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MESSER
Gases for Life

Gases for Life

The industrial gases magazine

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Dear Readers,

Our annual company conference took place recently under the motto "We take the Change". I had the pleasure of speaking about the process of change that has been set in motion by increasing digitalisation. This is presenting new challenges to us as an industrial gases company as well as to every other branch of industry.

Industrial gases are certainly not a "trendy" new product. But they will play an important role in many innovative applications. They already do so in some cases: a French company has developed technology that allows climate-damaging emissions released from landfill sites to be extracted, separated and cleansed. They can then be used as an energy source. Messer supplies the cryogenic liquid nitrogen needed for this application.

Find out more about this gas application – as well as many others with potential – in this issue of our magazine. I hope you find the content varied and fascinating.

Stefan Messer
CEO and owner of Messer

The cover photo shows
Ilias Lahchiri, an engineer at Messer Group. When he needs to grab a quick bite to eat on his lunch-break, he turns to convenience products. Thanks to protective gases, his sandwich is still appetisingly fresh when he opens it.

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Nitrous oxide for Starbucks

Shelly Zhao (left) and Shally Xia of Messer in China enjoying a frappuccino at Starbucks

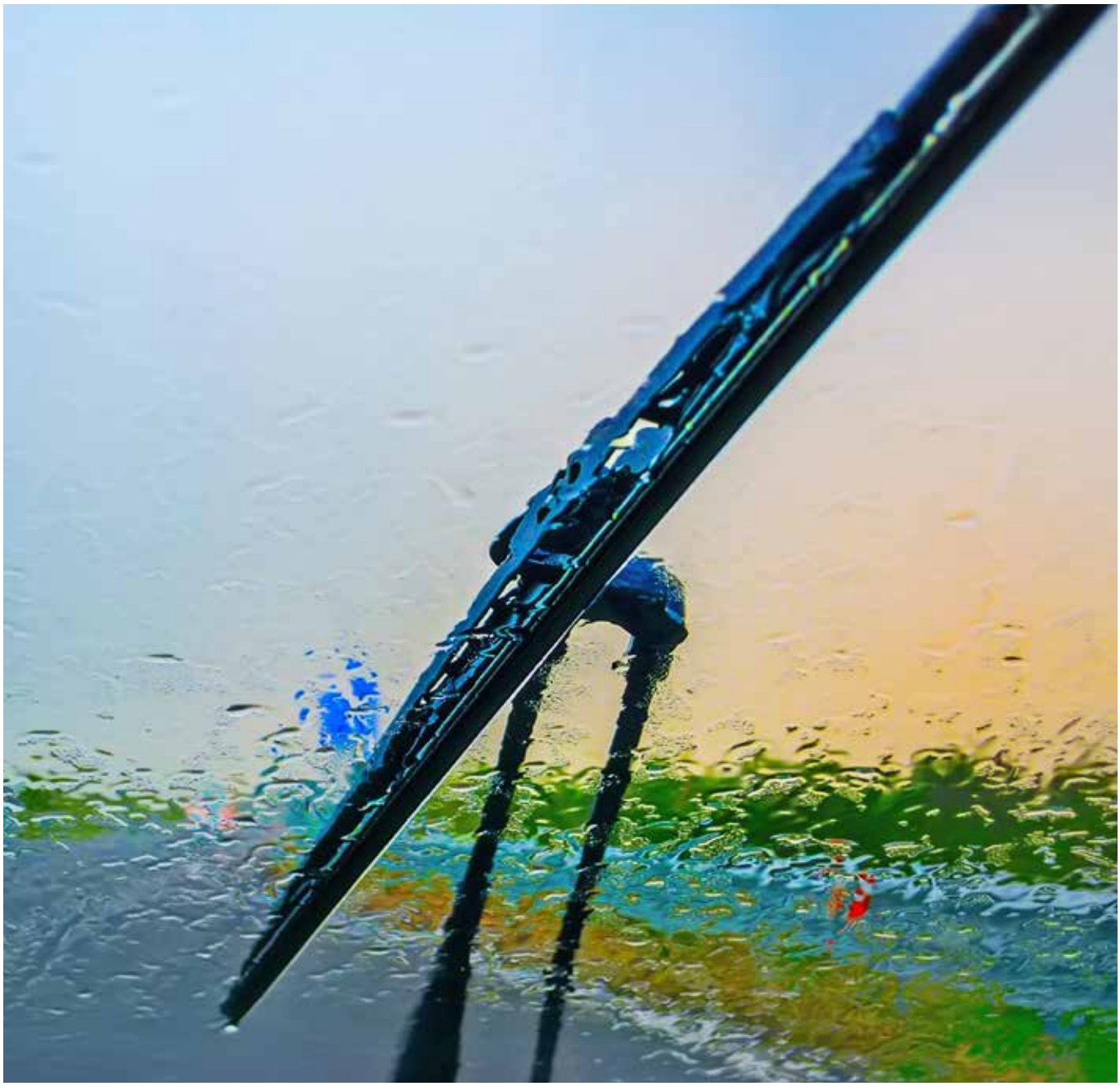
China | Starbucks in China uses nitrous oxide from Messer to speed up the process of making whipped cream. Instead of minutes of stirring, a quick blast of gas is enough to turn the liquid milk product into a fluffy, creamy mass. In addition, the bubbles produced have a flavour-enhancing effect on account of their size. The gas is therefore used frequently in the food industry to froth up liquids and emulsions. For example, the American coffee giant uses it to make coffees such as mocha, con panna and frappuccino particularly creamy. Starbucks has some 2,600 cafés in China. Messer has specially developed a refillable nitrous oxide pressure cylinder for the company's outlets in Shanghai. Compared with the disposal cans used hitherto, it contains 250 times more gas and therefore needs to be replaced much less often.

