

No. 21 Issue 01 | May 2017

MESSER
Gases for Life

Gases for Life

The industrial gases magazine

COVER STORY

The history of light

PRACTICAL FOCUS

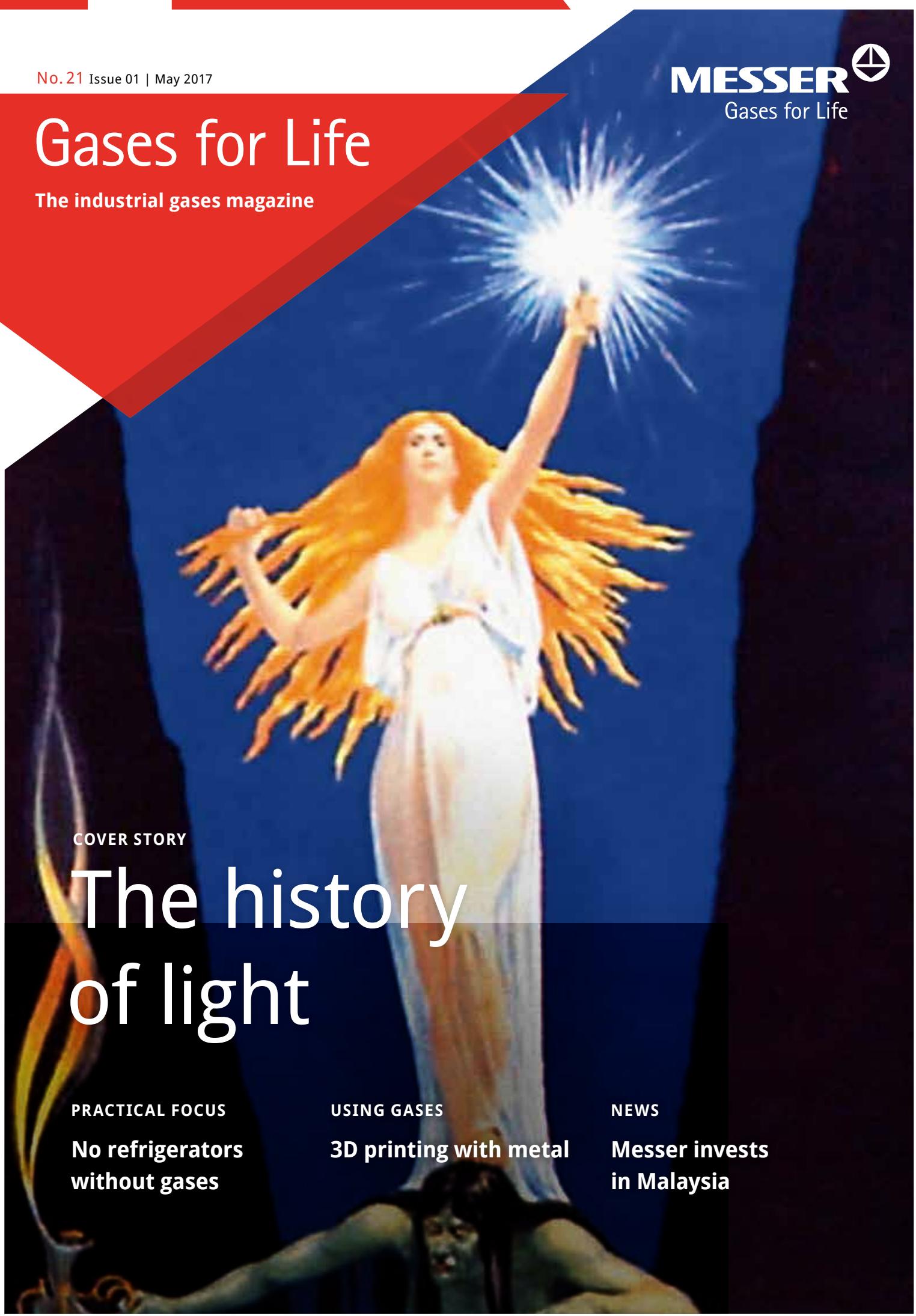
**No refrigerators
without gases**

USING GASES

3D printing with metal

NEWS

**Messer invests
in Malaysia**





Dear Readers,

Our increasingly integrated global economy with multinational trade agreements is faced with a growing trend back towards national interests.

I am personally convinced that we will only be able to solve the pressing problems of our time – including climate change and the refugee situation – as a global community.

