KAESER KOMPRESSOREN

KAESER report

Market Sector: Construction



The construction site of tomorrow

From smart controllers to emission-free drives

Compressed Air Applications in Construction

KAESER Products and Services

Assuring the future of the past with modern technology

Preserving cultural heritage with advanced portable compressors

A revolution in tunnel construction

Compressed air for next-generation tunnel boring machines

CONSTRUCTION









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Building the future, today

From the towering skylines that define our cities to the vital infrastructure connecting our communities, compressed air is an essential utility required for a vast array of applications across the construction industry. Its presence is felt throughout nearly every project stage, underpinning a truly extensive range of operations - from providing the high-pressure air flushing essential for geotechnical drilling to the precise delivery of high-quality compressed air for shotcreting and dry-ice blasting.

In a sector currently undergoing an unprecedented transformation, the demands on critical utilities like compressed air are evolving at a rapid pace. Driven by digitalisation, sustainability, and the push for greater productivity and resilience, this shift is evident as companies actively seek greener building methods, more energy-efficient equipment, and digital tools. The scale of this evolution is immense; construction-industry-related spending already accounts for approximately 13% of global GDP, and the market is on a trajectory to reach over $16 trillion by 2030. Consequently, while durable and dependable performance remains paramount for consistent operation, portable compressors are now also required to be highly energy-efficient to meet stringent environmental targets, and equipped with advanced digital features for optimised management and data-driven insights.

At KAESER KOMPRESSOREN, we understand these intricate demands, and our portable compressors - such as the renowned MOBILAIR range - are designed to not only meet but exceed these challenges. True to our core philosophy of delivering „More compressed air for less energy," our units are designed for exceptional energy efficiency. This includes the MOBILAIR e-power electric portable compressor range, perfect for use in low emission and noise protection zones. Beyond core performance, our commitment to cutting-edge design extends to advanced digital integration within our products. Our advanced control systems, such as the intuitive and easy to use SIGMA CONTROL MOBIL 2, provide real-time data, facilitate remote monitoring via KAESER TELEMATICS, offer diagnostics, and support predictive maintenance strategies, ensuring optimal performance, maximum uptime, and significant cost savings for demanding construction projects.

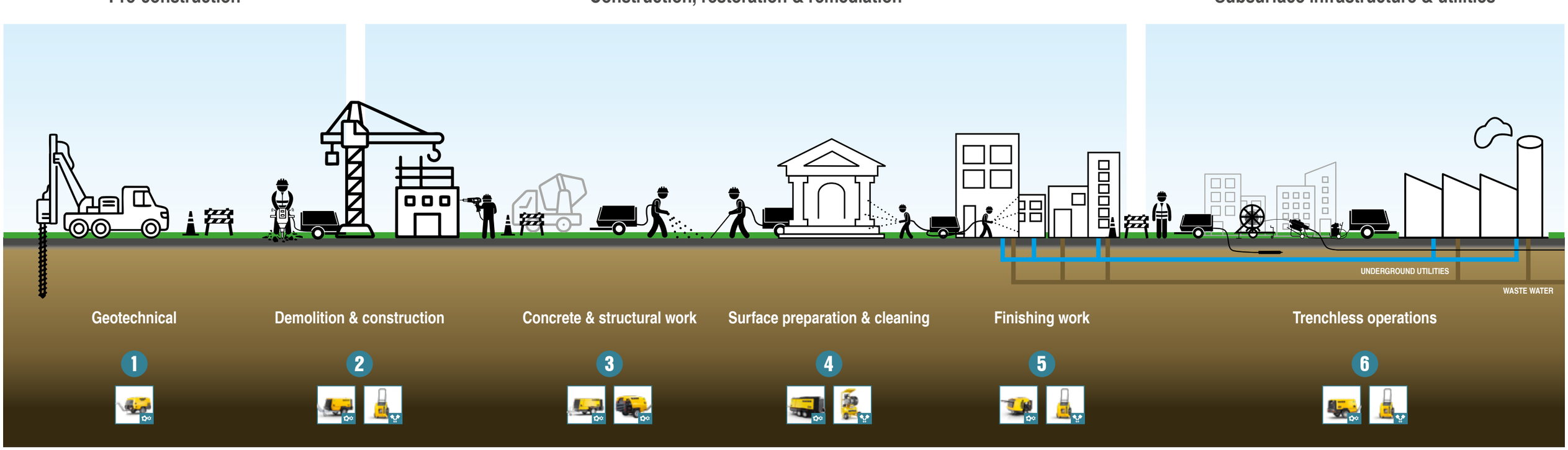
In this special edition, we explore the key compressed air applications across the entire construction value chain, highlighting our extensive product portfolio engineered to meet these diverse needs. You will also find a curated selection of success stories that showcase our equipment in action. From the heavy-duty demands of tunnel boring and demolition to the precision required for surface preparation and cleaning, such as sandblasting and dry-ice blasting, these real-world examples demonstrates how our portable powerhouses adapt to the unique challenges of every project stage.