Jasmine Yan, Messer China

Nitrogen for rubber deflashing

Germany | W. Kerspe, a rubber and silicone factory in Wipperfürth, produces more than 4,000 different products, mainly for the electrical and automotive industries. The products range from extremely small moulded parts with a diameter of five millimetres to 140cm-long windscreen wipers or power distribution boxes weighing 20kg. Kerspe uses nitrogen from Messer to deflash the rubber mouldings after production. As the cryogenic gas cools the rubber parts, the thin flash becomes hard and brittle. It is then blasted with small plastic pellets and breaks off cleanly. After deflashing, no further rework needs to be carried out on the mouldings.

Thomas Böckler, Messer Group



At Kerspe, windscreen wipers measuring up to 140cm in length are among the products that are deflashed with nitrogen.

A clear picture for the right treatment

A detailed look inside the human body requires ‘dancing’ atomic nuclei. This can be achieved with a magnetic resonance imaging scanner and very strong magnetic fields. To enable the scanner to create these fields, its magnets are turned into superconductors by means of cryogenic cooling with liquid helium.

A fracture is clearly visible on an X-ray. Injuries to muscles, ligaments, tendons, blood vessels and nerves, on the other hand, can at best be guessed. However, on a magnetic resonance imaging (MRI) scan, the medically trained eye can clearly make out the soft tissues as well. As an imaging process, it reproduces the condition of the body in great detail. MRI scans depict the body in extremely thin layers and provide the additional option of selecting any plane you wish. The sectional images of the individual layers are joined together by a computer to produce a three-dimensional model, allowing the surgeon to plan their operation in precise detail. The MRI scanner obtains its images from radio waves emitted by hydrogen nuclei.

Atoms have a positively charged nucleus and intrinsic angular momentum, or nuclear spin. This gives them a magnetic moment. In a strong magnetic field, the atomic nuclei therefore align their axis of movement along the lines of the magnetic field. If an interfering signal in the form of radio waves is now emitted, the nuclei begin to dance and to change their orientation. If the interfering signal is stopped, the magnetic field takes over again: the protons dance back, realign themselves with the magnetic field and, in the process, release the absorbed energy in the form of radio waves. These signals are processed in the MRI scanner. Since each type of tissue contains a characteristic amount of hydrogen, a computer can use the differences in signal strength to compute a high-contrast image of the body's structures. However, this requires a very strong and homogeneous magnetic field that

Depending on the quantities required, dewars ranging in size from 50 to 450 litres are available for the supply of helium.

is 20,000 to 100,000 times stronger than the earth's. In order to create such a field, a length of several hundred kilometres of special wire is wound into a coil. At a temperature of around four degrees above absolute zero, the current in the coil flows without resistance – in other words, it is turned into a superconducting magnet. The strong magnetic field can only be maintained with superconductivity.

The necessary cooling is provided by liquid helium. It is the only element that remains liquid at minus 269 degrees Celsius under atmospheric pressure. It circulates in a separate cooling system, where it is vaporised and liquefied again to produce a cooling effect. Modern nuclear magnetic resonance imaging scanners keep the gas in hermetically sealed systems, where it is fully recovered after each cycle. However, some losses are unavoidable during maintenance. The lost helium has to be topped up again. If the temperature were allowed to rise, it would damage the superconductor. What is more, a large quantity of helium would suddenly vaporise and would have to be vented. MRI magnets are therefore always cooled, even when not in operation.

In medical diagnostics, nuclear magnetic resonance imaging is mainly used to carry out detailed examinations of soft tissue structures. A typical application is tumour diagnosis. MRI, for example, allows a doctor to assess the progression of a tumour or locate metastases. In the case of muscle, tendon and ligament damage, multiple sclerosis, vascular diseases or inflammatory processes, it provides essential information to help choose the right treatment. Nuclear magnetic resonance is also used in research and material testing, where it works according to the same principle as MRI (see box below).

