

# on air

No. 8 · August 2008

The magazine for industrial gases



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## Dear Readers,

Industrial gases and products that are made with industrial gases are part of our daily lives. And no, I am not only talking about my colleagues and myself. Nor about the fact that we all need the air in our atmosphere in order to survive.

Through "on air" we would like to show you how the constituents of air – oxygen, nitrogen and carbon dioxide along with noble gases such as helium – are used in the production of almost everything we deal with on a daily basis. The term "industrial gases" does not convey the fact that these are natural products which are

either obtained through air separation – as will be the case at our new air separation plant in Siegen (see page 6) – or extracted from underground wells, like helium and carbon dioxide; rather, it refers to the applications in which the gases are used. The Messer Group, therefore, is not only an expert in the production of gases, but also, and in particular, in their application across all sectors of industry.

Ten years ago, we developed the VarioSol process, which allows fine, uniform powders to be produced cost-effectively (see page 8). Our expertise here is in knowing the particular properties and functions of liquid carbon dioxide and using this knowledge creatively to improve processes. It is no more and no less than that. We do not see ourselves as researchers, discoverers or inventors, yet we always work together with our customers in developing our knowledge and technologies further. Ten years ago, VarioSol – short for "varied solutions" – was used in food production to atomise fats, thereby improving the quality of instant products, for example. Now it is also used in the pharmaceutical and cosmetics industries. Is this technology still an innovation? We think so!

I hope you enjoy reading this issue of on air!

Best regards,

Stefan Messer



*Stefan Messer*



*CO<sub>2</sub> is used as a decalcifier in tanneries.*

## CO<sub>2</sub> in tanneries

Water is used at many stages during leather production. This is particularly the case for tanning, during which the hide is treated with acid and salt. Innovative processes involving carbon dioxide offer a lot of advantages in

tanneries, too: even the use of large quantities will not result in acidification; carbon dioxide is user-friendly, it helps to reduce chemicals and is comparatively cost-effective.

A new CO<sub>2</sub> application for tanneries has been tested in Santa Croce by the Italian company Conceria Brostol S.p.A., part of the Vecchia Toscana Group. To ensure effective draining of the water from the leather, the water has to be neutralised – in other words, its pH must be adjusted to the correct value. This saves energy and resources. The next step will be to test how carbon dioxide can be used at other stages of the process.

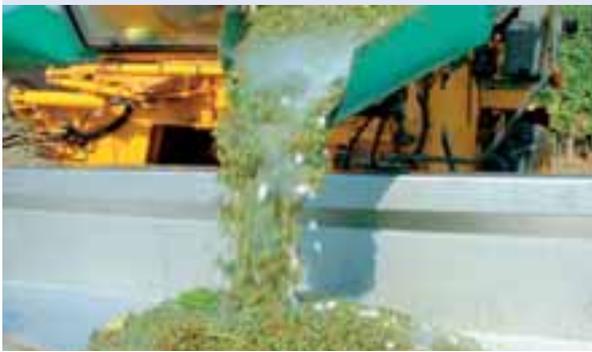
*Lorena Vaschetto, Messer Italia*

## Cool grapes for good wine

Grapecool is the name of the new, transportable system that Messer has developed in cooperation with DF AGRI, based in Siena, Italy. With this system, a bed of CO<sub>2</sub> snow keeps the grapes cool in the dump truck immediately after harvesting, thereby stopping them from overheating. This prevents premature fermentation on the way to processing. What is more, damaged grapes are protected against oxidation and contamination. The result is a very aromatic and less acidic wine – light and fruity. Well-known producers of Chianti in Tuscany will also soon be benefiting from the advantages of Grapecool.

*Lorena Vaschetto, Messer Italia*

*CO<sub>2</sub>-snow prevents premature fermentation after harvesting.*



*Dr. Bernard Hussler (left) can be proud of himself and his colleagues in the speciality gases laboratory in Mitry-Mory: Messer France is now a COFRAC-accredited calibration laboratory.*

## Speciality gases laboratory receives COFRAC accreditation

The Messer speciality gases laboratory in Mitry-Mory, France, led by Dr. Bernard Hussler, has received COFRAC accreditation as a calibration laboratory with effect from 1 May 2008.

COFRAC (Comité Français d'Accréditation), the Paris-based French specialist committee for laboratory accreditation, has awarded the certification to Messer in accordance with the ISO/CEI-17025 standard. It will initially be valid until the end of January 2013.

