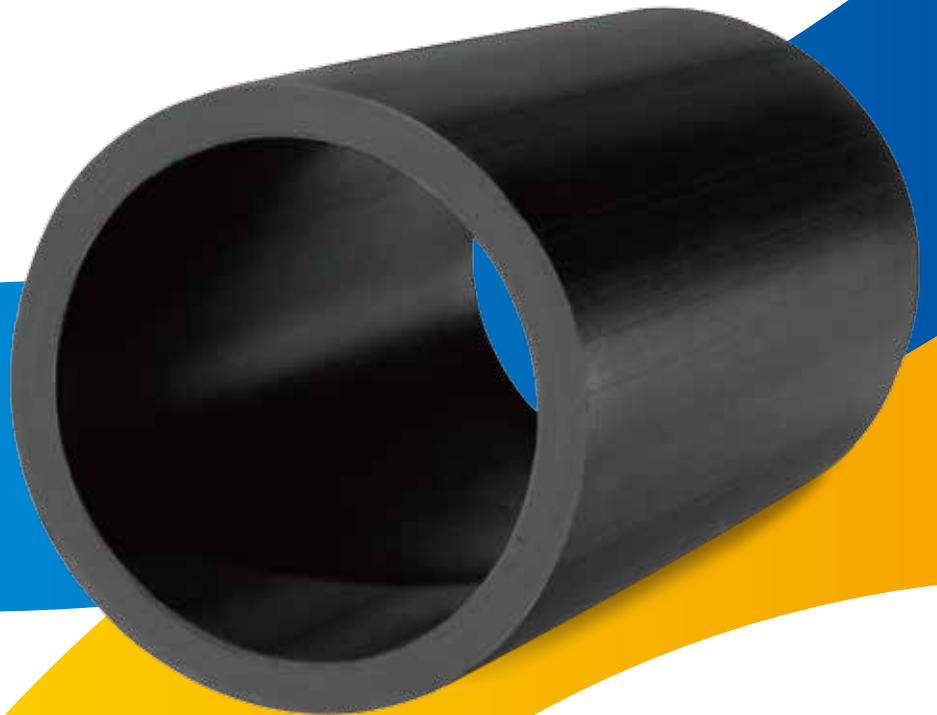


RELIABILITY+ INNOVATION

PIPE SYSTEM SOLUTIONS



OPENING THE DOOR TO NEW POSSIBILITIES

The SABIC story started more than 35 years ago in Saudi Arabia. Our aim was to utilize the natural gas resources in the region and transform them into products of value for people worldwide. From the very beginning, maintaining a healthy environment and handling valuable resources such as water and gas responsibly has been at the heart of everything we do.

While our roots are in the Middle East, our challenges, responsibilities, and opportunities are global.



Our background has given us years of first-hand experience dealing with the challenges of managing valuable natural resources. One of our most precious resources, water, is becoming scarce as the world's population grows and consumption increases. SABIC has always moved ahead of the market, designing innovative products that support the needs of pipe manufacturers, contractors and network operators.

We are committed to ongoing product and operational excellence, whilst ensuring that transporting liquids and gases is both economical

and safe. SABIC's experience and drive for innovation makes us a strong, reliable partner which can provide you with innovative and reliable pipe materials and open the door to new possibilities.

Today's pipe industry challenges require dependable, high quality solutions. SABIC's portfolio offers a broad range of materials for almost every pipe sector. Whether used in domestic, infrastructural or industrial applications, above ground or below, our products are engineered and quality tested to meet the challenges.

Using the very latest manufacturing technology, we produce the highest standard of raw materials, from polypropylene and polyethylene to engineering plastics. You and your customers can depend on materials that reliably deliver consistent, high performance, and build a competitive advantage.



INFRASTRUCTURE

Millions of people worldwide have no access to safe drinking water and proper sanitation. Plastic pipes offer an efficient, reliable and affordable way to distribute drinking water and reduce both the risk of contamination and illness. SABIC® HDPE pipe materials safeguard the distribution of energy and SABIC® RELY PP offers safe handling for urban sewage and rainwater.

APPLICATIONS:

- Gas
- Potable and storm water
- Sewage and drainage
- Cable – and micro ducts
- District heating
- Fittings
- Manholes and inspection chambers

SOLUTIONS:

- SABIC® HDPE – PE80
- SABIC® HDPE – PE100
- SABIC® HDPE – SABIC® VESTOLEN A RELY
- SABIC® PP – HOMOLYMER
- SABIC® PP – IMPACT COPOLYMER
- SABIC® PP – SABIC® PP RELY

DOMESTIC

The need for more innovative domestic pipe systems is increasing. Whether you are providing a reliable and safe supply of clean water, wastewater management, heating and cooling or sanitary systems, we can provide you with tailor-made materials that deliver high temperature and chemical resistant, excellent durability and long-term performance.