Compressed Air Applications in Construction

From demolition and construction, to restoration and remediation projects, compressed air is an essential utility used extensively across the construction sector. Here, robust and high-performance portable compressors are required, that can deliver a reliable and continuous supply of compressed air - even under the harshest construction environments and climatic conditions.

KAESER Products, Services and Solutions for the construction site
To be equipped for every need – no matter how demanding – our compressors can be fitted with a wide range of options. Our product range extends from compressed air treatment components such as filters or aftercoolers, through various chassis versions, to variants with generators for the simultaneous production of compressed air and electricity.

Our MOBILAIR portfolio for your compressed air needs on the construction site
- Mobile screw compressors including TELEMATICS
- Mobile piston compressors
- Tools and accessories
- KAESER Air Service



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With a wide range of equipment and compressed air treatment options, the portable compressors of our MOBILAIR range are equipped to meet all requirements. They offer outstanding performance, flexibility, and absolute reliability – every time.

1 Geotechnical

Pre-construction of major structures typically start with geotechnical drilling to assess the strata. Compressed air is required to transport the cuttings to the surface in a process which is referred to as flushing. When a DTH (Down-The-Hole) drill is being used, compressed air will also often be required to operate the drill.
Typical applications: air flushing, DTH drilling



Geotechnical drilling requires compressed air for flushing.

2 Demolition & Construction

Favoured for their power, durability and efficiency, pneumatic tools require a reliable source of compressed air for optimal performance. The dependability, efficiency, and in some cases quality of the compressed air supply will further impact pneumatic tool productivity and service life.
Typical pneumatic tools: breakers, hammer drills, impact wrenches, nailers, screwdrivers, chisel hammers, drills



Many demolition and construction projects use pneumatic tools, which require a reliable compressed air supply for effective operation.

3 Concrete & Structural Work

Compressed air is pivotal in achieving good concrete compaction in shotcreting and concrete vibration. For optimum results, the compressed air supply must reliably meet the pressure and airflow required, delivering cool and condensate-free compressed air. Shotcreting additionally requires technically oil-free air.
Typical applications: shotcreting, concrete vibration.



Compressed air is frequently used in the placement and finishing phases of concrete placement and plays a crucial role in achieving good compaction.



KAESER portable compressors ensure a consistent, reliable supply of compressed air - perfectly suited for the preparation and cleaning of surfaces indoors and outdoors.

4 Surface Preparation & Cleaning

Many surface preparation and cleaning applications rely on compressed air, such as sand- and dry ice- blasting. For maximum productivity and equipment longevity, these applications require a constant supply of cool, condensate-free and technically oil-free compressed air that consistently meets the compressed air pressure and airflow requirements.
Typical applications: sandblasting, dry ice blasting, floor stripping, sanding & grinding



A conventional spray gun is used for painting surfaces.

5 Finishing Work

Compressed air is often used for applications like surface painting, plastering shell walls, and installing blown-in insulation, where pneumatically powered equipment is favoured for its efficiency and speed in getting these finishing jobs done.
Typical applications: blown-in insulation, grouting, plastering, surface painting



Many trenchless applications require compressed air for repairing, replacing, and installing underground utility lines.

6 Trenchless Operations

Many trenchless technologies require compressed air in repairing, replacing and installing underground utilities. For optimum performance some applications will require air treatment. Pressure and flow are additionally critical factors impacting the efficiency, performance, and suitability of an air system for a specific application.
Typical applications: impact moling, fibre blowing, sewer rehabilitation

Preserving cultural heritage with advanced portable compressors

Assuring the future of the past with modern technology



The Romanian village Geoagiu, located in the heart of Transylvania, is home to what is believed to be the oldest medieval chapel in Romania. In the early 1990s, archaeologist Gheorghe Petrov began his quest to find out when exactly the chapel was built. On a journey of discovery that would last over a decade, he examined both the exterior and the interior of the building in minute detail. During the associated excavation work, he and his team uncovered more than 200 tombs, the oldest of which date back to the reigns of King Ladislaus I (1077-1095) and King Coloman the Learned (1095-1116).