This means that Messer can offer gas mixtures consisting of two components (O<sub>2</sub>, CO<sub>2</sub>, CO, SO<sub>2</sub>, NO, C<sub>3</sub>H<sub>8</sub> in nitrogen) in certain concentration ranges and with a guaranteed maximum deviation. In the future, these gas mixtures will be produced primarily for the automotive industry as well as for testing institutes and environmental agencies, which will use them to calibrate their instruments.

*Angélique Renier, Messer France*

## Carbon dioxide preserves mushroom spores

The Lithuanian compost producer "Baltic Champignons" supplies Lithuanian, Latvian, Estonian, Polish and Russian mushroom growers with special compost that is ideally suited to mushroom growing. During transportation, the temperature of the compost, which is permeated with mushroom spores, must not exceed a permitted maximum, as otherwise the spores would die. Messer's coolant – carbon dioxide – helps to stop the natural fermentation in the compost and keep the compost temperature constant. Carbon dioxide snow cools the compost and preserves the mushroom spores during transportation to the customer.

*Natalia Vinogradova, Elme Messer Gaas*



*Mushroom spores in compost are cooled with liquid carbon dioxide during transportation.*



*Environmentally friendly paper production – made possible by CO<sub>2</sub>.*

## Sheet by sheet with CO<sub>2</sub>

Three major paper manufacturers in the Benelux countries use carbon dioxide for completely different applications:

SAPPI (South African Pulp & Paper Industries) has replaced aluminium sulphate with CO<sub>2</sub>, thereby not only reducing its chemical costs significantly, but also the sulphate content in the paper mill's circulated water and wastewater.

STORA ENSO uses liquid CO<sub>2</sub> for sticky reduction in recycled paper. Stickies from recycled paper lead to deposits on the paper machine which in turn result in production disruptions. The use of liquid CO<sub>2</sub> (Messer patent) allows these production disruptions to be significantly reduced.

Smurfit Kappa has utilised the biostatic effect of CO<sub>2</sub> to reduce microbiological activity in the paper mill's water supply, and therefore also odour emissions.

*Denis Reydams, Messer Belgium*

## Car parts, hard as steel

New MGM is a Hungarian manufacturer of axle bearings, primarily for the automotive industry but also for other industrial sectors. The metal components are hardened in a furnace by adding nitrogen. New MGM used to operate its own nitrogen generator, but this has now been decommissioned. Messer in Hungary now supplies a million cubic metres of nitrogen per year.

*Lajos Bak, Messer Hungarogáz*

*MGM manufactures axle bearings for the automotive industry.*



## Snowline now also in France

The new Snowline technology has also been in use in the CHR hospital centre in Strasbourg (France) since May. The system allows ready cooked dishes to be cooled and heated up. The system, which was developed by Messer in collaboration with its hardware partner Electrocalorique, consists of special high quality heatable and coolable containers as well as a filling station for liquid carbon dioxide, which provides dry ice to deliver the required cooling effect.

*Monika Lammertz, Messer Group*



*The Snowline System's temperature-controlled carts use dry ice for cooling.*

## Training offensive in Serbia: Messer is training new specialists

"Welding and welded structures" – this is the name of a new department that was set up at the Technical University in Belgrade two years ago in collaboration with Messer. Since 2007, Messer has been supporting the training of welding engineers with its know-how and with scholarships for stu-

dents. Moreover, Messer and Castolin have built a joint laboratory for welding and metal coating, which is also used as a venue for international seminars. Practical demonstrations are also carried out as part of the training programme.

The collaboration with the university and the Ministry of Education is being further strengthened. In order to provide broad support for the new subject area, Messer is also promoting the expanded

educational programme for holders of a vocational baccalaureate diploma in mechanical engineering. In addition, the new subject area has been introduced at five mechanical engineering schools throughout Serbia. All five schools have been equipped with welding machines, cutting and welding sets, pressure regulators etc., as well as a jointly used flame spray gun from Castolin, and supplied with gases from Messer.

*Marija Vuković, Messer Tehnogas*



*Practical demonstrations are an elementary part of the training.*

# Steel and oxygen are two strong

The foundation stone for the construction of Messer's first air separation plant in Germany on the Deutsche Edelstahlwerke site in Siegen has been laid. On this occasion, Karl Haase, CEO of Deutsche Edelstahlwerke GmbH, spoke to Diana Buss about his company's long-term partnership with Messer, the promotion of training and the markets of the future.

