
HSE Report 2018
"We make valuable products for our customers, in a safe way, in compliance with all applicable regulations. At the same time, we elevated our commitment to doing this in a sustainable way."

Welcome to Teijin Aramid’s Health, Safety and Environment (HSE) Report 2018. In 2018, we continued to make valuable products for our customers, while guaranteeing the quality of our products and ensuring they are manufactured in a safe way, in compliance with all applicable regulations. At the same time, we elevated our commitment to doing this in a sustainable way.

As Teijin Aramid, we aim to be transparent about the impact of our own activities on people and the environment, so we find it important to report on the HSE performance of our production locations in the Netherlands (Twaron® production).

As we would like to emphasize our increased level of ambition regarding sustainability, we have changed the setup of our HSE Report. In a more attractive layout, we highlight our views on developments around the globe, the impact of global issues such as climate change and waste, and what this means for us as a company. Specifically, we focus on the subjects energy and resources, and we also report on the performance of Twaron® in these areas. In addition, we continue to provide insights into the local HSE performance of our facilities in Delfzijl, Emmen and Arnhem in the Netherlands.

We would very much like to receive your feedback on this report, so that we can make further improvements next year. Please send us your views, comments or observations by submitting the online form on our website (www.teijinaramid.com) or by sending us an email (information@teijinaramid.com), and we will get back to you. Any feedback will be greatly appreciated.

**Energy savings thanks to the use of aramid in conveyor belts.**

The application of Twaron® instead of steel as the reinforcing material in conveyor belts makes the belts considerably lighter. As a result, operating Twaron®-reinforced conveyor belts requires less energy. In 2018, these savings at end-users amounted to more than 300 Terajoule (TJ).
“Our ultimate goal is a fully sustainable circular aramid chain with a finite use of resources on the basis of 100% renewable energy.”
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Through its lightweight and durable high-performance fibers, Teijin Aramid has always had sustainability at its core. Thanks to our materials, our customer and end-users benefit from products that last longer, require less maintenance, and reduce energy costs and CO₂ emissions. At the same time, we have long focused on minimizing energy consumption and waste in our production processes. We do this through our Energy Efficiency Plans (EEPs) and by recycling used aramids, thus preventing them from ending up as waste and giving them a new lease of life in the form of pulp.

People around the world are increasingly concerned about climate change. The younger generations are even taking to the streets to voice their anger that politicians and businesses seem to be far too slow in enforcing measures to reduce CO₂ emissions. The Paris Agreement, the extension of CO₂ pricing, and the energy transition to sustainable sources of energy have all led to a heated political debate. In the Netherlands, where our Twaron® and Endumax® plants are based, this has resulted in a Climate Agreement. All these developments are adding to the sense of urgency that we at Teijin Aramid feel to accelerate our own ‘sustainable energy’ efforts.

As a business-to-business company, the effects of our sustainability efforts are noticeable throughout the value chain. The energy footprint of our products does not stop when we have produced the materials. Thanks to our lightweight and durable aramids, customers and end-users can achieve significant energy savings themselves – a win-win for both them and the environment.


Energy & Environment.
Energy & Environment.

“In 2018, we initiated a clear shift of focus towards accelerating the reduction of our CO₂ emissions.”

Energy efficiency

Energy has a significant impact on our ecological footprint. In our efforts to reduce our ecological footprint, we are always seeking new ways of reducing our energy consumption in manufacturing our products.

Teijin Aramid has taken energy efficiency and energy saving very seriously for many years. Since 2009, we have participated in the MJA-3 covenant, which involves long-term agreements between the Dutch government and companies on improving energy efficiency. The implementation of these agreements are defined per location in Energy Efficiency Plans (EEPs). The objective is to achieve an annual average of 2% energy efficiency savings in our production processes. In addition, in recent years, we have intensified our research efforts to develop new technologies that will make our processes even more energy-efficient. And whenever we expand our plants or build new facilities, we make sure to include the latest and most energy-efficient technologies and equipment.

