GREEN BALANCE
Committed to safeguarding the future

RECLAIM
Green dry separation technology for wet painting systems

AERO
Optimizes the separation of very fine coolant aerosols

Keller worldwide
Keller systems around the globe
Dear Readers and dear Business Partners,

It is always our objective to be a reliable and competent partner for our customers and to support them with individual separation systems concerning an efficient and environmentally-friendly production. We continuously make progress in the further development of our products and with the cooperation within the company, our processes and procedures are examined on a regular basis.

Developments in the economy and in society are recorded watchfully to ensure that we recognize trends early and adjust our strategies accordingly. We aim to develop solutions today, which our customers will demand tomorrow.

Accelerated by the energy turnaround, the topics of energy efficiency and consumption of resources increased in importance in our decision-making for innovations. Our product range already includes corresponding products and procedures. We stay abreast of changes that the greater market demands. Our future developments will meet the requirements for environmental stability on a larger scale.

With this in mind, we developed the Green Balance label to identify the corresponding products and processes in the future. Keller Lufttechnik hereby commits to reliable, far-sighted treatment of all resources – to bring into line technological progress, operational issues and social targets in order to protect the environment.

The articles in this magazine, issued with a new layout and under a new name, provide you with a view into our various activities.

Please enjoy reading this issue of our LUFTREin-magazine.
Keller Lufttechnik participates in the industry commitment to save the environment and natural resources. As the developer and manufacturer of high quality air pollution control systems for industry and commerce, issues with respect to environmental engineering have always been part of the solutions which the company has been offering to its customers for many decades.

Basically, the focus is on optimal particle filtration to create clean working conditions and processes. However, the challenges regarding the careful handling of nature’s resources are gaining more and more attention.

The earth’s bio capacity is limited – namely, its ecological footprint. This footprint measures the consumption of nature’s resources. Various interactions and environmental data are summarized in a manageable manner. As an example, which are necessary for survival. The national differences also mandate the protection of humanity, these direc-

Industry has been provided with guidelines for saving the environment. The effects of unrestrained energy and raw material consumption as well as nature’s reaction to the resulting changes are increasing. Examples and evidence are widely available. Additionally, the intensive consumption of energy and raw materials worsened with the increased prosperity of newly industrialized regions worldwide.

The issues raised by this topic are no longer a matter of personal responsibility, but also the responsibility of the economy overall.

Companies and entrepreneurs are increasingly taking on the challenge to contribute towards an environmentally-friendly and humanitarian future.

Keller Lufttechnik of course is positioned within the global industrial structure. Energy is created from other sources and separation systems will most probably require power from the available energy supply as well in the upcoming decades. However, it is our obligation to reduce this energy consumption requirement.

In the near future, economics and ecology can no longer remain separate – this is the only solution for safeguarding the future. Keller Lufttechnik’s board of management is also committed to this initiative.

Green Balance — Name and motto for a new strategy.

How can the process of change be initiated and directed towards “green” technology? A declaration of intent is insufficient – because in the end, every individual in a company is involved in its realization, either with the design and control of a drive with respect to energy efficiency or with designs targeting the lowest possible consumption of material.

The acquisition of materials or consumables, their production conditions and transport routes are becoming increasingly important. End customers in the manufacturing chain selling their products to customers have to ensure that their products are evaluated in a positive manner according to the criteria of the ecologic footprint for competitive reasons.

Companies in the present day are already considering the advancement of corresponding research methods and setting new criteria.

The automotive industry, for example, must deal with the question of a deployment of resources to maintain the air quality in a painting facility. As a leading manufacturer, Keller Lufttechnik is prepared for such requirements. Green Balance is the effective tool.

Green Balance establishes goals for achieving a balance between the needs of industry and the best means of achieving these environmental efficiency goals.

Energy efficiency, production quality, separation efficiency, sustainability, standards and guidelines are the essential criteria which must be considered or be continuously improved. Guidelines for balancing the economy and ecology apply to Keller products as well as to the company as a whole.

Since Keller has already introduced appropriate products and measures, the new label can be appropriately applied such as on systems for the new RECLAIM dry separation during wet painting processes.

With GREEN BALANCE Keller Lufttechnik GmbH + Co. KG is committed to reliable, far-sighted treatment of all resources – bringing into line technological progress, operational issues and social targets in order to protect the environment.

www.keller-lufttechnik.de/greenbalance

The articles on the specified pages show what this means exactly. >
**RECLAIM:**
Green dry separation technology for wet painting systems

Whether compact or large paint booths, solvent-containing or water-based paints, the reusable dry separation system RECLAIM with ProBran® filters ensures a reliable, cost-saving and energy-efficient separation of paint overspray. Long filter service lifetimes enable trouble-free and continuous operation of the system. Air recirculation contributes to considerable energy savings.

Keller’s RECLAIM separation technology for wet paint overspray and adhesive aerosols totally lives up to its name by fulfilling the advanced system technology in several respects.

**ProBran® filters – reusable and efficient**

The filters are cleaned online while the system is operating. “We optimized the dimensions, surface structure and the material composition for our new ProBran® filters”, explains Joachim Haußmann, Sales Manager at Keller Lufttechnik.

The woven fabric filter material with a rigid structure is equipped with a membrane consisting of a smooth surface which prevents the overspray from accumulating inside the filter pores, which would interfere with compressed air cleaning of the filters. This usually occurs with other types of filters with various coating types and materials. By contrast, the coating of the ProBran® filters reliably ensures a pure surface filtration.

