

The background of the entire page is a scenic photograph of a mountain range. The mountains are rugged and grey, with patches of snow or light-colored rock. In the foreground, there is a dense forest of dark green evergreen trees. Below the trees is a calm body of water, likely a lake or a wide river, which perfectly reflects the mountains and the sky. The sky is a pale, hazy blue with soft, white clouds. Overlaid on this image are several large, semi-transparent geometric shapes: a large dark triangle on the left side, a large light blue triangle on the right side, and a large white triangle at the bottom. The text "START WITH CLEAN AIR" is centered horizontally across the middle of the image, overlaid on the white triangle.

START WITH CLEAN AIR

START WITH AIR CLEANING BY ZEHNDER

Everything starts with clean air. It's the basis for safe, healthy employees, excellent quality, a positive image – and **success for your company!** In other words, taking steps to ensure clean air in the workplace is a good move for your business.

As the world's biggest name in clean air systems, Zehnder Clean Air Solutions can draw on **decades of experience and unmatched expertise** to help you. The other factors that make us different are the strong partnerships we have with our customers, which enable us to develop effective solutions together, and the way we listen to customers' individual requirements.

The result? Clean air solutions that create a sanitary working environment, significantly improve employee health and enhance your business's performance.



2,500+

DUST MEASUREMENTS PER YEAR

1 BILLION+

LITRES OF AIR CLEANED EVERY HOUR

15,000+

AIR CLEANING UNITS INSTALLED

20+

COUNTRIES

13+

YEARS PART OF ZEHNDER GROUP

3,000+

CUSTOMERS WORLDWIDE

20+

YEARS OF EXPERIENCE IN CLEAN AIR

100+

EMPLOYEES IN THE TEAM

TOP 10 BENEFITS OF CLEAN AIR

OUR CUSTOMERS' EXPERIENCES



Healthier, more motivated employees (+50%)

Show your employees that they are your greatest asset by investing in their health and wellbeing. Our customers have found that clean air is the key to a healthy and safe workplace. This helps them to motivate their teams to be more productive than ever.



Reduced cleaning costs (-70%)

You can get rid of dust through expensive cleaning contracts, but with Zehnder Clean Air Solutions, the cleaning burden on our customers' employees diminishes, allowing them to focus on their core business and generate more revenue.



Less equipment maintenance and reduced downtime (-30 %)

Abrasive dust can cause mechanical issues. Machines may require more frequent maintenance and even break, hampering your productivity. By ensuring clean air in their facilities, our customers have cut downtime by at least 30%, saving them both time and money.



A five-star review every time

Investing in clean air means that you can provide your clients with a first-class experience. Whether it's the shipping quality, fresh and clean looking products, or hitting that all-important deadline, our customers deliver time and again for their clients.



Meet tight delivery deadlines

Clean air means that you pay your employees to focus on achieving your client's deadlines rather than cleaning the product before it ships or cleaning your machinery before it breaks down. By removing dust from the air, our customers remove time and cost from their business plans.



Next-level productivity (+30%)

Air cleaning means that less dust settles on surfaces and equipment. As a result, they don't require cleaning or maintenance as often. This reduces wasted time, boosting efficiency by up to 30%, saving time and money.



Always ready for inspection

A clean work environment is one that is ready for an audit at any time. Don't spend extra time preparing for an audit or inspection or worry that someone will turn up unannounced; be confident that your site is inspection-ready all the time. Clean surfaces also make it easy to meet your insurer's requirements.



On the path to market leadership

If you start with clean air, you will differentiate yourself from your competition by boosting productivity, product quality, efficiency and your reputation.



Improved corporate image

Visitors to your site will judge its appearance and equate it to how well your organisation is run. Our customers remove dust before it has a chance to settle, so they always project a spotless image to their employees, customers, and visitors.



Better working environment

When your employees have a clean working environment, they're happier and healthier. Our customers can attract and keep the best people in their industries and improve their brand's image by providing clean air. Start with a smart solution for a better business, start with Zehnder Clean Air Solutions.



