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MESSER
Gases for Life

Gases for Life

The industrial gases magazine

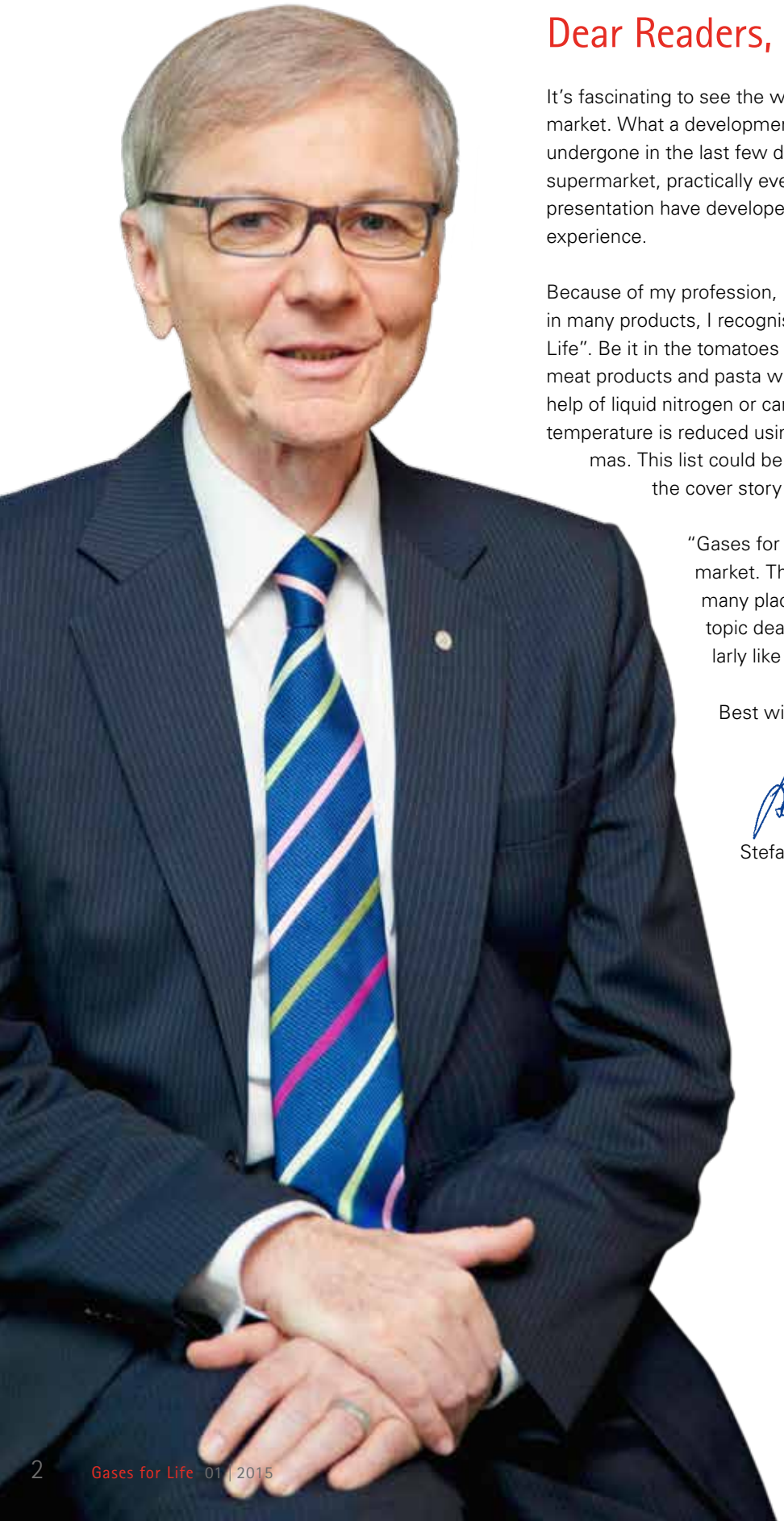
Traces of gases in the supermarket

Fleeting but indispensable

Nitrogen for cold grinding:
Efficiency with a taste of cinnamon

Practical focus:
Medicine on tap

Using gases:
More heat, less waste gas



Dear Readers,

It's fascinating to see the wide range of goods offered in a modern supermarket. What a development the way we provide ourselves with food has undergone in the last few decades: from the small corner shop to today's supermarket, practically everything has changed, the product range and presentation have developed enormously, and shopping has become an experience.

Because of my profession, I see the variety on offer from another angle: in many products, I recognise the use and benefits of our "Gases for Life". Be it in the tomatoes which are "fertilised" with carbon dioxide, the meat products and pasta which are mixed and kneaded gently with the help of liquid nitrogen or carbon dioxide, or the wine whose fermentation temperature is reduced using dry ice in order to preserve its fruity aromas. This list could be extended considerably, but I will leave that to the cover story of this issue.

"Gases for Life" also play a role on the way to the supermarket. They ensure greater reliability and safety in many places in every aspect of our mobility – another topic dealt with in this magazine, which I would particularly like to recommend to you.

Best wishes,

Stefan Messer

Cover photo:
For Johanna Mroch, application specialist at Messer in Germany, what counts when shopping for food is good quality, and this is guaranteed by Gases for Life.

Good for you and the environment

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Romania: Rave with carbon dioxide fog to help create the atmosphere

Dancing in the fog

1,455 kilograms of CO_2 from Messer were consumed when Armin van Buuren appeared in Bucharest last November. The gas from the austere-looking grey cylinders was used to create swirling fog which flowed round the dancers and – the slogan for the show in Bucharest was "Only intense" – contributed to the event's special atmosphere. The special effects were enacted by the experts of "Pyro Events Team & Enigma Fireworks" from Braşov. The Dutch DJ is one of the best in the world in his line of work. A State of Trance, the name of his weekly radio broadcast, also describes the style of music with which he thrills his fans.

