Aerzen – one step ahead

COM·PRESS

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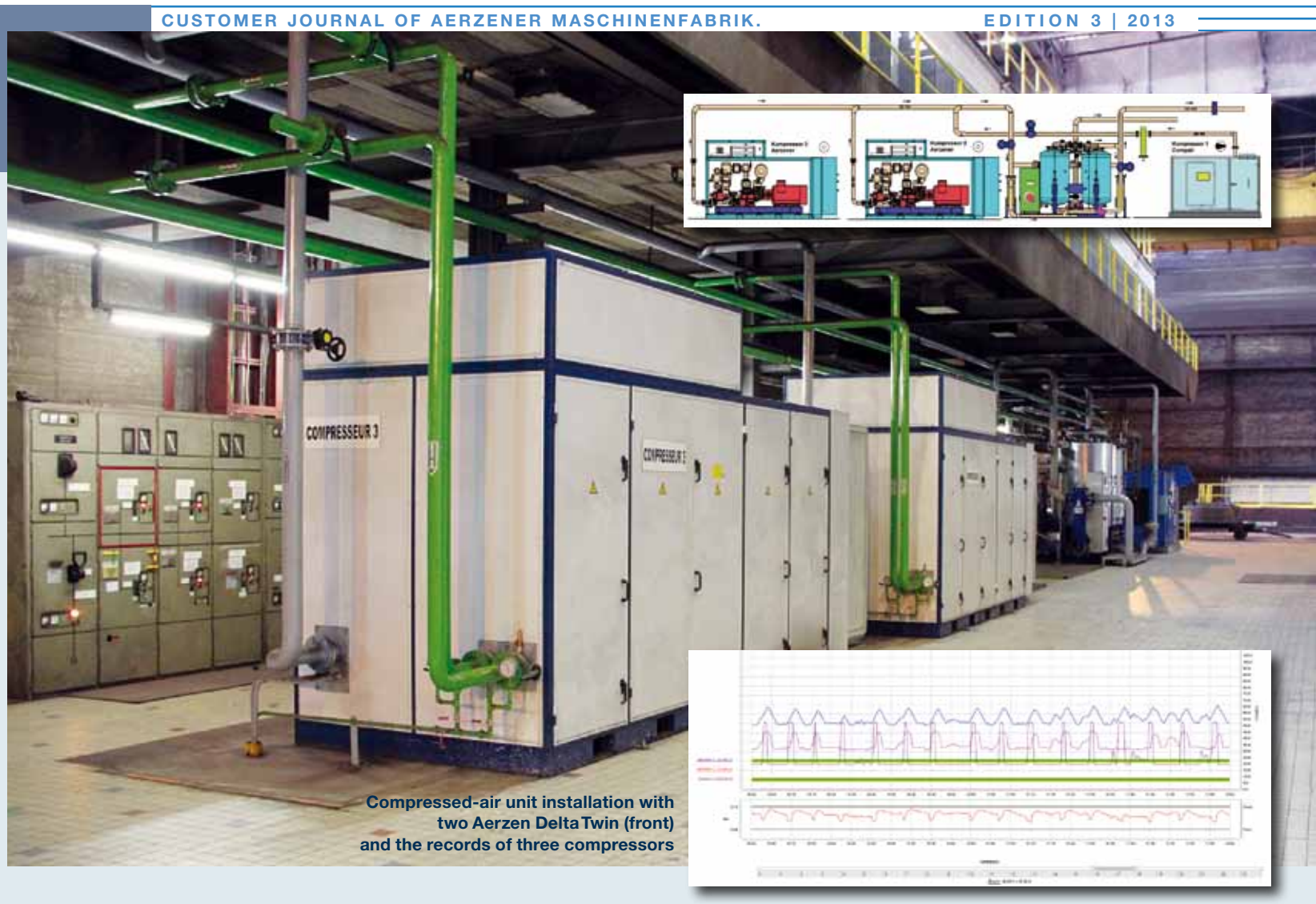

Compressed-air unit installation with two Aerzen Delta Twin (front) and the records of three compressors

Compressed-air Production in a Challenging Environment

Aerzen Screw Compressors in ArcelorMittal's beam rolling mill

Two oil-free Delta Twin DTS 35 WG screw compressors are used in ArcelorMittal's largest beam rolling mill. They ensure a safe production in spite of pressure drops in the distribution system, together with a turbo compressor, superordinated control unit and absorption drier.

