort includes a much broader collection of data from not only members, but also upstream suppliers.

More Information can be found on the TDMA website.

www.tdma.info/sustainability



KRONOS ecochem - 40 years of up-cycling byproducts

Forty years ago KRONOS established a successful new division, KRONOS ecochem, offering a wide range of iron salts.

In the production of white pigments, large quantities of iron salts are captured and produced as byproducts. With major investments in research and development, along with the establishment of KRONOS ecochem, these salts are sold into a variety of markets.

While our main focus remains the production of titanium dioxide, our byproduct business is significant. In the chemical industry, success depends on continuous operation of production lines and disposition of byproducts.

By marketing and selling our byproducts, we enhance the production of titanium dioxide by putting production of titanium dioxide by putting these byproducts to

beneficial use, the disposition of which would otherwise be costly and less efficient. The disposition of which would otherwise be costly and less efficient.

As a result of regulatory changes in the 1970s, we created a department focused on identification of beneficial uses and markets for all materials produced in our processes.

These efforts in research and development resulted in identification of byproduct value for various industries outside of our core titanium dioxide markets.

Wastewater treatment plants all over Europe use our iron salts to eliminate phosphorus and sulfur, as well as to reduce flocculation. Many municipalities use them to control nuisance odors from sewage systems. In water purification, our products remove arsenic, generating usable process, or even drinking, water. Desulfurization is also an issue in biogas generation, as a high sulfur content impairs the combustion of this environmentally friendly gas.

Application of our iron salts thereby contributes to establishment of this new source of renewable energy. KRONOS ecochem has even

had a positive impact on the construction industry. High chromate content in cement can cause contact dermatitis among bricklayers, who come in contact with cement during their work. Adding iron salts to cement reduces chromate, providing a positive impact to thou-

sands of cement workers by alleviating allergic reactions.

KRONOS' upcycling to generate these products represents a pioneering achievement by not only finding value markets for these products, but finding several markets which have a positive impact on health and the environment.



The voice of our customers

Our customers are our most important stakeholders. They are the ones for whom our products are developed. They have enabled KRONOS to be a successful business partner for over 100 years, and good customer relationships will enable us to continue our success for another 100 years. At KRONOS a customer represents more than just a number in a sales report, but is a valued partner – time to give them a voice.

We spoke to Peter Butcher and Ulrich Volken, both of whom have been customers for many years.

Mr. Peter Butcher - International Chemicals Ltd.

INTERVIEWER: The business relationship between KRONOS and Industrial Chemicals Ltd. has lasted for over 20 years now. How would you describe this relationship?

PETER BUTCHER: I would describe it as the perfect relationship between a supplier and its customer. And I would even go so far to say that we became friends over those years. We met together on a regular basis at our sites in the UK and also at KRONOS' sites in Germany and occasionally in Norway to discuss any queries or problems. And I think through that a friendship grew out of it.

“They are working immediately and very closely together with us. This is the sort of thing that makes it a sustainable business relationship.”

I am glad to say it is a friendship between the two companies, but it is also a personal friendship.

INTERVIEWER: Is there something you can identify within your relationship, which makes it a sustainable relationship?

PETER BUTCHER: Both companies are completely open. KRONOS involves themselves in any inquiries and problems that we have and helps us to solve them together.

Peter Butcher works for Industrial Chemicals Ltd. (ICL) from the UK, and is responsible for buying ferrous sulfates from KRONOS eco-chem. Our cooperation with ICL started over 20 years ago. Through that time, we developed not only a trusting business relationship, but also a friendship. Ulrich Volken works for LANXESS in Cologne, which uses our ferrous sulfate as a starting material for the production of color pigments. He is not only a trusted neighbor, but also a welcomed guest at KRONOS.

For example, if we want a slight change in the product, they would do very good at their end to comply with our requirements. In one occasion we had a problem with the moisture content of one shipment. KRONOS sent over their technicians within the next day to look at the problem and work out a satisfactory solution for all of us. At the end they made sure that we had a product, which was acceptable for our operation. They are working immediately and very closely together with us. This is the sort of thing that makes it a sustainable business relationship.

INTERVIEWER: So KRONOS has quite a quick response when it comes to service operations. How did you experience the availability of products and the response to your demands?

PETER BUTCHER: We never had a particular problem with availability of products. Of course we are ordering with as much notice as possible, but I think we could probably order at the beginning of next week for the week after. In that perspective, we have always been able to get the material when we required it.



Mr. Peter Butcher - International Chemicals Ltd.

INTERVIEWER: KRONOS ecochem provides sustainable products, which are for example used in water treatment, for sewage treatment and water purification. How would you describe the importance of KRONOS' sustainability for the sustainability of Industrial Chemicals Ltd.?