Carmen Baragan, Messer Romania Gaz

Estonia: Elme Messer Gaas certified

AEO status facilitates trading

Elme Messer Gaas has been recognised by the European Union as an Authorised Economic Operator (AEO). This enables the company to profit from considerably easier customs proceedings when importing and exporting across EU borders. A requirement for the certificate was a thorough examination of its commercial activities by the Estonian tax and customs authorities. Their focus lay in particular on an efficient logistics system, plus commercial reliability and financial solvency. Together with the partner company Elme Trans, which was also awarded the certificate, Elme Messer Gaas now intends to significantly expand its export activities.

Viktoria Jaroš, Elme Messer Gaas

Spain: Nitrogen for traditional dishes

Excellent cuisine

Messer in Spain has installed a cooling tunnel for "La Bona Cuina" in Igualada by Barcelona in which pasta, vegetables and meat products are frozen to minus ten degrees Celsius in just a few minutes. This ensures optimum conservation. The family company specialises in typical traditional Catalan cuisine. Messer has supplied the liquid nitrogen for deep freezing the precooked dishes since 2013. The necessary freezing equipment was initially installed directly by Messer in Spain.

Marion Riedel, Messer Ibérica de Gases

Germany: New tamper evident closure

Security first

In many gas applications, it is extremely important for the users that the integrity of the gas content is guaranteed. This applies particularly for customers in the medical and food sectors. Having introduced a filling seal for the new MegaPack bundle, there is now another product which uses this seal. The new valve protection system – Messer ValveGuard VG1 – is authorised for cylinders up to 45 kilograms, which corresponds to a content of 20 litres. After a cylinder has been filled, the filling seal is fastened by simply clipping it in place and has to be pulled off to connect an appliance. If the seal is intact, this proves that the cylinder still contains the original filling in Messer quality. A handle is also integrated into the ValveGuard which enables the small cylinders to be transported conveniently. It is available in the standard colours white, blue, grey and red.

Alexander Kriese, Messer GasPack

Hungary: Nitrogen for cold grinding

Playful recycling

GreenTyre in Marcali can recycle up to 20,000 tonnes of old tyres per year – that is roughly half of the waste tyres in Hungary. Some of this quantity is ground with liquid nitrogen from Messer. The cryogenic gas freezes the tyres to temperatures of between minus 120 and minus 150 degrees Celsius and makes them brittle. In this state, they are easy to breakup and even grind into a fine powder. The raw materials thus produced are used to manufacture road making material, artificial turf and floor coverings for sports grounds and playgrounds, to give just a few examples.

Lilla Németh, Messer Hungarogáz

Hungary: Gases for aluminium melting

Optimised efficiency

Messer has concluded a contract to supply the new aluminium recycling plant in the Hungarian town of Várpalota with liquid gases. The plant is a joint venture between metal companies Inotal and Martin Metals.
Since the middle of April, the Várpalota facility has been melting down aluminium scrap in two tilting type rotary furnaces (TTRFs) fitted with Oxypyr-F burners. The addition of oxygen enables them to achieve an optimally efficient combustion process. Nitrogen is used for melt cleaning through purge gas treatment. The aluminium plant is designed for a capacity of 20,000 tonnes per year.

Krisztina Lovas, Messer Hungarogáz

Medicine on tap

Everyone will at some time have noticed the small coloured "sockets" by the beds in hospitals. These connectors do not supply electricity, but medical gases for treating patients. These gas withdrawal points, as they are properly called, can also be found in hospital diagnostic rooms and operating theatres. Complex supply systems are required to ensure that they always reliably provide the right gas in the required medical quality. Experts are employed at Messer who specialise in planning and installing such systems.

Many medical gases play an indispensable role in modern health care. Their use ranges from ventilation and pain therapy right through to anaesthetisation. Depending on their application and effect, the gases in the pipes are subject to Pharmaceutical or Medical Devices Law. In both cases, however, perfect quality must constantly be ensured. The gases provided must always comply with the prescribed specification, and their quality may not be impaired on their way through the piping. Equally stringent demands consequently apply for the systems as for the gases themselves. "An average-sized university hospital needs around three to four kilometres of gas piping in order to supply all the wards and functional areas with medical gases," explains Donato Clemente, an expert for medical installations at Messer in Switzerland. The pipes may only be laid by certified companies which are familiar with the requirements for medical gas installations.

Stefan Fuchs, a technician at Messer in Switzerland, installing the piping for supplying medical gases in a hospital.

Reliable reserves

However, for the pipes to serve their purpose, the gases must first be provided. Large gas tanks are installed on the hospital grounds to cater for the high demand. Smaller volumes of gas are supplied in single cylinders or bundles of cylinders. Gases in cylinders are also frequently provided in reserve. Experts refer to "three guarantees", as Donato Clemente explains: "The first guarantee is the basic supply, which automatically switches to the reserve supply (second guarantee) when necessary. At the same time an alarm is triggered. The third guarantee is an autonomous supply which is used when the basic supply and the reserves fail." If a pipe breaks down, an area control unit on each floor or in each ward enables gases from cylinders to be fed in directly.

Continuous planning

In his many years of practical experience, Mr. Clemente has only rarely witnessed the need to switch over to the gas reserves. This is because Messer as the gas supplier, in coordination with the hospital, also monitors the gas supplies and replenishes them long before they approach a critical threshold. "We also ensure efficient utilisation and tell our customers when they should use up their reserve cylinders so that the expiry dates are not exceeded."