Focus on reducing CO₂

Within our business, our energy consumption is our main contributor to CO₂ emissions, and we will continue to improve the energy efficiency of our processes. However, this will not be enough for a fully sustainable future. A big game changer here is the general shift in focus toward the reduction of CO₂. That’s why, in 2018, we decided that we will need to accelerate the reduction of our direct and indirect CO₂ emissions. What’s more, our ambition is to take a leading role in the world of aramid in this regard.

Energy transition

In the Netherlands, we feel the pressure of the energy transition at our Twaron® production sites. To run our business, we will always need energy. Even with more efficient processes, our energy consumption is still a major contributor to our CO₂ generation. In 2018, we therefore started exploring our options with regard to our own energy transition, such as the use of renewable energy as our primary source of energy.

As we cannot do this alone, we will need to partner up with our energy suppliers, who feel the same pressure as we do. They also need to find ways of making the energy they sell more sustainable. We have therefore entered into discussions with our suppliers in Emmen and Delfzijl to explore how we can create a win-win situation. We are confident that we can make the first essential steps in the coming years. Besides working closely with our traditional suppliers, we may also need to find new, innovative partners in the market to support us in our drive toward a CO₂-neutral future.

Raw materials

For our raw materials, we depend on the chemical industry. To improve our eco-efficiency profile, we have initiated a number of pilot projects to make our raw materials more sustainable. For example, we work closely with our supplier of raw materials for our plant in Delfzijl. As they are increasingly using renewable sources of energy, the ecological profile of the raw materials we purchase is also becoming more sustainable.

Challenges

Our ambitions reach high, and achieving them will not be easy. An important challenge that industry in the Netherlands as a whole is facing is that CO₂ limits imposed by law do not take into account any CO₂ benefits in the chain. We feel that this is a missed opportunity. If the total value chain of our products is taken into account, we can show that the application of aramid instead of alternative materials saves a multitude of the CO₂ emissions related to the production of the aramid in question. Another dilemma is the limited availability of renewable energy, and, to a lesser extent, the higher prices. Scarcity is in fact one of the biggest challenges, and one we will not be able to solve on our own. We will therefore need to partner up with like-minded parties to look for new ways of generating sufficient renewable energy.

Focus and dedication

Going forward, Teijin Aramid is committed to taking the necessary steps that will continue to reduce our ecological footprint, and we will accelerate our efforts where this is possible. This requires focus and dedication in the way we organize our activities, working closely with suppliers, customers, and all other partners in the chain.
In 2018, we worked according to our third Energy Efficiency Plan (EEP), for the period 2017-2020. All local results are given in the local performance pages (see appendices). The graph below shows that the energy consumption per ton production of Twaron® has stabilized over the past few years. Increasing our energy efficiency even further is clearly taking more and more effort, as all the low- and medium-hanging fruits have already been picked.

Looking at the results of the current EEP period (for the years 2017 and 2018), we achieved an overall energy savings of 2.5%. This is lagging behind on the plans agreed, and we have therefore defined various actions to get back on track.

In 2018, we added a focus on reducing our direct CO₂ emissions (scope 1). The graph below shows the overall direct CO₂ emissions per ton production of Twaron® in the Netherlands. This is the direct CO₂ emitted by using natural gas for our drying and heating process (scope 1). It does not include the indirect CO₂ emissions from the generation of all other energy sources purchased (scope 2). The reduction is mainly the result of our efforts with regard to reducing the amount of energy required.

The reductions achieved so far will not be enough to drastically reduce our direct CO₂ emissions further. This will require more sustainable sources of energy. In 2019, we will start a program to define relevant CO₂ reduction targets and corresponding actions.

**Our product carbon footprint**

In 2016, we first calculated our ‘product carbon footprint’, i.e., the average eco-profile of our Twaron® yarn and pulp. We are currently in the process of recalculating this footprint, but for now we still use the 2016 product carbon footprint values.

