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MESSER
Gases for Life

Gases for Life

The industrial gases magazine

Gases in water treatment

Following nature's example

Instrument making:
The secret of sound

Inert gases:
Protective function

Recycling:
Second life for used tyres

Dear Readers,

Water is a precious asset that is not available in unlimited supply. Yet in many countries, we take it for granted to have the best quality water flowing from our taps. Water is also a frequently used and irreplaceable "ingredient" for industrial processes.

If we want to be able to use drinking water of the usual high quality, it has to be treated in a targeted way which at the same time is as environmentally friendly as possible. With wastewater and process water, the objective is to reduce contaminants and unwanted side effects efficiently and economically. That is exactly what our Gases for Life are designed to do. The cover story in this issue explains how this works, providing you with an insight into the wide range of applications that exist.

Another gas application is the use of nitrogen to treat brass instruments. According to renowned instrument makers, the low temperatures provided by nitrogen ensure a softer, richer tone and make it easier to reach high notes. That is pleasing to the ear – and not just for gases specialists.

I hope you find our magazine an enjoyable and interesting read.

Best wishes,

Stefan Messer

Cover photo: Dr. Monica Hermans, Manager Application Technology Chemistry/Environment at Messer Group, is an expert in water and wastewater treatment.

Good for you and the environment

This magazine not only brings you interesting articles and interviews – it is also kind to the environment. "Gases for Life" is printed on 100% recycled paper.

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Other Sections

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For long-term storage of our magazine, request the free "Gases for Life" slipcase.

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Excellent cooling

Germany: Nitrogen for superconductivity

The AmpaCity pilot project for efficient power transmission has won the German Climate and Environment Innovation Award (IKU) 2015. Messer developed new cooling technology for the superconducting power supply cable used in energy utility RWE's project. Normally, it is not possible to cool anything to below minus 196 degrees using liquid nitrogen. However, Messer's new cooling technology vaporises liquid nitrogen at below atmospheric pressure. It thus reaches a temperature of minus 209 degrees Celsius, facilitating electricity transmission through the cable virtually loss-free. Superconductors are seen as a forward-looking solution for particularly space-saving and effective electricity transmission in towns and cities as well as at industrial facilities. The winners of the IKU were presented with their awards in person by Federal Environment Minister Barbara Hendricks.

Dr. Friedhelm Herzog, Messer Group

China: Xenon chloride for display production

Excited noble gas

Messer supplies neon mixtures to the BOE Technology Group, China's largest manufacturer of flatpanel displays, used in excimer lasers for the application of its photolithography equipment. Excimer laser generate broad laser beams with wavelengths in the ultraviolet range. The beams are emitted by the noble gas halide's electrically excited molecules. The lasers are used to recrystallise silicon in the production of Low Temperature Poly Silicon (LTPS). LTPS technology allows the production of thin, lightweight and elastic displays with a particularly high resolution. Messer is one of the few gas suppliers who is capable in offering this kind of mixtures in China.

Jasmine Yan, Messer China

Thin elastic displays with high resolution for today's smartphones are possible thanks to Messer's neon mixtures, for example.

Serbia: Refrigerator recycling

40 refrigerators per hour

Messer supplies liquid nitrogen to Božić & Sinovi, a Serbian company that collects and recycles refrigerators, computers and small electrical as well as electronic appliances.

The recycling unit, which was supplied by the Italian company Forrec, also allows Božić & Sinovi to recover the environmentally harmful CFCs which are released during the process of grinding the polyurethane refrigerator insulation. The gaseous CFCs are liquefied by the cold nitrogen and can then be collected. Nitrogen is used to defrost the unit again overnight.

Zoran Jurić, Messer Tehnogas

Czech Republic: Drinking water treatment with ozone

Clean water for northern Moravia

The Podhradí waterworks recently started using ozone to improve the quality of its drinking water. The facility, which has a capacity of 2,200 litres per second, belongs to the northern Moravian water supply and sewerage company SmVaK (Severomoravské vodovody a kanalizace Ostrava a.s.), which operates one of the most extensive water and sewerage networks in the Czech Republic and supplies the city of Ostrava as well as a large part of northern Moravia with drinking water. Messer in the Czech Republic provides SmVaK with a tank for liquid oxygen and supplies the gas for the process. The ozone used to treat the water is produced on site from the oxygen.

Vít Tuček, Messer Technogas

Hungary: Dry ice blasting of bakery equipment

Easy on the environment and the kneader

König Maschinen, an Austrian manufacturer of bakery equipment, has bought an ASCOJET dry ice cleaning unit for its factory in the Hungarian town of Celldömölk. Besides producing new machines, the plant also carries out maintenance on used equipment and ovens. Rock hard dough remnants were previously removed by hand and with chemical cleaning agents. The machines had to be dismantled for this purpose. This is no longer necessary as the dry ice jet also reaches hidden places. At the same time, the cleaning process is gentle on the surfaces and does not leave any chemical residue. The dry ice that is supplied by Messer can also be used for cleaning electrical components.