The rolling mill, which is situated in the Differdange, Luxembourg plant of ArcelorMittal, a worldwide leader in the coal and steel industry, has a greatly fluctuating consumption of compressed-air. Production is ensured only if the pressure drops caused by short-term large withdrawals are duly compensated for.

Interception of pressure drops

Aerzen's objective was to complement an existing turbo compressor with two additional fast reacting oil-free compressors, in order to compensate for these pressure drops both quickly and efficiently. Both Delta Twin DTS 35 WG compressors (3,142 m³/h, 6.5 bar, 355 kW) fulfill these requirements exactly due to their large control range and short start-up period, with simultaneously high volume flow. In order to ensure a suitably energy-efficient compressed-air production, a superordinated control option was selected through which the Turbo compressor and both Aerzen compressors could be combined into an intelligent compressed-air production unit. An absorption drier protects the process against the effects of humidity and the risk of external pipes freezing in winter. Moreover, challenging installation conditions had to be considered in order to ensure a safe operation, including the high dust load in the rolling mill.

Planning by Aerzen Systems

After the planning phase had been completed by Aerzen Systems, the unit was taken into operation at the end of 2011, in close co-operation with the maintenance department of the rolling mill.

Due to its slow control and long preparation time the Turbo compressor handles the base load. One of the Delta Twin compressors balances out the peaks, while the second one provides redundancy. However, to ensure constant utilisation and extended maintenance intervals, the screw compressors alternate every 24 hours.

Production ensured

Initial minor difficulties during commissioning were resolved thanks to Aerzen Systems. Since then, the unit has fulfilled the projected requirements and is easily able to balance the high volume flow differences. On the advice of Aerzen Systems, in the future any partly large withdrawal quantities will be additionally intercepted by a sufficiently dimensioned buffer. The unit is also supplemented by a refrigeration drier during the summer months in order to save additional energy. O

Dipl. Ing. Pol Philippe, Maintenance ArcelorMittal Differdange:
»Due to the close co-operation with Aerzen Systems, the unit fulfills all our requirements in this challenging operational environment.«

Frank Glöckner, After Sales Field Service, Aerzener Maschinenfabrik

Dear Readers,

In this edition of your customer magazine, you'll find information on products, interesting projects, events at our subsidiaries, important dates and news about the expansion of the Aerzen Group. I would particularly like to draw your attention to the article entitled "Aerzen's contribution to the big bang theory". This not only describes the efficiency of Aerzen machines, but also gives information about scientific facilities in which they are used. The continuous expansion of the After-Sales-Service Centre in recent years allows overhauls of Aerzen compressor and blower stages to be completed with very short lead times. Aerzen machines also operated very reliably in industrial applications. This is evident in the articles about the screw compressors at ArcelorMittal in Luxembourg and the Delta Blower Units G 5 at the Vattenfall power station in Boxberg. This edition also has information about the next fairs at which we hope to welcome you. But I do not want to get ahead of myself. I hope that there is much to arouse your interest and that you will enjoy reading our exciting and informative Aerzen customer magazine. Aerzen COM.PRESS.

With best regards

Frank Glöckner

Aerzen Andina in New Premises

In July, Aerzen subsidiary Aerzen Andina, which was founded in 2007, moved into its new premises near the Andean metropolis of Bogota in Colombia. The availability of more space, and better working conditions, convinced Managing Director Ricardo Castillo to make this move. Eleven employees work at the 650 m² new premises and they take care of customers from Peru, Bolivia, Ecuador, Venezuela and Colombia in respect of blowers and compressors. Castillo is optimistic, that the additional capacity will be fully utilised within five years. At present, Aerzen Andina is working on comprehensive plans to provide even better support to the key customers in the neighbouring countries.

The new building of Aerzen Andina ...

... offers more space.

Exhibition Dates

For the remainder of 2013, and in 2014 Aerzener Maschinenfabrik, its sales companies and representatives, will once again participate in fairs and trade exhibitions worldwide of a number of different industries.

Fachausstellung Meistererfahrungsaustausch Lübeck (trade exhibition exchange of experiences of master craftsmen), Lübeck-Travemünde/Germany	3rd/4th December 2013
Rohrleitungsforum (piping forum), Oldenburg/Germany	6th/7th February 2014
IFAT, Munich/Germany	5th – 9th May 2014
easyfair Schüttgut, Dortmund/Germany	21st/22nd May 2014
SMM, Hamburg/Germany	9th – 12th September 2014
GAT/WAT, Nuremberg/Germany	30th September – 2nd October 2014
Chillventa, Nuremberg/Germany	14th – 16th October 2014
Bio Energy Decentral, Hanover/Germany	11th –14th November 2014

Cross section through the annular channel of the particle accelerator

Compressor station with five VMY 536 machines made by Aerzener

Major Inspection at CERN

Aerzen's Contribution To The Big Bang Theory

The European large-scale research institution CERN in Geneva has the world's largest particle accelerator, which is subject to a general overhaul - including the installed compressors made by Aerzener.