Filters can be cleaned with a lower pressure of only 3.5 bar. “The filter resistance is reduced by 40 – 50 percent due to the large surface and its optimized structure. At the same time, considerably less compressed air is required for the cleaning process because of the reduced supply pressure as compared to its ancestor SINBRAN®”, says Haußmann. “Instead of six bar, it is only 3.5 bar. This optimization means a great improvement in the system’s energy consumption.”

At the same time, these types of filters are sturdier and can handle constant temperatures of up to 110 degrees Celsius instead of 60 degrees Celsius. For utilizing the system in painting systems, it is necessary that the filters are free of paint-wetting impairment substances (PWIS) such as, for example, silicone. “We inspect each filter element with regard to this capability and document our inspections with retained samples”, explains Haußmann.
Limestone powder coats the filter with an auxiliary layer. “When selecting this precoating material, it is important to consider occupational safety, to choose a material which does not react with other substances in the separator – that means it should be inert”, explains Haußmann. “Moreover, the global availability of the material also plays a role.” Another important consideration: the limestone powder which bonds to adhesive aerosols can be used several times. After filter cleaning, it falls into a collection tank, the silo, below the separator. A so-called fluidization process performs the blending, so that the adhesive particles are encased in limestone powder and the mixture of limestone powder and paint overspray can be blown upwards onto the cleaned filter elements to create a new auxiliary layer.

Even “waste” can be recycled
Depending on the composition of the paint overspray, the online filter cleaning is either controlled by the differential pressure or interval-controlled, or a combination of both. Should the filter resistance reach a maximum value, the compressed air pulse cleans as many filter plates sequentially as possible until a defined value – adjusted as lower filter resistance – is reached. Once the limestone powder is fully saturated, it is automatically discharged from the system and new limestone powder is added. Depending on the size of the paint booths and the RECLAIM system, the supply and disposal containers can differ: 25 kg bags, Big Bags or silos are all available. The mixture of the waste paint overspray and limestone powder is dry and can therefore be recycled without any further treatment. An application example is in the cement industry, or thermal reutilization is another possibility. This is an additional advantage of the RECLAIM process.

Weight monitoring ensures proper operation
Weighing chambers monitor the fully automated supply and disposal of the precoating or waste material and compare the values between the two. To ensure their long service life, the weighing cells are located outside the dust area. The monitoring principle works as follows: if the system withdraws a certain weight unit from the silo or the central additive supply, the same weight unit must move to the filter cells. This is precisely monitored by the weighing booth. During filter cleaning, the precoating material falls into the silo together with the paint particles. The weight must also be accurate. How much paint weight was added is determined by the mixing ratio between paint and limestone powder. “With this method, we are working with the weight and not with the volume which can vary from paint to paint”, explains Ziller. “We ensure that the system runs trouble-free. In the event of clogged ductwork or material escaping to the outdoors due to a leak in the ductwork, we immediately detect the problem and are able to react.” The same advantages also apply to the disposal technology.

Continuous operation for a minimum of 15,000 operating hours
“The independent cleaning of the filters and automatic discharge of the precoating material saturated with paint particles prevents a shutdown of the system which would otherwise be necessary in order to exchange filters or collect residue. Many manufacturers operate their painting systems in three shifts. This results in the loss of valuable production time for a shutdown”, explains Joachim Haußmann. “Using RECLAIM, the customer can rely on 15,000 hours of continuous operation. During this period, Keller Lufttechnik guarantees certain pressure loss and residual dust values.” In practice, the systems can operate considerably longer without a filter exchange. “Once the separator efficiency decreases, this can be calculated and the filter exchange can be integrated into operating procedures in such a way that it doesn’t interfere with normal operations.

Energy-saving air recirculation
RECLAIM cleanses the air so thoroughly, that air recirculation in automatic coating plants is possible and useful. Because of the high separation efficiency of our ProBran® filters, up to 95 % of the separated dirty air is recirculated into the paint booth as pre-conditioned clean air. This results in considerable energy-savings.

The energy costs for the paint booths can be reduced by up to 50 %. To illustrate, 1000 cubic meters of fresh air per hour which has to be ducted from the outdoors and heated can consume 60 megawatts of energy. Energy savings of up to 60,000 € per year can be achieved because only five percent of air is required from outdoors and subsequently heated as opposed to 100 percent. The RECLAIM system pays for itself within 1.5 to 3 years.

Energy-savings in after-treatment of the exhaust air
Air recirculation leads to an accumulation of solvents (Volatile Organic Compounds, VOCs) which pass through the filters as gaseous materials. This requires the addition of approximately 5 percent of fresh air. The system required to treat the solvent fumes for these considerably smaller exhaust air flows that are concentrated with VOCs, becomes substantially reduced. Due to the higher solvent concentration, the thermal after-treatment can be operated without requiring any additional energy supply. This is another advantage of the air recirculation which contributes to the reduction in the energy consumption of the exhaust air after treatment system, as well as in investment and operating costs.

Green technology particularly economical
RECLAIM stands for a highly efficient and recovery method to separate overspray from wet paints and adhesive aerosols in exhaust air systems. It fulfills the Keller guarantee of maintaining continuous air quality and considerable cost savings as well as environmental advantages.