Kriszta Lovas, Messer Hungarogáz

Germany: Gases apps

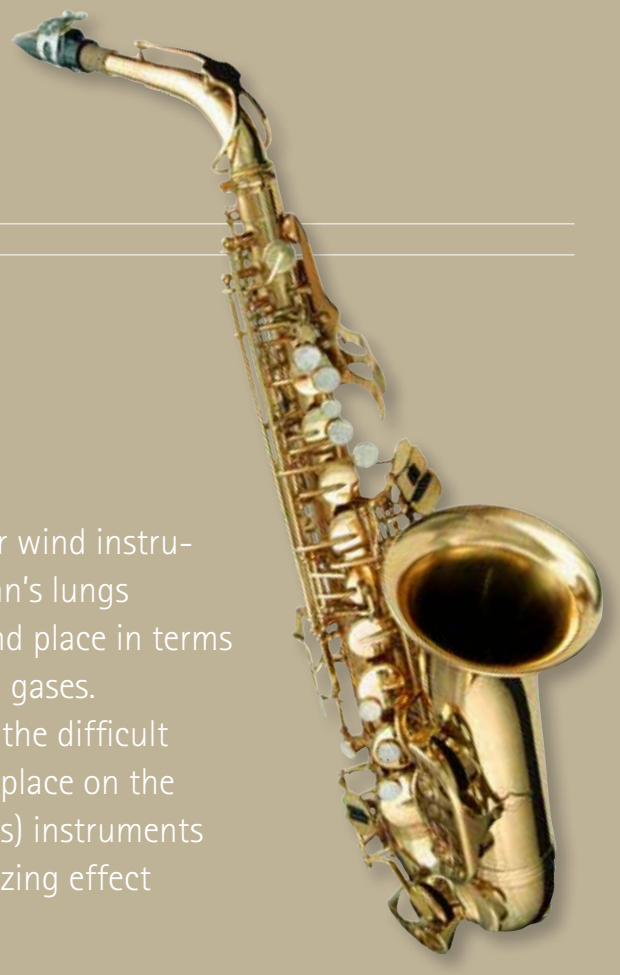
Knowledge in the pocket

14 Messer apps provide comprehensive answers to questions relating to gases and applications. They have been downloaded over 39,000 times so far. About ten per cent of these users have used the "Welding Gases" app to find out which shielding gas meets their welding requirements. The "Welding Positions" app, too, has already been accessed well over ten thousand times for Android alone. This app helps you find the correct position in accordance with DIN EN ISO 6947. The range of apps for welding experts is rounded off by the "Cylinder Valves" application. It provides users with quick access to country-specific information on the right valve for the cylinder gases they are using.

An overview of all the available apps can be found at www.messergroup.com/our-apps. Our app specialists are constantly developing new apps to expand the range and welcome suggestions from users. Gases for Life readers are welcome to contact the magazine's editorial team with their suggestions.

Benjamin Auweiler, Messer Group

The secret of sound



Naturally, plain old breath is the most important gas for wind instruments. It generates sound as it flows out of the musician's lungs and through the instrument's cavities and valves. Second place in terms of importance for the sound is occupied by the welding gases. They protect the metal of the brass instruments during the difficult manufacturing process. Nitrogen is now claiming third place on the podium: the cryogenic gas is used to cool (not just brass) instruments to minus 180 degrees. Cryogenic treatment has an amazing effect on the sound.

Argon protects brass

It takes three months to put together the 650 individual parts that make up a saxophone. At least that is how much time they take at Henri Selmer Paris. The family business, which has its headquarters in the French capital, is the world's leading manufacturer of professional saxophones – amongst other things, for it has been producing practically every type of brass instrument for over 130 years.

The metal bodies are crafted from high-quality brass sheets. Their number and shape depend on the size and type of instrument. In the case of an alto saxophone, two sheets are needed for the bulbous bow alone, which makes up the lower part of the instrument. Once these have been worked into shape, they are welded first to each other and then to other parts of the body.

At Selmer this is done by means of tungsten inert gas welding (TIG). The French brass specialists use argon from Messer as a shielding gas in order to protect the high-quality material against oxidation. The gas thus contributes a vital detail to the high quality of the instruments.

Cold produces richness

But even the best quality can always be improved, or at least you can try. The fact that cold treatment enhances the quality of tool steel, for instance, has been known for a long time. In the 1990s, someone in the USA hit upon the idea of applying the cryogenic process to brass instruments. The treatment did indeed change the instruments in a positive way. Musicians reported a softer tone and richer low notes, while they also found it easier to reach the high notes. There were no longer any problem notes after the cold bath.

Georg Selders, himself an amateur musician, is the first person to offer this process in Germany as well. His company, Cryoservice, based in Weeze-Wemb in the Lower Rhine region, carries out the cold treatment of alto saxophones, for example. Each instrument is placed into a chest supplied by Messer. Liquid nitrogen, also from Messer, is vaporised and conducted into the insulated container. In a controlled process, the temperature gradually drops to minus 180 degrees Celsius. This is followed by several cycles of relative warming and renewed cooling, before the temperature is finally raised – again very slowly – to plus 35 degrees.