Economically and technologically, too, there is no convincing alternative to “borderless cooperation”. Messer has a tradition of operating globally. We have recently been strengthening our presence in the ASEAN markets (ASEAN = Association of Southeast Asian Nations). We have successfully expanded our production capacities and formed new partnerships in the region. Our joint venture with Universal Industrial Gases in Malaysia is an example of this (see page 8).

I hope you enjoy reading our new magazine and wish you a wonderful spring.

Best wishes

Stefan Messer
CEO and owner of Messer



The Cover Photo shows

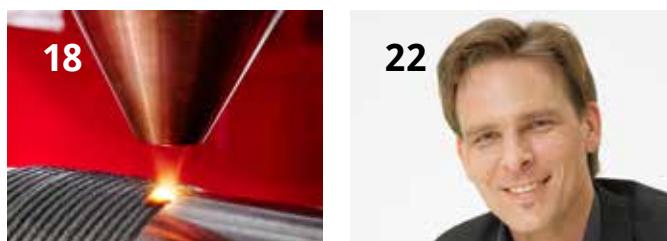
a historical Adolf Messer GmbH advertising poster: The acetylene lamp's bright light was actually supposed to replace the paraffin lamp. Its ascendancy did not last long – Thomas Edison invented the electric light bulb, paving the way for electric light.

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From gas lanterns to LEDs: the history of artificial light is also a history of gases. Without them we would spend our evenings sitting in the dark.

**SCIENCE****16 Dark mysteries****USING GASES****18 Pushing the boundaries**

3D printing with metal could soon experience a boom. The technology offers completely new possibilities.

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Ten million chickens in one day

More and more Chinese consumers are turning to frozen chicken products.



Zhang Hai, Application Manager for Food at Messer China, with a freshly delivered chicken pack from Qingyuan

China | Poultry producer Qingyuan Qingnong E-Commerce is known for products of a particularly high quality. The freshly slaughtered animals are frozen with liquid nitrogen in a tunnel freezer before being packaged. They are sold throughout China via the Internet. In January 2016, Messer installed a 50

cubic-metre tank at Qingyuan, which it regularly tops up with gas. In just one day last year – on November 11, China's "Double Eleven" festival, which is celebrated as a shopping day – the company sold ten million chicken packs.

Jasmine Yan, Messer China

Demonstrably faster welding with ternary mixture

France | Muller Rost, a steel construction company based in Wintzenheim near Colmar, has converted its welding processes to the Ferroline C12 X2 ternary mixture following successful tests. This shielding gas allows faster welding with considerably less smokiness. Thanks to the fact that it is supplied in 300-bar cylinders, there is 50 per cent more storage capacity and a reduction in time and effort storing, retrieving as well as exchanging cylinders.

Caroline Blauvac, Messer France

Dry ice for automated mould cleaning

Switzerland | ABB, the energy and automation technology group, uses ASCOJET dry ice blasting technology and dry ice from ASCO for automatic cleaning of casting moulds in a special facility. This facilitates efficient and careful removal of mould release agent residues.

Simone Hirt, ASCO CARBON DIOXIDE

Variety of processes in the Basque Country

Spain | The Basque province of Gipuzkoa is a traditional centre of the iron and steel industry. Among other things, machine tool components, turbines, cranes and foundations for shipbuilding and aircraft construction as well as for wind turbine generators are manufactured in the workshops of Talleres Juan Lasa. The Basque metalworkers use argon, Ferroline, Aluline and ternary mixtures from Messer. The gases are used in various welding processes, for oxyfuel flame cutting and in deposition welding of carbon and stainless steel.

Marion Riedel, Messer Ibérica



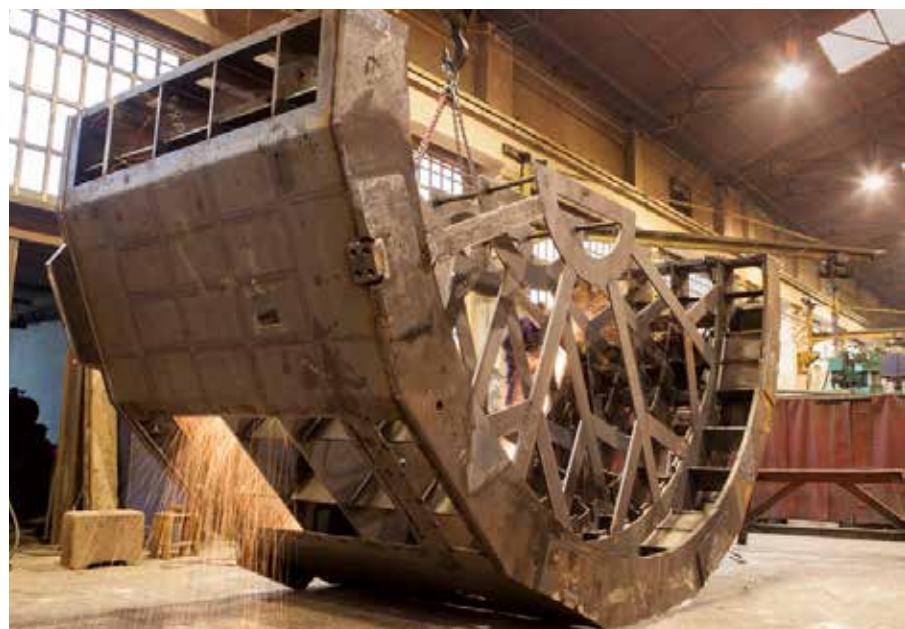
Injection-moulded plastic products are used for many car parts – including control panels.