In order to be able to make a good comparison, the current GWP (Global Warming Potential) values are based on a fixed set of data: the average production data from 2012 to 2014. The scope of these product carbon footprints is ‘from cradle to factory gate’, covering the extraction of raw materials, the production of intermediate materials, and the production of our end-product Twaron®.

It is important to bear in mind that comparisons between materials are often made on the basis of its eco-profile per kg of material. However, we always emphasize that it is in fact the function of the material that reveals a product’s total ecological impact.

By means of our Customer Benefit Model, we make fact-based calculations, which we discuss with our partners. For example, when comparing the use of para-aramid instead of steel as a reinforcement material in conveyor belts, we can calculate that the application of aramid significantly reduces CO₂ emissions. A Twaron®-reinforced belt weighs up to 40% less, resulting in high energy savings of up to 25% and reduced CO₂ emissions over the belt’s total life time.
"I strongly believe that the chemical industry will actually be part of the solution to the CO₂ challenge."

Edward Groen, Site Manager Delfzijl, the Netherlands

"At our site in Delfzijl, we produce monomers and the aramid polymer that serves as the raw material for Teijin Aramid’s successful Twaron® para-aramid fiber. As this is a highly energy-intensive process, we’ve actively worked on energy reduction for many years.

Thanks to more energy-efficient equipment and innovative technologies, we’re steadily progressing towards our 2030 objective of a 49% reduction in energy use per kg of polymer compared to 1990. However, because our business is growing fast, our absolute CO₂ emissions continue to increase. And no matter how energy-efficient our processes are, we’ll always need energy. In order to truly minimize our CO₂ emissions, we’ll need to start using renewable sources of energy rather than fossil fuels. In 2018, we started exploring further options with our utility supplier to see if we can start using steam produced from biomass. Another promising renewable energy source we’re looking into for the longer term is hydrogen generated from wind energy through electrolysis.

One of our main challenges here is that we’re competing on a global level, including when it comes to energy costs. Renewable sources of energy are still up to four times more expensive than natural gas, so we need the prices to come down before we can make real steps in this regard.

As we work on solutions, new business models will arise, and cross-chain collaboration will be essential to create breakthroughs. That’s why, as Teijin Aramid, we work closely with our suppliers, partners and customers and take part in a regional industry consultative body. In this way, we stay at the forefront of developments.

I strongly believe that the chemical industry, which is always looking for breakthrough innovations, will actually be part of the solution to the CO₂ challenge. If we can pool everyone’s expertise effectively, I’m convinced we can help make the energy transition come true and leave a more beautiful world for the next generations."
For several decades, we have taken the benefits of plastics and synthetic materials for granted, without paying much attention to the global disaster we see looming now. In recent years, citizens, governments and businesses around the world have been waking up to the fact that we will need to act fast. We see initiatives arise such as the Ocean Cleanup and bans on certain plastic products, particularly those that are only used once and then thrown away.

As an aramid producer, we rely on primary resources that are oil-based, and we produce synthetic materials that are meant to last. As such, we do not actually contribute to the ‘plastic soup’ problem in the oceans, but some of our residual materials may still be incinerated or end up in landfill at the end of their useful life. In our drive for sustainability, the way we source and reuse our materials throughout the chain is therefore hugely influential when it comes to preventing waste.

We attach great importance to reusing and recycling materials - not only of the chemical substances we use in our production processes, such as sulfuric acid and NMP but also of our finished products, the aramids themselves. Our products are far too valuable to end up as waste. By reusing our aramids, we not only save on the energy-intensive process of producing new materials, but we also reduce net waste, CO₂ emissions and costs.
Towards a circular economy

In an ideal world, there is no waste. In a circular economy, we will simply keep using the same materials over and over again. Our focus on circularity will enable us to serve two important sustainability goals: reduction – and ultimately elimination – of both CO2 emissions and waste.