In the accelerator known as the Large Hadron Collider (LHC) protons are made to collide at high speeds in order to reproduce the occurrences during the so-called "big bang". Last year, researchers proved with 99.9 per cent certainty the existence of the Higgs-Boson elementary particle, which had been known until then only hypothetically. At present CERN has 20 member states, about 3,200 employees and approximately 10,000 guest researchers.

The 26.6 kilometre long annular accelerator, located at a depth of 100 metres, had been in continuous operation for three years. In February, CERN started shutting down the accelerator for a general overhaul and finally switched it off completely.

In order to cool the magnets of the annular channel with helium, a complex cooling system has been installed which achieves a temperature of 1.9 Kelvin (-271.3 °C), i.e. near absolute zero. This includes 20 refrigerating compressors type VMY 536, distributed among four compressor stations.

After careful preparation, and due to the tight schedule, 17 of these compressors are currently undergoing a general overhaul at the Aerzen repair centre while the accelerator is at a standstill. Nothing must be allowed to hinder the accelerator's trouble-free operation and further experiments. O

Aerial photo with position of the ring

Aerzen Positive Displacement Blower

It runs and runs... and just keeps on running!

At the Sindorf waterworks an Aerzen service technician came across an 'old treasure'.

The blower has been working reliably for 58 years.

During the installation and start-up of two packaged units GM 25 S, the supervisor discovered, in another part of the Kerpen waterworks, an AERZEN positive displacement blower with year of manufacture ... 1955! Despite its considerable age of 58 years, this blower was in perfect external and technical condition. The blower was being used in the regeneration of a gravel bed filter, and has operated for many years - without ever having an Aerzen service technician on site. Up until now all maintenance work on it has been carried out entirely by the operating personnel. O

External compressed air emergency supply for briquette factory of RWE

Simply Shutting Down Was Not Possible

Due to repairs, the Wachtberg briquette factory in Frechen had to temporarily shut down its compressed air station and the corresponding electrical switchgear. But a compressed air supply should not be interrupted - particularly when you have a total delivery volume of 282 m³/min.The solution: an external rental station from Aerzen International Rental B.V.

At its site in Frechen, near Cologne, RWE Power AG processes 5.15 million tons of crude lignite every year into about 900,000 tons of pulverised lignite and 1.1 million tons of briquettes. In a second operational area the company's own power plant produces 0.983 terawatt hours of electrical energy every year using briquetting carbon. For the 24-hour-production of both areas a fail-safe compressed air supply is a must. This is generated in a central station by three oil-free compressing, speed-controlled Aerzen screw compressors: two units for base and peak load, the third for redundancy. Afterwards the compressed air is dried in three water-cooled adsorption dryers to a pressure dew point of -80 °C, kept available separately as working and instrument air in two compressed air reservoirs and then fed into two separate operating networks. The station works with a pressure of 6.5 bar as only then can the flawless functioning of all the consumers connected within the entire system be guaranteed.

Six Aerzen Screw Compressors for external compressed-air emergency supply, as well as emergency-units and diesel tanks were installed on the paved courtyard in front of the central compressed-air station.

Double dilemma

In 2012/2013 this concept was systematically reviewed. Leakage was detected in the cooling water system of the three adsorption dryers which could only be removed during standstill of all three dryers. But, as the compressed air could not be fed into the systems in an undried condition, the standstill of the dryers also meant a standstill of the compressors, the compressed air supply and consequently of the entire production.

Furthermore, the inspection showed that upgrades were also needed in fire protection and asset value protection, which could only be achieved during a two day complete shutdown of the electrical distribution station. Consequently, the electrical supply of the company's compressed air station was not available during the repair period. For the repair period an external emergency supply had to be found.

Foto: RWE Zura

Dipl. Ing. Christoph Zura, Plant Engineer power plant technology at RWE Power AG:
»AIR as general contractor completed the entire project in exemplary fashion: All the dates they promised were adhered to precisely. The entire job was completed in one week, including assembly and dismantling of the stand-by station.«

The Wachtberg briquette factory has been co-operating with Aerzener Maschinenfabrik for many years now, as Aerzen compressors are not only working in the central compressed air station, but also in the ash-handling plant. So, together with Aerzener they were looking for potential solutions.