Additional information on RECLAIM can be located on our homepage: www.reclaim-keller.de

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Customized collection elements guarantee successful separation

The more directly the collection of dusts at machine tools the more effective the overall separation efficiency. Simulations and tests help customizing the collection elements to a machine in order to achieve optimal results. An example is a Keller Lufttechnik collection system developed for a Fanuc machine used in the production of graphite electrodes for die-sinking processes.

The best separator is inadequate if sufficient released particles in industrial processes are not collected thoroughly. Many particles can disperse into the ambient air, affect the work environment for employees, contaminate machinery, reduce the energy consumption since the required air flow may be lower than expected. "Environmental protection efforts succeed or fail with optimal collection of foreign matter."

Flow simulations
Choosing a suitable collection element for a particular machine and optimizing it is performed with flow simulations. "We review an ideal-typical model providing us first with a record of whether the chosen collection element fits and how the collection can be optimized", according to Schwenger. In many cases, particles of different sizes are created whose physical and thermal behavior can barely be simulated in a realistic manner, posing a difficulty in comprehending the collection situation. Plenty of experience is required when interpreting the modeled simulation results and to detect and study inaccuracies. Simulations such as these can be utilized profitably to optimize existing machines because preventable air currents are illustrated and indicate locations where the existing installation could be improved.

"Together, we collaborated on possible solutions for optimal collection."

Fanuc: Collection of graphite dust at a new machine tool
Simulations and practical tests with different collection methods are useful in providing a conclusive result. Fanuc Robomachine Europe, a subsidiary of the Japanese electronics and machine manufacturing company Fanuc, contacted Keller with a complex task. "We were about to develop our Robodrill, a compact high speed cutting machine to produce graphite electrodes and needed an element to collect the greasy graphite dusts which are created during the process", says Stefan Raff, Sales Manager at Fanuc Robomachine in Neuhausen. "We turned to Keller Lufttechnik, since we have been informed that they specialize in difficult extractions."

"Together, we collaborated on possible solutions for optimal collection."

Trial runs indicated which method worked out best
As a result the curtain was beneficial, the encasing of the milling head in contrast was unnecessary. Also, table collection was unnecessary. Schwenger eventually developed an optimized collection element especially customized for the Fanuc Robodrill. Ultimately the collection system also contributed to the fact that the Robodrill with its very low power requirement (5 kW) was approved. "The compact Robodrill machining centers combine favorable cost and economies of operation with high processing quality. This is what persuades our customers who, for instance, utilize the Robodrill in the serial production of automotive components and electronic components as well as in medical technology, the watch and jewelry industry or tool-making and mold-making industries. They get back to us after years: 'We are very satisfied', reports Stefan Raff.

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AERÖ optimizes the separation of very fine coolant aerosols

AERÖ’s secret lies with the new MICOS-P fine fiber filter elements which separate up to 99 percent of the smallest lubricant particles from the air in machining processes or mechanical metalforming activities. New manufacturing processes – such as at Daimler, among others – set innovation in motion. In addition, the German car manufacturer utilizes the initial models of our new separators. There are more to come and existing systems will be retrofitted with MICOS-P filter elements.

It is a technical challenge to reliably separate very fine coolant aerosols. Keller Lufttechnik sets new standards with the new oil mist separator AERÖ. The modular combined system provides a separation efficiency of 99 percent without utilizing a storage filter. Moreover, it is compact in size and requires little floor space. “Space on production floors is expensive and this is why efficient use of floor space is an important economic consideration”, according to Leopold Rang, sales representative at Keller Lufttechnik. The compact design is accomplished by using the new, efficient MICOS-P filters. The filters are composed of fiber material, whose separation efficiency is increased by the use of a cartridge shape and the larger filtration surface that it provides. Therefore, only one main filtration stage is sufficient for the AERÖ system. Only a single demister is installed upstream. The knitted metal mesh serves as a pre-separator of coarser particles and simultaneously adjusts the air flow so that it maintains an even flow through the main filter.

Modified manufacturing processes required a new generation of separation technology. The development of the new system has its own history; Daimler in Untertürkheim, which is close to Stuttgart, has been utilizing Keller oil mist separators for years – until their manufacturing process changed. “Our customary demisters reached their limits due to the strong dirty air load”, explains Michael Osdoba, Keller’s Key Account Manager for Daimler Stuttgart. “Clean air values no longer met the requirements. So we started retrofitting the separators with MICOS filter elements – and as a result, our AERÖ was developed as a completely new product.” Keller experts provided evidence that the clean air value was reduced from 93 mg of mineral-based oil aerosols to 0.3 mg for every cubic meter of air.

New separator convinces in daily use
Since the beginning of 2011, AERÖ has been utilized at Daimler in engine production. The separator has proven successful and still maintains the preset limit values.

Retrofitting existing systems
Some systems which no longer meet the requirements will be retrofitted with MICOS-P filters. “However, we have to check if this is feasible in specific cases because of the system dimensions”, according to Michael Osdoba. “Potentially, we have to add another filtration level since the continued use of existing housing, electrical and ductwork connections is economically beneficial.”

Automatic filter cleaning
If necessary, MICOS-P filters are cleaned automatically in specified intervals during operation or optionally after switching-off the separation system. The demisters are rinsed in process oil which drains into a tub together with the oil mist. It drains through a drain connection and then either flows back into the machine or into a treatment system. If a drain outlet is inadequate, a pump container can easily be installed in the AERÖ if necessary.

Modular construction
Keller’s AERÖ is available in three sizes for nominal airflows of 4,000, 7,500 and 12,500 cubic meters per hour. The modules can be combined and operated economically by a fan and a common control.