Recycling within our production processes

Within our production processes, recycling has always been important. We have designed and optimized our processes in such a way as to maximize recycling opportunities. At our plant in Delfzijl, for example, we recover the solvents NMP and CaCl₂ from our spent solvent streams, and in Emmen we have a closed sulfuric acid loop, while we also reuse water as much as we can. In Arnhem, we collect our spent solvent stream. For economy-of-scale and efficiency reasons, this is treated in Delfzijl to recover NMP. The water is reused in Delfzijl, while the NMP is reused in Arnhem.

Recycling aramids

We reuse sub-grade aramid materials from our own production process by reprocessing them. In addition, we buy used aramid materials from the market, which serve as source material for our Twaron® pulp. This pulp is used for friction products, mainly for the automotive industry. The recycling materials we process are yarn residuals, production leftovers, fabrics, and ballistic vests.

With a view to the future, in 2018 a multidisciplinary Circular Economy Team has been set up, which is looking into even more recycling opportunities, retrieving materials from other sources, such as intermediate products, and working out what they could be used for. Our research efforts will also focus on expanding the possibilities of reusing materials in different ways and from a larger variety of end-products. This will be particularly valuable in a market where used aramids are hard to come by and their value is high.

Joint effort

In the Circular Economy Team, colleagues from R&D work closely with the sales team to ensure alignment with market developments. We also work closely with customers and other partners in the value chain to retrieve more used materials from the market. Our aramids often form only a small part of the end-product in which they are used, and the value chain from us to the end-user can be quite long. This makes it extra challenging to retrieve the aramids from the end-products before they are discarded as waste. In addition, as early as in the design stage of end-products, it will become increasingly important to consider the ways in which aramids are incorporated in order to facilitate recovery and recycling. Good collaboration and common objectives will therefore be essential in creating a win-win-win situation for ourselves, our partners, and the planet.

Challenges and opportunities

A circular business requires new ways of working. As we deliver such a wide variety of materials for so many different markets, and because they may end up in just very small amounts as part of all kinds of products, our value chain is very complex and multidimensional. To make sure we can retrieve as much of our material as possible, we need more in-depth insight into this chain, as well as the potential recycling chain. To make sure we can retrieve as much of our material as possible, we need more in-depth insight into this chain, as well as the potential recycling chain. We cannot just take back any materials. We need to know where things come from, what is in them exactly, and whether they are safe to work with. We therefore rely on other parties and partners in the chain. The fact that governments around the globe are increasingly introducing legislation that prohibits the dumping of materials will be helpful in this regard. There is a clear global movement towards promoting circularity. Together with our partners, we should seize this momentum as an opportunity to step up our efforts to reuse as many aramids as possible.

Resources.

“Our focus on circularity will enable us to serve two important sustainability goals: minimizing both CO2 emissions and waste.”

Long-term dream: from oil-based to renewable-based

Another development that will become more urgent in the longer term will be the origin of our raw materials. Our polymers are currently oil-based, and will remain so in the foreseeable future, but we are also stimulating the development of bio-based raw materials. In collaboration with our research institute, our site in Delfzijl is looking into ways of creating a super-strong high-quality fiber on the basis of sustainable raw materials. Together with an external partner, we have set up a lab-scale pilot to test the production of a bio-based yarn.
We report on our performance with regard to resources in three areas: recycling, water consumption and waste.

**Recycling**

As we explained earlier, recycling involves several aspects, including the recovery of raw materials. Where possible, we have closed process loops, in which we recover auxiliary chemicals such as sulfuric acid (Emmen), NMP (Delfzijl and Arnhem), water, and other valuable raw materials. Where applicable, we also try to maximize the recycling of our sub-grade aramid material and waste. In addition, we recycle reusable aramids.