PETER BUTCHER: I think the sustainability of KRONOS is very important to us. And they are our main supplier of the ferrous-sulfate raw material that we buy. This is primarily because of the service we received in the past and the price that we get from KRONOS ecochem. Most of the time, if not all the time, they have been the most competitive supplier on the market and they proved to be a very worthwhile supplier. Of course we have to look at the economy of our company as well and we have found that they are the best partner to have in our operation. Only because of precaution we buy a certain amount of product from other suppliers. We do so to ensure that we could cover our own requirements just in case of a major problem at one of KRONOS' plants.

INTERVIEWER: As a customer you provide an external perspective. How would you evaluate sustainability at KRONOS from this external perspective?

PETER BUTCHER: My opinion is that KRONOS is a sustainable business. They are very strong in the titanium dioxide business and because of that, they will always be a supplier for the ferrous sulfates we require.

“Most of the time, if not all the time, they have been the most competitive supplier on the market.”

INTERVIEWER: The ferrous sulfates you just mentioned again are not KRONOS' main product, but a side product. And KRONOS found a way to make use of that side product. So if you think of sustainability in the ecological sense, how would you judge on KRONOS' performance?

PETER BUTCHER: I think they have been very clever in marketing a byproduct from their main production line. But they also realized, that they have to make sure, that this byproduct meets the quality and price, which is demanded in the market place. To my mind they have done very well.

INTERVIEWER: Thank you for the pleasant conversation and your time!

Mr. Ulrich Volken - LANXESS

INTERVIEWER: We heard about your successful business relationship. How long does this relationship exist so far?

ULRICH VOLKEN: KRONOS is a producer of titanium dioxide. In one of the processes, ferrous sulfate is generated as a by-product. LANXESS is procuring titanium dioxide and ferrous sulfate from KRONOS. The main business is on ferrous sulfate. Our relationship with KRONOS dates back more than 50 years, to the time when we started to produce iron oxide pigments using the precipitation process.

INTERVIEWER: How would you describe this relationship between KRONOS ecochem and LANXESS from your point of view and why is it such a special relationship?

ULRICH VOLKEN: Our relationship with KRONOS ecochem is a long standing relationship that survived several reorganizations in both companies. The relationship is built on mutual respect, trust and the true spirit of partnership between the two companies.

INTERVIEWER: How would you describe a sustainable business relationship – how does this fit to the relationship to KRONOS ecochem?

ULRICH VOLKEN: A sustainable relationship is driven by trust, commitment and cooperation. It considers the needs of the business partner and thrives to find a solution that fits all. In times of environmental and social challenges this also includes questions of resource efficiency, reduction of energy costs or greenhouse gases and the consideration of social challenges. In an integrated value chain this leads to improvements, wherever the challenges occur. We feel that this describes our relationship to KRONOS ecochem.

INTERVIEWER: How did you experience the availability of products? How does KRONOS ecochem react to your demands?

ULRICH VOLKEN: The by-product availability obviously always depends on the production of the target product. However, due to the big capacity and the multiple sites that KRONOS is operating, they are almost always able to satisfy our demand in terms of availability. In addition, we are using different suppliers and can easily manage the shortfall of one supplier with increased volumes from others.

INTERVIEWER: How is LANXESS' sustainability in all categories Economy, Society and Ecology influenced by KRONOS ecochem and its products?

ULRICH VOLKEN: LANXESS considers the economic, environmental and social dimension in its corporate business processes. By not only considering the economic relationship with our suppliers and customer, but by looking at the environmental and social performance of our operations, we expect to provide a better long term value as a company.

By-products such as KRONOS' ferrous sulfate are a very good example of an integrated value chain that aims at resource efficiency. A by-product generated in KRONOS' production process for titanium dioxide is consumed in our nearby production plant and converted into a prime grade synthetic iron oxide pigment. Our long term commitment to our business relationship with KRONOS also influences our financial sustainability.

INTERVIEWER: Thank you for the pleasant conversation and your time!



Photoactive pigments – an innovative way to improve air quality

Titanium dioxide has brightened lives for many years, but it can do much more. Together with STEAG Power Minerals, KRONOS developed Photoment®, a product that builds upon the characteristics of titanium dioxide and has the potential to fight air pollution in highly populated areas.

Cities all over the world struggle with polluted air due to high traffic and large industrial facilities. Major problems are caused by nitrogen oxides from combustion processes in engines, heaters and production plants. Most conventional solutions put in place by local authorities have not had the desired outcome, or even resulted in major downsides, such as those from driving bans and production stops, which are unpopular and may slow down the economy. Green areas within cities help to lower pollution levels, but due to space limitations, they are neither scalable nor feasible as a means for major improvements.

This is where titanium dioxide can be a feasible solution. Titanium dioxide can work as a catalyst, using sunlight to enhance conversion of nitrogen oxides into harmless substances. The jointly developed Photoment, is a powder that can be added to concrete in the manufacture of paving stones and other concrete goods.