**on air:** Mr. Haase, what do you need the oxygen from the new air separator for?

**Karl Haase:** Here in Siegen we can still talk about "refining": refining in steel production is the removal of carbon from the steel. To achieve this, and to get rid of other unwanted elements in the steel, gaseous oxygen is injected into the furnace. At the moment, the oxygen is delivered in liquid form in tankers and converted into gaseous oxygen on site. As soon as the air separation plant is in operation, we will receive the required quantity of oxygen already in gaseous form. This is a huge advantage as we will avoid the high energy costs associated with the conversion process. However, the requirement for our steelworks is not large enough to justify building our own production plant for industrial gases in Siegen. We are delighted to have found a partner in Messer who wants to produce gases on-site using the air separation process. A large part of what is produced will be bought by us – thus two wishes have come together successfully.

**on air:** So why exactly did you choose Messer as a partner?

**Karl Haase:** We have signed a 15-year deal with Messer as part of the long-term revitalisation of our

Siegen location. We began our search for a suitable partner by approaching the very big industrial gases suppliers, but they were not interested in this kind of business deal – it was too small for them. We then soon got together with Messer who, as an owner-managed company, also make long-term decisions. It only took one meeting between Mr. Messer and the Chairman of our Supervisory Board to realise that the partnership would be a productive one.

**on air:** Another aspect that the two companies have in common is their commitment to training. Could you please tell us a bit about the training you offer at Deutsche Edelstahlwerke.

**Karl Haase:** Training has a long tradition in our company and was a feature of the company even before it was called Deutsche Edelstahlwerke. In collaboration with our works council, we set the training quota at seven per cent. "The best steel with the best people" – this phrase was coined by our personnel manager. If you want the best people, you have to train them

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*The air separation plant in Siegen (shown here as a model) will supply oxygen, nitrogen and argon.*



# partners

*Karl Haase, CEO of Deutsche Edelstahlwerke GmbH, symbolically cuts through a barrier to signal the start of construction work on the air separation plant in Siegen.*



yourself, and, above all, you have to like steel! You have to hear the call and decide whether you fear or like the industry. We have to demonstrate our technology to people. When we do, we can see that there are still technophiles out there! At our headquarters in Witten, we have gone one step further. The training workshop had been sold in order to cut costs and make savings in personnel. Under the leadership of Schmolz + Bickenbach, we have reacquired this training centre and renamed it: it is now called "Deutsche Edelstahlwerke KarriereWerkstatt" ("Deutsche Edelstahlwerke CareerWorkshop"). After all, a steel plant can offer a range of careers. A good career does not always have to involve becoming managing director or a member of senior management; success can also be achieved as a foreman or master craftsman. Good training is essential for this, and that is why we chose this name. We currently have 340 trainees, including 100 trainees from other medium-sized businesses.

**on air:** Finally, Mr. Haase, what are your predictions for the markets of the future?

**Karl Haase:** I see alternative energies as the markets of the future. Companies that work in the field of wind power are experiencing a tremendous boom, with annual growth of up to 20%. We, too, are seeing our strongest growth in this market, since we supply the steel for the wind turbines' drives, shafts, gear wheels and bearings. But exploration technology is also an attractive area for Deutsche Edelstahlwerke. In view of the high oil price, more oil clearly needs to be extracted. It is therefore necessary now to extract reserves which in the past would not have been worth exploring due to technical and financial factors. Increasingly deeper boreholes up to 4,000 or even 5,000 metres deep are not uncommon. As well as supplying the steel for the drilling machines, we also make the semi-finished products for drilling pipes. The automotive market is also strong, but I see it as relatively saturated. Vehicles are certain to become slightly smaller in the future, and will perhaps even use different drive technology. Nevertheless, there will always be cars and we will continue to supply steel to the automotive industry.

*Diana Buss, Messer Group*



*During the panel discussion that was held on the occasion of the laying of the foundation stone for the new air separation plant, Karl Haase spoke to Diana Buss, Head of Corporate Communications at Messer Group.*



*Messer trainee Katharina Butzen carefully scrutinizes the quality of the different powders made with the VarioSol process.*

## Powders made easy

The VarioSol\* process developed by Messer offers completely new possibilities for the production of fine powders. It is suitable for small quantities as well as for flexible product changes and is used in the food, chemical and pharmaceutical industries.