We have two recycling facilities: one in Emmen and one in Arnhem. At both locations, we make pulp products out of reusable aramids. Over the past few years, we have continued to increase our recycled input. The graph shows the tonnage in % compared to the selected reference year 2010.

(WB: This is a schematic representation. Our auxiliary chemicals are not 100% recovered.)

**Waste**

In spite of our closed loop and recycling approach, our production plants still produce waste that we cannot reuse. At all our locations, this waste is either offered for external recycling or sent to incinerators. A small part is discharged as landfill. Although limiting waste is not a strategic priority, we try to reduce waste where possible. This has resulted in a reduced total tonnage of waste per ton production.

**Water consumption**

All our factories make use of industrial water. In our production processes, we try to reuse as much water as we can. Nevertheless, we still need additional fresh water. Most of our water intake is used for the washing process of our yarn. Reducing our water intake is not a strategic priority, but we do try to improve our footprint in this regard. Over the past few years, we have been implementing various efficiency improvements in our production processes.
“Given our circular economy drive, recycling is increasingly becoming a highly strategic topic.”

Rene Lohmann, Sales & Marketing Manager
Ballistics, Wuppertal, Germany

“Recycling is becoming increasingly important, and we want to more than double our volumes in the next five years. The markets we get return streams from are currently the US and Europe, and the materials we buy back are yarns, fabrics, and ballistic materials such as vests.

We are now working on making the purchasing process more efficient, eventually getting return streams from all applications and all our markets at a global level, including Asia and South America.

Importantly, we don’t just buy back our own materials, but also other para-aramids from the market, either directly from some of our customers or from other para-aramid users. When dealing with customers, we work closely with our sales colleagues. Because the ‘normal’ relationship is reversed, genuine partnerships and common goals are essential. We depend on trusted and reliable parties, with a professional and sustainable chain for processing the materials.”

Saskia Verhoeven, Plant & Site Manager,
Arnhem, the Netherlands

“The recycling materials bought back by the purchasing team end up in bales in Arnhem. This materials is fed into our ‘recycling lane’, and is handled with care, as the material may sometimes still contain shards or other sharp materials such as bits of knives and bullets. Our people who work on this lane therefore always wear protective gloves.

The material is cut up in a special cutting machine, which is quite a challenge, given the strength of the material. The cut material is processed into a special type of Twaron® pulp. This pulp is used for many different high-tech applications, and is a safe alternative to asbestos.

Recycled materials are a very important source for Teijin Aramid. They enable us to offer our customers ecologically responsible solutions and attractive GWP footprints.

Given our circular economy drive, recycling is increasingly becoming a highly strategic topic. That’s why our focus going forward will be on acquiring more in-depth insights into the recycling chain and gaining access to more and good-quality materials throughout the world. We realize that this will be quite challenging, as the market is extremely competitive, with a growing number of players. We’re ready to take it on!”
With regard to safety, we aim to be among the best in class. We want our employees and contract workers to return home from work safely, every day. A safe work environment can be achieved by managing risks well. On the one hand, this is done by means of process management (technologies and systems) and, on the other hand, by means of social management (people and behavior).

Health and safety are main priorities in the development and manufacturing of our products. Given that our core business involves the handling of hazardous chemicals and machinery, it is of crucial importance that our employees and contract workers, as well as people living in the neighborhood, always remain safe. This mainly relates to conscious behavior, a well-functioning dialogue between collaborative parties, and compliance with relevant procedures. We are striving for what we call a ‘proactive safety culture’ within our organization. However, we are not there yet. To achieve our goal, we have set up various programs that address both labor safety and process safety.
Our goal is to achieve a pro-active safety culture by increasing people’s awareness of risks and encouraging safe behavior.

Safety is key for our license to operate, and we pay a great deal of attention to the continuous improvement of our safety standards and safe ways of working, both for our own employees and for the contractors we work with.

In our safety approach, we differentiate between labor safety and process safety. For both areas, we have set up various programs to further improve safety levels.