The Romanesque chapel “Rotonda” in Geoagiu is one of the oldest surviving sacred buildings in Romania. Due to its circular shape and the construction materials used, it is a rarity amongst Romanesque architecture in Transylvania. Its exact construction date is unknown, but based on the archaeological finds – especially the tombs located in the churchyard, which date back to around 1100 AD – the church must have existed as early as the late 11th century. The chapel “Rotonda” was used as a church until the end of the 16th century, when the new church (Biserica Reformata) was completed adjacent to it in the churchyard. Today, the building remains home to a valuable pipe organ crafted by the renowned organ builder István Kolonics. It is interesting to note that numerous church details, both inside and out, reference aspects of Roman history and tradition, such as the statues of two lions on the church door, which are possibly ex-voto statues for healing of the sick, who used the nearby thermal baths. However, they may refer to the coat of arms of the XIV Roman legion, the so-called Gemina, who were encamped in the Geoagiu area. To the right of the entrance there is a bas-relief depicting the demigod Hercules, who was worshipped by Roman soldiers, and directly beside it is a funerary monument embedded in the church wall, with a portrait of a Roman woman.

Image right: Compressed air is essential to operate the various special equipment needed for façade restoration.
Image below: Numerous details both inside and outside the church reference aspects of Roman history and tradition.



In-depth technical know-how

In order to preserve this unique edifice for future generations, the “Reformed Diocese of Transylvania” commissioned Domino Construct Expert, a renowned construction company, with restoration of the sacred building in 2021. The extensive renovation work on the façade not only required in-depth technical know-how and specialised equipment, but also a particular proficiency in working at great heights. The necessary expertise for this part of the restoration was provided by façade specialist ALPIN SHUNT. Founded in 2009 by Managing Director István Cseresznyes, the company provides expert façade restoration and cleaning services for historical monuments and buildings – skills which are in great demand today. ALPIN SHUNT employs a wide variety of sophisticated equipment, allowing it to conduct specialist operations such as the most diverse sandblasting processes currently available (blasting with sand, dry-ice blasting and hydroblasting). When it comes to performing restoration and cleaning work on tall buildings and monuments (such as church towers) or metal structures (e.g. tin roofs), such operations have to be conducted in combination with climbing techniques – as was the case with the Romanesque chapel in Geoagiu.

Construction site powerhouses Made in Germany

Compressed air is essential to operate the various special equipment needed for façade restoration. It provides the power for all devices, such as vacuum cleaners, high-pressure cleaners, dry-ice blasters, water jet washers, steam cleaners, etc. To deliver the necessary compressed air, ALPIN SHUNT relies on MOBILAIR 31 and MOBILAIR 82 portable compressors from KAESER. Equipped with advanced, fuel-saving Kubota diesel engines and durable bodywork, these versatile powerhouses are able to meet even the toughest of construction site conditions: featuring rotation-sintered PE enclosures for maximum impact resistance, they are also intuitive and simple to operate, making them highly valued construction site partners. Costly downtime is also avoided thanks to optimal accessibility to all maintenance points, which is especially important for timely completion of restoration work. Furthermore, the MOBILAIR 82 is equipped with a generator to provide a mobile power source whenever and wherever it is needed on the construction site. Emission-free e-Power versions with energy-saving electric motors are also available for sensitive indoor and enclosed areas.



All images: Sorin Gliga, GLISOR MIX SRL

> The portable compressors from KAESER provided a dependable supply of quality compressed air for all of our restoration equipment.
>
> *István Cseresznyes, owner ALPIN SHUNT*

Preserving cultural heritage with modern craft compressors

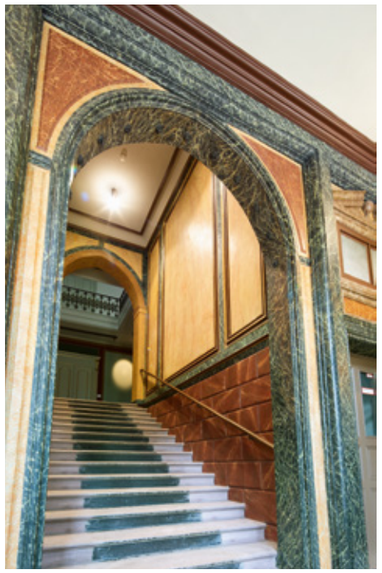
Industrious artisans in their element...

The neo-Gothic summer palace in Coburg, Schloss Ketschendorf, was built in 1868 and looks back on a long and eventful past. The owner back then was the celebrated French opera singer Victorine Noël, later Baroness von Ketschendorf, whose most ardent admirer was none other than Duke Ernst II of Saxe-Coburg and Gotha. The residence changed hands several times in the intervening years and was even used as a youth hostel from 1956 to 2010. It has been owned by KAESER KOMPRESSOREN since 2012 and is once again resplendent in its former glory after years of dedicated renovation and repair work with the help of modern technology.