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Galloo is a Belgian company specializing in metal recycling. Scrap metal is shredded by huge shredders and during this process, different dusts and gases are released. A specially designed Keller separator reduces these arising emissions so thoroughly that future, tightened limit values are fallen below considerably.

Around three hundred shredder plants exist throughout Europe which shred large quantities of scrap metals such as end-of-life vehicles, household appliances and electric appliances. They are separated in various sorts and are fed to recycling systems after the separation process. Inside the shredders, with up to 10.000 PS, very high temperatures can arise. This procedure not only separates in various sorts and are fed to recycling appliances and electric appliances. They are separated in various sorts and are fed to recycling systems after the separation process. Inside the shredders, with up to 10.000 PS, very high temperatures can arise. This procedure not only separates in various sorts and are fed to recycling systems after the separation process. Inside the shredders, with up to 10.000 PS, very high temperatures can arise. This procedure not only separates

Only one separator is no longer sufficient
Shredders normally have just one wet scrubber. “This is a useful method due to the explosion risk during the shredding process. The wet separation reduces the risk of explosion spreading into subsequent system components”, explains Bernd Müller, Sales Manager at Keller Lufttechnik. The pollution load in the air after the wet separation process meets the mandatory standards concerning dust emissions. In the future, reliable values – especially at gaseous components – will decrease and further systems are required, to achieve the requested degree of purity.

Shredding process of scrap metal releases vapors which have to be separated.

The Galloo group annually recycles 1.6 millions of scrap metal
At the moment, Keller is installing an exemplary secondary filter level which reduces the load of purified exhaust air at gaseous components by up to 90 percent, at dust reduced to less than 1 mg each cubic meter. Galloo annually recycles 1.5 millions of tons of ferrous metals and 80,000 tons of non-ferrous metals on their sites in the Netherlands. “It is important for us to work under environmentally-friendly conditions and to meet all exhaust air values reliably. Whenever possible, we try to reduce the emission of hazardous substances considerably enough to fall below the limit values”, reports Rik Debaere, General Manager of Galloo. “This is very important here in Menen since the residential houses are not far away.”

Best filtering results at different operating conditions
First of all, Galloo had Keller install a test plant. “We tested such a long time different filters and auxiliary materials to bind airborne substances, until we found the optimal combination with the ProBran filter and an adjusted sorption layer”, informs Hans Boels of Keller Beneux. “The tests took more than one year and were financed by both, Galloo and Keller Lufttechnik.” During that time, different scrap metal compositions went through the shredder and the meteorological conditions varied considerably. Keller experts inspected the exhaust air values in the chimney over and over on changed conditions and can now be assured that the found filter solution reaches optimal results in every application.

Galloo has been trusting in Keller Lufttechnik for a very long time
For more than 20 years, Galloo has been trusting in Keller Lufttechnik concerning the separation of material. “We see Keller not only as a supplier but also as a partner. We sit around a table and discuss solutions. The new separation system is absolutely unique which is tailor-made on our requirements and an excellent example about how well working in a team can work”, emphasizes Debaere. A tour through the company shows the long history of cooperation: The shredder’s wet scrubbers are also by Keller as the so-called air classifiers and air filters. Air classifiers are adjusted downstream the shredders. The air classifier separates light parts such as foils and foam material from heavy materials such as plastics, copper and stainless steel by an airflow. “The correct separation of recycling material becomes more and more important”, explains Boels, “because in the future, many base materials for the metal production will exclusively come from recycling material.”

For innovation, see Keller not only as a supplier but also as a partner.

www.kl-direkt.de
ProFlap meets new testing standards

For explosions inside a protected system, ProFlap ensures that the flames cannot spread within the ductwork. Recently, our proven product successfully passed tests according to new test standards. In addition, the expansion of the product line is in the works.

Warning of explosion risk: If very fine dusts in particular concentrations are created, a tiny source of ignition is sufficient to create an explosion. “However, this happens very rarely. As a precaution, all our Keller systems are designed to withstand pressure surges and are equipped with additional measures against explosion protection”, according to Jens Kuhn, Quality Manager at Keller Lufttechnik.

Explosion decoupling
One of these measures is by means of explosion decoupling, which prevents flames from spreading inside the ductwork. “During operation, the downstream mounted back pressure flap is kept open by the air flow”, explains Jens Kuhn. “In the event of an explosion, the flap closes as soon as it detects the pressure front inside the ductwork.”

ProFlap II meets new test standards
Keller Lufttechnik repeatedly tested the proven part because new test standards will apply in the future. In fact, although the new standards are not yet adopted, the test group is already working on a preliminary version. The necessary tests are much more complex. “We perform tests at a minimum and maximum installation distance”, reports Jens Kuhn.

Several tests are performed for various applications, explosion protection types and diverse container constructions.

Optimized and expanded production line
Keller experts took advantage of the tests to optimize the product – especially regarding potential energy savings. “The back pressure flaps of smaller dimensions were designed to be narrower so that the resistance and therefore the energy consumption for the entire operation of the system decreases”, explains Jens Kuhn. In addition, Keller introduced versions of the ProFlap in which the flap is securely locked and re-opened only by means of an electrical signal, if necessary. “Application ranges with dusts in category 2 should be equipped with this type of installation”, explains our expert. Customers have frequently demanded a back pressure flap for ductwork with large nominal diameters. “Shortly, we are planning to launch our ProFlap1000 with a nominal diameter of 1000 mm”, announces Jens Kuhn, who is completing final testing at the head-level back pressure flap.