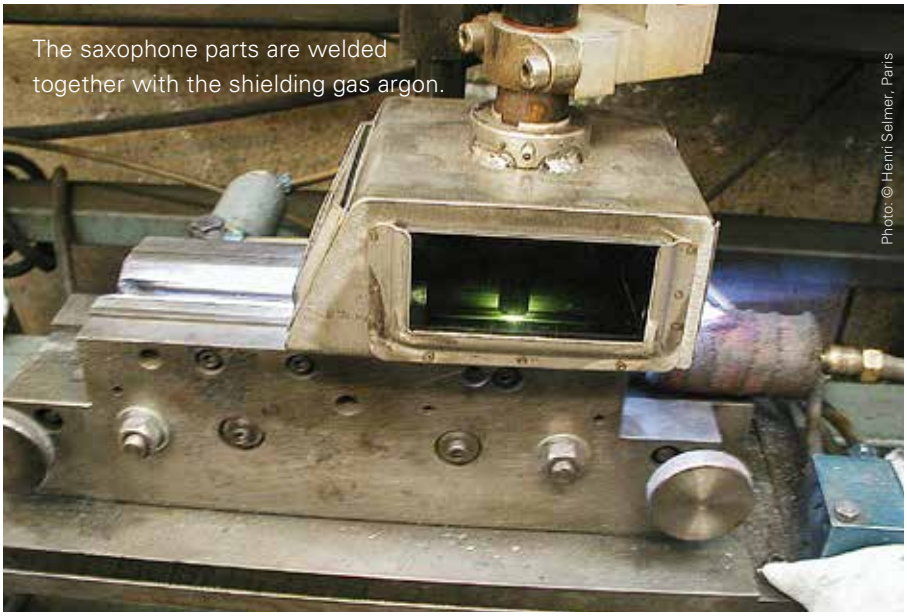
"The treatment takes between 15 and 24 hours, depending on the instrument," Georg Selders explains. "Exactly what happens in this process has not yet been researched in detail. We know from the cold treatment of steel that residual austenite is transformed and stresses in the material disappear.

Dr. Christoph Erdmann, a member of the editorial team, recently took up playing the tuba, the lowest of all brass instruments.

Something similar is evidently happening with the brass of the instruments."

It is not just brass instruments that benefit. Piano and guitar strings or the pick-ups of electrically amplified instruments are also modified by the treatment. It even has a positive effect on wood, with rapid treatment giving it the kind of condition that is typical of wood which has been stored for a long period of time. There is also no longer any warping after cryo-treatment. This makes it possible, for example, to optimise the unvarnished violin shells, Selders explains. "The varnish would suffer in the chest freezer. Vintage guitar enthusiasts, on the other hand, love precisely this effect – after treatment, the new electric guitar looks like a decades-old instrument, and sounds like it too!"

Editorial Team



The saxophone parts are welded together with the shielding gas argon.

Photo: © Henri Selmer, Paris

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Czech Republic: Cutting gas for air-conditioning technology

Nitrocut gas is used in the cutting laser.

Nitrocut and gas supply

GEA Heat Exchangers (DencoHappel CZ) in Liberec gets Nitrocut cutting gas and rents the gas supply system for its new cutting laser from Messer. The gas tank, vaporiser and piping were installed in December 2015. The reason for purchasing the cutting laser was to enhance product diversity and reduce delivery times.

GEA Heat Exchangers (DencoHappel) is one of the technology leaders in air, climate and filter technology as well as process air cooling. It has been active in this field for more than 100 years.

Jan Kašpar, Messer Technogas

Gas tank at the GEA Heat Exchangers (DencoHappel) site in the Czech Republic

Hungary: Gases for pharmaceutical testing

Transport route for molecules

In the development and testing of drugs, in vitro studies (not carried out on live animals), such as cell cultures, are indispensable. Scientists can gain important insights from the reaction of the different cell cultures to the potential active substances contained in the drugs. Solvo Biotechnológiai Zrt., a Hungarian company with a presence in some 40 countries, is one of the leading producers of cell culture products. At its headquarters in Szeged, Solvo carries out cell culture tests on behalf of over 450 customers. The focus for the cell culture products as well as the company's own tests is the transport of the drug molecules through the cell membrane. Solvo needs various gases for the tests, which are supplied by Messer. Liquid nitrogen is used to freeze the samples; carbon dioxide is used to set the desired air mixture in the incubators; high-purity argon and nitrogen are required for analysing the samples.

Kriszta Lovas, Messer Hungarogáz

Germany: Diving gas mixtures

Reliable components for the depths

Diving to great depths places particular demands on divers, their equipment and the diving gas mixtures they use. Underwater, it is necessary to take account of the depth itself as well as variables such as the duration of the dive and the corresponding decompression time. Diving gas mixtures are used to react to the specific conditions that exist deep underwater. For example, the greater the depth, the higher the oxygen partial pressure, which can have a toxic effect on the human body at certain oxygen concentrations. Divers therefore use special diving gas mixtures which are individually calibrated for each dive in order to ensure safe diving. Under the brand name Diveline, Messer supplies helium, oxygen and nitrogen as pure gases, in accordance with the EN 12021 standard, which can then be used to prepare diving gas mixtures.

Katrin Hohneck, Messer Group

People Focus

6 questions for

Magdalena Słomiany

Magdalena Słomiany has been working in Logistics at Messer in Poland since 2010. She lives with her family in Chorzów, not far from her place of work, so she can cycle to work when the weather's nice.