The neo-Gothic summer palace in Coburg was built in 1868 and has been in KAESER's ownership since 2012.

The residence, constructed in the neo-Gothic style and situated in a beautiful park setting in the Coburg district of Ketschendorf, has changed hands nine times in the 153 years since it was built in 1868. From 1956 to 2010 it operated as a youth hostel, owned at the time by the city of Coburg, but this use had to be discontinued due to the need for extensive renovation work. When the residence subsequently came up for sale in 2012, KAESER KOMPRESSOREN took immediate interest and the idea to create an extraordinary training centre quickly gathered momentum. Lectures, seminars, workshops and training courses for employees and customers will soon take place in the historic rooms following completion of the extensive renovation work. From the very outset, the core aim of the restoration project was to preserve the historical fabric of the building. This involved various craft businesses, predominantly from the surrounding region, who could demonstrate their impressive workmanship and expertise, whilst compressors from KAESER provided dependable onsite compressed air support.



During the renovation, great care was taken to ensure that the historical fabric of the building was preserved.



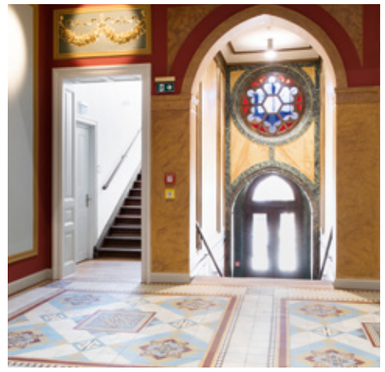
The stucco ceilings, as well as the wall and ceiling murals, had to be exposed and restored throughout the residence.

The right help makes all the difference

The precious, historical wooden and tiled floors throughout the residence were in very poor condition, but were brought back to life during the course of extensive renovation work. This was no easy task however, since tiles that were too badly damaged needed to be replaced with new ones, but these were not allowed to differ in shape or colour from the existing ones. The wooden floor was therefore renovated and partially renewed by a company that specialises in such delicate and detailed work. All craft compressors from the PREMIUM CAR series are the ideal choice for a wide range of indoor work. The PREMIUM CAR 450/30 W (see page 13) can be perfectly adapted to meet the needs of various craft applications through the selection of appropriate accessories. For example, it can be used in combination with a compressed air lance to remove old floor coverings, or with a compressed air chisel to loosen defective tiles. In conjunction with a small CO_2 blasting unit, it is the perfect partner for the removal of encrustation from sandstone – a particularly gentle technique when it comes to preserving the existing fabric of a building. Its somewhat smaller brother, the PREMIUM COMPACT S 450/30 W, also provides significant benefits with its compact design, which makes it especially interesting for the construction industry. The floors, the stucco ceilings, as well as the wall and ceiling murals, were all in very poor condition throughout the building. Some stucco elements were even missing and had to be reconstructed by hand. The wall and ceiling murals, some of which had been painted over several times over the decades, were no longer visible, but were uncovered and restored to their former glory. The MOBILAIR 13 E portable compressor with electric drive has proven to be an invaluable assistant for major indoor renovation work, especially when a higher working pressure is required. In combination with a small CO_2 blasting unit, old varnish and paints can be reliably removed from carrier materials such as wood and metal without damaging the sensitive surfaces beneath. The slightly



The wooden floor was renovated and partially renewed by a specialist craft company.



Irreparably damaged tiles were removed and replaced with new ones.



The craft specialists can remove defective floor coverings using the PREMIUM CAR 450/30 W in combination with a compressed air lance.



The i.Comp 3 reciprocating compressor is a popular choice when carrying out fine work on the roof structure.



Extensive renovation work was carried out on the sandstone and clinker brick façade with the MOBILAIR 27 portable compressor (also see image below).

larger MOBILAIR 13 portable compressor with combustion engine was used outdoors for fine chiselling work, since no electricity supply was available. The historic windows and doors were reconstructed, renovated, colour-matched and subsequently reinstalled by a craft business specialising in cultural heritage protection, so that they could shine again as they did when originally new. With their compact footprint of only 0.62 m² and combining all of the components necessary for quality compressed air supply (namely a SIGMA Profile rotary screw compressor, a refrigeration dryer and a compressed air receiver), turnkey all-in-one SXC compressed air stations were the ideal choice for this work, which was carried out in a special onsite workshop. The compressed air quality is matched to the pneumatic control devices of modern machine tools, such as those used in wood window production.

Created for craftwork

The greatest challenge was the repair of the roof structure, which had to be completely renewed and today spans a spacious interior for larger workshops and events. KAESER's PREMIUM CAR series craft compressors are perfect for all types of carpentry work. The craft specialists particularly like to reach for the i.Comp 3 (pressure variable up to 11 bar, flow rate up to 160 l/min) reciprocating compressor when carrying out fine work on the roof structure, since it does not use a compressed air receiver. This makes the compact compressor exceptionally lightweight and means that it can be taken anywhere. In combination with a small spray gun (airless gun), the i.Comp 3 is a great construction site helper.