The experts from Messer can take over the entire planning of a gas supply system and also perform installation with their own specialist staff or partners. "Complete planning is only required for new buildings or comprehensive renovation," explains the Swiss expert. "But we also handle the extension and modernisation of existing systems so that patients always receive the gases they need."

Editorial Team

Medical gas supply in the hospital: Behind the simple circuit poins in the hospital room, as seen in this advertisement from Messer, hide sophisticated piping systems.

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Vietnam: Nitrogen for cold grinding

Cassia cinnamon is produced from the bark of the Chinese cassia. The raw material contains five per cent essential oil which is retained in the powder after cold grinding.

Efficiency with a taste of cinnamon

Son Ha Spice & Flavorings from Tu Son near Hanoi has recently started using the cold grinding technology of Messer for processing raw spices. The Vietnamese spice specialist was convinced by experiments with the bark of the Chinese cassia, the raw material for a cinnamon-like spice. Its high percentage of essential oils was fully retained after the cold grinding process. The introduction of cryogenic nitrogen or carbon dioxide into the grinding process causes the heat produced there to be removed and the atmospheric oxygen to be displaced. This means that the aromatic substances can neither evaporate nor oxidise. In addition, thanks to the low temperature of the gas, the product throughput increased while the amount of powder which remained stuck in the mill decreased considerably.

Ivan Perez, Messer Haiphong

Netherlands: Welding and cutting

Air and shade

Thanks to the personal support provided in optimising welding and cutting processes, Messer Benelux has succeeded in gaining the company Snelder in Utrecht as a new customer. Snelder develops and produces ventilation and screening systems for the greenhouse industry. Its two welding robots are supplied with Ferroline C8, and the laser cutting machine with nitrogen and oxygen in bundles. The optimised process enabled Snelder to minimise the product loss during laser cutting and at the same time to reduce the gas consumption.

Marina De Ridder, Messer Benelux

Sun shading system in the anthurium greenhouse

Slovenia: Gases in food processing

Fish and meat

Gases are also playing an ever greater role in the food processing industry in Slovenia. For example, Messer installed the gas supply for packing fresh fish at the long-established company Delamaris there in 2014. Last year, too, the meat mixer at the subsidiary Pivka Perutninarstvo was equipped with Messer technology which enables the use of dry ice. Perutnina Ptuj, a leading processor of poultry meat in the region, obtains from Messer, among other things, liquid nitrogen to surface freeze the poultry sausage, which can then be processed more efficiently. In addition, the company uses CO_2 for mixer cooling with Clapet nozzles and protective gas mixtures for packing the finished products.

Dejan Šibila and Alenka Mekiš, Messer Slovenija

People Focus

6 questions for

Jana Zušťáková

Jana Zušťáková has worked at Messer Tatragas in Šaľa, Slovakia, for 15 years as a specialist for analytical processes. She is also responsible for filling and quality control of gas mixtures and medical gases in cylinders. She lives with her husband and their two children in Šaľa.

1. **A working day is perfect …**
   … when everything functions seemingly automatically, according to the maxim of the philosopher and educationalist Johann Amos Comenius from the 17th century which I allow myself the freedom to change into: Work through play.

2. **What I absolutely need for my task are …**
   … functioning analytical apparatus, and naturally a productive working atmosphere in the team.

3. **A novel/film which I can recommend without reservation is …**
   … the Millennium trilogy by Stieg Larsson. After reading the three parts ("The Girl with the Dragon Tattoo", "The Girl Who Played with Fire", "The Girl Who Kicked the Hornets' Nest") I think everyone will become a fan of the Nordic thriller.

4. **I can get irritated by …**
   … people who explain to me in detail how you can't do something.

5. **I can get excited about …**
   … the expert help from my colleagues which they give me when I'm solving my customers' problems.

6. **For the future I wish myself …**
   … success for the company so that the employees thrive.

Fleeting but indispensable

The only gas sold in the supermarket is butane for filling cigarette lighters. So when someone enters a supermarket, they are probably not thinking of gases, but of things like tomatoes, sausages and washing-up liquid. Without gases, though, many goods on the shelves would not look, smell and taste as they do, and some would not be there at all. Gases for Life went to the supermarket searching for traces of the fleeting substances which are present everywhere in everyday life.

We find the first trace in front of the entrance, where you grab a shopping trolley. By the time the iron has been melted, drawn to form steel wire, shaped and welded together to form a practical shopping assistant, a number of gases will have been involved in the process. Presumably oxygen was fed into the blast furnace to optimise heat generation, argon was used to refine the molten steel and enhance its quality. While the metal was being turned into wire at the rolling mill, nitrogen in the heating furnace prevented oxidation. Last but not least, shielding gas mixtures are indispensable when robots weld the wire together to form shopping trolleys.

Gas fertilisation for tomatoes

We begin shopping at the fruit and vegetable stand. The greenhouse tomatoes may have been "fertilised" with carbon dioxide. Hothouse air is enriched with the gas, which promotes growth and enables greater yields. The bag with the ready-cut salad almost certainly contains a mixture of nitrogen, oxygen and carbon dioxide which prevents the greens from turning brown round the edges and ensures that they stay crunchy for longer. Ready-cut salad saves time, as does instant coffee, which can be brewed in a jiffy. To guarantee it tastes good, it should be freeze-dried: coffee extract boiled at 200 degrees under high pressure is frothed up with air or CO_2 and then deep frozen. Liquid nitrogen provides the cold temperatures in the cooling circuit. It also cools the ice condenser which removes the water that has turned to ice from the extract in the vacuum dryer. The gas enables the temperature to be decreased to as low as minus 100 degrees Celsius. This means that it takes only a very short time to dry and the flavouring substances are preserved.