APPLICATIONS:

- Floor heating, cooling and radiator connections
- Hot, cold and waste water
- Chimney and ventilation
- Conduit and protection

SOLUTIONS:

- SABIC® HDPE – PE80
- SABIC® HDPE for PEX-b compounds
- SABIC® PP – IMPACT COPOLYMER
- SABIC® PP – RANDOM COPOLYMER
- SABIC® PP – HOMOPOLYMER
- SABIC® PP – SABIC® PP RELY
- SABIC® PP – SABIC® PP VESTOLEN P
- SABIC® PVC – SABIC® SPVC
- SABIC range of engineering plastics for water solutions and cable protection



INDUSTRIAL

Worldwide in chemical plants, mines, and process industries is a need to transport aggressive and dangerous fluids and waste in a safe and economical way. Both SABIC®HDPE and SABIC®PP are typically used for pipes, slurries and in industrial applications that must also be able to withstand higher pressures and handle industrial fluids and substances.

APPLICATIONS:

- Chemical
- Cooling
- Dredging and mining
- Hydropower
- Oil and gas
- Slurry
- Ventilation

SOLUTIONS:

- SABIC® HDPE – PE80
- SABIC® HDPE – PE100
- SABIC® HDPE – SABIC® VESTOLEN A
- SABIC® PP – IMPACT COPOLYMER
- SABIC® PP – RANDOM COPOLYMER
- SABIC® PP – HOMOPOLYMER
- SABIC® PP - SABIC® VESTOLEN P
- SABIC® PP – SABIC® PP RELY

AGRI- & AQUACULTURE

Conventional methods of farming and fishing are already reaching their limits. The latest plastic solutions offer new possibilities such as pressure -and drip irrigation. The SABIC®HDPE material enable the manufacture of long-lasting and dependable structures. SABIC® VESTOLEN P is a durable replacement for steel systems for heating and cooling of larger agricultural complexes and farms.

APPLICATIONS:

- Cages for fish farming
- Drainage
- Pressure and drip irrigation
- Sewage

SOLUTIONS:

- SABIC® HDPE – PE80
- SABIC® HDPE – PE100
- SABIC® HDPE – SABIC® VESTOLEN A RELY
- SABIC® PP – IMPACT COPOLYMER
- SABIC® PP – RANDOM COPOLYMER
- SABIC® PP – HOMOPOLYMER
- SABIC® PP - SABIC® PP RELY
- SABIC® PP - SABIC® VESTOLEN P
- SABIC® LLDPE

INFRASTRUCTURE

CHALLENGES

Millions of people worldwide don't have access to safe drinking water and proper sanitation. Plastic pipes offer an efficient, reliable and affordable way to distribute drinking water and reduce the risk of contamination and illness. Likewise, not having proper sewage and drainage pipe systems in place could lead to flooding, resulting in waste water mixing with fresh ground water and leading to contaminated drinking water. Treating and handling waste water and storm water is also crucial to us.

For people living in hot or cold climate zones, it is essential to create an adequate indoor climate. District heating - and cooling systems offer an environmentally friendly way to do so. In addition, access to telecommunication systems and internet is becoming essential. Changing the way people learn and communicate in their daily lives.

INFRASTRUCTURE APPLICATIONS

Gas
Potable and storm water
Sewage and drainage
Cable – and micro ducts
District heating
Fittings
Manholes and inspection chambers



SABIC SOLUTIONS

SABIC offers a complete range of PE80 and PE100 grades which are typically used for pipes for drinking water, gas and sewage. To address a diverse set of challenges in each application, SABIC has developed an 'integral innovation approach', focusing on the overall solution rather than the product alone. The introduction of the SABIC® RELY family is an example of the success of this approach, setting new standards in the infrastructure pressure pipe market, in terms of product performance, conversion efficiency and an uncompromising focus on the industry needs.

This technology enables the production of special polymer design of SABIC® PE100 with excellent low sag properties suitable for producing most challenging pipe dimensions (SABIC® RELY 5924R), and additionally enhanced resistance to slow crack growth (SABIC® RELY 5922R). This allows the installation of pipes without open trench or sand bedding, reducing construction time, the impact of traffic disruptions, and transport emissions. These particular properties can also reduce the risk of pipe failure through eventual surface damage or point loads.