Liquid nitrogen optimises injection moulding

Slovenia | Technoplast manufactures moulds for plastic injection moulding in Blejska Dobrava. The company itself also produces injection-moulded parts such as door handles and control panels for car interiors. Injection moulding involves the use of liquid nitrogen from Messer to build up the necessary pressure, adjust temperatures, prevent unwanted ox-

idation and optimise the production process. Messer in Slovenia recently supplied the company with a storage tank for the liquid gas along with a vaporiser and a compressor. The latter conveys the gas into the injection moulding machines at a pressure of 285 to 300 bar. Technoplast has plans for further expansion in the future.

Alenka Mekis, Messer Slovenija



Part of a five-metre-diameter generator frame for a hydroelectric power station.

No refrigerators without gases

Refrigerators are as indispensable in our daily lives as the gases that are needed to manufacture them. This involves the use of a whole range of the volatile substances.

During the socialist period, a considerable proportion of refrigerators in Eastern Europe bore the name Lehel and were made in the Hungarian town of Jászberény. The make and site were taken over by Swedish company Electrolux, one of the leading manufacturers of household appliances. The factory now trades under the name of Electrolux Lehel and continues to specialise in the manufacture of refrigerators. Today the company has another site in Nyíregyháza. The two factories

account for around 70 per cent of European refrigerator production.

World class at soldering

The main parts of a refrigerator are made of metal. Soldering and welding are therefore key stages of the production process. For example, the cooling coil's tubes are soldered to the compressor's connections, which consist of copper and copper-plated steel. Since the compressor vibrates slightly when it is running, the functioning as well as

the service life of the refrigerator as a whole depend on the quality of this joint. It must be made to last and must remain gas-tight.

The skilled workers at Electrolux Lehel use a mixture of natural gas and oxygen for soldering. "When it comes to soldering, our colleagues are world class, producing the best-quality soldered joints in the entire group," says József Csibra, Technical Manager for Refrigerator Production. Nevertheless, the cooling elements are leak tested



— PRACTICAL FOCUS —

together. Here the appearance of the welds and adjacent parts must be flawless. To ensure that the meticulously worked surfaces are not damaged in any way during cleaning at the end of the production process, they are blasted with fine-grained dry ice. The kinetic energy of the jet gently removes any dirt. Furthermore, this process does not leave any residue as the CO₂ pellets evaporate upon impact.

Explosion protection and water barrier

Another gas performs important functions with regard to operational safety. Some of the substances that are used in the production process are quite explosive. Examples include the natural gas used for soldering as well as the hydrocarbons cyclopentane (liquid) and isobutane (gaseous), which are used as coolants. Detectors monitor the spaces in which these substances are handled. They trigger the disconnection of the supply lines if the concentration of these gases or vapours exceeds a certain limit.

The shut-off valves are pneumatically operated. However, they are not actuated with compressed air, as is usually the case. The moisture content in



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compressed air could lead to the valves and lines freezing up in winter. Instead, the pressure build-up is achieved with nitrogen. In addition, the inert gas acts as a dry protective layer for the polyol mixture and the isocyanate, both of which are precursors of the insulating foam for the cooler walls. Isocyanate is extremely hydrophilic, i.e. water-friendly. Without the gaseous water barrier, it would therefore draw all the moisture from the adjacent air with a resulting loss of quality. The gases that Messer supplies to Jászberény are quite literally ubiquitous in the process of manufacturing these indispensable kitchen appliances.

*Kriszta Lovas and Mónika Zimányi-Csere,
Messer Hungarogáz*

with helium prior to assembly. The noble gas's atoms are so tiny that they penetrate the smallest pores, thus indicating any leaks.