When exposed to sunlight, toxic nitrogen oxides are catalyzed by this product into non-toxic nitrates. Covering inner city areas with Photoment could therefore reduce ambient nitrogen oxide levels. Research has shown the catalyst is not spent by the reaction, which can therefore repeat indefinitely. Furthermore, the photocatalyst not only effects harmful gaseous substances, but also dirt and liquids on the ground like drops of oil. Adding Photoment to a material creates a super-hydrophilic surface. As a result, rainwater spreads out across it and displaces unwanted particles so they can be flushed off by the next rainfall. This is why it also makes sense to use Photoment on smaller areas like private drive ways in order to keep such surfaces clean.

KRONOS believes that Photoment has the potential to provide significant improvements to city life all over the world and can contribute to a sustainable future.

More information on Photoment® and its applications can be found on the product website:

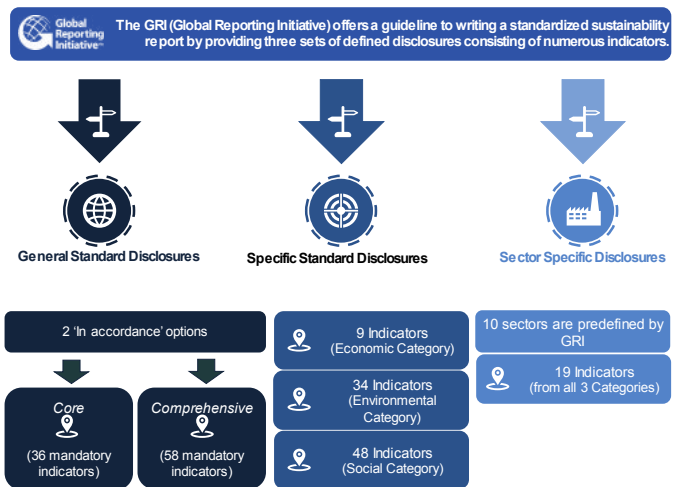
www.photoment.com/en/home



GRI-Index

General Standard Disclosures	Page
Strategy and analysis	
G4-1 Letter from Executive Management	3
Organizational profile	
G4-3 Name of the organization	36
G4-4 Primary brands, products, and services	20-22
G4-5 Location of the organization's headquarters	37
G4-6 Countries where the organization operates	6, 12-13
G4-7 Nature of ownership and legal form	36
G4-8 Markets served	6, 12-13
G4-9 Scale of the organization	6, 8
G4-10 Total number of employees	7, 9
G4-11 Percentage of collective bargaining agreements	7
G4-12 Organization's supply chain	18-19
G4-13 Significant changes of the organization	14, 18, 36
G4-14 Precautionary approach	10
G4-15 Economic, environmental, and social charters	11
G4-16 Memberships of associations	11
Identified material aspects and boundaries	
G4-17 List of all entities of the organization	8
G4-18 Process for defining report content	4
G4-19 Material aspects identified in the process	5
G4-20 Aspect boundaries for material aspects	5
G4-21 External aspect boundaries	5
G4-22 Restatements of previous reports	-
G4-23 Changes since previous reports	-
Stakeholder engagement	
G4-24 Stakeholder groups engaged	24
G4-25 Identification and selection of stakeholders	4
G4-26 Approach to stakeholder engagement	4
G4-27 Key topics for stakeholder engagement	4
Report profile	
G4-28 Reporting period	4
G4-29 Date of previous reports	-
G4-30 Reporting cycle	4
G4-31 Contact point for questions	36
G4-32 GRI content chosen	4
G4-33 External assurance for the report	4
Governance	
G4-34 Governance structure of the organization	10
Ethics and integrity	
G4-56 Organization's values, principles, and standards	23

Specific Standard Disclosures	Page
Disclosure on Management Approach	24
Environmental	
G4-EN3 Energy consumption within the organization	29
G4-EN32 New suppliers screened for environmental criteria	18-19
G4-MM1 Amount of Land disturbed or rehabilitated	17
Social - Labor practices and decent work	
G4-LA5 Percentage of formal joint management	26
G4-LA6 Rates of injuries and diseases	27
G4-LA14 New suppliers screened for labor practices	18-19
Social - Human rights	
G4-HR3 Incidents of discrimination	23
G4-HR10 New suppliers screened for human rights criteria	18-19
Social - Society	
G4-SO9 New suppliers screened for impact on society	18-19
G4-MM10 Information on future closure plans	17
Social - Product responsibility	
G4-PR1 Health and safety impacts per product	22
G4-PR3 Types of products and service information	22





KRONOS®

KRONOS Worldwide, Inc.
5430 LBJ Freeway, Suite 1700 | Dallas, TX, 75240 USA
Tel.: +1 972 233 1700
Fax: +1 972 448 1445
www.kronostio2.com



Conception and Design
OSCAR GmbH, Cologne

KRONOS Worldwide, Inc. is incorporated in the State of Delaware, United States of America. Major changes in ownership did not apply during the last two years.