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Magnetic rescue mission

On 31 March, staff at the NMR (Nuclear Magnetic Resonance) Centre at the University of Vienna's Faculty of Chemistry noticed a temperature increase in a superconducting magnet. There was a risk of a quench happening, where the superconductor suddenly turns into a normal conductor. This can result in the complete destruction of the magnet with a loss of about a million euros. Within three hours, Messer in Austria organised the delivery of a thousand litres of liquid helium to cool the apparatus until the manufacturer's engineers managed to find and rectify the fault. "On more than one occasion, I have been very impressed with Messer's flexibility and extremely rapid reaction in coming up with such emergency solutions," says Professor Hanspeter Kählig, head of the NMR Centre.

Jürgen Steiner, Messer Austria

All-round gas supply for waterworks

Spain | The Consorci d'Aigües de Tarragona (CAT) water treatment plant purifies water from the river Ebro. It supplies 85 per cent of the population of Tarragona province as well as many industrial firms with drinking water. Messer has been supplying the plant with liquid carbon dioxide for more than ten years and once again won the gas supply contract at the end of 2016. CAT uses liquid carbon dioxide to adjust the pH in the drinking water treatment process. Since January, Messer has also been supplying liquid oxygen for ozone production in the plant's own facility. The ozone gets rid of undesirable constituents in the untreated water by means of oxidation. In addition, the plant's laboratory carries out analyses using specialty gases from Messer. The liquid nitrogen supplied in dewars is used to freeze water samples.

Marion Riedel, Messer Ibérica

The CAT water treatment plant uses water from the Ebro.

Oxyfuel fuels cement production

France I LafargeHolcim uses Messer's oxyfuel technology for cement klinker at one of its sites in France. In this process, the raw materials – mainly limestone and clay – are heated to very high temperatures in rotary kilns. With oxyfuel, pure oxygen is blown into the kilns to make combustion with alternative fuels more efficient. This allows the target temperature to be reached with considerably less primary fuel consumption and a corresponding reduction in CO_2 emissions. In addition, oxyfuel might also enhance product quality.

Caroline Blauvac and Gautier Vial, Messer France

New dry ice blasting unit

International I Messer subsidiary ASCO CARBON DIOXIDE has put the Nanojet, the first of a new generation of dry ice blasting units, on the market. The cleaning machine features an integrated pellet mill that crushes the dry ice into very fine particles. As a result, the consumption of dry ice and compressed air is reduced significantly when compared with conventional units. Amongst other things, this makes the ASCO Nanojet suitable for the special requirements of the plastics industry, where compressed air is not always part of the usual range of working media used. Over and above that, its efficient and wear-free cleaning technology is suitable for almost all areas of application and industries.

Simone Hirt, ASCO CARBON DIOXIDE

Vildana Ćosić

Vildana Ćosić (27) is a pharmacist and has been working at Messer in Bosnia and Herzegovina since 2014. She is responsible for medical gases and lives and works in the capital Sarajevo.

1. What has been your greatest success at Messer?
Thanks to good teamwork, we managed to get Messer registered as the first pharmaceutical manufacturer of medical gases in Bosnia and Herzegovina.

2. What would you say is a must-see for anyone visiting your country?
The historic old town of Sarajevo with its religious and ethnic diversity. Churches, mosques and synagogues are just a few metres away from each other. The Olympic mountains, Bjelašnica, Jahorina and Trebević, are also nearby.

3. What three things would you miss least?
Injustice, cigarettes and traffic jams during the evening rush hour.

4. Which famous person would you like to spend an evening with?
Angela Merkel, because she is one of the most influential women of our time. I am impressed by her down-to-earth attitude, humanity and dependability.

5. What else would you like to learn or study?
Professionally, I would like to learn more about process optimisation. Outside of work, I would like to try kitesurfing one day and be able to speak fluent French.

Gases for Cockaigne

The gas in a crisp packet is nitrogen, not air. It protects the snack's freshness and flavour while it is sitting on the shelf waiting to be purchased. It is hard to imagine food packaging today without a modified atmosphere.

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Many people find a packaged snack the ideal solution, for example if they need to grab a quick bite to eat on their lunch-break.

Besides the product itself, the packaging of convenience products often contains a protective gas mixture.

The land of Cockaigne is a concept that first appeared in the Middle Ages. In those times, people primarily associated it with food, as illustrated a little later in the famous painting by Pieter Brueghel the Elder. If the painter had been teleported into a modern supermarket, it would indeed have seemed like the land of Cockaigne to him: food in every conceivable form and in bountiful abundance.

For us today, this abundance – plus cash registers – is something we take for granted. Modern agriculture and food technology provide us with an almost infinite variety of food products; motorised means of transport and unbroken cold chains ensure that they reach even the furthest-flung places. However, from the processing stage all the way to the consumer's plate, gases are also increasingly important. In many cases, modified atmosphere packaging (MAP) is absolutely key in ensuring that consumers receive high-quality and appetising products.

Three gases

"If, in addition to the product, the packaging also contains a gas cushion, it can be assumed that this is a selected gas or mixture of gases rather than air," says Johanna Mroch, who is responsible for food applications at Messer. She further explains that "we are almost always talking about three gases here, which we are constantly inhaling as natural constituents of air: nitrogen, oxygen and carbon dioxide."