As SABIC evolves to meet the changing market needs, SABIC extends the pipe portfolio with multimodal HDPE compounds by making use of an advanced multi reactor technology. SABIC's multi-modal compound SABIC® HDPE P6006AD offers optimal balance between stiffness and toughness, excellent ESCR, and higher strength. SABIC® HDPE P6006LS combines this performance with low sag properties.

In the market of Telecommunication, where micro ducts protect sensitive optical fibers used in communication lines, SABIC's bimodal grade BI5828 provides additional safety through its excellent stress cracking resistance. It also allows optimum line speed and efficiency during the extrusion process.

SABIC's innovative HDPE and PP grades enable economically efficient systems, which are easy to install and require minimum maintenance, with a lifetime of 50-100 years.

The SABIC® PP RELY family combines excellent stiffness and impact resistance at various temperatures with high temperature, oxidative, and chemical resistance. This product line supports an easy extrusion process and enables the production of pipes with a smooth inner surface. It exhibits excellent stiffness and impact resistance, and was named 'best grade' in its application class.

The new SABIC® PP RELY 61EK61PS combines the good processing behavior of SABIC® PP RELY 71EK71PS with higher levels of stiffness. This makes installation in demanding soil and loading conditions possible. Uniquely, it also provides high impact strength at low temperatures. This means additional safety for converters and installers during transportation and when installing or handling. The PP grades within the RELY family are all equipped with state of the art additive packages, and fulfill the stringent requirements.

DOMESTIC APPLICATIONS

- Floor heating, cooling and radiator connections
- Hot, cold and waste water
- Chimney and ventilation
- Conduit and protection



SABIC SOLUTIONS

Polypropylene random copolymer (PP-R) is easily installed by welding, is both taste and odor neutral, and offers good temperature and pressure resistance. Pipe systems made of PP-R are also a sustainable alternative to traditional copper pipes. They offer long-term improvements in water quality and in the reliability of sanitary systems.

SABIC PP-R product has been used in hot water installations worldwide for over 35 years, which is a testimony to its unrivalled quality and dependability. SABIC® VESTOLEN P 9421 was the first type of PP-R to be used for this application field. More recently the SABIC® PP 651H was introduced in the KSA market.

Engineered to withstand pressure under high temperatures, SABIC® PP-R have a very broad service temperature range, handling cold and hot water up to 70° C with a minimum service life of 50 years. It also delivers good performance under suitable pressure levels at temperatures reaching 90°C for periods under 50 years.

SABIC® PP-R provide even more advantages for converters, installers and end-users. They are easily welded and engineered to form strong welds ensuring the most reliable pipe systems with minimum water leakage. They can also be combined with stainless steel or brass fittings or insert providing ease of installation and design. SABIC PP-R product has been delivering safe drinking water around the world for decades, and longer than any other PP-R. It also meets all the stringent requirements for drinking water worldwide.

SABIC is expanding its pipe product portfolio with the introduction of two NEXLENE grades for the PE-RT hot and cold water applications. Suspension Poly Vinyl Chloride (SPVC) can be used for different domestic pipe applications such as clean water supply pipe and waste discharge pipes. SPVC pipe is easily to install by using PVC cement/glue. SPVC offer good pressure resistance for the water supply and can be a sustainable alternative to the traditional clay and steal pipe. SPVC has shown long-term improvement in water quality and in reliability of sanitary systems. SPVC 67S is used for pipe applications while the SPVC 59S is used for pipe fitting applications.



DOMESTIC



CHALLENGES

Pipes bring our most valuable commodity into our homes – water. And the quality of the fresh water supply is important for virtually every aspect of our lives.

As society becomes more complex the need for more innovative domestic pipe systems is also increasing. Whether you are providing a reliable and safe supply of clean water, waste water management, heating and cooling, or sanitary systems, we can provide you with flexible material solutions that deliver high temperature and chemical resistance, excellent durability and long-term performance.

INDUSTRIAL



CHALLENGES

Worldwide in chemical plants, mines, and process industries is a need to transport aggressive and dangerous fluids and waste in a safe and economical way.

Pipes made out of polyolefins are particularly suited to meet these requirements.