Nice welds required

The evaporator plate, which is just 0.5 millimetres thick, is joined to an aluminium pipe by means of arc welding. With this AWI welding method, argon prevents oxidation of the metal surfaces involved, as it does when welding the visible metal parts of the refrigerator



Gases for soldering and welding are indispensable in Electrolux Lehel's refrigerator production processes.

Messer invests in Malaysia



Messer has signed a joint venture agreement with Universal Industrial Gases (UIG). In October 2016, UIG commissioned the second plant in Selangor province, south of Kuala Lumpur.

Malaysia | The German industrial gases manufacturer holds a 60 per cent majority stake in the company, which was founded in Senai, in the southern province of Johor Bahru, in 2009. At the Selangor and Senai sites, a total of 50 staff are employed in cylinder filling, acetylene production and the supply of industrial gases to end customers. The joint venture is planning to invest in gas cylinders and optimise safety and quality assurance. The product portfolio is also going to be expanded. These measures are intended to

ensure collective competitiveness in the growing market. "Malaysia is a dynamic, modern country with a population of 31 million," says Tim Evison, who is responsible for the strategic expansion of Messer's business in the countries of Southeast Asia. "We anticipate further economic growth and want to support our customers' and partners' production processes with our gases and our application technology know-how," says Kam Fook Yong, founder and managing director of UIG. He is in charge of the joint

venture along with Dimitar Popcev of Messer. "Malaysia is currently seeing billions being invested, for instance in the petrochemicals, steel and electronics industries. This offers great potential for us, since many of these projects require the use of gases," Dimitar Popcev explains. Gases are as important as water and electricity in the manufacture of many end products, which is why production facilities and filling plants for industrial gases are located close to customer sites.

Editorial Team

Excellent water from a primeval forest

Slovenia | Costella mineral water comes from the small village of Kostel on the edge of the primeval forest of Kočevje, which is very dense. The water is considered to be of a particularly high quality, having won more than 40 national and international awards. Following a change of ownership, which brought a fresh injection of capital into the company, Costella recently expanded its capacity, including through the installation of a new carbonator for its soft drink products. These are produced primarily for the Middle Eastern market. Messer has installed a CO₂ tank as well as piping in Kostel and is supplying the gas that provides the fizz.

Alenka Mekis, Messer Slovenija



Costella soft drink produced with water from a primeval forest

Gases for car air conditioning

Austria | Automotive supplier Modine manufactures heat exchangers for air conditioning systems in Kottingbrunn, Lower Austria. Messer has installed a cryogenic on-site facility to supply gaseous nitrogen for soldering in an inert atmosphere. In addition, helium is being supplied for leak tests on the heat exchangers.

Katja Paset-Pavlovic, Messer Austria

Complete installation for Oerlikon

Slovakia | Messer has installed a gas pipe system at coating specialist Oerlikon Balzers' new site in Veľká Ida. The installation includes a tank, pump and loop for liquid CO₂ as well as bundle stations for nitrogen, argon and acetylene.

Editorial Team

Cheng Yan



Cheng Yan (42) has been working as a buyer at Messer in China since 2007. She lives in Chengdu, Sichuan province, with her husband and 16-year-old daughter.

1. What has been your greatest success at Messer?

The construction of the new air separation unit in Chengdu. It was a great honour to be able to work on this project from the beginning. I am very proud to be part of the team.

2. What would you say is a must-see for any visitor to your country?

Jiuzhaigou National Park – “Nine Villages Valley” – in Sichuan, with its cascading waterfalls and colourful lakes.

3. Which piece of your country's cultural heritage should everyone be acquainted with?

The Palace Museum of the Forbidden City in Beijing. The palace, with its 980 buildings and 8,704 rooms, was the imperial palace of the Ming and Qing dynasties. From here, 24 emperors ruled over the Chinese empire. The red and yellow colours of the walls and roofs are a symbol of China and imperial power.

4. What three things would you rather do without?

Smog, stinky tofu and rats.

5. Which celebrity would you like to spend an evening with?

The TV presenter Chen Luyu, who is clever, insightful, and has a good sense of humour. She is China's answer to Oprah Winfrey.

6. What else would you like to learn or study?

Yoga. It helps you stay healthy and keep your mind pure.

The history of light

While "neon tubes" contain no neon at all, they would remain dark without another noble gas. Since the days of gas lamps, artificial lighting has been inconceivable without gases.

Continued on page 12





The first gas streetlamps lit the streets of London in 1807.