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Keller Lufttechnik in China: Perfect teamwork between parent company and subsidiary in Shanghai!

Our team at Keller Environmental Equipment (Shanghai) Co. Ltd., a Keller subsidiary, is working hand in hand with colleagues in the parent company when providing Chinese companies or subsidiaries of international companies with a suitable solution for a separation system.

In April 2011, Keller Lufttechnik founded the Chinese subsidiary Keller Environmental Equipment (Shanghai) Co. Ltd. which was formerly known as our Shanghai Representative Office. The growing team supporting Mr. Sven Gottelt looks after well-known customers such as the Chinese affiliates of Volkswagen, Siemens, Bosch and General Motors.

Grob relies on Keller

When Grob in Mindelheim received an order for two machining centers from the Chinese engine manufacturer FAW Jiefang Automotive Co., Ltd., Wuxi Diesel Works, located in Wuxi, in the Jiangsu province, it was obvious which company would supply the necessary separation systems: Keller Lufttechnik. It was the job of the Keller team in China to find a suitable solution for the separation of metal dusts and coolants for the machines processing cylinder heads and engine blocks for an 11-L diesel motor. In the end, four coolant mist separators with a separation volume of 170,000 cubic meters of air per hour were employed.

Teamwork at its finest!

All four coolant mist separators were delivered, including switch and control units as well as the return pump stations from Germany. The remaining system components, such as radial fans, exhaust air silencers, suction ductwork and vent stacks came from China. “The coordination between parent company, the team in Shanghai and the suppliers on site worked extremely well”, informs Andreas Tolsdorf, the responsible Project Manager at Keller Lufttechnik. “The team on site was close by and knows the market. Thus, the cooperation with our Chinese suppliers works smoothly and they function as our “extended arm” and represent our company very well.”

Installation and commissioning worked hand in hand. “Our fitter introduced the Chinese partners so that they were able to operate mainly independently.” Consequently, perfect teamwork!

Coolant mist separator for the separation of coolants.

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Keller systems around the Globe

More than 40 Keller employees support customers outside Germany. Thanks to the cooperation among our Keller teams in 20 countries they cover our separation technology throughout the world. Large enterprises, such as Ford, include German technology in their specifications and require them as standards for their plants worldwide.

Experts at the machine building company MAG in Eislingen developed a system to manufacture engine blocks and engine heads, and involved Keller engineers in the design to deliver a suitable separator for dusts which are created during the treatment of grey cast and aluminium. The result: The TR-1 dry separation system. Since the systems are directly installed adjacent to the machines, explosion protection played an important role! TR-1 with specific explosion protection equipment incorporates a spark detector which immediately detects possible sources of ignition (ProSens) as well as a valve at the filter which ensures flameless pressure relief (ProVent). The ProFlap back pressure flap closes the ductwork in the event of an emergency thereby avoiding the spread of explosion pressure and flames to other system components.

Proven high efficiency and energy-saving operation
Keller’s solution passed all tests very well and persuaded Ford’s decision makers with its high efficiency, energy-saving operation and the fact that there is no need of additives. “Further developments continue”, informs Bernd Blümlein, Project Manager at Keller Lufttechnik. Working with MAG, and taking into consideration accumulated experience from the Ford plants, we continuously upgrade our system. This process is known as FMEA, the Failure Modes and Effects Analysis.”

Total solutions requested
The close cooperation between machine manufacturers and air handling engineers resulted in sophisticated, modular design systems. The separators do not exhaust centrally, but rather they exhaust each machine with an airflow of 800 to 1200 cubic meters per hour. The retrofitting of additional systems can be accomplished easily. “The plug and play principle applies”, says Bernd Blümlein. The interdisciplinary cooperation also affects the design in a positive way: “our separator fits the systems perfectly”, informs Blümlein. This is another feature which is increasingly important for customers.

Our Systems are installed in the United States, Romania, France, Brazil and China
Besides various Ford plants in the United States, they are also installed in Craiova, Romania, as well as in Bordeaux, France, in addition to Brazil and China. Additional installations will follow. “Keller delivers to MAG and the systems are shipped to their scheduled location from MAG”, explains Blümlein. Occasionally Keller ships its separators directly to the customer. Keller and MAG representative offices maintain contacts on site and advise the customer as facilitators.

Additional machine manufacturers are selling the TR-1 as well
Other companies such as Heller in Nürtingen or Grob in Mindelheim request the TR-1 and supply their machine customers all over the world with the Keller separators simultaneously.

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Support for our team

Ferdinand Geiz and Peter Leyendecker … … are our new sales representatives for territories “Nordrhein” and “Westfalen”. They live centrally in their sales territories ensuring convenient access to their customers.

Jochen Dessel … … is the new Key Account Manager for VW. The increasing globalization of the automotive industry requires a central contact person, with the responsibility of total oversight. Jochen Dessel oversees all VW locations in close collaboration with the Keller subsidiaries on site, such as China and the USA.

Marcus Kraus … … is the new Sales Manager in our Team 2, dealing with all “machining” processes. As an expert in coolant technology, he assists the team among other matters with support for automotive and tool manufacturers.

Alexander Malkin … … is the new Sales Manager at EFT in Moscow. EFT is a cooperative of companies in Baden-Württemberg, for the recommendation and sale of environmental products in Eastern Europe. Alexander Malkin facilitates Keller market penetration, especially in Russia, and on-site customer care.