1. A working day is perfect ...
if it starts with a nice cup of aromatic coffee, in a friendly atmosphere and in the team spirit with which we'll tackle the tasks of the day together.

2. What I absolutely need for my job is ...
good internal communication and productive collaboration with all my colleagues.

3. A novel/film which I can recommend without hesitation is ...
anything by Stephen King – his books are so exciting that I would love to read them in one go.

4. I can get irritated by ...
lies, heartlessness, long queues at the checkout and getting up early.

5. I can get excited about ...
running, cycling, meeting friends and riding a motorbike – only pillion for the time being, but who knows what the future holds…. I would like to take this opportunity to thank my boss and colleagues who have given me the running bug! We take part in races and also spend a lot of time together after work.

6. My wish for the future ...
is to stay healthy, to have the strength to live life to the full and to develop on a personal and professional level.

Following nature's example

Water is used in a variety of ways: we need it as drinking water, use it for hygiene and swimming, for transport and irrigation, and also as process water in almost every kind of industrial production. This wide range of applications results in very different requirements which have to be met in terms of water quality – and therefore also in terms of water treatment. Gases help produce clean drinking water, supply optimal process water and thoroughly clean even heavily contaminated wastewater.

Gases have been used in large-scale water treatment for over a century. The earliest example of this is the disinfection of drinking water with chlorine gas[1]. Modern treatment processes now largely avoid the use of toxic or corrosive chemicals. Increasing use is being made of two gases that are also part of the natural water cycle: oxygen and carbon dioxide.

Oxygen is either used for oxidation processes or it serves as an elixir of life for beneficial microorganisms and aquatic animals in biological processes. The versatile gas carbon dioxide performs such diverse tasks as adjusting the pH value of water, hardening drinking water that is too soft or precipitating soluble components from process water and wastewater. It is also used in the cleaning of membranes and for desalination.

Greater effect with pure oxygen

In principle, it is also possible to use air for oxidation processes and to supply oxygen to beneficial microorganisms. But with its high nitrogen content, the effect of ordinary air is limited in many applications. Pure oxygen, on the other hand, accelerates the processes and boosts their efficiency. For example, oxygen is needed for removing dissolved iron and manganese when treating groundwater to obtain drinking water. If left untreated, these metals would give the water a rusty brown colour and be deposited in the pipes. They react with the oxygen to form insoluble oxides, which can be easily separated in sand filters. If the groundwater also contains ammonium, the amount of oxygen required for drinking water treatment increases sharply. With a content of about 2.5 milligrams or more per litre, complete oxidation of the ammonium can only be achieved with pure oxygen.

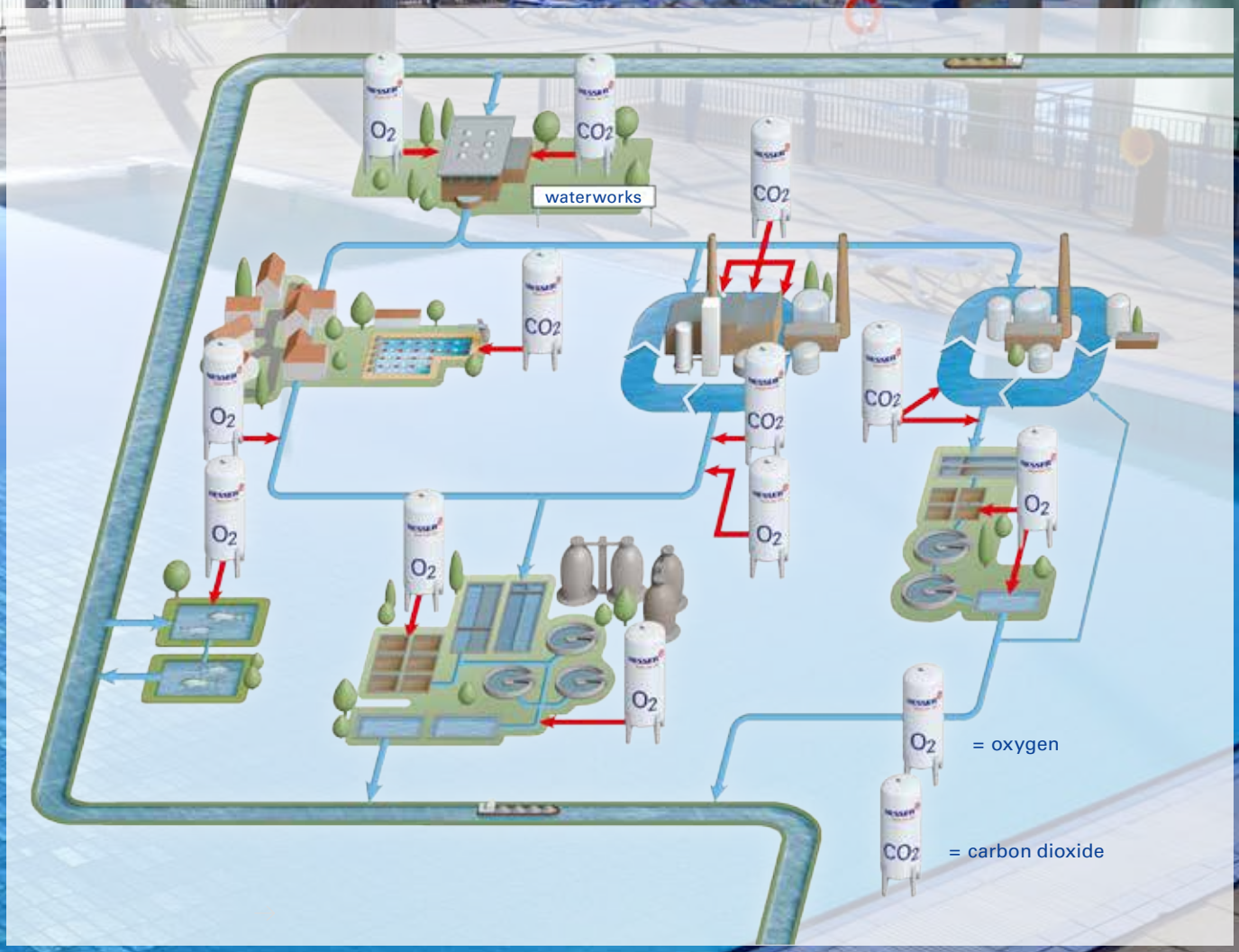
In biological wastewater treatment, the purification work is carried out by microorganisms. They need oxygen to survive and to be able to break down the pollutants in the wastewater. Here, too, it is possible to make existing, overloaded facilities much more efficient with pure oxygen: for the same tank volume, the clarifier's capacity increases considerably, so there is no need to build any additional basins.