Over many millennia, after sunset, humans had to content themselves with the poor lighting provided by dim oil lamps and flickering candles or the light of a campfire. We do not want to include the natural atmospheric oxygen that they needed for combustion among the light gases here, particularly since almost all the energy of the flames is released as heat rather than light. It was only the advent of gases produced and supplied by technical means that enabled the brightness of the artificial source of light to be increased significantly. This was made possible for the first time by burning a gas produced from hard coal, which was widely known and used around the world as "town gas". The gas lamp was patented in Paris in 1799, with the first gas streetlamps appearing in London in 1807. Town gas was later replaced by natural gas. The end of the 19th century also saw the introduction of acetylene as an illuminating



The classic filament light bulb: now phased out for environmental reasons

nating and fuel gas. And it is with this gas that the Messer story began in 1898. Back then, Adolf Messer set up a workshop for the production of acetylene gas generators, which obtain the gas from calcium carbide and water. Fascinated by the beautiful light given off by an acetylene flame, the company founder first fitted such a lamp in his parents' butcher's shop. However, he could do nothing to halt the upward march of the electric light bulb.

From filament to electrification

The principle of the glowing filament had been known since 1801. But it took a while longer for it to become everyday technology. Thomas Edison was the first to have his electric light bulb mass-produced with a carbon filament from October 1880 onwards. In the early 1900s, it was discovered that particularly bright filaments can be made from

tungsten. However, they only worked well over the longer term if they were protected against oxidation and vaporisation by an inert gas. Because the electric light bulb still had one thing in common with the oil lamp: it produces light through heat. Initial attempts involved the use of pure noble gases, but these were simply not available in sufficient quantity and too expensive for mass production. From 1911, an argon/nitrogen mixture established itself in the market as an inexpensive and effective inert gas. This gas, the coiled tungsten filament and the screw base – the latter also developed by Edison and widely used to this day – became a global recipe for success. The increasing popularity of electric light bulbs went hand-in-hand with the installation of electricity in people's homes, so the days of gas lighting were numbered. High-quality noble gases came into play again when halogen bulbs – a development from the electric light bulb – came onto the market. Their small glass bulbs are filled with krypton or xenon as well as a halogen component.

Cold gas discharge

In 1857, glass-blower and physicist Heinrich Geissler invented a "cold" light generation principle. His "Geissler tube" became the forerunner of all fluorescent lighting, including energy-saving bulbs. All such bulbs consist of a hollow glass body that is filled with a gas. In most cases, it is a noble gas such as neon or argon, sometimes mixed with mercury or sodium vapour. This gas is ionised by being subjected to a voltage. The separation of ions and electrons results in a gas discharge: the gas begins to glow. This, too, generates heat, but here, for the first time, it is a by-product of the light. Depending on the material the electrodes are made of, the distance between them, the voltage and the operating temperature, there are many different types of gas discharge bulbs. Each gas glows with a different colour, which can also be influenced by the type of glass or its coating. Incidentally, the light produced by neon lamps is by no means pale white – ionised neon emits a rich orange-red. Fluorescent tubes, often colloquially called "neon tubes", are actually low-pressure gas discharge tubes that are filled with mercury vapour and argon.

The next displacement process

With their ubiquitous light, electric light bulbs and fluorescent tubes have fundamentally changed people's lives and the appearance of our planet in the 20th century. Yet now they face the same fate that befell gas lights a hundred years ago. The light-emitting diode – better known as LED – has major advantages over conventional lights. It is also leading to the emergence of new players in the light bulb market.

While the traditional products are supplied by a few specialised lighting giants based in Europe and America, LEDs are mainly produced by the Asian semiconductor industry – a light-emitting diode basically being a type of microchip. It consists of a semiconductor material that emits light when a current flows through it. As with other chips, this semiconductor is based on a monocrystalline wafer. This is a thin slice that has been cut from a larger single crystal of silicon or another semiconductor material. The LED represents a completely new level of efficiency in lighting. The tiny size of the light-emitting diodes makes entirely new types of lighting possible, for instance in the form of LED strips that can be attached to any surface. They can last for up to 20 years. In terms of light yield per watt of electrical energy, they have now left all other forms of lighting behind. Until another new physical lighting principle is discovered, the future of artificial lighting no doubt belongs to the LED.

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Dr Milica Jaric, an expert in applications of specialty gases, in the company museum, in front of Messer's first luminous advertising sign – shown at the World Exhibition in Paris in 1913.



This close-up clearly shows the distribution of the individual LEDs on a lighting element.

World market in transition

Interview with John van Gansewinkel, Commodity Manager Illumination Materials at Philips Lighting Procurement

What role does Philips Lighting play in the lighting market?

We are the number one player in the global market, which is currently undergoing far-reaching changes. With LEDs, we are seeing a lot of chip manufacturers entering a sector that was previously dominated by a few large specialist lighting companies.