Continued on page 12 →

Continued from page 11 →

The right mixture

The selection at the meat counter would look and taste totally different without gases. When minced meat is mixed, liquid nitrogen or carbon dioxide are introduced to the mixer as refrigerants, for example in Messer's Variomix process. The cryogenic gas removes the heat created by the mixing process. The low temperatures which are important for the shelf life are maintained throughout while the meat is mixed. Kneaders are cooled according to the same principle when producing bakery products. The Variomix method is also used in the production of foodstuffs in powder form, such as packet soups and instant products. When powders are encapsulated, it ensures that the components remain granular and pourable. The products lying on the ice at the fish counter have travelled along the cold chain. When the quality of seafood in a supermarket located far away from the coast almost matches that of freshly caught fish, that is also due to a state-of-the-art freezing method using a cryogenic gas. The speed at which products are cooled when they are deep frozen is important. If the cooling is too slow, large ice crystals form in the frozen food, which damage the cells – vitamins, nutrients and flavour substances are lost. In Messer's Cryogen-Rapid freezing systems the food is therefore frozen in the shortest possible time using liquid nitrogen or carbon dioxide. The process also helps to protect fish stocks: close seasons can be complied with and the consumers nevertheless supplied with their favourite fish all year long.

»Our gases and applications are as varied as the product range in supermarkets.«

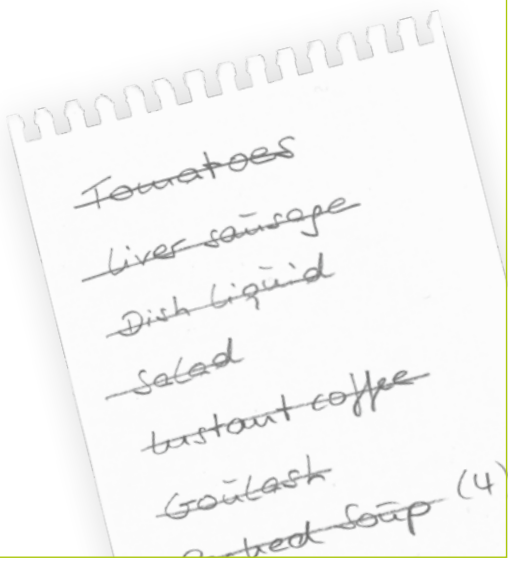
Label: More than bubbles

Gases are also used in the production of red wine – for example nitrogen for inerting.