Nitrogen (N_2) makes up 78 per cent of the earth's atmosphere. It is odourless and flavourless, barely dissolves in water and is practically inert, i.e. of very low reactivity. This means that it forms virtually no chemical compounds with food components. Its most important function in packaging is to displace atmospheric oxygen. Many important ingredients in food are changed as a result of oxidation, leading to a loss of quality. Oily and fatty products become rancid and inedible, although inherently they actually keep for a long time. For instance, this applies to cooking oil, nuts or potato crisps. Packets containing oily products are filled and sealed in a nitrogen atmosphere. A welcome side effect is the dryness of the gas. Unlike air, it contains virtually no moisture, meaning that the crisps retain their flavour as well as staying crispy. N_2 is also used for packaging animal feed, as for example at Indjija in Serbia.

CO_2 inhibits microbes

Carbon dioxide (CO_2) is also of very low reactivity and can be used to provide protection against oxidation. Since it dissolves readily in water and therefore lowers the pH, it also has a bacteriostatic effect – inhibiting the growth of microbes and moulds. This also applies to anaerobic bacteria, which can survive without oxygen.

As already mentioned, oxygen (O_2) is undesirable for many foodstuffs. Too much oxygen leads to damage through

oxidation and promotes the growth of aerobic microorganisms, which are dependent on oxygen. However, there are products where the gas is required after packaging. For example, in the case of fresh fruit, salads and vegetables, it is important that the metabolic process is not stopped altogether after harvesting. Their living cells should, to a certain degree, continue to consume oxygen and produce CO_2. They would "suffocate" in an oxygen-free atmosphere, resulting in the products becoming limp and unappetising. "In the case of such plant products, a little oxygen is added to the modified atmosphere," Johanna Mroch explains.

O_2 also plays a role in fresh meat packaging. Meat contains myoglobin, which in its oxidised form – oxymyoglobin – gives the product its red colour. Without oxygen in the surrounding atmosphere, this substance would lose its O_2 bond and therefore its red colour. The addition of oxygen to packaged meat therefore ensures that the product retains its appetising appearance. Irrespective of the meat's appearance, producers and distributors do, of course, have a duty to comply with the relevant quality standards and only offer the product for sale within the specified safe time limit.

The right mixture

The land of plenty offered by supermarkets would not be complete, of course, without the range of pre-prepared food and ready meals that can be consumed straight away or after quickly heating them up. The packaging process for convenience food's varied ingredients involves the use of specifically blended gas mixtures. "One such product is our N70 Gourmet gas, which we offer for sale as a ready mixture containing 70 per cent nitrogen and 30 per cent CO_2," Johanna Mroch explains. "The carbon dioxide, for example, develops its bacteriostatic effect in sandwich packaging. Nitrogen is used as an auxiliary gas to ensure that not too much of the carbon dioxide is dissolved in the moisture present and that the film packaging does not collapse."

This mixture is also used for sausages, as for example at Székelyfalat in Romania or Bísaro in Portugal – two

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Packaging systems that use protective gas

Tray sealer

Vertical tubular bag machine

Horizontal tubular bag machine

Thermoforming machine

Documented quality

Interview with Hedvig Szakács, Managing Director of ZIMBO Perbál GmbH

What kind of products do you package using MAP?
Food for barbecuing, cold meat, sausages and different types of salami, sliced and unsliced. MAP accounts for a constantly increasing proportion of packaging. It is presently about 50 per cent.

What kind of gas mixture do you use?
As a rule, it is three quarters nitrogen and one quarter carbon dioxide. The residual oxygen content in the packaging should be less than one per cent, which we check by means of random sampling. The gas mixture creates a special microclimate for the product, prolonging its shelf life and protecting its flavour.

Are you planning further technical developments?
We are constantly developing our packaging technology. At present we are planning to buy residual oxygen measuring instruments with a direct data link. Such technology, which allows the residual oxygen to be determined and documented for each individual package without damaging the film, has already been presented at food fairs. This possibility could become obligatory one day.

What do you expect from your gas supplier?
Punctuality, electronic order processing and documentation as well as detailed tracking of batches. At times we experience sharp seasonal increases in demand, and then

companies that have specialised in artisan sausage production based on traditional regional recipes. Other producers, such as Slovenian meat product manufacturers Pivka, Panvita and MDK, get the gases in pure form and mix them themselves.

"We advise our customers on finding the perfect gas composition," Johanna Mroch emphasises. "Here we can draw on empirical data based on years of experience. However, since each food product and the associated packaging line form a unique combination, we also carry out joint practical tests and train employees in the correct use and handling of Messer's Gourmet gases." These gases are subject to strict food quality control and safety standards. As a foodstuff, they are completely safe for consumers.