Last but not least, the MOBILAIR 27 portable compressor with aftercooler and centrifugal separator, in combination with a breaker, proved its mettle in performing extensive renovation work in the outside area, on the sandstone and on the clinker brick façade.

The renovation and repair work on the Schloss Ketschendorf summer palace in Coburg spanned five years (2015 - 2020) and the results are clear to see. There is no question that the original goal of transforming the once dilapidated residence into a sparkling jewel has been achieved, and today the historical backdrop offers a more than befitting stage for a wide variety of events for KAESER customers and employees alike.



Various craft businesses from the region could demonstrate their impressive workmanship and expertise.





With its compact footprint, the turnkey, all-in-one SXC compressed air station is also suitable for smaller workshops.





Dependable construction site helpers: PREMIUM CAR series reciprocating compressors (left image) and the M 13E electric drive portable compressor (right image).

Expanding the machine park at Germany's Federal Agency for Technical Relief

M 59 PE – Emergency assistance specialist



Civic emergency relief operations depend on compressed air. Frequently, they also require an electrical power supply for their special equipment. The new all-rounder from KAESER's road-going range of portable rotary screw compressors not only delivers more compressed air for less energy, but can also be specified with an optional integrated generator, thereby transforming it into a compact and convenient power plant. The associated flexibility, functionality, versatility and sustainability of the overall package convinced the German Federal Agency for Technical Relief to expand its equipment park with these innovative systems from KAESER's tried and tested MOBILAIR series.

The demands that Germany's Federal Agency for Technical Relief (THW in German) places on its fleet of mobile compressors are as varied as the emergencies it could find itself facing. On the one hand, compressed air is frequently required during emergency rescue operations for powering hand-held tools such as drills and breakers, in order to clear away rubble, open up access ways, etc. On the other, some rescue situations also require the use of electrically powered tools, lighting equipment and submersible pumps.

Enter the new all-rounder from KAESER KOMPRESSOREN's MOBILAIR range of portable compressors: the M 59 PE. With its optional integrated generator, this versatile compressor provides the perfect combination of compressed air and power generation.

To accommodate the vast range of potential emergency situations it may confront, the THW requires a flow rate of at least 4 m³/min at a minimum pressure of 8 bar – a walk in the park for the M 59 PE, which is available in 10 bar and 14 bar versions with flow rates from 3.8 to 4.7 m³/min (135 – 165 cfm). The integrated generator is available in one of two variants; an 8.5 kVA version or a 13 kVA version. With this variety of options, the new M 59 PE is able to meet the needs of virtually any scenario effortlessly, as and when required.

The new, road-going M 59 PE portable compressor is equipped with robust wing doors constructed of roto-moulded polyethylene.



Perfect control

The M 59 PE owes its extraordinary flexibility to its standard-equipped pV control, which allows the operator to use the maximum possible flow rate in accordance with the current set pressure. Pressure is adjusted simply and conveniently at the press of a button via the tried and tested SIGMA CONTROL SMART internal controller. Thanks to perfect interplay with the engine management system, the internal compressor controller ensures maximum compressed air availability relative to power requirement and the set operating pressure. The operator can set the maximum pressure (p) in 0.1 bar steps anywhere between 10 and 14 bar – a feature that is particularly useful when working with longer hose lines.

Environmental benefits

Given the nature of its equipment fleet, the introduction of EU Emissions Stage V legislation at the beginning of 2019 was a matter of particular importance for the THW. In the case of the M 59 PE, the limit values stipulated in this regulation are easily achieved thanks to its electronically controlled engine featuring a diesel particulate filter. The version used by the THW is further configured to run on Panolin special biodegradable oil, certified with an EU Ecolabel for its especially environmentally friendly operation. Further features of benefit to the environment include a closed floor pan, which ensures that any potential fluid leakage poses no threat of ground contamination, as well as an integrated compressed air aftercooler. As with all MOBILAIR units, the hot exhaust gases from the engine are used to evaporate any accumulating condensate.

> The ability to provide variable compressed air and power generation convinced us to add the M 59 PE portable compressor to our machine park.