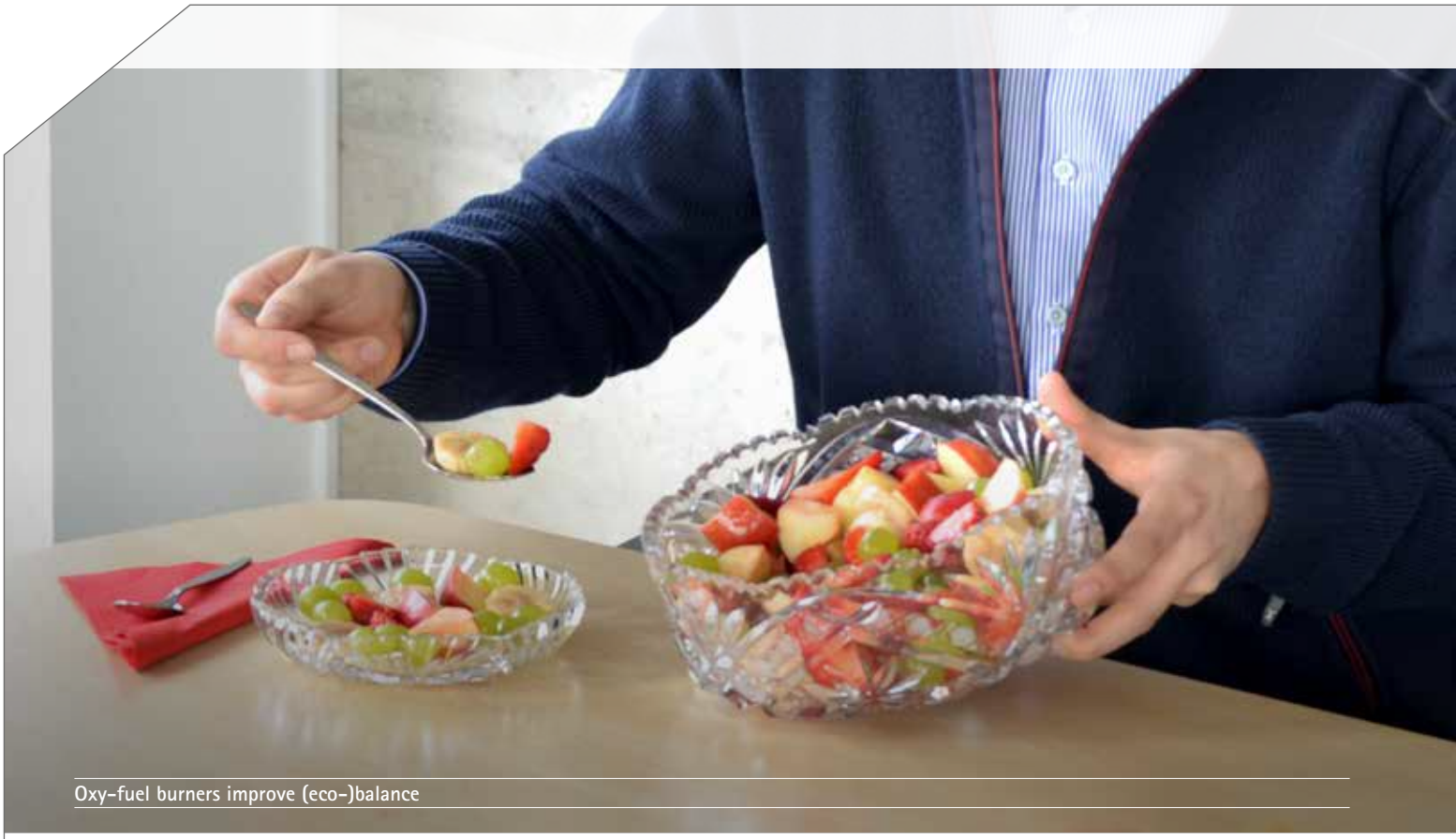
Aromas and scents

Fish is accompanied by white wine, the fermentation temperature of which was reduced using dry ice. This retains the fruity aromas of the grape. While the fine wine is maturing, an inert gas forces the air out of the tank and prevents oxidation. But on the other shelves, too, hardly a drink is to be found for which not at least one gas was used in the preparation or filling process. The applications range from the carbon dioxide which makes lemonade fizzy to the drop of nitrogen in the headspace of a bottle of fruit juice, to name but two. In addition to providing protection against oxidation, the gas there maintains the pressure which stabilises the thin-walled PET container. Gases are involved in many steps in the manufacture of most detergents and cosmetic products. Among other things, they help to extract the intact natural fragrances from the raw materials. At a particular ratio of pressure to temperature, carbon dioxide enters the supercritical state – halfway between liquid and gas. At the same time, it attains enormous dissolving power and can, for example, extract essential oils from plants both gently and efficiently. Only the final type of extraction in the supermarket – when the wallet or purse is extracted from the pocket – requires no gas whatsoever.

Editorial Team



"Gases for Life" are also used to manufacture the paper for the shopping list. They help to save energy and resources and significantly reduce pollutant emissions during paper production.