*Applications in a very compact space. Unlike other processes, VarioSol does not need huge spray towers.*

■ □ The VarioSol technology from Messer, a process for the production of fine powders from melts, was originally developed by Messer for the food industry more than ten years ago. The trend towards innovative products and new product forms led to a growing demand for new, improved base substances in the food industry. In terms of handling and applicability, powder products in particular offer huge advantages: fine powders with uniform particle size distribution are easy to dose, mix well and are readily soluble.

In the food industry, this is particularly relevant in the production of base products, sauces, soups and instant products, where free-flowing fats and their mixtures are used. But the pharmaceutical and cosmetics industries, too, are increasingly interested in this process. Longer-chain fatty acids in powder form are used here as base products for creams, ointments and pills.

Conventional production of these fine powders from melts is mostly carried out by atomising the melt into droplets. These are then air-cooled to below the melting point. "However, this technique is increasingly reaching its limits," explains Thomas Berger, Application Manager at Messer. "It is often difficult to crystallise low melting substances or to maintain the required particle size distributions in highly viscous products," the expert explains. This, he says, makes additional treatment steps, such as aftercooling and sieving necessary. Another disadvantage of the conventional process is that it requires large spray towers, in which smaller product quantities or

trial/sample batches are mostly expensive and uneconomical to produce.

### CO<sub>2</sub> performs three functions

The VarioSol process involves the use of liquid carbon dioxide, which performs three functions during the process: the expanding gas atomises the liquid product, the cold energy that is released as the gas expands is passed on to the product so it crystallises, and in addition, as an inert gas, the CO<sub>2</sub> protects the product from oxidation and eliminates the risk of a dust explosion. The entire process works as follows: the melted product – this can also be a product mixture containing solids – is conveyed to the spraying unit via a product supply line and atomised together with liquid CO<sub>2</sub>.

The powder particles that are produced are collected and can be processed further immediately or stored. Compared to the conventional practice of using cold air, the CO<sub>2</sub> has a much higher specific cold content, which means that even very low-melting products such as fats and fat/oil mixtures can be crystallised in the most compact of spaces thanks to the easily adjustable product-gas ratio. The achievable particle sizes range from 0.1 to 300 µm and can be varied by means of the CO<sub>2</sub> pressure.

Prof. Franco Pattarino and Dr. Lorena Segale are very happy with the VarioSol technology from Messer. The two scientists at the Institute for Chemistry, Nutritional Sciences, Pharmaceutical and Pharmacological Sciences at the Università del Piemonte Orientale A. Avogadro in

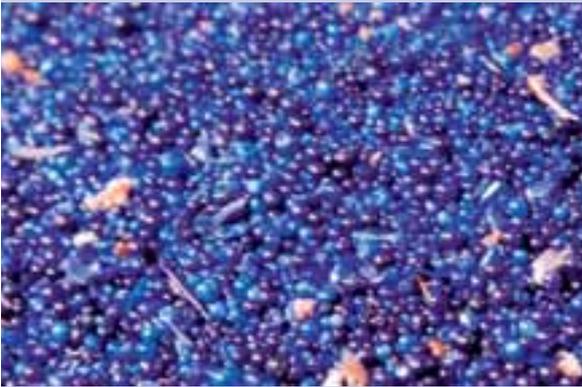
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*Production of powders with VarioSol.*



□ □ □ Novara (Italy) are carrying out research into, among other things, drug molecules that exhibit certain disadvantages that are typical of pharmaceutical substances, such as low chemical stability and low solubility. Their aim is to modify the properties so that better therapeutic effectiveness can be achieved. They are also carrying out research on microcapsules which contain the drug in their core or shell and which can release the active component at a particular time or in a particular quantity. "We are currently using VarioSol in our work on etidronate, an active ingredient that is used for the treatment of osteoporosis.

We want to provide pharmaceutical companies with an information pack on a molecule for further

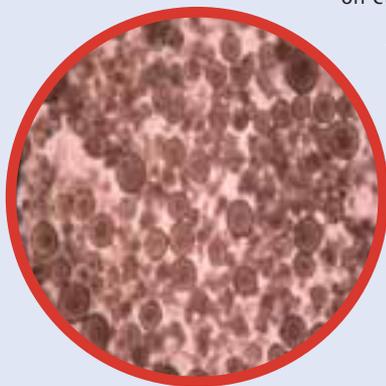
product development," say the researchers. (See also Interview, p. 11.)