DB SCHENKER SUCCESS STORY

“I was impressed that the results were visible immediately after commissioning. The employees appear cleaner and are enjoying their work more.”

Benjamin Kalle, Head of system freight



CHALLENGES

Developing sound relationships with customers, partners and employees requires commitment and time. Dealing with high dust levels formed part of the right strategy for this procedure for DB Schenker, a leading transport and logistics company.

Operations at logistics facilities breed dust easily, especially in overland transport terminals where goods are constantly in motion. Levels of dust affected visibility and employee health, with some struggling to breathe properly. The facility had several safety risks.

BENEFITS

DB Schenker decided to install ten Zehnder air cleaning systems in the trans-shipment hall and the results were immediate and impressive. The air was visibly cleaner, with some describing the air as HD in quality. What's more, employees were described as cleaner and reported they could breathe better. Customers also noticed the difference and complimented the facility on its cleanliness.

Due to the success of these installations, Zehnder now supplies an additional two contract logistics facilities, at the Dortmund site with air cleaning systems.



LOCATION

Dortmund, Germany



INDUSTRY

Transport and logistics



87%

Dust reduction

EXCELLENT AIR QUALITY: WHY IS IT A MUST?

We spend a large part of our lives at work – usually inside buildings, such as factories or warehouses. With an average eight-hour day, most of us are at work for about a third of our time. That's why it's crucial to ensure good, clean air in the workplace. A high particle load isn't just harmful to your employees, but to your business as a whole.

Another important consideration is the question of pandemics, an issue that's on our minds now more than ever. Recent studies have shown that viruses "adhere" to particles, which allows them to spread. Because the dilution effect is usually less powerful in enclosed industrial buildings than outdoors, paying greater attention to air quality in the workplace is a sensible move for the future. For forward-looking, responsible companies, this means taking measures to ensure efficient air cleaning in good time.

Dust: What is it and where does it come from?

Dust consists of tiny, airborne particles. It can occur in nature, for example in the form of pollen, fungi or bacteria. It is also often produced by human activity, for instance in manufacturing, agriculture and construction.

How is dust particle size defined?

The size of a particle can be indicated in PM (particulate matter). A particle of around PM10 or larger is visible to the naked eye. The finer the dust, the greater the potential hazard. Particles of PM2.5 or smaller can be inhaled and enter the lungs or even the bloodstream. When this happens, these dust particles can cause significant, long-term health damage.

SIZE MATTERS

PM1: Ultrafine particles

Less than 0.001 mm
(can get into the bloodstream)

PM2.5: Fine particulate matter

Less than 0.0025 mm
(can reach bronchi and pulmonary alveoli)

PM10: Fine particulate matter

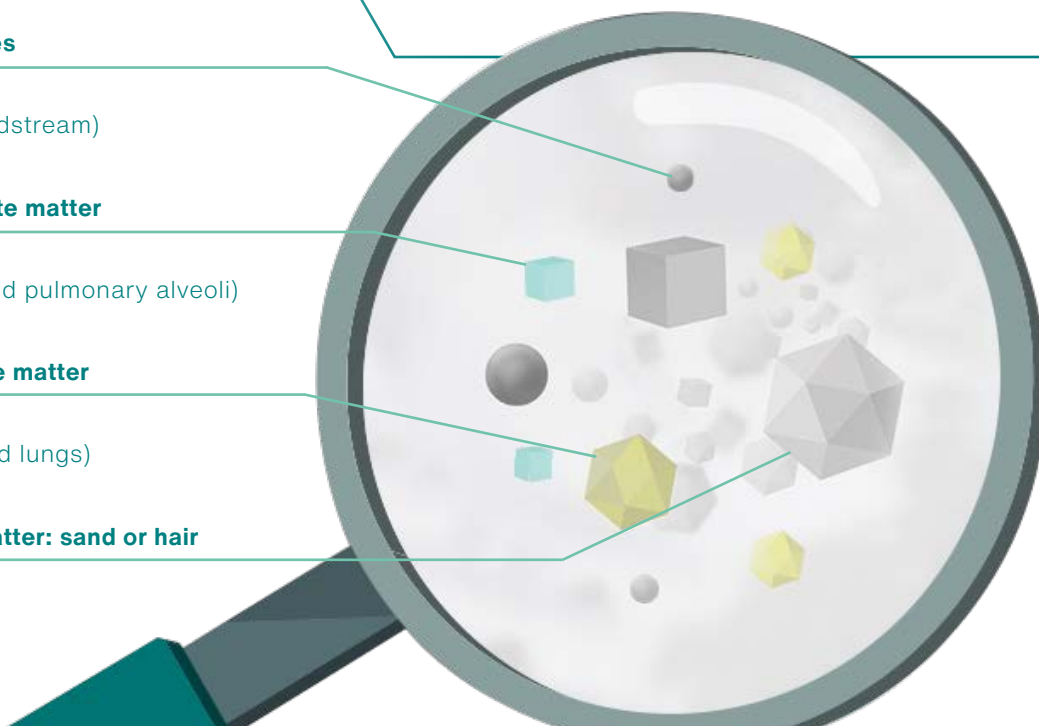
Less than 0.01 mm
(can enter sinuses and lungs)