How are LEDs changing the market?

We have witnessed greatly accelerated "LEDification" over the past four or five years with 15 to 20 per cent growth

and a market share already in excess of 50 per cent. I believe that, little by little, LEDs will largely replace conventional lighting.

What opportunities are there for your company as a result of this trend?

One of the things made possible by LEDs is what we call Connected Lighting. For example, we can adjust street lighting in accordance with current requirements, play with colours and create ambient scenes, use light for customized advertising campaigns in supermarkets or enable

Precise to within 3 ppm

Up to 10,000 LED chips are produced from a single wafer. Further crystal layers of materials with different electrical properties are first applied to this wafer. This is done through crystal growth in epitaxial reactors. The substances from which the crystal structures are formed are supplied to these reactors in gaseous form. Silanes – compounds of silicon and hydrogen with different numbers of atoms, such as SiH₄ or Si₂H₆ – play an important role in this process. The required light emission for the LED chip is achieved by combining certain layers. The choice of materials and structures influences such properties as intensity and colour of the light.

The silanes are introduced into the reactors mixed with pure hydrogen. "Per million parts of hydrogen, there are only 200 parts, or 200 ppm, of silane," Gary Li, who is responsible for specialty gases at Messer in China, explains. "For the desired crystal growth to be able to take place, the mixture must fulfil the precise specifications. We produce it with a maximum deviation of 3 ppm." Another gas mixture used for the reactors consists of nitrogen with a silane content of five per cent. The manufacturers give little away about their processes, preferring to keep their know-how strictly protected. "However, we know that a range of other gases are used in addition to these mixtures," says Li. "Messer also supplies LED customers with high-purity hydrogen, nitrogen, nitrous oxide, helium and argon."

Editorial Team



The "cool" light emitted by LEDs has become part of our everyday life.



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lighting to be controlled via a smartphone. Philips Lighting is very successful in this area. At the same time, we are also gaining market share in conventional lighting because we stay focussed and are able to meet the continuing demand in this area.

Which gases do you get from Messer?

In my field, it's mainly the noble gases xenon, krypton and neon. There aren't many suppliers who operate worldwide and have reliable access to raw materials. Most of them therefore want long-term contracts with set and fixed volumes. By contrast, Messer has always offered us the flexibility we need. Cooperation between us is very effective, deliveries are on time and reliable, communication is open and conducted in a spirit of partnership.



Philips Lighting Procurement

Philips Lighting is the global leader in lighting products, systems and services, delivers innovations that unlock business value, providing rich user experiences that help improve lives. Serving professional and consumer markets, Philips Lighting lead the industry in leveraging the Internet of Things to transform homes, buildings and urban spaces. With 2016 sales of EUR 7.1 billion, Philips Lighting has approximately 34,000 employees in over 70 countries.

Dark mysteries and economical rockets

There are two ways to explore the universe:
Either you work from Earth or you set off into space.
In either case, the noble gas xenon plays an important role.

Electric rocket

Conventional rocket propulsion basically functions like an internal combustion engine. If you want to generate thrust with it in the vacuum of outer space, then besides propellant you also need a supply of oxygen. Both first need to be carried into space, overcoming the hurdle of the Earth's gravitational pull. This "double burden" on the propulsion can be drastically reduced with an ion thruster, because it generates forward thrust with electric energy, usually supplied by a solar module.

This energy is used first to ionise a relatively small quantity of a gas. Xenon has proved to be the substance that is best suited to this purpose in space. The application of an electric field allows the xenon ions to be accelerated to a high velocity. When exiting the propulsion unit, they produce the necessary thrust.

If the classic combustion rocket is a "Ferrari", then the ion spacecraft is the equivalent of a tricycle. Its thrust is sever-

al orders of magnitude less powerful, yet there are virtually no limits to this vehicle's acceleration. Once in space, an ion rocket can slowly but surely be accelerated to very high speeds. That is why there are plans for just such a craft to fly out ahead of the first manned mission to Mars and drop off the baggage on the red planet for the human crew following on behind in the "Ferrari". Xenon ion thrusters have been providing reliable position correction for satellites for years.

Xenon catches dark matter

Whilst only small quantities of the noble gas are used in satellites, much more of it is required for the hunt for dark matter here on Earth. The existence of dark matter has not yet been proven – though astrophysicists conclude that it must exist on the basis of their measurement findings and calculations. Without dark matter, they reason, the galaxies would be ripped apart by the centrifugal forces generated by their rotation.