### Space-saving design

The process is also used in the chemical industry, for example in plastics processing. During processing of plastics, additives such as lubricants are added, which improve the flowability during the manufacturing process. Other additives include dyes. This process often involves working with small particles, which means that there is a major dust hazard in the workplace, in turn making dosing much more difficult. "The VarioSol process makes it possible to encapsulate the dyes in the lubricants, thereby eliminating the dust problem," says Berger.

But whatever industry it is used in – food, pharmaceuticals or chemicals – the big advantage of the process is its variability, its relatively low technical complexity and its space-saving design. "The process can be implemented on virtually any scale from one to 1,000 litres per hour, and it can also be integrated into existing processes," explains Berger. This also makes it attractive to smaller production operations or research projects.

*Text: Editorial team*



*Only visible under the microscope: the individual powder granules can be as small as 0.1 µm.*





## Messer wins award for best scientific presentation

At the symposium of the AFI, the Italian Pharmaceutical Industry Association, held in Rimini in the middle of June, Messer received an award for the best scientific poster presentation. The results achieved with VarioSol had been presented there by Messer Italia and SiTec Consulting.

*Dr. Lorena Segale (left) and Prof. Franco Pattarino (centre) talk about their experiences with VarioSol in an interview with Lorena Vaschetto, Marketing Manager at Messer Italia.*

## "We see great potential for VarioSol"

The scientists at the Department of Chemical, Food, Pharmaceutical and Pharmacological Sciences (DISCAFF) at the Università del Piemonte Orientale A. Avogadro in Novara (Italy) carry out research at almost every level of pharmaceutical analysis. The collaboration between the department and Messer began in January 2008, through the agency of SiTec Consulting, which works with Messer in the biopharmaceutical sector. "on air" talked to Prof. Franco Pattarino and Dr. Lorena Segale about the implementation of the VarioSol technology.

**on air:** What are your first impressions of the VarioSol process?

**Prof. Pattarino:** Familiarising yourself with the technology proved very easy. The research team got to grips with the equipment and the technology straight away.

**on air:** What advantages does VarioSol provide?

**Dr. Lorena Segale:** In comparison with other processes, it enables us to produce very fine and perfectly spherical, homogeneous particles ranging from 20 to 50 µm. Furthermore, the use of near-critical CO<sub>2</sub> as a spray or coolant allows a high processing speed to be achieved, which means that the material retains its chemical and physical integrity. The system also has a high level of reproducibility. Thanks to its flexibility, it can be

used for processing a range of formulations. Also, the cryogenic conditions created by the expansion of the CO<sub>2</sub> can improve the formulation of thermolabile molecules, which would otherwise be damaged at high temperatures.

**on air:** What are you hoping to achieve with VarioSol?

**Prof. Pattarino:** Our laboratory carries out research into drug molecules that have certain pharmaceutical disadvantages such as chemical instability and low solubility, in order to then modify these properties so that better therapeutic effectiveness can be achieved. We are currently using VarioSol in our work on etidronate, an active ingredient that is used for the treatment of osteoporosis, and which has poor

absorptive capacity as well as low solubility. We are also carrying out masking tests on metoclopramide, which is used for the treatment of nausea, in order to get rid of the bad taste. Our goal is to provide pharmaceutical companies with an information pack on a molecule for further product development.

**on air:** Are your experiments primarily aimed at the pharmaceutical industry?

**Dr. Lorena Segale:** We also work with cosmetics companies, for example researching caffeine as a treatment for cellulite, and with food producers on the development of probiotics and food additives. We see great potential for VarioSol here.

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*A wide variety of powders can be produced with VarioSol.*



*Hoses are used to pump the liquid nitrogen into the ground.*



## Chilling helps with bomb disposal

**Germany:** At the beginning of the year, Messer's soil freezing technology was instrumental in recovering a World War II bomb unearthed in Marl in North Rhine-Westphalia.