View of the diesel motors and the reservoirs for diesel fuel.

Meticulous planning

Besides the Aerzen sales office West in Velbert, the Aerzen subsidiary company Aerzen International Rental (AIR) played an important role in the detailed planning and realisation of the entire project. The company, which has its head office in Duiven, Netherlands, specialises in the emergency supply of industrial enterprises with compressed air with extensive machinery. They can be reached around the clock, issue emergency plans, supply and install the required units with their own staff, take care of the cabling, the electrical connection to the piping and put everything into operation.

Also at Wachtberg: The scope of supply included six speed-controlled, oil-free compressing, air-cooled Aerzen screw compressors. In addition, AIR provided for the period of the repair an external electrical supply with five diesel driven generators: Four generators each directly supplied the four large compressors, while a fifth generator supplied electrical energy for two smaller units via a sub-distributor. Furthermore, AIR installed five filled fuel containers for energy supply of the diesel engines. For safety reasons a tanker truck was available at the factory's premises for quick refilling of the fuel tanks. Half of the produced compressed air was dried with two adsorption dryers provided by AIR - a compromise, which was sufficient for the short repair phase.

AIR supplied all the required Aerzen bypassing components on low-loaders, put these on the courtyard and connected them in readiness for operation. Within two days all the components had been installed, test runs and inspections were completed and the compressed air supply was changed smoothly, by shutting down the Wachtberg factory compressors one after the other and simultaneously starting the Aerzen rental compressors one after the other. After the repair had been completed the Wachtberg station was reactivated step-by-step and since then has once again been supplying all the locations on the network independently. O

The central compressed-air-station of Brikettfabrik Wachtberg: - on the right three enclosed Aerzen Screw Compressors: - on the left three adsorption driers.

40th Anniversary of Aerzen Machines Limited

Aerzen Machines Limited, based in Loughton, Essex, celebrated its 40th anniversary in November. This subsidiary is responsible for the whole of the United Kingdom and Ireland, and is certified as per ISO 9001:2008, ISO 14001 and OHSAS 18001 and checked by UVDB, SAFE Contractor, PICS. The subsidiary has been acknowledged as an 'Investor in People'.

In recent years, the company has invested heavily in personnel, and in organisational and technical matters. Product managers are responsible for the following fields: process gas, biogas and compressed air. In addition, a new grinding and painting machine has been installed and a special test bench has been developed.

40th anniversary of Aerzen Machines Ltd.

30th Anniversary of Aerzen USA

In September, Aerzen USA celebrated its 30th anniversary. Before the start of the official events to mark this anniversary, a "National Sales Meeting" took place. All representatives from environmental engineering, as well as employees of Aerzen Canada and Aerzen Mexico, were invited. Nearly 60 staff members participated in this conference, such that nearly every agent and almost every Federal State in the U.S. had been represented. This underlines the strong market presence and significance of Aerzen USA. During the two-day conference, the product programme of Blower, Hybrid and Turbo had priority. Special attention was also given to a new test bench at Aerzen USA, and a live presentation of a Hybrid and a Turbo package was given.

The anniversary events included an "Open House" day, as well as an evening event for employees. Aerzen USA welcomed more than 200 guests to this event, mainly customers and suppliers, but also a number of local business leaders.

The culmination of the anniversary events was the first "North American Service Meeting" which took place the following week in the premises of Aerzen USA.

The team of Aerzen USA – well positioned and highly motivated.

Spare Parts: Better Take the Original!

Aerzen original spare parts are specially designed for the compressors and blowers of Aerzener Maschinenfabrik. Consequently, they provide a high degree of reliability and safety. In addition, Aerzen After Sales Service offers warranty, a large inventory and a quick identification of the correct parts as well as short delivery and response times. In short: Confidence is good – Original is better!

Questions, Suggestions, Ideas?

We are looking forward to all your queries, comments and suggestions on our customer journal and we are at your disposal for further information on Aerzen products and services. Please visit our website:

www.aerzen.com/news

Pleasant and Successful Co-operation

For the first time in Aerzener Maschinenfabrik's company history, the engineering for a VMY compressor package has been carried out in Aerzen, within a recently completed and very successful process gas project. Our subsidiary, Aerzen USA, was responsible for the project management, the packaged unit assembly and start-up.