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Labor safety
Labor safety refers to the level of safety with regard to incidents and unsafe situations leading to personal injury. In the event of an unsafe situation or an actual incident, we always report it. We see each report as an opportunity to improve safety levels. All reports are saved in a database, and relevant actions are defined to improve the situation. In order to make structural improvements to safety within our work environment, we investigate all reports to look for trends or other overarching issues and underlying causes that require our attention. We do this at all locations, and share best practices.

This analysis has shown that, in order to reduce the numbers of incidents, we should focus more on people’s behavior. Our goal is to achieve what we call a pro-active safety culture. For this purpose, in 2017, we introduced the ‘brain safety model’, which aims to increase people’s awareness of risks and to reduce the negative effects of potential risks. Emmen was the first location to start working according to this philosophy. A key element of this approach in Emmen was the introduction of ‘safety coaches’. We now have some 50 safety coaches in place. These coaches are trained to discuss safety with their colleagues by asking questions and giving feedback in the workplace.

In 2018, the principles of brain-based safety were introduced in Delfzijl. In 2019, the method will also be rolled out at our Twaron® pulp location in Arnhem.

Exposure
In our production process, we work with various chemical substances. Preventing employees’ exposure to chemical substances is an absolute priority and receives a great deal of attention. In particular, we aim to reduce exposure to chemical substances; this is always the first step. However, if reduction measures are not sufficient or feasible, the use of personal protective equipment (PPE) is mandatory to ensure that people work safely within the legal limits, or our own limits if they are stricter.

Process safety
Besides labor safety, we also pay a great deal of attention to process safety. This focuses on the safety and integrity of our equipment. Our production plant in Delfzijl is a process facility par excellence, which is why it plays a leading role within Teijin Aramid when it comes to process safety.

Over the past five years, our large production plants have been working in accordance with the industry standards for process safety management drawn up by the American Center for Chemical Process Safety (CCPS). In line with these standards, we periodically carry out scans of twenty different aspects of our organization in order to evaluate if our process safety management is at an informal, functional, integrated or leading level. Based on the results, we implement targeted projects to make our plants even safer. In 2018, we executed various projects at all of our locations to improve our process safety levels.

In 2019, all our locations will be assessed or reassessed in accordance with the required ATEX standards. As a relatively small location, our Arnhem site will carry out an applicability scan rather than a full assessment.

ATEX
In 2018, we paid specific attention to our ATEX zones. ATEX (Atmospheres Explosives) is a set of European Union regulations designed to ensure a safe working environment for employees and to guarantee the suitability of equipment and protective systems used in areas where an explosive atmosphere may occur (ATEX zones). All our locations have identified their ATEX zones and taken the required measures to ensure a safe working environment. The next step will be to make sure that all technical instrumentation is in accordance with the required ATEX standards. An analysis has been made, and the implementation of all required improvements has been planned.
Despite all our efforts, hazardous situations still occur and, unfortunately, incidents still happen. We do everything we can to prevent this, as we believe that each incident is one too many.

We measure our safety performance on the basis of the following data:
1. Incidents leading to absence (Lost Time Injuries – LTI)
2. Incidents leading to temporary alternative work (Restricted Work Cases)
3. Incidents requiring medical treatment (Medical Treatment Cases)

Using this information, we calculate the Total Recordable Rate (TRR), which is the total number of incidents (i.e., the total of Lost Time Injuries, Restricted Work Cases and Medical Treatment Cases) per one million working hours. We also calculate the LTI frequency rate, which is the total number of LTIs per one million working hours.

The health of our employees is very important to us. One of the ways we measure our performance with regard to our employees’ health is our ‘absence due to illness rate’. In 2018, this rate was 6.3%.

Despite our many efforts to lower absenteeism due to illness and to improve the employability of our people, our ‘absence due to illness rate’ has not significantly improved. Particularly in Emmen, illness-related absenteeism is high. Here we see that an ageing work population and shift work are taking their toll. Long-term absenteeism (from 6 weeks to 12 months) has a noticeable effect on the rate.