Smaller quantities of highly concentrated industrial wastewater and sludge are pre-treated under high pressure by means of wet oxidation prior to biological purification: at 3 to 220 bar and 120 to 320 degrees Celsius, unwanted constituents are largely oxidised.

Continued on page 12

[1] *Hendricks, David W.; "Fundamentals of water treatment unit processes: physical, chemical and biological" 2011; CRC press Tayler & Francis Group.*

Club Atlètic-Barceloneta enjoys a privileged location by the beach in Barcelona.



The range of applications for gases in water treatment is extremely wide.

Continued from page 11

Ozone turbo

If the microorganisms are unable to break down certain pollutants, ozone (O_3) is used. The three-atom oxygen molecule is even more reactive than the two-atom one, and considerably so. However, the turbo version is unstable and has to be produced from O_2 on site where it is going to be used. "We provide our customers with advice on ozone production and also offer to carry out tests," says Messer water expert Dr. Monica Hermans.

Ozone is also significantly more reactive than chlorine and, unlike the latter, it is very environmentally friendly. It leaves only oxygen and harmless oxides and does not form any unwanted chlorinated by-products. Ozone is involved, for instance, when paints and other stubborn chemicals have to be removed from industrial wastewater. It removes pharmaceutical and pesticide residues from municipal wastewater as well as organic substances such as humic acid and pesticide traces from drinking water.

CO_2: Getting the chemistry right

Process water should neither have a corrosive effect nor lead to scale formation. For that to be the case, the pH value – in other words the concentration of hydrogen ions in the liquid – must be balanced out as precisely as possible with the calcium content and the natural content of dissolved carbonic acid. If the pH value is too low, the water becomes aggressive. In contact with stone or concrete, it dissolves lime out of these materials, and it attacks the substance of steel or copper pipes, corroding them. If, on the other hand, the pH value is too high, the lime is precipitated as scale. This leads to the formation of the dreaded deposits which over time completely clog up the pipes and valves. The water's pH value frequently has to be lowered specifically to avoid this scenario.

"Carbon dioxide is by far the most suitable solution here," Dr. Hermans explains. "It dissolves in water to form a weak acid which also occurs naturally and doesn't cause salination of the water as is the case with mineral acids. Excessive acidification is not possible. The pH value can be adjusted extremely precisely. At the same time, the system is very easy to operate and there is no need to invest in the storage of aggressive mineral acids." These advantages also apply to wastewater treatment, where CO_2 facilitates particularly environmentally friendly neutralisation of highly alkaline wastewater.

Lime control in practice

Some time ago, limescale build-up was discovered in the facilities of the Maribor waterworks in Slovenia. Following detailed analysis of the water at various points, it was decided to inject pure CO_2 continuously at one of the pumping stations. This enabled the pH value in the entire piping system to be balanced out effectively with the calcium content.

In swimming pools, the water's pH value increases wherever there is a swirling mix of water and air, for instance in showers and whirlpools or on water stairs. The Spanish swimming club Atletic-Barceloneta compensates for these constant shifts by adding CO_2. The gas is kind to the skin, odourless and completely safe in every respect for use in swimming pools.

CO_2 is used to stabilise the pH of swimming pools.

The addition of oxygen enhances the efficiency of industrial wastewater treatment.

Drinking water is an elixir of life.