Equipped to impress

Not only does this new addition to the MOBILAIR range feature the very latest technology, it also boasts a number of impressive additional features, such as a transport chassis that enables the unit to be easily hoisted onto a loading bed and securely lashed in place; like all MOBILAIR models, the M 59 PE is equipped with lifting eyes as standard. Another useful feature is the hose reel installed at the front of the machine. It holds 20 m of lightweight hose which, for added ease of operation, does not need to be fully reeled out for use. Furthermore, the integrated tool lubricator ensures correct lubrication throughout that distance for the latest-generation breakers such as those supplied within the scope of delivery to the THW, which impress with their low air demand and finely tuned start-up behaviour.

When it comes to the body colour, it does not always have to be yellow either. The PE wing doors are available in 4 special colours ex-stock. In this case for example, rather than go with its usual corporate RAL 5002 (Ultramarine Blue) colour, which is theoretically also available, the THW opted for the more readily available RAL 5017 (Traffic Blue) option, which will make ordering spare parts quicker and easier in the future. The PE wing doors provide perfect sound insulation regardless of the choice of colour, whilst the large opening angle ensures best-possible access to all components, thereby guaranteeing maximum maintenance-friendliness.

Portable compressors in the service of science

The highest construction site in Europe

In a challenging alpine environment at an altitude of 4,554 metres, the “Capanna Regina Margherita” mountain hut is the site of a collaboration between scientists from the Polytechnic University of Milan and the Italian Alpine Club. Here, using portable compressors from KAESER, a research team is installing sensors for the purposes of monitoring permafrost conditions and rock stability.



Named after Queen Margherita of Savoy, the “Margherita Hut” is the highest alpine hut in Europe, situated at an elevation of 4,554 metres above sea level. The hut is located in the Monte Rosa group (Valais Alps), on the Swiss-Italian border between the towns of Alagna and Zermatt. Its establishment dates back to a resolution by the delegate assembly of the Italian Alpine Club in 1889 to build a mountaineer accommodation and research station on the summit.
To this day, the mountain hut houses scientific facilities for high-altitude medical experiments, in addition to an observatory.

Scientific collaboration

In September 2023, work began in the immediate vicinity of the Margherita Hut as part of a project led by Francesco Calvetti, Professor of Geotechnics at the Polytechnic University of Milan, in collaboration with the Italian Alpine Club (CAI). The research project’s goal was to assess the condition and stability of the surrounding permafrost and the safety of the overlying structures by measuring various data. Soon, geologists Andrea Tamburini, responsible for data processing and analysis, and Fabio Baio – a seasoned expert in glaciology and permafrost drilling thanks to his numerous assignments in Antarctica and the Alps – joined the project. We had the opportunity to talk with Fabio Baio about the details and background of the research project.



> The reliability and performance of the compressors are decisive factors for the success of the project.
>
> ***Dott. Fabio Baio***

Image left: The payload capacity of the transport helicopter had to be taken into account when selecting the compressors.
Image right: MOBILAIR portable compressors are well equipped for demanding, continuous use on construction sites, even under harsh climatic conditions.



All images: KAESER COMPRESSORI s.r.l.

Dott. Baio, what is the purpose of the project?

This project aims to measure and evaluate the quality and stability of the rock using suitable measuring instruments, as well as to record temperature and vibration values that may indicate events such as earthquakes or collapses. For installation of the sensors that collect the measurements, two boreholes were drilled near the hut, one horizontally and one vertically. This allows the sensor chain, connected to a strain gauge, to monitor the condition of the permafrost and the stability of the rock.

What role does compressed air play in this project?

Compressed air played a crucial role as an energy source for the drilling operations required to install the measuring and testing instruments. For our application, two diesel-powered portable compressors from KAESER's MOBILAIR range provided the perfect solution.

What were the selection criteria for the compressors?

We selected the compressors based on several factors: first, we needed to meet the delivery volume requirements for the drill, which were 6 to 7 m^3/min (at 5 to 7 bar pressure). We also considered the unavoidable performance losses due to the lower oxygen content in the high-elevation atmosphere compared to standard conditions. Lastly, we took into account the payload capacity of the helicopter used to transport the equipment to the site. We chose two portable compressors from KAESER's MOBILAIR range, which, with their weight of less than 750 kg, could easily be transported by helicopter.

KAESER MOBILAIR units are well equipped for demanding, continuous use on construction sites, even under harsh climatic conditions. They reliably deliver the required compressed air quality thanks to numerous optional treatment components. The Anti-Frost Control automatically adjusts operating temperature to the outside temperature.

Dott. Baio, what did you think of the performance of the MOBILAIR units overall?

The KAESER units performed flawlessly and more than met our expectations. In this extreme and unpredictable alpine environment, the reliability and performance of the machines are essential to ensure smooth operation of all tools and equipment. Their exceptional reliability, even under such extreme climatic conditions, provided us with the necessary compressed air to operate the instruments and monitor the various environmental parameters, enabling us to properly conduct all activities related to the project's measurement objectives.