Therefore, its mass must be five times as great as that of visible matter. According to the generally accepted theory, it consists of weakly interacting massive particles, or WIMPs. Every second on Earth, around 100,000 of these particles are presumed to hurtle virtually unhindered through an area the size of a thumbnail. Nevertheless, collisions with visible matter are a very rare occurrence. And if they do happen, they are very hard to detect as there are other collisions which occur much more frequently. These innumerable collisions at the particle level are constantly being produced by natural radioactivity as well as the ubiquitous cosmic radiation.

In order to provide protection against such radiation, China's Jin-Ping underground laboratory, for example, is located at a depth of 2,400 metres inside a mountain in Sichuan province. At the laboratory, scientists from all over the world are engaged in the search for the mysterious particles. The project – named PandaX – uses a tank containing

half a tonne of xenon, partly liquid, partly gaseous. In theory, if a dark matter particle collides with a xenon atom, the resulting flash of light will allow it to be identified. However, it has not yet been possible to achieve this in practice. The high-purity gas used in the research project is supplied in part by Messer in China.

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— USING GASES —

Pushing the boundaries

3D printing with metal is not yet as advanced as its plastic counterpart. Yet development is progressing, and the boom could start soon. Special protective gases will play an important role in this process.

Additive manufacturing – the technical term for 3D printing – is becoming increasingly widespread in the processing of metal materials. The challenges here are much greater than with plastics processing, the first one being the source material. "Metal 3D mostly uses a metal powder, which is difficult to manufacture and has to meet very high quality standards," Dr Bernd Hildebrandt, a Messer welding and cutting specialist, explains.

Powder bed and laser beam

Such metal powders come at a price. For 3D printing, they are first melted in portions, just like the plastics, but that is where the similarity between the processes ends. The first layer of the component is made from a thin layer of metal powder, which involves melting it using the heat generated by a guided laser or electron beam. The next layer of powder is then applied, which, again, is melted along the component contours. In this way, the desired product is produced layer by layer.

Another additive process – powder spraying – is more reminiscent of welding. A carrier gas conveys the powder into a laser head, where it comes into contact with a laser beam and melts. The pressure of the gas moves the melt onto the work-piece, where it is given the desired shape by the computer-controlled movement of the head. This method can also be used to supplement and change existing components.



Even complex metal parts can be manufactured with a 3D process.

Complex structures

Additive processes take time. Depending on size, it can take hours or days to complete a component. "So far, therefore, 3D printing with metal has not exactly been a prime contender for mass production," Dr Hildebrandt explains. "However, if we are talking about high-quality components with a complex geometry, then it is definitely worth considering. For example, you can produce turbine blades with intertwined cooling channels in a single operation, which would not have been possible with conventional processes." In fact, besides the aircraft industry, power plant technology is one of the most important fields in which additive manufacturing is used. A well-known tyre manufacturer uses it to produce profile moulds for its HGV tyres. The process is also ideal for the manufacture of implants – tooth implants, artificial hip joints etc. – that are an exact fit for the patient's anatomy.

Gas protection

The molten metal always needs to be protected against atmospheric influences, in particular oxidation. That is another similarity between additive manufacturing and welding. A publicly funded research project has confirmed how, in principle, different gases influence additive manufacturing with metals. "This is why we have created the 'Addline' product line. I expect the technology to experience a boom in the near future, and we are prepared for it."

Diana Buss, Messer Group



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— FOCUS ON CYLINDER —

Eco-friendly lens production

Messer has installed a fully automatic pH measurement and CO₂ dosing system for Japanese optical specialist Hoya at its production site in Mátészalka.

Renáta Simonics, Sales Manager Specialty Gases at Messer in Hungary

Hungary | Messer supplies optical specialist Hoya with equipment for its production as well as the cylinder gases it needs. These ensure safe and environmentally friendly neutralisation of the process water used in lens manufacture. The water is generated during surface treatment as well as cleaning. Before it drains away into the sewerage

system, it is purified and, if necessary, neutralised. The customer also gets dry ice from Messer, which cools the auxiliary agents used in production during transportation, thereby protecting their quality. The small town of Mátészalka in eastern Hungary is a centre for the manufacture of lenses.

Mónika Zimányi-Csere, Messer Hungarogáz

Hydrogen for weather balloons

Hungary | The National Weather Service (OMSZ) recently started getting the hydrogen for its meteorological balloons from Messer. These balloons rise to altitudes of up to 30 kilometres, conveying radio probes that measure pressure, temperature and relative humidity as they ascend. The measurement results are used in national and international weather forecasting. For a long time, Messer has also been supplying high-purity calibration gases – including carbon monoxide, sulphur dioxide, nitrogen, nitric oxide and CO₂ – to the Hungarian Reference Centre for Air Pollution Control, which is part of the National Weather Service. These gases are used to adjust the air pollutant monitoring instruments. The weather service gets the hydrogen and the calibration gases in cylinders.