Stefano D’Amicos … … is our new Sales partner in Italy. This qualified engineer maintains his office in Milan and looks after Keller’s customers in Italy.

Masdar PV:
“Keller Lufttechnik’s specialists discovered an appropriate solution for the separation of fine silicon oxide particles”

When glass plates are coated with silica they convert into a photovoltaic (PV) module. During this coating process fine silicon oxides (in nanometer size) are created which presents a special challenge for separation.

Masdar PV Gmbh in Thuringia invested in a Keller Lufttechnik filtration system to separate the finest dust from the exhausted air by nearly 100 %. A special briquetting machine was an ideal solution for waste disposal.

Located in Germany - Ichtershausen, a town south of D-Erfurt, Masdar PV GmbH produces micromorphous thin-film PV modules. This company is a subsidiary of Abu Dhabi’s Initiative for Future Technologies, Masdar, whose most well-known project is the nearly pollutant-free future-town, Masdar City. Masdar PV in Germany specializes in large-scale thin-layer solar modules which are particularly suitable for outdoor installations and large-sized roofing. Transparent PV modules can be used for facades (building integrated PV – in short: BIPV). Consequently, the futuristic building fronts transform into a source of energy. Because of the expensive manufacturing process, the thin-layer modules are characterized by their capability to deliver a high output even under low light conditions. In addition, they retain their full functionality even at very high temperatures.

Measurements detected a high concentration of fine dust in the exhaust air.

At Masdar PV, D-Ichtershausen there are four PECVD coating plants which currently produce PV modules up to a size of 2.2 m x 2.6 m. The glass plates are coated with photosensitive silica inside vacuum chambers. Residues of the gaseous source material are oxidized by introducing natural gas, then they are “washed”. As a result, a very fine film of silicon oxide still remains. “The particle size falls in the nanometer range. They are practically invisible to the naked eye”, Mario Manthey reports; he is Equipment Engineer at Masdar PV and is responsible for the coating plants. When the company initiated production they did not realize that the plant’s filtration systems did not capture this fine dust. “Further measurements provided proof”, Mario Manthey remembers. Then the manufacturer further performed tests to efficiently separate these dusts but were unsuccessful because of the unusually fine particulate. “We realized that we require a specialist. We contacted Keller Lufttechnik, as we were already utilizing their excellent filtration units for our laser systems, which burn the current lines into the silica layer.”

“We realized that we need a specialist. We contacted Keller Lufttechnik since we were already utilizing their excellent filtration units” Mario Manthey, Masdar PV
Suitable filtration technology was discovered after analyses and tests. However, the filtration solution was not easy to apply. “The coating plants required filtration systems of a completely different type,” says Bernd Müller, Sales Manager at Keller Lufttechnik.

Working in conjunction with experts of Cottbus University, Keller’s specialists first investigated the exact particle sizes of the dust to be separated and installed test plants at Masdar PV, as well. They further determined the ideal filtration technology – a dry filtration filter VARIO 4 which is equipped with high-quality membrane filter elements. “The filtration efficiency is brilliant. At nearly 100%, the values are clearly below allowable limits,” Manthey says enthusiastically.

Filtration efficiency is clearly below existing limit values:

![Image](image1)

The dust must be compressed for waste disposal. The fine dust and light weight present a problem regarding waste disposal. The waste material was collected in Big Bags with a volume of 1 cbm. The resulting weight of such a Big Bag filled with this dust totaled a mere 40 kg. “The bags had to be changed and emptied every three or four days”, Manthey said, “this wasn’t manageable”. Therefore, Keller Lufttechnik combined a briquetting system with the filtration unit. “Although the unit does not press briquettes from that fine dust, the dust is compressed enough so that ten times the dust can be collected inside a container, at about 400 kg”, Bernd Müller reports.

Masdar PV expands its production plant
The first two systems have been operating for one year. “During that time we have not had to clean the filter unit once. The filter’s differential pressure is correct, which not only saves time and money but is also an important help for environmental protection,” Manthey says. In 2012 they plan to build a new facility with four plants which will also be equipped with the well-proven Keller Lufttechnik filtration technology. “It is important for us that our products are a positive influence on environmental protection. Even the production process must be according to ecological criteria with minimal impact on the environment”, Manthey says.

In the Fall of 2011, we scheduled several customer training sessions on the subject of “professional care of air pollution control systems”. Just prior to the introduction of its new product line, Keller Lufttechnik launched a new training space, which is dedicated to the former company director, Otto Keller, Torsten Messerschmidt, Department Manager of Aftermarket Services is pleased. “The events were fully booked immediately, so that we were able to offer an additional date. We had 74 participants and we were appreciative of the positive feedback – also concerning the new training room.”

Continuous improvement and input from participant surveys
In written surveys following our training, the participants graded us well. “The surveys provide information on possible additional topics requested by our customers or feedback on how we can improve our training,” reports Messerschmidt. “We are currently planning a new customer training session which covers the subject of ventilation and air-conditioning technology and measurement engineering in more detail and is therefore specifically tailored to planning engineers. We look forward to welcoming many of our customers here to Kirchheim in the Fall.”

Contact: Bernd Müller ∙ phone: +49 7021 574-294 ∙ e-mail: mue@kl-direkt.de

Customer training in our new teaching facility

![Image](image2)

The new training room with a capacity of up to 35 people.