Working at this elevation poses a significant challenge for both the scientists and the equipment.

Compressed air for next-generation tunnel boring machines

A revolution in tunnel construction

Driven by a desire to redefine the status quo of tunnelling technology, Elon Musk and his company, “The Boring Company”, launched a bold new competition in July 2020. The aim? To challenge students from around the globe to design a tunnel boring machine that’s faster than anything the world has seen. Leading the charge was a team from the Technical University of Munich (TUM) – and they’ve topped the podium three times.



M 65:
Compact, powerful and ready for anything: The MOBILAIR M 65 delivers between 4.6 and 6.6 m³ of quality compressed air per minute. Thanks to its innovative pV Control, equipped as standard, pressure can be flexibly adjusted between 6 and 14 bar to meets the needs of the specific application at hand. Its low-emission Stage V engine guarantees environmentally responsible performance, while the intelligent Anti-Frost Control automatically adjusts the system according to ambient temperature, thereby providing optimum protection in cold conditions. When paired with the optional tool lubricator, it also safeguards pneumatic tools from freezing – extending their service life and ensuring maximum reliability. The M 65: portable compressed air, wherever you need it.

The MOBILAIR M 65 injects a stabilising foam into the Texan clay, preparing the soil for efficient tunnelling.

The Boring Company is driven by a bold mission: to revolutionise tunnelling technology by reducing costs and speeding up construction. The aim is to make underground transportation systems – such as the Las Vegas “Loop” and future “Hyperloop” concepts – faster, more efficient, and economically viable.
In pursuit of this vision, the company launched the international “Not-a-Boring Competition”, challenging the brightest minds in tunnelling to design and build the world’s fastest tunnel boring machine. Among the most consistent contenders is TUM Boring – Innovation in Tunneling e.V., a student organisation of more than 60 members from the Technical University of Munich (TUM). Since the inaugural event in 2020, the team has claimed first place twice – and in March 2025, they returned for a third time with their next-generation machine, setting new standards in speed and technology.

> Our machine had to be incredibly reliable to win this competition – and KAESER was a rock-solid partner.
>
> ***Felix Blanke, Project Manager***



The TUM Boring team has now taken part in the “Not-a-Boring Competition” three times.

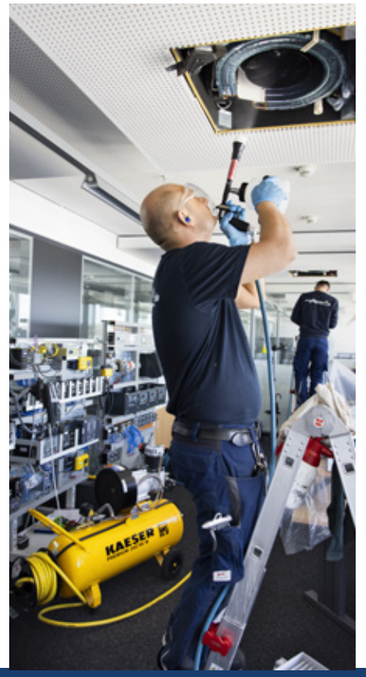
Engineering meets ingenuity

At the core of their new design is the “Power Pipe” – the lead tunnel section housing all systems required to power the cutting head. This rotating head excavates the soil as it advances, pushed forward by a hydraulic press frame that also drives the tunnel lining. “The spoil is extracted centrally using a suction excavator,” explains Technical Director Anton Vierthaler.
It may sound simple, but this breakthrough is the result of months of intensive development. The team significantly increased the torque at the cutting head, relocated the drive system underground, and developed a new pipe-joining system capable of transmitting both compressive and tensile forces – enabling machine operators to respond flexibly to different ground conditions.
Yet innovation brings its own challenges, and the sticky clay in the Texan soil proved particularly troublesome. To tackle this, the team developed a sophisticated soil conditioning system using a specially formulated foam to reduce stickiness – and this is where another key player entered the story: the MOBILAIR M 65 from KAESER.
This portable compressor not only cleans the cutting head, but also foams the soil conditioning agent – a crucial process for maintaining steady progress in difficult ground conditions. “When it came to selecting a compressed air partner for our project, KAESER was our first and only choice,” says Project Manager Felix Blanke. “That was partly based on recommendations from other companies in the tunnelling industry, but also because we needed absolute reliability to have any chance of winning the competition. And KAESER’s quality is second to none.” This gave TUM Boring a clear advantage, and the strategic use of compressed air proved to be a real game-changer.