Mónika Zimányi-Csere, Messer Hungarogáz



A perfect welding result thanks in part to gases from Messer

Protective gas for protective guards

Romania | Makita angle grinders are used for professional cutting, grinding and polishing in a number of sectors, including metal and stone working, coach-building and the construction industry. Autonova, a metalworking specialist in Satu Mare, manufactures metal guards for the grinders. This involves the use of Ferroline C8 and C18 from Messer. Besides Makita, Autonova's customers include such companies as Renault, Dacia, Assa Abloy and Punck PowerTrain.

Carmen Baragan, Messer Romania Gaz



Makita angle grinder with a protective guard from Autonova

Inox welding for plant engineering

Switzerland | At Swiss firm ISF Industrie-Service Fricktal, stainless steel is welded with welding argon, Inoxline H5 and the forming gas H8 from Messer. In its state-of-the-art production hall, the company prefabricates and pre-assembles facilities and systems for the chemical, pharmaceutical and food industries. In addition to the construction of new facilities, there is a major focus on the modification and extension of existing facilities. Qualified skilled welders guarantee a perfect welding result in a state-of-the-art workshop with semi-automated welding equipment and the latest orbital technology.

Reiner Knittel, Messer Schweiz





“We need a reliable gas supplier”

Stephan Kowalzik, sales manager and authorised signatory, GTI medicare GmbH

What does GTI medicare do?

We offer patients an oxygen supply at home, even on holiday, and sell our products in this area to wholesalers and specialist retailers as well as rescue services. Our sister company MedicAir specialises in artificial respiration.

Which medical gases do you use?

The main one is medical oxygen. We buy this medicinal product in liquid form, while we produce the gaseous version ourselves in Hattingen. Our portfolio also includes carbon dioxide and compressed air as medicinal products in cylinders.

Why is oxygen so important?

It is simply the most important gas in patient care. Our 160 employees use liquid oxygen for several thousand patients. In addition, there is the supply of gaseous oxygen in cylinders as well as the supply of oxygen concentrators, which draw the gas from the ambient air..

What are the most important considerations with regard to the supply of medical gases?

The impeccable quality of the pharmaceutical and medicinal products is the number one priority, of course. But reliability of supply is almost just as important! Supply bottlenecks simply have to be avoided at all costs as patients need a guaranteed supply at all times.

What do you expect from your gas supplier?

We need a fair price to allow us to operate profitably. However, the decisive criteria are partnership-based cooperation and punctual delivery. We need to be able to rely on our supplier in the same way that our customers rely on us. We require a partner that can always supply us with what we need.

How has your work together with Messer evolved?

Messer has supported us in the development and expansion of our sites. This includes technical assistance in designing tank installations, planning liquid withdrawal points and obtaining the necessary planning and building permission. It is a real plus to have the support of an experienced gases manufacturer such as Messer, one of the benefits being regular training in the safe use of gases for our employees.

Katrin Hohneck, Messer Group



Stephan Kowalzik, sales manager and authorised signatory, GTI medicare, Hattingen, Germany

Win a delicious prize!

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

What is the purpose of epitaxial reactors?

Please send the answer by e-mail with the subject line "Gases for Life competition" to:

angela.bockstegers@messergroup.com

The deadline is 5 June 2017.

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 **Walter Gehrke** from Hamburg, Germany.

The correct answer was:
"Customer Container Tracking System"

— IMPRINT —

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Sparkling indulgence

Do we speak of 'effervescent' joy because we usually celebrate with a glass of bubbly when we have cause to be joyful? Or was sparkling wine invented to give appropriate culinary expression to this feeling? There is plenty of sparkling indulgence to be had in the Catalan wine-growing region of Penedés, Spain's "Champagne". The sparkling wine produced in Catalonia is called "Cava", after the natural cellars in which the wine is matured. For example, Cava Bertha, the name of a young wine-growing estate in Sant Sadurní d'Anoia, refers to the cellar as well as the product. The estate's vintner uses food-grade nitrogen and carbon dioxide – Gourmet N and Gourmet C – from Messer to protect the wine's subtle flavours against oxidation. Both gases are also used as a propellant to produce pressure which facilitates transfer of the Cava. Providing an injection of fizz to the Cava, the Gourmet C carbon dioxide enhances the experience of sparkling indulgence.

Marion Riedel, Messer Ibérica