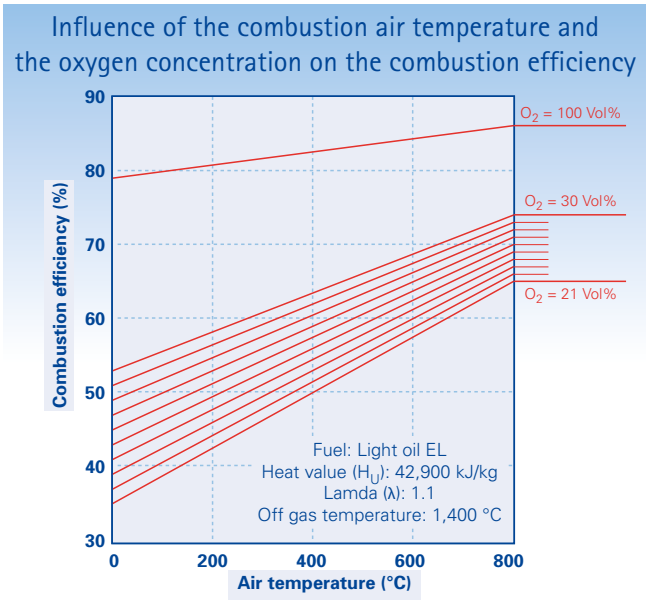
Oxy-fuel burners improve (eco-)balance

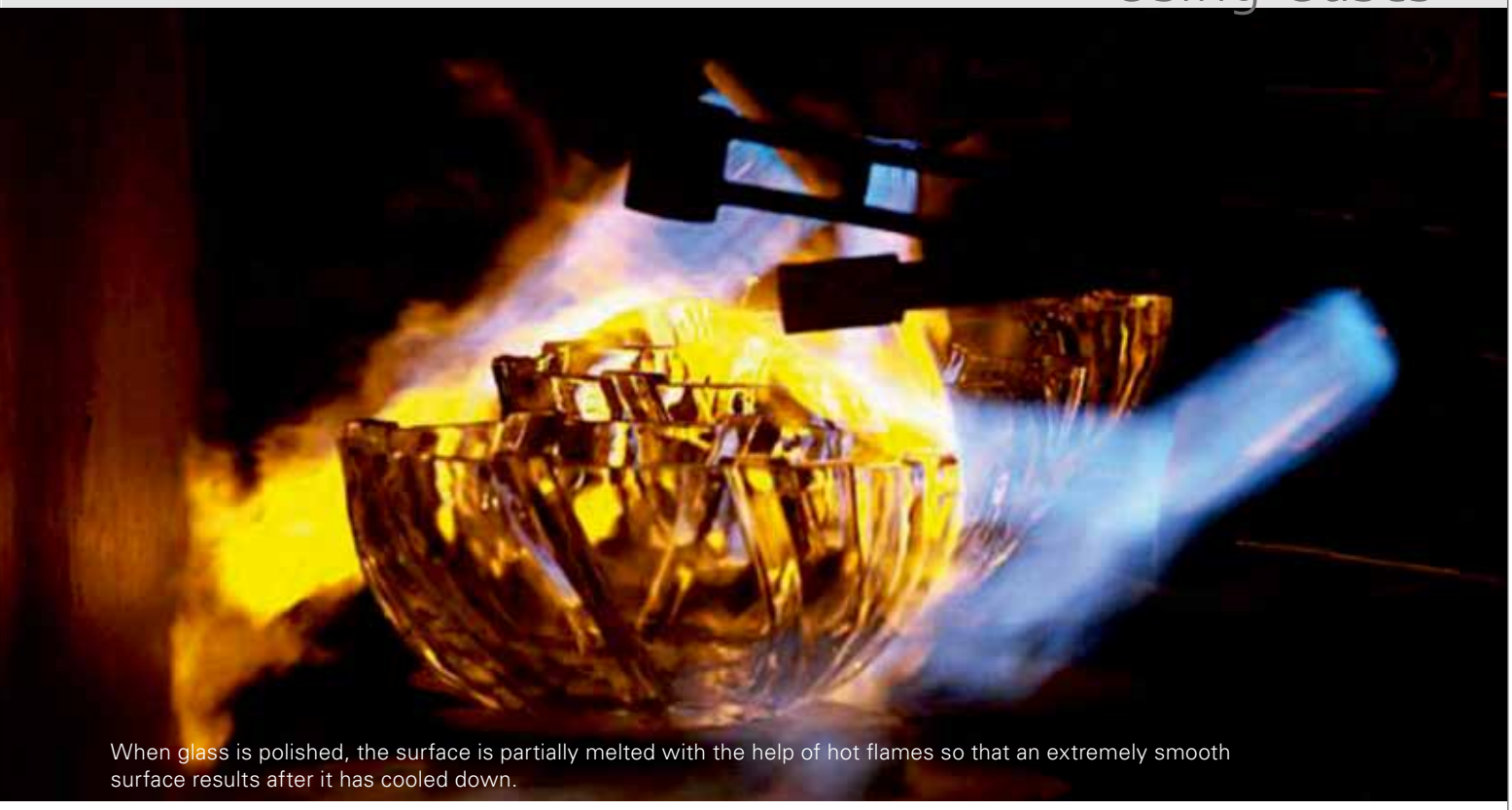
More heat, less waste gas

Air is totally free. Pure oxygen (O_2), on the other hand, requires the use of energy in its production. Storage and transport of the gas also necessitate a certain outlay. Nevertheless, it is worthwhile replacing free air by O_2 in combustion processes. Because the extremely reactive gas promotes combustion to such a degree that the overall costs can be appreciably reduced while at the same time improving the eco-balance. Messer has perfected the oxyfuel burner with Oxipyr technology.

Air consists of 79 per cent nitrogen – an inactive gas which contributes virtually nothing to combustion. But it is unavoidably also heated during combustion processes, consuming a substantial amount of primary energy. "That naturally has an effect on the process temperature," explains Michael Potesser, technology specialist at Messer in Austria. "The higher the temperature, however, the more efficient combustion is. Put simply, with oxygen combustion you generate more heat from a particular volume of fuel. Increasing the O_2 concentration in the combustion air increases the flame temperature and the combustion efficiency, while, when seen as a whole, generating less carbon dioxide."

Influence of the combustion air temperature and the O_2 concentration on the combustion efficiency





When glass is polished, the surface is partially melted with the help of hot flames so that an extremely smooth surface results after it has cooled down.

Greater throughput

The figures from practical application speak for themselves: fuel consumption and CO_2 emissions decrease by up to 50 per cent, while the furnace throughput can be up to 50 per cent higher. In addition, when the oxy-fuel technology is employed correctly, the production of harmful nitric acids is noticeably reduced. "Our experience shows that this enables the cost of steel production to be significantly decreased, while at the same time benefiting the environment," emphasises Mr Potesser. The technology can also be used to optimise the processing of non-ferrous metals, glass and ceramic materials. Furthermore, the use of oxy-fuel burners in this context also consistently results in further desirable side-effects, as shown by the following examples.

Aluminium, glass and copper

An additional smelter with a capacity of 25 tonnes was installed at Aluhut in Dobris, Czech Republic, last September. Messer equipped this smelter with an Oxipyr F burner which provides a maximum performance of three megawatts. As an extra benefit, a hot air extractor fan enables the kiln exhaust gas to circulate, which results in an additional heat input into the smelting process. This technology also allows Aluhut to process contaminated aluminium scrap without having to use ecologically problematical chlorides and fluorides. The combination of the hot gas blower and the Oxipyr burner provides the option of post-combustion, thus permitting optimised utilisation of the primary energy.

New production lines were equipped with Oxyfuel burners at the Czech glass manufacturing company Kavalierglass in Sázava. These are employed, among other things, for treating the surfaces and edges. After modifying the glass mixture, the use of highly toxic hydrofluoric acid also baecame superfluous for polishing table glass. At Jinxin Copper in Mianyang, central China, copper scrap is melted in a 100-tonne anode furnace in order to retrieve the valuable metal for new products. Messer in China supported the company in replacing the conventional air combustion by two Oxipyr F burners each providing a performance of three Megawatts and fully automatic burner control with a burner extraction device. The duration of the melting process degreased from 25 to 23 hours, and natural gas droped from 12,000 to 7,000 cubic metres. In addition to the significant decrease in costs, this also achieved an 80 per cent reduction in the exhaust gas load.

Jasmine Yan, Messer China,
and Vít Tuček, Messer Technogas

Interview [3]

Raif Emir

General Coordinator of Hüner Kriko Limited Company, Bursa, Turkey

How did 'window regulator' (Kriko) come to be included in the company name?
When the Hüner Kriko was founded in 1975, our first product was a window regulator – and that's how the company name originated. But we also manufacture other automotive body parts. In the meantime, Hüner Group consist of five different companies and has four different production facilities located in Bursa, Turkey. All four facilities are mainly focused on automotive industry.

Mechanised MAG welding with Ferroline C18

What are your most important projects?
Together with Contitech, we have developed resonator in order to attenuate noise generated by turbo chargers which are nowadays commonly used by vehicles. In this cooperation project, production is geared specifically to the needs of end customers.