Schedule for 2012:
- This year, the following customer trainings will take place:
  - Professional care of your air pollution control system
    - 18. October 2012 | Dry separator
    - 25. October 2012 | Wet scrubber
  - 08. November 2012 | Coolant mist and oil mist separator

Contact: Susanne Zeeh ∙ phone: +49 7021 574-118 ∙ e-mail: zs@kl-direkt.de
Keller service at the Handtmann Group: “This works out very well!”

Michael Bautz appreciates Keller’s expertise and the prompt reaction.

The facilities engineering team of Handtmann in Biberach has been working with Keller Lufttechnik for approx. 25 years regarding the service and maintenance of the 30 systems in the company. “LUFREIN” spoke recently with Michael Bautz, the responsible contact about the long-term cooperation.

LUFREIN: Mr. Bautz, what is manufactured at the Handtmann Group and what are your specific responsibilities?

Michael Bautz: We have seven companies here in Biberach. The largest is the metal casting plant, in which light metal cast parts for the automotive, heating and electronics industry are manufactured and the machine plant in which packaging and measuring systems for the food processing sector are manufactured. I work for Handtmann Service GmbH & Co. KG which provides services for all other companies within the group. My responsibility is facilities engineering and therefore the documentation and maintenance of all systems. This means that my team and I are responsible for the monitoring of the separators.

LUFREIN: Which type of routine work comes along with the monitoring of the separation systems?

Michael Bautz: Once a week we perform a so-called visual inspection. The cleaning staff was specially trained in this area. Using a checklist, they inspect for dust accumulations in the system parts, which must be mostly free of dust. If not, there could potentially be a malfunctioning filter. Our specialists precisely know which areas must be cleaned properly to ensure a trouble-free, long-term system operation. However, for annual maintenance we do request an expert from Keller Lufttechnik, who simultaneously inspects the systems of our external companies. The air quality annually. We can compare their values with those from Keller. This, is also potentially informative.

LUFREIN: For some years now, Keller performs an optical residual dust measurement during the annual maintenance. Is this helpful to you?

Michael Bautz: Yes, because this measurement detects leakages and recognizes if limit values according to TA-Luft are adhered to. In addition, a certified measuring institute tests the air quality annually. We can compare their values with those from Keller. This, is also potentially informative.

LUFREIN: Thank you for this interesting conversation.

This and participation in customer training helped me to get to know the systems – and this is very important for me, because in the event of a potential breakdown, I can envisage where the problem may lie. Potential errors can therefore be corrected by our own staff. Sometimes for example, someone just forgot to open up the water supply. The customer training helped me in another way: I was informed about allowable dust limit values. I can pass on this information to our customers and advise them accordingly.

LUFREIN: What happens, if failures occur anyway?

Michael Bautz: That depends on what type of failure. Smaller matters such as broken door latches are repaired by our locksmiths. Some spare parts, especially impellers, are in stock and we can exchange them, if necessary. If we cannot handle the matter on our own, we contact Keller. What I really appreciate is the fact that I always receive a competent response and that – in the event of an emergency – someone can be immediately available to solve the problem, and I know that is not to be taken for granted. In terms of the system’s maintenance, I work exclusively with Keller. I know their experts and they in turn know our company very well – we have been cooperating very well for many years now.

LUFREIN: You’ve become very knowledgeable about air handling technology. Why is this so important for you?

Michael Bautz: Yes, indeed, I always looked over the technicians’ shoulders and assisted them when they were servicing our systems. Hence, I know their experts and they in turn know our company very well. This is very important for me, because in the event of a potential breakdown, I can envisage where the problem may lie. Potential errors can therefore be corrected by our own staff. Sometimes for example, someone just forgot to open up the water supply. The customer training helped me in another way: I was informed about allowable dust limit values. I can pass on this information to our customers and advise them accordingly.

Michael Bautz appreciates Keller’s expertise and the prompt reaction.

The visit by a Keller team at Handtmann was according to our customers and advise them accordingly.

The modified casting process creates a problem in the separation.

“For so far, the separation system collected a large volume of sand besides the polystyrene fumes”, explains Georg Schirmer, the responsible at Handtmann. “Now, we modified the process a little bit, so that the separator does not collect as much sand.” The filter’s reliability period have been reduced. Until recently, a filter lasted for approximately half a year. “That was OK for us”, says Schirmer. But the last filter had to be replaced after seven weeks. Since filter exchange after replacement is very expensive, Schirmer inquired how the service life of the filters could be extended.

Handtmann: Keller service in action

The separation problem is discussed collectively and a solution is developed.

Collaborating on a solution together

“The problem could potentially be solved by adding limestone powder which binds with the fumes so that the filter can be cleaned more easily”, advises Rolf Stojan of Keller Lufttechnik. “An alternative would be to attach the polystyrene separation to a system with two filter cells whose separation method would be specifically designed for adhesive fumes. The currently used system also separates various other locations.” Keller is presently testing different processes and will ultimately come to a suitable solution that meets both the customer’s expectations and all legal requirements.

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Keller Service
Behind the Scenes

Miniature exhibits attract visitors

“The car’s future is the electric drive vehicle. The limited supply of fossil fuel energy sources and the climate change impel us to act.”

All the headlines read the same. Keller Lufttechnik participates in paving the way for electric-powered mobility in utilizing an electric vehicle in its car pool. The company not only installed its own photo-voltaic system to produce current, but also applies environmentally friendly resources inside the drive controls.