In December 2007, construction workers carrying out ground surveys on the site of Evonik AG in the Marl chemicals complex unearthed a 500kg aerial bomb from the Second World War, which had to be recovered. However, since this cluster bomb was lying underneath the foundations of a chemical production facility, it was not possible to use conventional methods for the excavation: while it was possible to stabilise one side of the excavation with conventional measures such as sheet piling, securing the foundation side proved more difficult. This was a job for Messer and its soil freezing technology. This involves using lances to inject liquid nitrogen into the ground that is to be frozen. The liquid nitrogen withdraws energy from the soil as well as from the water contained in it, thus causing the formation of a frozen mass. In this case, the frozen mass formed a stable wall which also supported the load of the foundations, allowing experts to dig down to the bomb at an angle.



*The liquid nitrogen is transported to the site in large tankers and fed into on-site tanks.*

### Stably frozen right to the end

Within just a few weeks, everything had been installed, from the nitrogen tank to the nitrogen supply and discharge pipes, from the freezing lances to the



*A bird's-eye view of the excavation, clearly showing how the individual hoses feed the liquid nitrogen into the soil.*

measurement and control system. This meant that freezing could commence as planned on 15th February this year. After approximately 500,000kg of nitrogen had been pumped into the pit, the frozen mass was stable, and the bomb disposal team could move in and successfully remove the bomb.

The frozen mass was preserved for a few more days to ensure the structural stability of the ground for the backfilling work.

*Jens Tauchmann, Messer Group*

*Stefan Kosock, Messer Industriegase*

## Racing with alternative fuels

**Hungary:** "Vehicles of the Future" with alternative fuels was the central idea of two events held in Hungary, at which young engineers had the opportunity to demonstrate and test their self-built prototypes – Messer supported the vehicles, which were powered by synthetic air. This was the third time that the Széchenyi race had been held on the campus of the István Széchenyi University in Győr.

This year, two prototypes were powered by synthetic air from cylinders, including the Messer-sponsored NitroMobil, designed and built by construction engineer Miklós Vogel, which won the prize for the most innovative vehicle. This unique vehicle is powered by a converted Wartburg engine and three 20-litre nitrogen cylinders (with a total energy capacity of 7 MJ). Two people can travel a distance of eight kilometres in it, reaching a maximum speed of 50 km/h.

In addition to the serious design work that went into these prototypes, imagination and humour also played an important part. The prize-winning "Wirecar", an agile, electronic vehicle painted in gaudy yellow was the spectator's favourite. A nun with an electronic



The Messer NitroMobil Team at the Széchenyi race.

Citroën 2CV, an AntiBike, solar-powered futuristic vehicles and converted electronic production cars rounded off the field of participants.

At the Bosch-Rexroth-Pneumobil race held in Eger on 16 and 17 May, Messer was the sponsor of the fuel gas (nitrogen). Teams of students took part in this race with their air-powered prototypes.

*Krisztina Lovas, Messer Hungarogáz*

## Centre of excellence for welding technology

**Hungary:** At the end of April, Messer's new welding technology centre in Hungary opened its doors for the first time. The technical centre will be used for the development of welding and soldering technologies and also as a venue for practical training courses for welding experts. The centre has four welding stations. The centre has the full range of equipment whose possible applications and settings the future experts need to know, from the simple step switch welding

machine through to the complex high-tech welding machine. The theory is taught by internationally experienced Messer experts as well as recognised specialists in the relevant fields. In the practical sessions, the experienced welders and welding instructors pass on their knowledge and expertise. In addition, Messer offers its partners and other interested companies a TÜV certification of the procedures developed in the Hungarian technical centre. The technologies

developed in the welding centre are to be certified in accordance with ÉMI-TÜV-SÜD EN ISO 15614, which acts as a guarantee of enhanced safety and quality for Messer's international partners and customers.

*Krisztina Lovas, Messer Hungarogáz*

The practical demonstrations aroused great interest among the visitors.





*The team in front of a hydrogen trailer, which is used to supply the Siemens factory (from left to right): Yan Degang, Sun Qiang, He Wenbin, Zhang Yanchun (all from Messer), Tom Stenger, Huang Ya, Wang Yanjun (from Siemens)*



## High-purity gases for Siemens

**China:** A large number of new power stations are to be built in the People's Republic in the coming years. The German company Siemens is also playing a part in this development. And the necessary gases are being supplied by Messer.

In future, Siemens will manufacture highly specialised gas turbines directly in China. The company has built a new manufacturing facility in the Shanghai region. High-purity gases from Messer in China are being used in surface treatment as well as in various other heat treatment processes. A supply agreement for hydrogen, nitrogen, oxygen and argon was signed between Siemens Gas Turbine Parts Ltd. and Zhangjiagang Messer Gas Products at the end of 2007.