What material and what gases do you use?
In our production department, we process stainless steel, aluminium and mild steel using oxygen, argon, acetylene and carbon dioxide, as well as the gas mixtures Ferroline C18, Ferroline C5 X2 and Inoxline X2 in single cylinders and bundles. Our welding processes include WIG and MAG/MIG welding as well as induction brazing.

What are your most important quality criteria for welding?
When welding, the durability of the welded joint has high priority for us and we check it by penetration depth. We check this in all our products before we start mass production. We also consider it important to keep spatter formation and blistering to a minimum.

What do you expect from your gas supplier?
Punctual delivery is essential for us. If we had to shut down production because of a lack of gas, the costs for us would be immense. Perfect quality of the shielding gas is also decisive as it has a direct effect on the quality of the parts. In terms of both these aspects Messer has always proved itself to be a reliable partner.

What kind of relationship do you have with Messer?
The cooperation with Messer came about over 25 years ago owing to the proximity of our companies at the time. We regard Messer not as a supplier, but as a business partner. For new projects we always draw on Messer's experience and advice in order to optimise our welding processes.

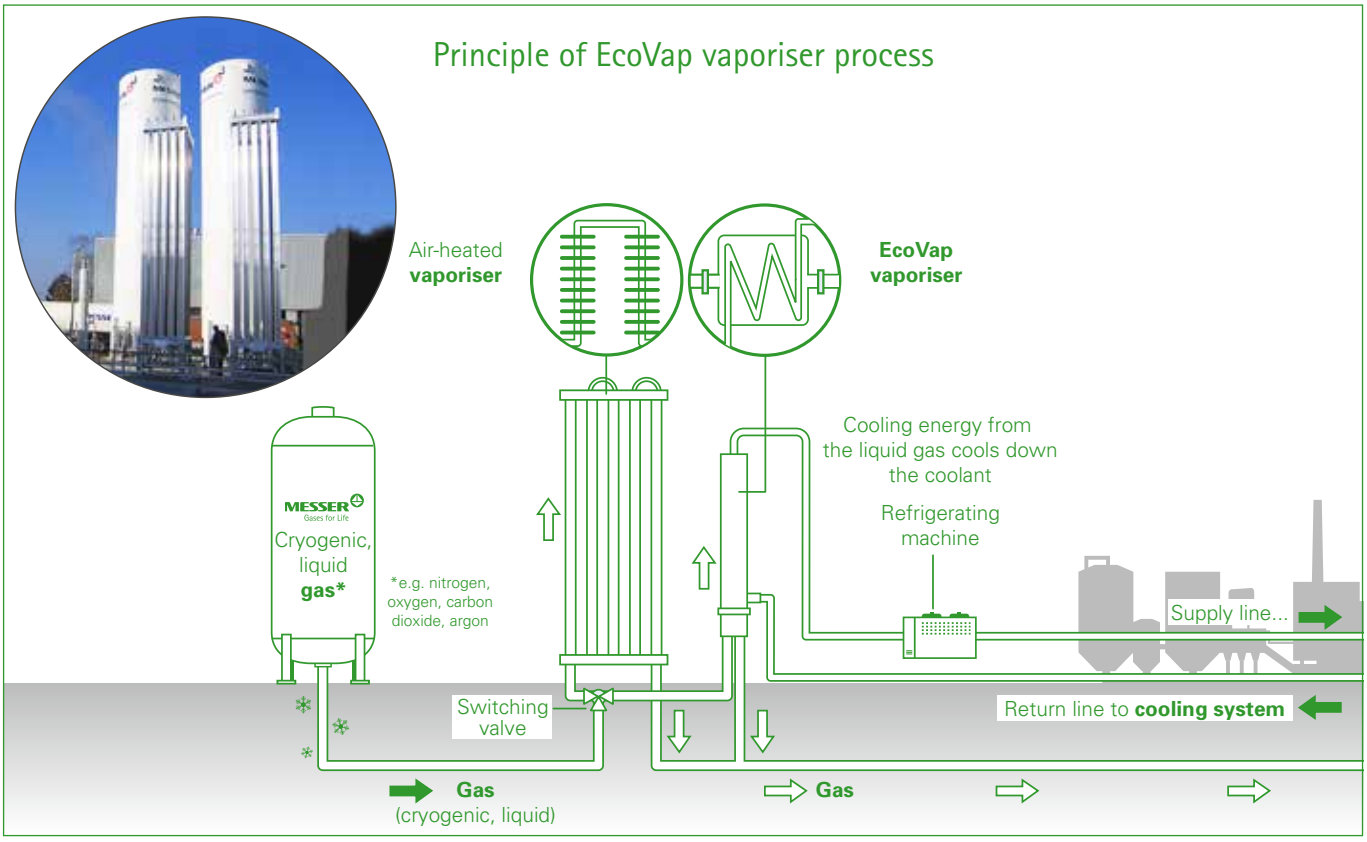
Editorial Team

Sensible energy transfer

Winters in Bosnia are cold. That can become a problem for the subsidiary of the steel company ArcelorMittal which is based there: for waste water neutralisation, the plant uses CO_2 which is stored in cryogenic, liquefied form. But in winter, the ambient temperature is not high enough to vaporise a sufficient quantity of the liquid gas. The EcoVap vaporiser from Messer is now scheduled to ensure the necessary heat input by utilising the waste heat from compressors.