Keller Lufttechnik is participating in the research project “MeRegioMobil” together with EnBW and Daimler which is supported by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Select customers test the smart electric drive vehicle for this project.

The goal of the project is to collect data from an integrated charging process which provides information for the further development of electric vehicles and a suitable infrastructure.

The intelligence of the charging process lies in the exchange of information between the smart fortwo’s electronics and the power supply system. This, among others, makes it possible to control re-charge intervals in such a way that favorable charge times can be used effectively.

The “quiet scooter” boasts a lithium-ions battery as the first electric vehicle in the world which is re-charged with Keller’s own current. Charging at the in-house filling station, the so-called “wallbox” and at public charge stations is comfortable, easy and safe – as is the billing.

With a range of 135 kilometers and a top speed of 100 km/h, the smart is an ideal vehicle for urban and regional travel. The electric vehicles are still quite expensive, but soon the batteries will become less costly. As soon as the electric car costs equal those of an automobile with a combustion engine, it realizes a clear advantage: electrical current costs are half of those for gas or petrol.

GIFA, the International Trade Fair for Foundry, Foundry Technology and Melting Furnaces concluded in June 2011 in Dusseldorf setting a new exhibitor and visitor record.

Keller Lufttechnik exhibited three miniature air pollution control units. The systems are fully functional and were specifically manufactured for the trade fair by our Keller interns. Future production mechanics, draftsmen, and Bachelors of Engineering were entrusted with the construction, manufacture and assembly of the miniature systems. Our interns were also responsible for the commissioning on site on the platform and for disassembly after the trade fair. The smaller exhibits were an eye-catcher and an attraction for visitors.
Project KLean renders administrative processes at Keller much more effective

Improvements can always be made: In accordance with this motto, Keller tested its administrative processes, defined optimized processes and immediately implemented them. External consultants supported the project team. It was concluded that the details created the problems. The goal was that the Keller administration work more effectively with the new processes effective March 2012. Customers benefit by receiving their quotations and finished transactions earlier, and more reliably with an order processing process. The process optimization reduces the causes for the errors simultaneously, the quality will inevitably increase – despite faster processing.

Project work binds everyone together

All modified processes have been adopted in daily operations since May 2012. Nevertheless, Jens Kuhn will not lay back. “Improvement is a constant process. We stay on task”, he promises. The prerequisites are perfect: The project work was good for team spirit and everyone had fun – maybe because of the newly introduced rule by the experts of Festool-Engineering that everyone who arrives late for a meeting has to perform a song.”

Company founder named patron

In the city center of Jesingen, which belongs to Kirchheim, a new square which invites one to stay, was opened only a five-minute walk from our company. The small river Lindach can be accessed by a stairway – an opportunity which is gladly used by children playing by the river. What was missing was a suitable name. Finding one was not difficult: Heinz-Dieter Keller, who directed Keller Lufttechnik for a span of four decades and who turned the company into an international enterprise and the largest employer in Jesingen. The senior director always displayed a strong social commitment. In February 1987 he received the Bundesverdienstkreuz am Bande which is an award of merit in the Federal Republic of Germany. It is awarded to individuals with special contributions to the political, economic, cultural, spiritual or charitable spheres. Heinz-Dieter Keller received this award for his support of local clubs, especially for work among the youth. He died in 2007 at the age of 80. The city center of Jesingen, the Heinz-Dieter-Keller-Platz was named in his honor.

Soccer for a good cause

This is the motto of the second charity soccer tournament, which took place on June, 2nd 2011 at the sports grounds in Jesingen. 16 teams played for the second KI-Cup 2011 to benefit the local Kindergartens and the youth team of the Jesingen soccer club. Keller suppliers and business partners as well as other local company and hobby teams took part. 2,100 Euro were raised from sponsors and entry fees. The youth team wants to use the money for new soccer balls and slalom poles. The kindertartens plan to invest in a water game and a slide for the garden. The winners of the tournament were the Keller interns who took the trophy home – back to their own training workshop.

Health Awareness Day at Keller Lufttechnik

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All employees enjoyed the opportunity to explore the subject of health on 20 October 2011. Experienced advisors were available for free precautionary measures. The team who accompanied company physician Dr. Martin Schmieder were responsible for taking blood pressure measurements, lung capacity, as well as influenza immunization and finally, medical counseling. Experts from Optik Bacher performed vision tests and advised some employees to wear glasses as a result of those tests. Cholesterol and blood sugar measurements were performed by pharmacy staff. The AOK, our local health insurance company, offered shoulder-neck massages and spinal column adjustments as well as a body-mass analyses. Smokers were able to measure the carbon-monoxide content of their exhaled air. This convinced some to stop smoking. The next health awareness day will demonstrate how well they followed up on their resolutions.
>> TRADE FAIRS 2013

We will be participating at following trade fairs:

**intec, Leipzig**
26.02. – 01.03.2013

**HANNOVER MESSE 2013 (HMI)**
08.04. – 12.04.2013

**EMO, Hannover**
16.09. – 21.09.2013

**K 2013, Düsseldorf**
16.10. – 23.10.2013

We are pleased to send you a free entry voucher. Please contact our Ms. Andrea Koch, koa@kl-direkt.de.

We look forward to your visit!

The information given in the leaflet does not have the function to convey a defined idea. Due to the application range variety, an individual advice by our engineers is absolutely necessary. We remain at your service for any additional questions you may have.

**IMPRESSUM**

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