Coarse particulate matter: sand or hair

Larger than 0.01 mm
(“classic” dust)

DID YOU KNOW...

... that air in the workplace is 2 to 5 times more polluted than outdoor air, and sometimes up to 100 times more?



CHALLENGES

GEWA Blechtechnik GmbH is a leading contract manufacturer in the metal industry.

The company manufactures a wide range of metal components, which are laser-cut, die-cut, edged and welded. This resulted in oil vapour, dust and welding smoke in the workshop and welding shop, with noticeable consequences such as a metallic smell, particle deposits and a visible haze. It was a situation that the management team at GEWA Blechtechnik wanted to change. Their aim was to take steps to create a healthier working environment and dramatically optimise cleanliness and overall quality.



LOCATION

Ried, Austria



SECTOR

Metalworking



81%

Dust reduction

BENEFITS

Thanks to the solutions provided by Zehnder, the fine particulate-matter load was reduced by an average of 81% in the workshop and an average of 72% in the welding shop. The metallic odour disappeared as soon as the new solution was started up. The units also circulate the air, which creates a good indoor climate on hot days. The amount of cleaning needed was also significantly reduced, since dust no longer builds up as much on the floor and machinery.

GEWA BLECHTECHNIK GMBH SUCCESS STORY

“Our goal is to deliver first-class quality and at the same time provide our team with a clean, healthy working environment. Zehnder’s air cleaning systems allowed us to make this a reality. Our employees noticed the difference immediately. I can wholeheartedly recommend the systems.”

Walter Zwicklhuber, Owner & Director



DUST IN THE WORKPLACE: THE CONSEQUENCES

When dust is not controlled, it poses a significant risk. It endangers the health and safety of your employees, puts a strain on your budget, results in dissatisfied customers, harms your company's image and can hold up audits and certifications. These are all good reasons to tackle the problem in good time.

1 Health and safety risks

A high dust level in the working environment can cause respiratory and lung diseases, silicosis, cancer, heart attacks and dementia. When it accumulates on floors, dust increases the risk of slipping, and when airborne, it impairs visibility. Certain types of dust are also flammable and can cause fires.

2 Dissatisfied customers

More and more customers are buying straight from the warehouse, but even there, cleanliness counts. Dusty products are slow sellers and lead to complaints. This can result in poor online reviews and prompt customers to look for alternative suppliers.

3 Higher operating costs

The higher the dust levels, the more cleaning is needed. Dust deposits can also build up on machinery, impairing the functionality of sensors and other components and impacting productivity, which causes downtime. Dust can block heating and cooling systems, driving up energy consumption.