INDUSTRIAL APPLICATIONS

Chemical
Cooling
Dredging and mining
Hydropower
Oil and gas
Slurry
Ventilation



SABIC SOLUTIONS

Both HDPE and PP are typically used for pipes in industrial applications, which must be able to withstand higher pressures and handle industrial fluids and waste. Their chemical and corrosion resistance for example reduces the necessary maintenance and increases safety significantly. The particular strengths of polypropylene or polyethylene can be deployed in a variety of applications, such as geothermal energy and district heating.

Geothermal pipes can be installed deep under the ground, which maximizes installation efficiency. The deeper the bore hole, the higher the temperature. Pipes made with our SABIC® VESTOLEN A RELY 5922R PE100-RC provide additional

safety and protection of ground water resources, with its enhanced resistance to slow crack growth. Resistance to corrosion is another important advantage that pipes made with PP and HDPE offer.

SABIC® PE100, used for mining or slurry pipes, can reduce the total cost of ownership by offering a long service life due to its inherent abrasion - and corrosion resistance.

SABIC® VESTOLEN P9421 is ideal for district heating pipes used to distribute hot water. Its temperature resistance, combined with easy installation (welding) makes this grade ideal suitable for this application. For example, 630 mm SABIC® VESTOLEN P pipes are being used to distribute hot water.

SABIC® VESTOLEN A 5061R enables producers of district heating systems to meet the most demanding standards for their casting pipes, assuring a long lifetime and efficient maintenance.

For chemical plants SABIC® PP is typically used for the transport of chemical waste.

In the food industry SABIC® VESTOLEN P is a durable substitution for steel pipe systems for the transport of various fluids at low and elevated temperatures.

AGRI- AND AQUACULTURE APPLICATIONS

Cages for fish farming

Drainage

Pressure and drip irrigation

Sewage



SABIC SOLUTIONS

Irrigation systems help to increase the yield of agriculture, while ensuring the most economic use of water possible. Drip irrigation supplies water directly to the fertile ground. This limits the amount of water lost through evaporation and supports more efficient irrigation. Traditional systems waste a lot of water by overwatering or run off. SABIC® LLDPE 0132HS00 is a hexene-1 copolymer that provides high mechanical toughness and ESCR for advanced drip irrigation systems.

SABIC® VESTOLEN A 5061R is for instance typically used for pressure irrigation of arable land. Its inherent flexibility and long-term pressure resistance allows it to bridge large distances (PE80 classification) between the water supply and the crops.

SABIC® VESTOLEN A and SABIC® PE100 are used for the construction of large on- and off shore fish cages. This allows the breeding of fish in a sustainable way without depleting limited natural

fish resources. The mechanical strength, toughness and easy weldability of the SABIC HDPE material enables the manufacturing of long-lasting and dependable structures. SABIC® VESTOLEN P is typically used for heating and cooling of farms and larger agricultural complexes.

SABIC®PP RELY and SABIC® PP Impact copolymers are typically used for waste water management and for rain water storage and re-use.



AGRI - AND AQUACULTURE



CHALLENGES

Adequate availability of food for a fast growing world population is one of the major global challenges of today. Conventional methods of farming and fishing are already reaching their limits and may not be able to respond to increasing demand and changed dietary habits.

A close-up, high-speed photograph of water splashing into a container, creating a dense field of white bubbles and droplets. The water is clear and bright, with a strong blue tint. The background is blurred, focusing attention on the dynamic movement of the water.

SPECIALTIES

CHALLENGES

Products which are used in constant contact with water require unique properties, such as long-term durability and hydrolytic stability, and resistance to chemicals and high temperatures. Often, metals are not the best materials for this purpose. Furthermore, ever-evolving regulations require companies to provide materials with very specific characteristics for use in contact with potable and non-potable water. As science evolves, these regulations become stricter, making the use of traditional materials in water management impossible.

SABIC provides a variety of different high performance resins and engineering thermoplastics, which have helped to revolutionized water management products from pumps, to water meters, to piping, to heaters. They continuously develop these materials, to ensure that customers receive the best possible solutions.



SPECIALTY APPLICATIONS

Pumps

Water meters

Boilers

Fittings and valves



SABIC SOLUTIONS

SABIC's NORYL™ resin, an amorphous blend of polyphenylene ether resin and polystyrene, offers a comprehensive solution for water industry design. The resin portfolio offers customers a wide variety of material solutions to meet specific application requirements. They have best-in-class hydrolytic stability and excellent high heat resistance, and can perform well in both hot and cold water applications. It is characterized by excellent dimensional stability, low mold shrinkage, low water absorption, and excellent creep resistance. Furthermore, SABIC's resins are lightweight, and the advanced molding technology, as well as the structural performance of the resins, offers the capability of part consolidation. This also has the benefit

of easier part assembly, and lower costs for the customer.