The turbine blades, which are subject to high thermal stress, have to be protected against temperature and wear by special metal and ceramic coatings. The coating methods that are used for this require high-purity technical gases. Tom Stenger, Factory & Technology Manager, who is responsible for the construction of the new Siemens factory, makes it clear: "We have to be able to rely 100% on the consistently high quality of the gases. Any deviations will directly result in poorer quality components, and this is unacceptable." In addition to the coating of components, other highly demanding manufacturing technologies in the new Shanghai Siemens factory include heat treatment in

high temperature vacuum furnaces and the laser drilling of cooling air holes in turbine blades. There is no question that a reliable supply of gases is also an important factor in ensuring that these complex products are manufactured on time.

Zhangjiagang Messer and Siemens have formed a project team to ensure that the planned gas supply system is started up after a short construction period and in accordance with the high standards demanded by Siemens Energy. Close coordination between both parties ensured that all the challenges were met, from the start of construction through to the final inspection. Tom Stenger was particularly impressed by the high level of expertise of the Chinese project engineers. Precise planning of the plant construction, based on the consumption data supplied by Siemens, as well as of the on-site installation, plus the communication with the Shanghai licensing authorities were all crucial factors in being able to start the manufacturing processes for the first turbine components "just in time".

*Xinli Niu, Zhangjiagang Messer Gas Products*

*Messer is supplying the high-purity gases for the heat treatment of the turbine surface.*



## COMPETITION

Win . . .

. . . a Messer mug – in the style of a gas cylinder cap

To enter, tell us on which page of the magazine this photo appears. Keep your eyes peeled and send your answer in an e-mail to



Closing date  
for entries:  
15 September 2008

\* This competition is not open to employees of Messer or their relatives.

diana.buss@messergroup.com

Congratulations to all the entrants with the right answer ("page 10") to the competition question in Issue No. 7 of on air. You can all look forward to receiving a copy of "100 per cent Messer", published by Piper.

## TRADE SHOW CALENDAR

In the coming months we will be at . . .



### 46th International Agricultural Food Fair

Gorna Radgona, Slovenia  
23 to 29 August 2008  
alenska.mekis@messergroup.com



### Umwelt 2008

Zurich, Switzerland  
10 to 12 September 2008  
hans-michael.kellner@messergroup.com



### 7th Packtech Expo Balkan 2008

Belgrade, Serbia  
17 to 20 September 2008  
marija.vukovic@tehnogas.co.yu



### Intercool 2008

Düsseldorf, Germany  
28 September to 1 October 2008  
stefan.kosock@messergroup.com



### Powtech 2008

Nuremberg, Germany  
30 September to 2 October 2008  
oliver.dietrich@messergroup.com



### Schweißen/Join-Ex

Vienna, Austria  
7 to 10 October 2008  
herbert.herzog@messergroup.com



### Medipharm

Belgrade, Serbia  
9 to 11 October 2008  
marija.vukovic@tehnogas.co.yu



### MIAC 2008

Sorbano del Giudice, Italy  
15 to 17 October 2008  
lorena.vaschetto@messergroup.com



### Farma 2008

Brussels (Exhibition Park Brussels), Belgium  
17 to 19 October 2008  
marina.deridder@messerbenelux.com



### Expoquimia

Barcelona, Spain  
20 to 24 October 2008  
marion.riedel@messergroup.com



### ExpoWELDING

Sosnowiec, Poland  
21 to 23 October 2008  
monika.zbrog@messer.pl



### EuroBLECH 2008

Hanover, Germany  
21 to 25 October 2008  
bernd.hildebrandt@messergroup.com



### Nationale Staalbouwdag

Gorinchem, Netherlands  
23 October 2008  
marina.deridder@messerbenelux.com



### IFAS 2008

Zurich, Switzerland  
28 to 31 October 2008  
hans-michael.kellner@messergroup.com



### Parts2clean

Stuttgart, Germany  
28 to 30 October 2008  
urweider@ascoco2.com

## Coming up in the next issue:

- □ Paper needs to be treated well – find out more in an interview about the use of industrial gases in every aspect of environmentally friendly paper production.
- A Hungarian chain of shops now relies on the Siber System from Messer for all its cold logistics requirements.