4 Problems with audits and compliance

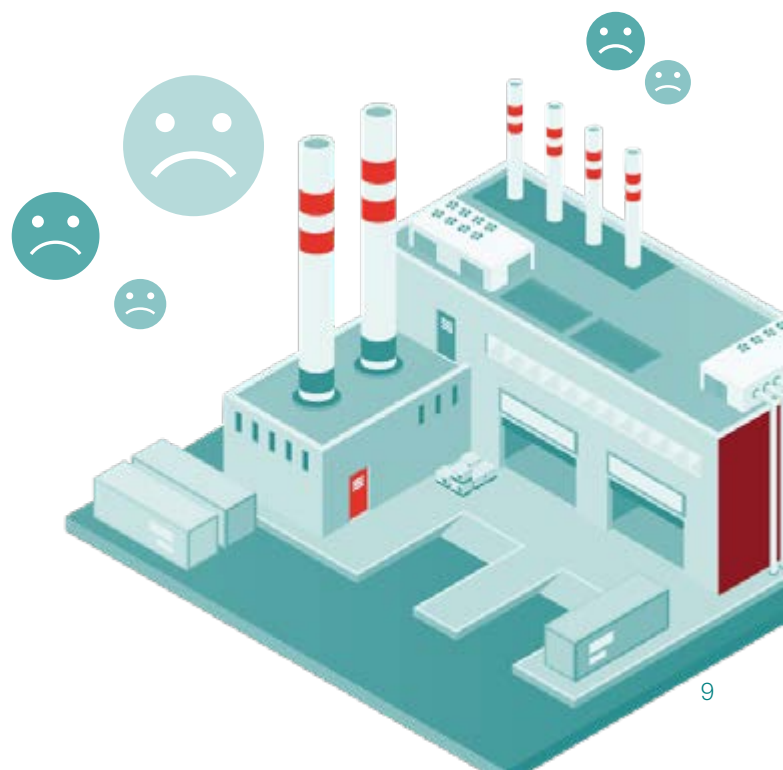
Health and safety requirements are becoming more stringent all the time, creating added challenges for businesses. These requirements include limits on permissible dust levels. In the UK, for example, if dust levels are too high a company can be issued with a warning or even penalised.

5 Negative impact on your reputation

Your good name is your most important asset. If your business has a positive image, potential investors, employees and customers will all feel equally valued and reassured. But it will be a different story if your working environment and products are affected by dust. Word will get around and damage your reputation as an employer and business partner.

6 Increased complaints

Dirty products result in customer complaints that can cause significant follow-on costs, for example through complaints processing, potential compensation, transport and exchanges. Customer satisfaction is also seriously affected.



CLEAN AIR IN THE WORKPLACE: MORE IMPORTANT THAN EVER

Fine particulate matter, climate change, environmental pollution – we hear about these issues every day. We're all aware of the importance of good air quality outdoors. But given that pandemics will be an issue that concerns us for some time to come, high standards in indoor air are also becoming increasingly important. And for good reason, because in enclosed spaces, dust and micro-organisms can spread more quickly than outdoors. Responsible employers are giving a lot of thought to the question of how to effectively protect their employees in the workplace.

Indoor and outdoor particle concentration

Until recently, it was widely assumed that you were more likely to encounter risks to your health and well-being outdoors than indoors. According to one Europe-wide study, only about 25% of respondents believed that indoor air was more polluted than outdoor air.

Legal requirements also reveal a similar assumption, with worldwide limit values for particulate load in the workplace being significantly above the limit of $50 \mu\text{g}/\text{m}^3$ for fine particulate matter in outdoor air. Unlike public authorities, the WHO also recommends this low value for indoor spaces.

One possible reason for the different values specified for indoor and outdoor air is that, while traditional "air pollution" is often something we can see, smell and feel, effects that we can't perceive with our senses easily escape our notice. This often leads to the mistaken assumption that we are safer from pollutants indoors than we are outside. Yet according to scientific studies, indoor air is 2 to 5 times more polluted, sometimes even up to 100 times more. What is especially worrying is that so many workplace pollutants are completely invisible and odourless, meaning that they can endanger employee health without even being noticed.

Fortunately, a shift in attitudes to the whole question of indoor air is now taking place. Bacteria and viruses, for example, can spread quickly in enclosed spaces and long-term, harmful exposure in indoor workplaces can cause illnesses. All in all, there are plenty of reasons for taking a good look at indoor air quality.