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Expertise in a seminar setting

In May, Messer held a seminar on food gas applications in the Vietnamese city of Can Tho. The 40 participants included representatives of different sectors of the food industry as well as professors and trade journalists. Messer regularly conducts similar seminars in other countries as well. These events always focus on specific know-how related to all aspects of the application of MAP processes. In addition, Messer's experts are available to provide individual advice to customers at any time.

Vu Thi Mai and Dieu Huong Nguyen, Messer Vietnam

we need a flexible and reliable reaction from our supplier. In addition, they must perform maintenance and – if necessary – immediate repair of gas supply equipment.

How have you found working with Messer?

Messer took over our previous supplier last year. The transition went smoothly and we have had nothing but good experiences since then. We work together excellently.

Editorial Team

ZIMBO Perbál GmbH

The meat processing factory in Perbál near the Hungarian capital Budapest was built in 1998 by German food company ZIMBO. In 2008, Swiss-based Bell AG acquired a majority stake in ZIMBO. The Hungarian factory delivers some 6,000 tonnes of meat products a year. They have received numerous awards, including the Grand Prize of Hungarian products.

Biogas from a box

About five per cent of the greenhouse effect is caused by emissions released into the atmosphere from waste landfill sites. The Wagabox® allows much of this to be converted into renewable energy. The methane contained in the emissions is extracted, separated and cleansed, after which it can be used as an energy source.

Even after separation and recycling, a considerable proportion of the waste generated worldwide goes to landfill. Inside the mounds of waste at these sites, the organic material gradually decomposes. This process produces biogas-like vapours largely consisting of methane. When released into the atmosphere, the greenhouse effect of this gas is 25 times stronger than that of carbon dioxide. "This in itself is reason enough to prevent any release of methane, if possible," says Mathieu Lefebvre, who founded French start-up Waga Energy together with Benoit Lemaignan, Nicolas Paget and Guénaël Prince. "However, at the same time, methane is a valuable hydrocarbon. To a large extent, it can be used as an environmentally friendly energy source, like natural gas." Landfill methane is intermixed with carbon dioxide, nitrogen, oxygen and other impurities though, making it unsuitable for immediate use. Waga Energy has recognised this potential and developed a standardised facility for separating the waste gases and obtaining pure methane for thermal utilisation. It is called the Wagabox®. In this context, people often speak of a dual environmental benefit.

First the landfill gas is extracted from the waste dump via a branched system of pipes and conducted to the Wagabox®. Here, any dust and gaseous impurities such as hydrogen sulphide are separated and captured with membrane filters. The CO_2 content is also separated with the aid of membranes.

Next, the purified landfill gas is fed into a cryogenic column where it is cooled to around minus 160 degrees Celsius using liquid nitrogen. Messer provides the liquid nitrogen needed for the first two units. "Methane liquefies at this temperature while nitrogen and oxygen remain gaseous," explains Guénaël Prince, who is in charge of Research and Development at Waga Energy. "Just like in an air separation unit, we can collect the liquefied methane and separate it from the air gases oxygen and nitrogen, which are still gaseous." This combination of membrane processes and cryogenic separation ensures particularly efficient purification of the landfill gas. Furthermore, the box is assembled virtually as a ready-to-use facility at Waga Energy, making it very easy to install on site.

The end product of this process is methane with a purity of 98 per cent. The gas can then be fed into municipal gas pipelines or used as a fuel for gas-powered vehicles – at a price similar to that of natural gas. The first Wagabox®, which was installed at Coved, a specialist waste treatment company in the small town of Saint-Florentin in Burgundy, France, generates 20 gigawatt hours of energy a year in this way, enough to supply 3,000 households. The Wagabox® recovers 90 per cent of the landfill methane, preventing this gas from being released into the atmosphere. Annual CO_2 emissions are reduced by an equivalent of 4,000 tonnes through fossil natural gas substitution.

Caroline Blauvac, Messer France

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Waste landfill sites like this contain substantial amounts of methane that can be collected and utilised.

Gases for tank production

Czech Republic | Chart Ferox in Děčín, Czech Republic, is both a customer and a supplier. The company supplies Messer with storage tanks for liquid gases. The manufacture of these tanks in turn involves the use of liquid nitrogen and carbon dioxide – gases that Messer supplies to the customer-supplier's site in the north of the country. Chart Ferox is part of Chart Industries, a US corporation, and specialises in the manufacture of cryogenic equipment. This also includes systems and facilities for storing and distributing liquid natural gas.

Vít Tuček, Messer Technogas

The employees of Messer in the Czech Republic were in good spirits during their visit to the Chart Ferox site, in spite of the inclement weather.

Hail control gun

Poland | Hail control guns fire a high-energy and high-speed shock wave into the clouds, thereby preventing the formation of hailstones. This is also the functional principle of the anti-hail gun used by the Specjalistyczne Gospodarstwo Ogrodnicze Marek Dzida market garden in Goczałkowice Zdrój. It protects the company's extensive fields and greenhouses from hailstorms, which are becoming increasingly frequent as a result of climate change. The shock waves are generated by detonating a small amount of the welding gas acetylene in the funnel-shaped gun. The gas for this is supplied by Messer.