SABIC also offers several other resins for water management applications. ULTEM™ is an amorphous PEI resin with excellent mechanical performance in high heat and chemically challenging environments.

LNP™ compounds provide exceptional mechanical performance in highly demanding applications such as submersible pump housings. They are extremely lightweight materials, which combine rigidity with outstanding strength and resistance to impact. They provide dimensional stability during operation, even in high heat, and are resistant to water absorption, corrosion, and scaling.

CYCOLAC™ and CYCOLOY™ plateable resins are resistant to cleaning chemicals, and offer a smooth finish and chrome-like appearance. This means that they are ideal for use in finishing components, such as taps and spouts.

In addition to their resin portfolio, SABIC Innovative Plastics also has a Water Management Centre of Excellence located in the Netherlands, which can provide customers with thorough technical data and product development advice. We work closely with the customer to develop a concept, which fits their requirements, and support them with long-term data and analyses on materials and applications.

INNOVATIONS

Home of Innovation™, based in Riyadh, Saudi Arabia, is a SABIC growth initiative that combines marketing, innovation and technology to help create demand and inspire ideas that enable local, and regional downstream industry development. The initiative connects SABIC with industry-leading companies to identify market needs and develop innovative solutions to answer them.



Home of
Innovation™
A SABIC growth initiative



THE FUTURE OF CHANGE

By 2050, another 2.5 billion people are expected to be living on our planet. This dramatic shift presents the world with many challenges. Population explosion, rapid urbanization, changing energy resources, shifts in economic influence... together, we can turn these challenges and many others into opportunities for innovation and growth. With new materials, smart solutions and better ways of working, we can provide solutions that help in addressing these challenges to help create a better future for everyone.



SABIC SOLUTIONS FOR THE FUTURE

BUILDING THE FUTURE

The construction industry is booming: By 2050, it is anticipated that 66 percent of the world's population will live in cities. More people means more houses — plus more office buildings, hospitals, schools, factories, roads, and so on. Building materials vary from concrete, pipes and cables to windows, doors, sealants and coatings — and chemicals and plastics are increasingly relied upon to improve performance and add protection.

REDUCE, REUSE, RECYCLE

Environmental regulations, consumer demand and better building science are improving construction practice around the world, so building sustainably is not only

good for the environment, it offers protection against future changes in government policy.

Reducing construction waste, using recyclable, recycled, and fewer raw materials during construction is just the beginning. Green strategies go beyond the build, and encompass a structure's end use — for instance reducing water, heat and energy consumption once it is occupied.

WATER TREATMENT

Water quality is essential to the health of both people and economies. Across the world, we spend \$587 billion every year supplying clean water to meet the demands of households, farms and industry. A sustainable water supply means thinking about how we extract, conserve, use and distribute