Ever present: There's no escaping dust and other particles

Particles are found in every production, transport and storage facility. Welding, painting, metalworking, forklift operations, packaging processing or food production – every industrial and logistical operation gives rise to dust, vapour, oil and other pollutants. The movement of people and industrial trucks then spreads particles spread around even more.

While the nose can block larger particles, smaller ones end up in the lungs, from where they can spread throughout the body. These fine dusts have the potential to do severe damage: they can lead to asthma and allergies, or even cause cancer, COPD, strokes and dementia in worst-case scenarios.

In addition to seriously impacting employee health, a high particle concentration also affects well-being and productivity. Consequently, employers have a special responsibility to provide clean air in the workplace and take all possible measures to reduce the strain on their employees' health.

Dust: The perfect vehicle for viruses

Other scientific research also reveals the importance of indoor air quality. Studies have shown that viruses can bind to dust particles and "travel" on them, remaining in the air for up to several days or even weeks. This is one possible reason why industrial regions have had a higher number of COVID-19 cases and may continue to be hotspots for the spread of disease in future.

TOO LAX?

Limits on fine particulate matter in the workplace*

Nitrogen dioxide: 950 $\mu\text{g}/\text{m}^3$ (causes lung damage)

Flour dust: 10,000 $\mu\text{g}/\text{m}^3$ (causes asthma)

Hardwood dust: 5,000 $\mu\text{g}/\text{m}^3$ (causes cancer)

Talcum: 1,000 $\mu\text{g}/\text{m}^3$ (contributes to lung disease)

*<https://www.hse.gov.uk/coshh/basics/exposurelimits.htm>



How can you improve indoor air quality, ideally right away?

Conventional methods don't cope well with particulate matter, as many companies have already found out. If you cannot prevent particles becoming airborne, then the best strategy is to remove them from the air before they can be breathed in. How? With industrial air cleaning from Zehnder Clean Air Solutions.

As soon as the systems are installed, they start filtering fine and coarse particulate matter, oils, vapours and more from the air, with up to 90% effectiveness depending on the area of use. This means that employees breathe in 90% less particulate matter. The result? Healthier working conditions and happier, more productive employees. But clean air has additional positive effects too: businesses benefit from lower maintenance and cleaning costs, higher product quality (with fewer customer complaints and less waste), increased productivity (due to fewer downtimes and stoppages) and less wear on infrastructure, which all adds up to long-term protection for their investments.

Excellent indoor climate quality leaves applicants and employees walking on air

The labour shortage that many industries are currently experiencing is yet another good reason to take action. Qualified applicants are scrutinising their future employers more closely than before, and if a company has a poor working environment and indoor climate, word will soon get around. This is where companies that make an extra effort for their team can make a good impression – for example, by creating optimum conditions for their employees, including a particle-free working environment. Given that supervisory authorities are already considering introducing lower limits for particulate load in indoor spaces, opting for clean air with Zehnder solutions means that companies can take a vital step towards to staying competitive and future-proof.

TYPHOO TEA

SUCCESS STORY

“We were gobsmacked by how good the units were. We can’t believe it went that well, Zehnder exceeded all our expectations. We would’ve been happy with a 50% dust reduction, so 81% is out of this world. It’s making a big difference to the team.”

Danny McGrail, Operations Manager



CHALLENGES

British tea manufacturer, Typhoo, prioritises the health and safety of employees above all else. When this was threatened due to high dust volumes created by various tea blending products, the company took action. Employees were inhaling the high levels of dust, which eventually spread to other areas in the factory – so Typhoo allocated additional hours to cleaning and the costs therefore increased.