Tank installation at the customer site

Quimica del Cinca, a Spanish chemical company based in Monzon, produces chlorine from saline solution. The used-up salt is topped up all the time, and during this process, elements such as barium and calcium, which need to be removed again, accumulate in the process water. When CO_2 is added, these elements form carbonates, which are easy to filter out. The alternative would be to add soda – with considerable disadvantages, as Dr. Hermans explains: "Soda is a fine powder. Dosing and dissolving it requires much more expenditure on machinery and substantial investment in automation technology. It also creates a lot of dust. By contrast, carbon dioxide is much more convenient to use while requiring significantly less investment. As with all applications, the customer gets the gas and the necessary equipment and technology from Messer as a single-source supplier."

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Interview with

Michal Císař
Wastewater and environmental protection expert at Kaufland in the Czech Republic

"We have been getting our gases from Messer for many years."

What task had to be solved?
Michal Císař: We operate a large meat processing factory in Modletice. Much of the municipal wastewater treatment plant's capacity is taken up by treating the wastewater from this factory. We wanted to make sure that the outgoing water complies with the limits even during peak loads.

Why did you turn to Messer?
Michal Císař: We have been getting our gases from Messer for many years. We were advised of the possibility of increasing the wastewater treatment plant's capacity by injecting pure oxygen into the clarifiers. Messer installed a facility which keeps an oxygen reserve ready for this purpose. When required, the gas is dosed into the activation tanks to protect the biological stage's microorganisms from an oxygen deficit.

What other options were available?
Michal Císař: We could have replaced the entire air-based aeration system, which would have required a longer stoppage of the treatment plant. But that was out of the question. We therefore opted for the oxygen reserve.

How have you found it so far?
Michal Císař: After a few months, we are not yet able to report in any great detail. We are very happy with the way everything was done, the system is working and making sure that oxygen is added as and when required.

Editorial Team

Kaufland

Kaufland is one of Europe's leading food retailers. In the Czech Republic, the group employs over 17,200 staff in more than 120 hypermarkets and supermarkets. The Modletice facility near Prague processes meat products for the own-brand K-Purland range.

Inert gases prevent explosions, fire and oxidation

Protective function

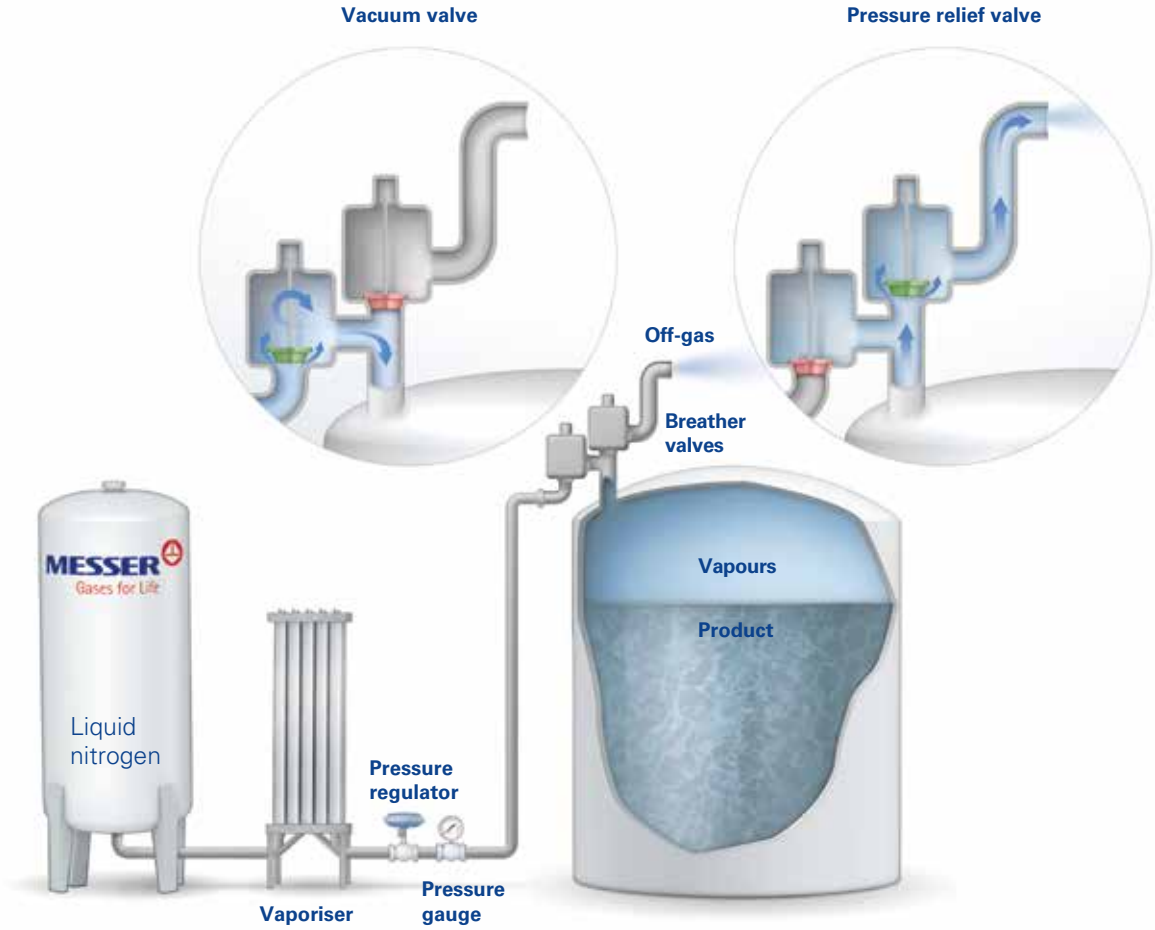
The term "inert" is of Latin origin and could be rendered as inactive or unskilled. The low reactivity of inert substances can be very useful, especially if you want to prevent explosions, fire or creeping oxidation. Inert gases can save lives, protect facilities and preserve the quality of products. Oxygen, on the other hand, is a highly reactive gas.