We will continue our efforts to reduce absenteeism due to illness. We do this by making use of ‘vitality coaches’ in collaboration with a certified occupational health and safety organization, as well as through various projects geared to sustainable employability, such as increasing the level of automation, lifestyle improvements, (shift) work patterns, etc.

In order to be able to measure the effect of our improvement programs, we have set ourselves the target of an overall Total Recordable Rate (TRR) of below 8. Despite our extra efforts, we did not achieve this target in 2018, and the safety programs implemented have not yet led to the desired results, as our TRR in 2018 was 8.7. Both our LTI frequency rate (2.09) and the other recordables are not yet up to our desired standards. We see this as a negative trend, and we are working hard to reverse it. In 2019, we will start with a thorough evaluation of our labor safety approach and the corresponding program. On the basis of this review, the program will be adjusted to significantly improve our safety performance.
Teijin Aramid is an international organization, with production plants in Japan, Thailand and the Netherlands, and with research centers in Japan (Tokyo), the Netherlands (Arnhem), Germany (Wuppertal), and China (Shanghai). Our sales organization covers all regions of the World: USA, South America, EMEA, Japan, China and India. The total Teijin Aramid organization employs some 1,750 people.

As part of Teijin Limited, Teijin Aramid follows the Group’s strategy and policies. These policies and their impact are reflected in the Teijin Group Integrated Report 2018. This report can be downloaded from the Teijin Group website (www.teijin.com/csr/report).

This HSE Report reflects the impact of Teijin Aramid’s operations in the Netherlands (Twaron®).
Appendices.

Performance per production location.

Teijin Aramid has an extensive global network of sales offices and agents, so that customers all over the world can optimally benefit from our products and knowledge. Our head office is located in Arnhem, as is our R&D department. Our Twaron® production facilities are located in Delfzijl, Emmen and Arnhem.

In this appendix, all local facts and figures are presented. In addition to reporting on our performance at Twaron® level, we also offer the data on a local level. If you have any questions regarding these data, feel free to contact us by e-mail (information@teijinaramid.com).

We express our energy consumption by means of the Energy Efficiency Index (EEI). This is the total energy consumption per ton manufactured product per site, compared to 2005.
Emissions to water

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Emissions to air

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</thead>
<tbody>
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<td>Polymer dust and other particulates</td>
<td>Delfzijl</td>
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<td>884</td>
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<td>1,143</td>
<td>1,070</td>
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<td>Arnhem</td>
<td>52</td>
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<td>301</td>
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<td>184</td>
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<td>10</td>
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<td>&lt;0.4</td>
<td>1.7</td>
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<td>146</td>
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<td>871</td>
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<td>1,051</td>
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</tr>
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</table>

Nitrogen oxide (tons)

|---------------------|----------|------|------|------|------|------|------|------|------|------|

All our factories make use of industrial water. We report on our water consumption by means of the water consumption index per location. This is the water consumption per ton of production, compared to our reference year of 2005.
At Teijin Aramid, everything we do is guided by our ambition to shape a better future for generations to come. Day after day, we move forward, continuously improving our processes, our technology and ourselves. As market leaders, we drive progress through collaboration and set new standards for high performance. We connect with our customers at every level, wherever they are in the world. Because we believe that, together, we can be something bigger. Together, we can challenge conformity.

From automotive and oil & gas, to civil engineering, ballistic protection and beyond, our products are empowering excellence in diverse markets and applications around the globe. By enabling lighter, stronger and more resistant materials. And by taking durability, protection and efficiency to new levels. Whether you choose Twaron®, Teijinconex®, Technora® or Endumax®, our high-performance materials are an enduring guarantee of reliability. You can be sure of that.

For more information
Please e-mail us at:
information@teijinaramid.com
or visit
www.teijinaramid.com