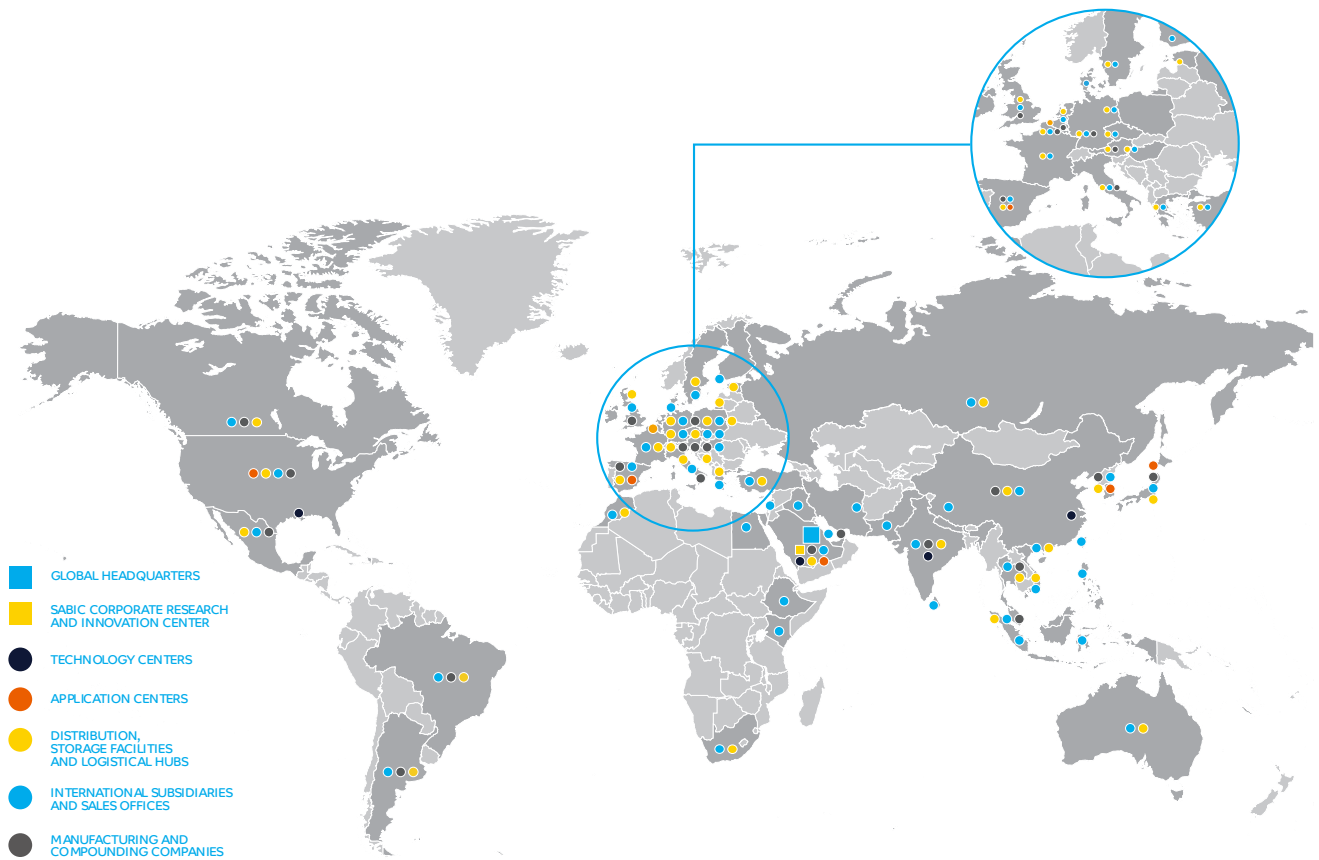
every drop — even areas with plenty of rainfall and freshwater can suffer scarcity, if all the infrastructure we need for water is not good enough.

THE FUTURE

In the Middle East, and specifically in the Kingdom of Saudi Arabia, reliable fresh water sources are scarce. This makes processes such as desalination of seawater and water recycling particularly valuable.

Across the developed world, a focus on water quality and recycling is driving innovation. Look out for new filters and advanced membranes that can rid water of microscopic molecules! The developing world will benefit too — regulation here is leading to massive investment in improving the sewage systems, for the benefit of everyone.

WE POWER YOUR AMBITIONS



Powering ambition is the essence of SABIC. We focus on helping our customers to achieve their ambitions and power their competitive advantage. SABIC's defining difference is the way we build long-term relationships and cultivate a spirit of ingenuity, as well as our dedication to deliver innovative solutions. Through what we do and how we do it, we power the ambitions of our customers, the society in which we operate, our business partners, and our employees.

WE SHARE YOUR COMMITMENT

SABIC shares your commitment to innovation, quality and consistency. Collaborating closely with our customers creates the solid foundation that makes visionary innovation possible.

SABIC has 19 Innovation Centers around the world, continuously working to improve quality and deliver ground-breaking material solutions for a multitude of applications. Over the years, we have grown from a solid supplier to a strong innovation partner.

WE UNDERSTAND YOUR CHALLENGES

As we understand our customers' commercial ambitions, we also understand what's at stake in the world we live in. We care about our planet, for today and tomorrow, and we know our customers have the same interest. Sustainability is an essential part of powering ambition, for our customers and communities.

By combining our deep understanding of what customers want, with our drive to develop innovative solutions, how we approach production processes, how we reduce the operating footprint and how we contribute to a sustainable environment for our communities, we foster our customers' success and help them strengthen their competitive advantage.

WE ARE WHERE YOU NEED US

We are right where you need us. Wherever you are in the world and whenever you need us, we are there. SABIC's local sales teams are ready to support your business goals and provide the best product solutions. Our technical experts can offer insights on your customized applications.

We create partnerships that drive growth and leadership for SABIC and our customers. And we call this

CHEMISTRY THAT MATTERS™

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