This property is essential in steel and glass production, but when something explodes, more often than not oxygen is involved. It reacts suddenly and violently with some substances. Petrol fumes and dust from coal or grain are prone to explosions, as are some essential elements used in fertilisers. Contact with oxygen must be prevented as far as possible: O_2 or the explosive fumes are displaced using an inert gas such as carbon dioxide (CO_2), nitrogen (N_2) or argon (Ar).

Displacing petrol vapour

Such explosion protection is typically used when carrying out maintenance at oil refineries. The explosive fumes present in the miles of pipework have to be removed before the maintenance work can begin. This involves piping slightly pressurised nitrogen into the pipes and tanks until all other gases and fumes have been largely displaced. Only then is it safe, for instance, to use welding torches and electrical tools. Inerting is also essential in the petrochemical industry's day-to-day operations. The large tanks storing flammable liquids have to be permanently protected against explosions and fire. Here the constantly pressurised nitrogen occupies the tanks' headspace. The N_2 supply and a pressure equalisation system ensure that the protective gas is always present in the required quantity and concentration, especially during filling and withdrawal. Similar systems prevent oxygen getting into the reactors used in the chemical industry. One example of this is the Duslo chemical plant in Slovakia, which specialises in the production of fertilisers, rubber chemicals and accelerators. The production facilities for the flammable and explosive substanc-

Pressure equalisation system



es are inerted with nitrogen. Messer recently installed and commissioned a N_2 production unit at the site.

Pendulum, lock, product quality

When filling and unloading rail tankers, gas displacement lines, as they are called, keep the explosion hazard in check: the liquid flowing in pushes the protective gas into the supply tank, thereby reducing the need for inert gas. Other protection systems are possible for transferring solid substances. Here, for example, an inert gas lock is required: a steady flow of nitrogen is conducted into the open area at risk. "Based on experience, we can determine how much gas is needed to keep the oxygen concentration there below the critical threshold," explains Messer's Thomas Berger. Inert gases also prevent slow oxidation processes and therefore protect the quality of many products such as medicines or vegetable oils and fats. The storage tanks are flooded with nitrogen to prevent the unwanted reaction which, for example, causes oil to go rancid. Moreover, N_2 keeps the substances dry: for example, water in the form of natural atmospheric humidity dissolves in biodiesel. Over time, the proportion of water would accumulate to such an extent that the fuel would be rendered unsuitable for engines. "Economical inerting requires the right gas to be selected and the most efficient technology to be installed," explains Thomas Berger. "We can give our customers comprehensive support with both."

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Nitrogen is stored in large storage tanks.

At the Palace of Wonders (Csodák Palotája, CSOPA) in Budapest, science is presented through play and games and explained in an entertaining way.

Palace of Wonders

What is CSOPA all about?
Dr. Paszternák: Firstly, we want our visitors to be able to experience physical, chemical and other phenomena with their senses. Secondly, we want to convey a clear picture of the role they play in our everyday lives.

How did the centre come into being?
K. Mizda: The idea and name go back to the teacher and physicist József Öveges. The physicists of the Hungarian Academy of Sciences were involved in setting it up, as was Ernö Rubik, who became famous thanks to the "Rubik's Cube" named after him.

What can visitors expect?
Zs. Papp: Our science playground has over a hundred different interactive exhibits. There are themed units such as the magnetism exhibit. Our current temporary exhibit deals with the four seasons. Four or five presentations on the different fields of physics are given every day. We also offer special programmes, including for preschool children.

What do you use gases for?
Zs. Papp: Mainly for demonstration purposes during presentations, for instance on the theory of heat or on acoustics. Among other things, we use dry ice, helium and sulphur hexafluoride. Liquid nitrogen in itself has very impressive entertainment value. One of the most popular demonstrations is the "thunderstorm", which we generate by bringing together nitrogen with a temperature of minus 196 degrees and water with a temperature of plus 100 degrees.

What do you expect from your gas supplier?
K. Mizda: We are neither a research institute nor an industrial enterprise. The gases and quantity of gases we buy fluctuate greatly, depending on our programme at any given time. We therefore need a quick, reliable and flexible service. Messer has proved to be the ideal partner.

Kriszta Lovas, Messer Hungarogáz

More information about the Palace of Wonders is available at: www.csopa.hu

Zsolt Papp, Head of Science Teaching, Katalin Mizda, Managing Director, and Dr. András Paszternák, Science Communication Coordinator (left to right)

Second life for used tyres

It takes about a hundred years for a used tyre's rubber to decompose through biological degradation. Its conversion takes place more quickly, and also more profitably, at ReOil in Poland: the company uses pyrolysis to produce carbon black and pyrolysis oil from shredded rubber tyres.