Aleksandra Kuczka, Messer Polska

The anti-hail gun is being used with the aim of preventing hail damage.

Seafood cooled by dry ice

Albania | Fish Land, a restaurant in the capital Tirana, uses dry ice from Messer to cool freshly caught seafood in the kitchen and when serving it to customers. The solid CO_2 doesn't melt, it sublimes – in other words it changes directly from a solid to a gas. In contrast to ice, the gas contains no microbes – besides which it is dry and a very effective coolant. Customers are treated to an additional aesthetic experience when the food is served since the process of sublimation involves water droplets condensing out of the air, producing the characteristic mist, while the fresh seafood remains healthy and appetising to look at.

Ilva Spiro, Messer Albagaz

The preparation with cryogenic gases opens up new culinary possibilities.

Part of Repsol's petrochemical complex in Tarragona

Prevention and protection

Preventing explosions and protecting the environment: essentially, that is the purpose of the gases that Messer supplies to the Tarragona refinery. Nitrogen's role is to prevent hazardous reactions or reactions that impair product quality. Elsewhere, oxygen ensures that oxidation takes place so that any undesirable substances can be rendered harmless.

The Casablanca platform is located in the Western Mediterranean, 52 kilometres from the coast of Catalonia. It has been producing oil since 1981, which is pumped through a pipeline to the refinery in the Tarragona Chemical Park. However, Casablanca's rather modest output has to be supplemented by oil tanker deliveries.

Pipeline supply

The platform and refinery are owned by Spanish oil company Repsol. The company also owns the petrochemical business Repsol Química, whose production includes 1,100 kilograms of ethylene per minute, enough for 30,000 plastic bottles. Besides the crude oil, Repsol also gets the gases delivered by pipeline. This second pipeline – about 90 kilometres long – is fed by the Messer air separation units that supply the Tarragona Chemical Park with gases.

Nitrogen is indispensible in a refinery, where you are surrounded by explosive substances. Flammable oil and petrol vapours or gaseous products such as propane and butane must therefore be prevented from coming into contact with air. When in operation, the refinery's towering columns and endless pipes are therefore hermetically sealed against outside air. If the plant facilities need to be opened for maintenance, they are first flooded with nitrogen. Jordi Soler of Messer in Spain explains: "As well as displacing any explosive vapours from the plant components, the presence of the inert gas also prevents explosive reactions, which are essentially a rapid oxidation process. Huge quantities of nitrogen are needed for this task when carrying out major inspections of the whole facility."

The gas is used all the time in normal operation as well, for instance for "blanketing". This involves filling the headspace of oil and petrol storage tanks with nitrogen. It covers the liquid like a blanket, thereby preventing the formation of an explosive vapour/air mixture. In the crude oil tanks, the gas is injected through a perforated base plate. As the bubbles rise, they stir up the oil and prevent its heavy components from being deposited at the bottom of the tank.

Oxygen (O_2), which is also supplied by pipeline, has a dual environmental protection function at Repsol. Crude oil contains sulphur. To ensure that no sulphur dioxide is produced later on when using the oil products, the sulphur is extracted from the raw material using the Claus process. In a multistage reaction, it is first converted to hydrogen sulphide before eventually being precipitated as elemental sulphur. This high-temperature reaction requires O_2.

Cracking chains

Over and above that, oxygen is used in the first stage of the refinery's own wastewater treatment facilities. Here, by virtue of its reactivity, the gas cracks long-chain hydrocarbons, splitting them into smaller molecules. These compounds can subsequently be rendered harmless in the biological stage of wastewater treatment. "The capacity of the wastewater treatment facilities can be increased by injecting oxygen instead of air," Jordi Soler explains. "What is more, this applies both to the wet oxidation process described here and to the subsequent biological stage."

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Hungary | Balatoni Hajózási Zrt. – the Lake Balaton shipping company – has been providing its transport services on the Hungarian lake for 171 years. Among other things, it owns 24 pleasure boats and four ferries that link the northern and southern shores of this long body of water. Last year, the company carried more than 1.7 million passengers in total. It also operates the public harbours on Lake Balaton. The company uses gases from Messer for maintenance and repair of the docks and boats. Ferroline and argon are the main gases used for welding, with nitrogen and oxygen used for plasma cutting. The latter is also used for flame cutting.

Mónika Zimányi-Csere, Messer Hungarogáz

Like so many others, Mónika Zimányi-Csere and László Takács of Messer in Hungary appreciate the beauty of Lake Balaton.

Welding gases for boiler construction

Portugal I Martin Caldeiras, a subsidiary of German waste-to-energy company Martin GmbH für Umwelt- und Energietechnik, produces spare parts for the boilers used in waste incineration plants. The subsidiary's factory in Caldas da Rainha, which was opened in 2017, also carries out coating work and offers a range of maintenance services. Messer supplies the company with argon, Ferroline and Inoxline for gas-shielded arc welding. The Swiss subsidiary, Martin AG, also gets its welding gases from Messer.