Many production companies procure industrial gases such as nitrogen, oxygen, carbon dioxide and argon in liquid, cryogenic form. A great deal of energy is used to liquefy the gases. Some of this is lost if the gases are heated with air vaporisers prior to use because they are employed in gaseous form. However, in companies where the production department requires not only industrial gases but also cold, sensible use can be made of this "cold energy". Messer has developed the EcoVap vaporiser for this purpose. Integrated into the return pipe of a refrigeration system, it ensures that the cold which the liquid gas releases when it vaporises reduces the temperature of the circulating refrigerant. This relieves the load on the refrigerating machine and cuts energy costs. The formation of ice and fog on the air vaporisers is also a thing of the past. Furthermore, the EcoVap guarantees that the temperature of the required gas is always constant – irrespective of the ambient conditions. At ArcelorMittal in Bosnia, though, it is not cold which is needed, but heat. Consequently, the system is reversed: The (previously unused) waste heat of the compressors in the air separation plant from Messer is conducted to the EcoVap vaporiser in order to vaporise the liquid carbon dioxide. The heating energy thus saved in comparison to a steam or natural gas heating system amounts to around 900,000 kilowatt hours per season, and at 180,000 kilograms the CO_2 emissions avoided are equivalent to the exhaust of approximately 40 passenger cars.

Dr. Friedhelm Herzog
and Dr. Monica Hermans, Messer Group



Industry Spotlight

Romania: Automotive parts for major customers

MegaPack for high throughput

The Romanian company MPO Prodivers Rezistent manufactures around two million welding parts each year. The producer of air filter consoles and hood handles for the automotive sector uses the shielding gas Ferroline C8 from Messer for its welding processes. The gas is supplied in the state-of-the-art MegaPack. MPO Prodivers Rezistent belongs to the French MPO Group, an important supplier for the Renault-Nissan Alliance. Messer in Romania has supplied the company since 2008, and has been its only gas supplier since 2013.

Carmen Baragan and Marius Rosu, Messer Romania Gaz

Czech Republic: Monitoring the gas supply

Reserve tank for welding work

Belated delivery in the automotive industry can result in severe contractual penalties. Fuji Koyo Czech, a supplier of steering columns, is well aware of this. To ensure that the welding process always runs smoothly at the Czech company, Messer has developed a sophisticated system to ensure perfect delivery of shielding gases. This includes a separate mixing unit, constant monitoring of the gas supply and continuous analysis of the mixture. If the monitored values were to deviate from the specifications, switchover to the reserve system would take place automatically. The system was installed in January 2015.

Jan Kašpar, Messer Technogas

Hungary: Plasma gases for turbochargers

Top quality at 40,000 degrees

BorgWarner Turbo Systems produces turbo chargers for companies including Audi, BMW, Fiat, GM, PSA Peugeot Citroên, Volkswagen and Volvo. In Oroszlány, Hungary, the company employs plasma welding robots which operate at high speed and at the same time provide weld seams of the highest quality. The plasma arc, which reaches a temperature of up to 40,000 degrees Celsius, consists of ionised argon or a mixture of argon and hydrogen. The gases are supplied by Messer in Hungary and are mixed directly in the customer's plant in accordance with the welding task. The high-precision mixing equipment and the entire gas supply system were also planned and installed by Messer. The US BorgWarner Group is one of the leading providers of powertrain elements for the automotive industry.

Krisztina Lovas, Messer Hungarogáz

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The "Gases for Life" editorial team

We are ...

From left to right: Tim Evison, Reiner Knittel, Dr. Joachim Münzel, Katrin Hohneck, Diana Buss, Marlen Schäfer, Benjamin Auweiler, Dr. Christoph Erdmann, Angela Bockstegers and Dr. Dirk Kampffmeyer (not pictured: Dr. Bernd Hildebrandt, Michael Holy, Monika Lammertz, Krisztina Lovas, Marion Riedel and Roberto Talluto)

Competition

Delicious!

The winner of this issue's prize draw will receive a gourmet hamper that is perfect for the cold season. For your chance to win this delicious prize, simply answer our questions about this issue of "Gases for Life". The letters in the numbered boxes will reveal the answer. Please send it by e-mail with the subject line "Gases for Life competition" to:
angela.bockstegers@messergroup.com
The deadline is 3 July 2015 per Mail. 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.

A new valve protection system from Messer is called:

☐ ☐ ☐ ☐ ☐ ☐
4 5

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
7 2

This process is used when meat is minced and mixed:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
8 6

What is the name of the comet which is being investigated with the help of calibrating gases?

☐ ☐ ☐
3

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ -

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
10 1 9

Congratulations!

The winner of the last competition was Karl Klein from Erftstadt, Germany. The correct answer was "winter time".

ANSWER:

1	2	3	4	5	6	7	8	9	10	
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Have fun and good luck! Your "Gases for Life" team!

THE ROSETTA MISSION

On 12 November 2014 the space probe PHILAE performed its world-famous bounce on the comet 67P Churyumov-Gerasimenko. It did not reach the ideal position on CHURY, but the mission was nevertheless an enormous success – not least of all because of the parent craft ROSETTA, which is orbiting the comet. It serves as a radio station for Philae and operates as an autonomous research station. Among other things, Rosetta's orbiter spectrometer means the systems are equipped for ionic and neutral gas analysis. ROSINA was built by the University of Bern in Switzerland and consists of two mass spectrometers and a gas pressure sensor. It is designed to determine the composition of the comet's atmosphere and ionosphere with high-precision measurements. The calibrating gases essential for this purpose which Rosina has on board are carbon dioxide, xenon, neon, helium and special gas mixtures in cylinders from Messer in Switzerland. Thanks to this work, we know today that Chury well and truly stinks: its atmosphere consists largely of hydrogen sulphide, ammonia and formaldehyde.

Reiner Knittel, Messer Schweiz