Pyrolysis involves the long, cross-linked polymer chains that constitute the tyres' rubber being split into smaller fragments. The process takes place at high temperatures, but – unlike combustion – without oxygen. The pyrolysis facility is inerted with nitrogen to prevent unwanted oxidation.

The ReOil plant in the Polish town of Myślenice has been in operation since 2015. Here the rubber waste first undergoes mechanical shredding. This exposes the steel wire in the tyres, which is then removed by a magnetic separator. The granulate is then fed into a continuously operating rotary kiln via a screw conveyor. In order to ensure that the atmosphere in the unit is constantly oxygen-free, gaseous nitrogen from Messer is also introduced into the screw. At temperatures of around 400 degrees and with the addition of a catalyst, the rubber waste is split in the rotary kiln. Before the nitrogen is then released into the atmosphere, a special filter unit removes any impurities from the gas. Carbon black and oil are retained, the recyclable products separated and cleaned.

ReOil recycles 100% of the material in the used tyres. The main end products from this process are carbon black, pyrolysis oil and steel wire. Among other things, these materials are used to produce new car tyres. They are also used for the production of lubricants, paints, plastics and coloured printing inks as well as in the construction industry. Large disposal sites, like the one in Kuwait where an estimated seven million used tyres are stored in the desert sand, will no longer be required in future.

Dr. Michał Wróbel, Messer Polska

Gases are being used in the modernisation of the swimming world championship venue in Budapest.

Hungary: Welding gas for construction site

Capacity 15,000

Hungary will play host to the Swimming World Championships in 2017. The "Dagály" swimming pool on the banks of the Danube in Budapest is being renovated and expanded for this major sporting event. CO_2 in cylinders from Messer is being used in this work. The sports pool will hold 5,000 spectators in normal operation, with temporary extensions increasing the capacity to 15,000 during the world championships. The steel concrete reinforcements needed for the extension are being supplied by building contractor Royals Expert, among others. The CO_2 is being used to weld the reinforcement cages for the pile foundation. The steel constructions will give the finished concrete elements shear, compressive and tensile strength.

Kriszta Lovas, Messer Hungarogáz

Netherlands: Gases for box production

Variety of boxes

Gepro Box produces pick-up boxes, underbody toolboxes and similar structures for trucks and delivery vehicles. In addition to a wide range of standard products, the company, which is based in Gouderak in the Netherlands, also offers tailor-made structures. The boxes are manufactured from aluminium, stainless steel or steel. Gepro uses nitrogen bundles as well as oxygen and welding gas cylinders from Messer in the manufacturing process. Oxygen is used in the sheet cutting process, while the welding gases – argon and Ferroline C18 – are used for joining the parts. Messer also supports Gepro with service and expertise.

Marina De Ridder, Messer B.V.

Belgium: Gases for construction group

The cylinder supply system ensures that each cylinder ends up in the right place.

Constant overview of cylinders

Heijmans NV, one of the Benelux countries' largest construction and real estate companies, recently started getting gases for welding and cutting from Messer. The supply contract includes argon, Ferroline C18, propane and oxygen. The service provided by Messer also includes the CCTS cylinder tracking system. Barcode scanning is used to record each cylinder prior to delivery and assign it to the customer and destination – in the case of Heijmans, this is the relevant construction site. The customer can check their current stock of cylinders on the Internet at any time. When the cylinder is returned, another scan ensures that the deposit and rental are always correctly assigned, even if – in the hurly-burly of a construction site – a cylinder ends up at another company.

Marina De Ridder, Messer Belgium NV

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The "Gases for Life" editorial team

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From left to right: Zsolt Pekker, Roberto Talluto, Marlen Schäfer, Frank Hopfenbach, Annette Lippe, Dr. Christoph Erdmann, Marion Riedel, Kriszta Lovas, Diana Buss, Katrin Hohneck, Reiner Knittel, Dr. Bernd Hildebrandt, Peter Laux, Benjamin Auweiler and Angela Bockstegers (not pictured: Michael Holy, Dr. Dirk Kampffmeyer and Dr. Joachim Münzel)

Competition

The winner of this issue's competition will receive a gourmet hamper with specialities that are perfect for the summer. For your chance to win this delicious prize, please answer our three questions about this issue of "Gases for Life". The letters in the numbered boxes will reveal the answer. Please send the answer by e-mail with the subject line "Gases for Life competition" to: angela.bockstegers@messergroup.com.
The deadline is 12 August 2016. Please remember to include your name and address. The competition is not open to employees of the companies of the Messer Group and their families. In the event of multiple correct answers, the draw determines the winner. The result of the draw is final and not subject to appeal.

What is the English translation of the Hungarian term "Csodák Palotája"?

8		11								
				2		6				

What is the name of one of the most renowned instrument makers based in Paris?

				5						
1			4							

Which company uses gases for pharmaceutical testing?

				9						
	3							10		
		7								

				M							
1	2	3	4		5	6	7	8	9	10	11

Congratulations! The winner of the last competition is Michael Steinmeier from Linz, Austria. The correct answer was „New York".


MESSER
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