The big moment in Texas

All the hard work paid off. At the final of the 2025 Not-a-Boring Competition in Bastrop, Texas, the TUM Boring team hit a new milestone, with their machine achieving a bore length of 22.5 metres and setting a new competition record. It secured them not only the overall win but a place in the history of cutting-edge tunnel construction. Three competitions, three clear victories, and each by a wide margin.
It’s a testament to the team’s tireless dedication, technical ambition and strong partnerships, such as the one with KAESER. “This success confirms that we’re on the right path, as a team and with our concept,” says Felix Blanke with pride. “It shows what can be achieved when passionate people work together towards a shared vision.”





Left: The 'Eisschmitt Truck' transports the MOBILAIR compressor and all necessary dry ice blasting equipment.
Right: On site at KAESER's Coburg facility – ventilation duct cleaning in action.

Ventilation hygiene and dry ice cleaning experts

No room for stale air

In the town of Rottendorf near Würzburg, Eisschmitt GmbH & Co. KG is making a name for itself as an agile, forward-thinking company. Specialising in the hygienic inspection and cleaning of ventilation systems, as well as industrial cleaning using advanced dry ice blasting technology, Eisschmitt relies on high-performance compressors from KAESER to power its cutting-edge equipment.

During our visit, owner Thomas Schmitt and Project Manager Jerome Thompson welcomed us for a behind-the-scenes look at the company's services – and gave us a first-hand introduction to some of the powerful technologies they use in the field.

Why is it so important to regularly clean ventilation systems in public buildings, facilities and businesses?
Thomas Schmitt: "Ventilation and air conditioning systems often accumulate dirt, germs and mould spores – all of which can significantly impact indoor air quality. In many cases, routine maintenance only involves changing filters and cleaning fans. But to ensure safe operation and prevent contamination of the air with harmful microbes or mould, the ductwork itself also needs to be cleaned at regular intervals."

How do you clean kilometres of ductwork effectively?
Jerome Thompson: "We offer a range of highly effective cleaning methods and equipment for air ducts. Depending on the system, we use rotating brushes, flexible shafts or air whip systems – always combined with simultaneous vacuum extraction and disinfection. For large installations and particularly heavy contamination, we use our in-house developed JETTY robot – a premium solution we created in partnership with the Faculty of Electrical Engineering at the Technical University of Prague.

The JETTY robot, created in partnership with the Faculty of Electrical Engineering at the Technical University of Prague, is used for large installations and particularly heavy contamination.



The JETTY robot is purpose-built to inspect and clean hard-to-reach areas. Its onboard camera system streams live footage to the operator's control panel, enabling real-time navigation and cleaning. The robot's primary method of cleaning is dry ice blasting."

What exactly is dry ice blasting?
Jerome Thompson: "Dry ice blasting is a proven and effective method for cleaning all kinds of surfaces. It works in a similar way to sandblasting – but instead of abrasive media like sand, it uses frozen carbon dioxide (CO_2), in the form of pellets or microparticles. At our facility, we produce our own dry ice in pellet, nugget and block form to ensure consistent quality and availability."

What role does compressed air play?
Jerome Thompson: "Dry ice cleaning requires a specialised blasting system. This typically consists of a dry ice container and a compressed air source, with the compressed air propelling the dry ice particles through the nozzle at extremely high speeds. When the pellets hit the surface to be cleaned, three things happen: First, the high impact energy helps loosen the contamination. Then, the extremely cold temperature of the dry ice (-78.5 °C) causes the dirt layer to freeze and become brittle. Finally, the rapid expansion of the CO_2 gas helps lift the loosened particles away from the surface. This combination of kinetic energy, thermal shock and gas expansion makes it possible to remove even the most stubborn of contaminants – such as oil, grease or dust – thoroughly, gently and without leaving any residue behind."

Which KAESER compressors do you use?
Thomas Schmitt: "We've been using a range of KAESER reciprocating compressors for years; however, the newest addition to our fleet is the MOBILAIR M 255 rotary screw compressor – a large, diesel-powered unit equipped with a powerful 210 kW Cummins engine. Thanks to its pV Control system, we can adjust the pressure between 6 and 14 bar, depending on the cleaning surface and the degree of contamination, all with a single machine. Its maximum flow rate of 25.5 m³/min is a perfect fit for our requirements. My team especially appreciates how easy it is to operate. The rotary switch and touchscreen interface are so user-friendly they can be operated even with bulky work gloves. We transport the KAESER portable compressor, together with all necessary dry ice blasting equipment, using our new 'Eisschmitt Truck'. Because the M 255 can operate up to four dry ice blasting systems simultaneously, we're able to work faster and more efficiently at the customer sites."

> Because the MOBILAIR M 255 can operate up to four dry ice blasting systems simultaneously, we're able to work faster and more efficiently.
>
> ***Thomas Schmitt, Owner of Eisschmitt***

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