A packaged unit, specially designed for the American market, is the oil-injected compressor, type VMY 436 B. This machine differs from the established Aerzen standard in a number of essential respects. The customer, Tesoro, a leading company in the American energy industry, stipulates that components have to originate mainly from American manufacturers.

The design process was the result of close teamwork between Aerzen USA and the design management unit of the Process Gas Division (PGD). In consultation with possible suppliers, the components were integrated into a 3D model of the entire unit. Installation and a functional test of the packaged unit were carried out by a qualified American packager under the leadership of Aerzen USA and the department PGD.

The unit was specially designed for the American market.

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External view of the lignite-fired power station of the Swedish Vattenfall-Group in Boxberg (Oberlausitz), first taken in operation in 1971 and, extended several times since, most recently in 2012.

Modern extraction systems in the lignite-fired power plant of Vattenfall

No Chance for (Coal) Dust because of Delta Blower

Coal dust deposits pose a very high explosion risk. This is why the working areas at Vattenfall Europe AG's lignite-fired power plant in Boxberg are cleaned by permanently installed extraction systems on a regular basis. The necessary negative pressure is generated by an Aerzen positive displacement blower of series Generation 5, which is mounted on a fourwheel trailer.

The ultra-modern power plant in Boxberg generates electricity and heat and is the second largest plant of the Swedish energy group Vattenfall in Germany which is powered by lignite. Although all conveying units in the coal charging operation have been provided with dedusting systems, coal dust deposits cannot be avoided entirely due to the length of the belts, the high conveying speed and the considerable transportation volume up to 1,600 tons of lignite per hour. The Fire Protection Ordinance stipulates that the layer thickness of these deposits may not exceed three millimetres.

Dry cleaning instead of wet cleaning

For this reason, all units had been carefully cleaned with water on a regular basis until 1990, when cleaning was switched over to dry cleaning. Special independent piping systems to remove the coal dust have been fitted. Mobile dust suction systems supply the necessary negative pressure. Meanwhile, four explosion-proof versions are in use on the premises. The manufacturer, IB Verfahrens- und Anlagentechnik GmbH & Co. KG in Lage, had constructed all of them as road vehicle units, because road traffic regulations must be observed on the premises. The vehicles had been continuously improved over the years with the result that the latest unit operates with only one knock-out vessel. "Since the very beginning of the co-operation with Vattenfall in Boxberg we have been using Delta Blower of Aerzener Maschinenfabrik," said Dipl.-Ing. Harry Lippmann, Project Manager at IB Verfahrens- und Anlagentechnik, adding : "Aerzen offers reliable packaged units and excellent service".

Aerzen Positive Displacement Blower

The units used in Boxberg operate with constant speed and negative pressure of 500 mbar. The new Aerzen unit is started manually via the operating panel. The blower, with a motor rating of 55 kW, is provided with a soft start. The dusty air, which is sucked in, first enters an explosion-proof separation tank via an explosion-proof slide where the coal dust element falls out. A second explosion-proof slide is installed behind the tank. In case the pressure increases unavoidably in the separation tank, both will be closed immediately via an explosion-proof pressure detector which is permanently monitored, so that a flame, should one arise, cannot enter the intake and the discharge pipes.

Waldemar Adomßent, Vattenfall, lignite-fired power plant Boxberg: *»The vehicles supplied by IB Verfahrens- und Anlagentechnik and provided with Aerzen positive displacement blowers are in use in two shifts from Monday to Friday. We appreciate the easy operation of the units and their high inlet flow with which it is possible to take coal pieces even the size of a lump of sugar«*

The pre-cleaned air then reaches a zone separation filter. After this, the cleaned air enters the Aerzen blower which is installed in a sound-absorbing housing and then it is discharged into the atmosphere with a dust content of less than 0.01 mg/m³. It is not necessary for these blowers to be explosion-proof as the moveable dust extraction units are only operated outside the building, and for this reason they are not liable to explosion risk.

Vacuum cleaning system manufactured by Messrs. IB process technology. A positive displacement blower of Aerzener Maschinenfabrik, located in a sound-insulating housing at the front of the vehicle, produces the necessary negative pressure.

Practical and efficient

Dust, which accumulates inside the separator in the filter, is discharged via a pneumatic filter dedusting. A small piston compressor in the blower housing supplies the necessary compressed air. It also provides the isolation valves and arranges for the loosening up of the coal dust, that has reached the tank, by the temporary filling of air cushions. The tank volume is thus ideally used. When the maximum filling level is reached, a level probe stops the suction process so that the tank can be emptied via an electrically operated flap on the ground, and the charged coal dust can be sent to the bunker complex again. O