Marion Riedel, Messer Ibérica

Welding robots and mould testing

Spain I Gedia España's plant in Santa Margarida i els Monjos near Barcelona manufactures shock absorbers, bumpers, dashboards and other components for the automotive industry, which is currently seeing good growth rates in Spain. Messer supplies argon, Ferroline, Inoxline and carbon dioxide for the welding robots as well as liquid nitrogen for testing the casting moulds.

Marion Riedel, Messer Ibérica

Oils need N_2 and H_2

Serbia | Dijamant Zrenjanin, the largest Serbian producer of cooking oil, uses nitrogen from Messer to protect the quality of its products. During the bottling process, the gas is introduced into the PET bottles in liquid form. It is also injected into the headspace of storage tanks in gaseous form. In both cases, it prevents the oil turning rancid as a result of oxidation. Dijamant Zrenjanin produces sunflower oil from local oilseed. The company's product range also includes olive, pumpkin seed and palm oil as well as margarine, mayonnaise, sauces and dressings. Since May, Messer has also been supplying hydrogen for the purpose of oil and fat hydrogenation. This process involves the conversion of liquid vegetable oils into solid or semi-solid fats such as margarine. Before that, Dijamant produced its own hydrogen in-house using an electrolysis process. Thanks to the fact that the firm is now being supplied by Messer, safety levels at the plant have been significantly improved and Serbia's last electrolysis plant has been decommissioned.

Branka Malidžan, Messer Tehnogas

Hydrogen chloride for super fleece

Melamine fleece production is largely automated.

Slovenia | Messer is supplying hydrogen chloride (HCl) to smartMELAMINE in cooperation with GHC. The company is a joint venture between Slovenian firm Melamin and OMPG, a Rudolstadt-based company carrying out material testing of textiles and plastics. It operates the world's first melamine fleece production facility in Kočevje. One of the remarkable features of the fleece material is its particularly effective sound and heat insulation. It is resistant to high temperatures, does not burn or melt, and is chemically stable and UV-resistant. The material is suitable for protective clothing and can also be used for insulation, for instance in the automotive and construction industries.

The production of melamine requires the use of hydrochloric acid as a catalyst. The hydrogen chloride is transported in thousand-litre drums, which are enclosed in a container for additional protection. Besides the chemical, Messer and GHC have also supplied the equipment for automatic HCl dosing and drum handling as well as a leak detection system. The developmental groundwork for the production of the new material was carried out by the Thuringian Institute of Textile and Plastics Research (TITK) in Rudolstadt.

Alenka Mekiš, Messer Slovenija

Laboratory facility for Škoda

Czech Republic | 800 metres of stainless steel piping, 99 withdrawal points and the relevant expansion stations were required for the gas supply system that Messer installed at Škoda in Mladá Boleslav. It is part of the new test laboratory that the car manufacturer has built for drive system development and quality control. The system provides the laboratory's test engineers with about 30 different, precisely defined gas mixtures as well as high purity gases. The laboratory is one of the most modern of its kind in Central Europe.

Josef Heřmanský, Messer Technogas

Making progress together

Interview with Michal Zelník, Engineering Manager at Martinrea

Photo: Martinrea

What does Martinrea produce in Slovakia?
In Svätý Jur we produce tailor-made piping systems that form part of the fuel and brake systems in cars. These products are delivered directly to the car plants' production lines, where they are fitted in the different models. For the fuel systems, we supply the section from the filler pipe to the fuel tank as well as the fuel line to the engine. As regards the brake systems, we supply the brake pipe packages for the brake fluid.

Which gases do you use?
We work on steel and stainless steel materials, using argon and oxygen mixtures to weld the individual components together.

What role does gas quality play in your processes?
There is a direct correlation between gas quality and welding quality. It is therefore of the utmost importance to us that the product supplied corresponds to the declared gas mixture. Punctual delivery is also very important to us, of course.

How did Messer support you with process optimisation?
As part of optimisation, Messer installed a gas station along with gas pipes to the individual points of use. This rectified previous problems associated with awkward cylinder handling.

What other competencies do you expect from your gas supplier?
We are currently preparing production for Jaguar Land Rover, who are in the process of building their production facilities near Nitra in southern Slovakia. We anticipate a significant increase in the consumption of argon mixtures and pure argon. Here too, Messer has proved to be a reliable partner who can offer a quick solution when circumstances change.

Erika Hergottova, Messer Tatragas

Michal Zelník, Engineering Manager at Martinrea in Slovakia

Win a delicious prize!

Simply answer our question about this issue of "Gases for Life" and win a food hamper with seasonal specialities:

Which gas ensures that crisps in packets stay crispy for longer?

Please send the answer by e-mail with the subject line "Gases for Life Competition" to:
angela.bockstegers@messergroup.com

The deadline is 26 January 2018. Please include your name and address.

The competition is unfortunately not open to employees of the companies of the Messer Group and their families. In the event of multiple correct entries, a draw will determine the winner. The result of the draw is final and not subject to appeal.

Congratulations!

The winner of the last competition is **Hermine Binder** from **St. Pölten, Austria**. The correct answer was: "LowOx system"

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Clean water wherever you go

Outdoor is a megatrend – you get well over two billion hits if you Google the term. People want to get outdoors. And more and more of them want to go where there is no electricity or running water. Or where it is best not to drink the tap water. The Swiss Katadyn Group specialises in the manufacture of various water purification systems. The larger ones, for example, can be used for the provision of emergency supplies to disaster areas, while the smallest units fit into a trekking rucksack, providing hikers with safe refreshment wherever they are. One of Katadyn's production facilities is in the Romanian city of Brasov. The plant uses oxygen, nitrogen and argon from Messer for its cutting and welding operations.

Carmen Baragan, Messer Romania Gaz

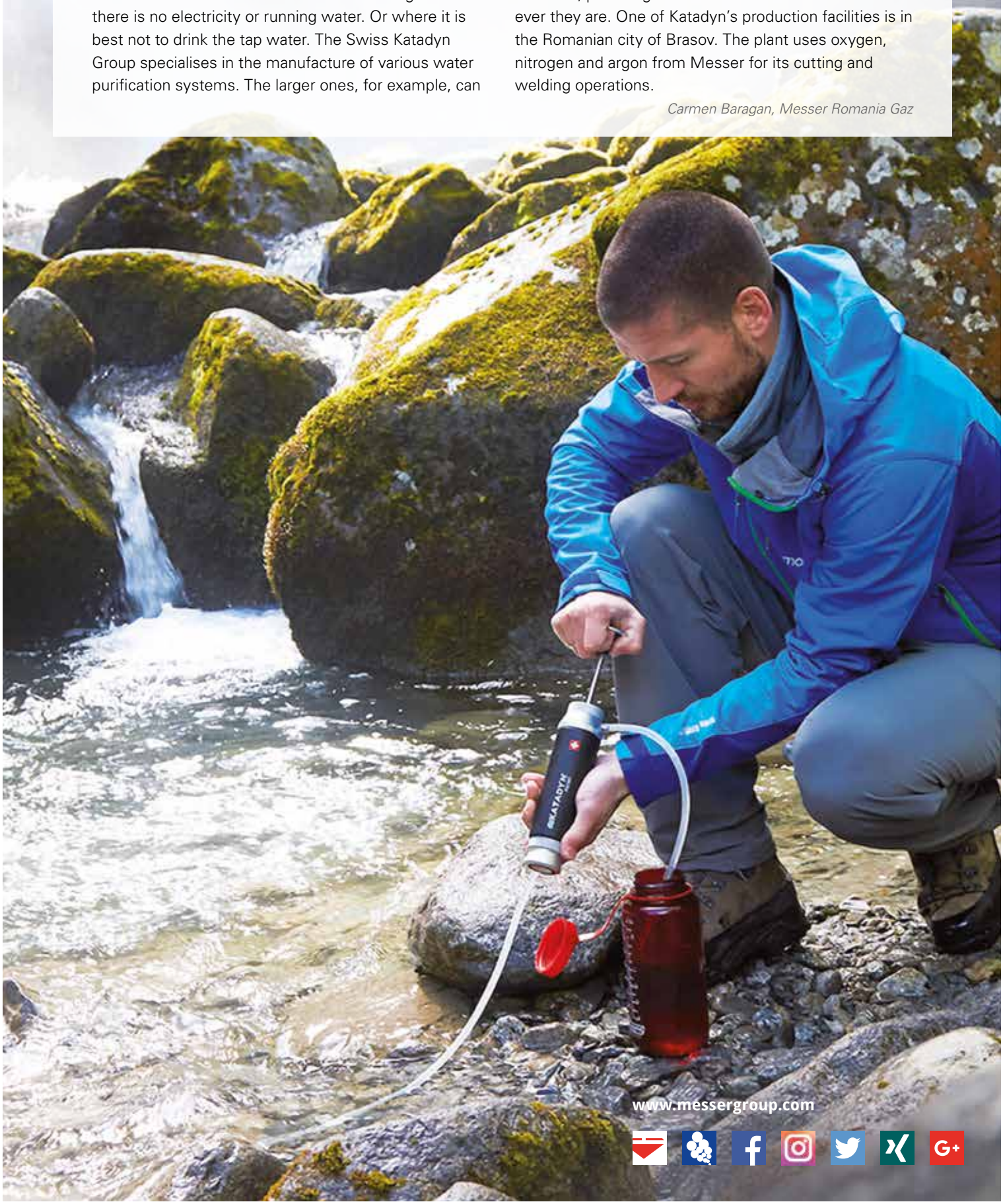

Photo: Lars Schneider

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