LOCATION

Merseyside, UK



INDUSTRY

Tea production



87%

Dust reduction

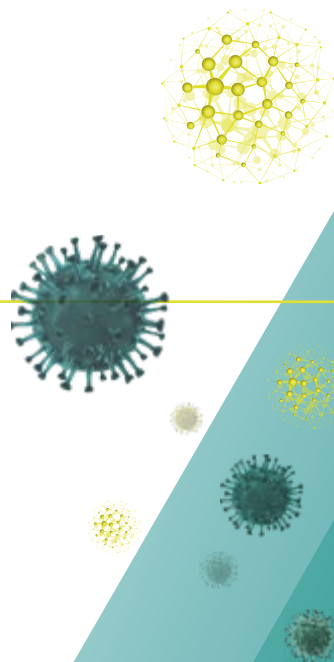
BENEFITS

In short, a cleaner, healthier and happier work environment was created: Within 48 hours of installing Zehnder’s clean air units, dust levels were reduced by 81% in the blending plant and hours allocated to additional cleaning times were cut from 15 to five hours a week – saving the company time and money. Finally, Typhoo staff could feel a positive difference in that the air was noticeably cleaner, and they could breathe more easily.



STATISTICS FROM THE UK

- **13%:** Airborne substances associated with spray painting or the production of foam products
- **7%:** Dusts from flour, grain, animal feed or straw
- **10%:** Airborne substances produced during welding, soldering or cutting/grinding metal
- **20%:** Dusts from stone, cement, brick or concrete
- **20%:** Generally unpleasant working environment: hot, cold, humid, wet, dry etc.





OERLIKON BALZERS SUCCESS STORY

“As soon as the employees entered the microblasting area after the units had been commissioned, they noticed how clean the air was immediately.”

Alexander Vogt, Production Site Manager



LOCATION

Balzers, Switzerland



INDUSTRY

Surface treatment



78 %

Dust reduction

CHALLENGES

Oerlikon Balzers is an innovative surface coatings company. It spans a wide variety of industries including general engineering, the automotive industry and power generation. In order to provide outstanding quality to its clients, Oerlikon Balzers collects components and tools directly from customer's site. These components are cleaned and treated and often involves microblasting and sandblasting. All the treatment phases create dust and material particles in the air, the floor and even the equipment.

BENEFITS

From the moment of installation, Zehnder's air cleaning units proved their worth by picking up particles before they had a chance to build up in the ambient air – or on the equipment. Employees also noticed an improvement in overall air quality. The production conditions tremendously improved, employees enjoyed the benefits of cleaner air and quality assurance costs were lowered.

360° SERVICE FOR TAILOR-MADE CLEAN AIR



Whether it's a factory or warehouse, a welding shop or bakery, clean air in the workplace is essential to protecting your employees, ensuring premium quality standards and boosting the competitiveness of your business. That's why we take this responsibility so seriously. We aim to provide support through a personalised service, so that you can achieve excellent air quality – as excellent as we would expect at our own premises.

We're good listeners, we have the facts and we're customer-focused

At Zehnder Clean Air Solutions, we listen carefully to find out exactly what your company really needs, and then we add that to a firm foundation of objective data. Before installation begins, our experts measure the dust level at your premises to produce a reliable analysis of your "particulate hotspots". This is necessary, because dust levels can vary over the course of the day and throughout the week depending on the customer's activities.

From this starting point we develop a comprehensive, made-to-measure solution. We then carry out final measurements to demonstrate that our industrial air cleaning systems don't just benefit your employees' health, but your business as a whole.

Another pillar of our philosophy is that every customer is a top priority. So we aim to make things as easy as possible for you. For example, we install our clean air solutions at a time that fits your schedule – even if that means outside your working hours.

All these ingredients are what make our recipe for success. As a result, today we are the biggest air cleaning systems company in the world.

Years of expertise and a reliable partnership

Our technical support team carries out dust level measurements for over 2,500 customers in Europe and the USA every year – and they've been doing it for decades. That's why you can rely on us to recommend a solution that's genuinely based on best practices, as demonstrated by the measurement data.

What's more, working with Zehnder Clean Air Solutions means having a reliable, highly flexible long-term partner. If your business grows or requirements change, our experts will be there for you to help you find exactly the right solution.



YOU DON'T NEED MUCH

There are just 3 installation requirements

1. A 230 V connection
2. Lifting equipment, e.g. forklift
3. Some space on the ceiling (or alternatively on a wall or floor)

OUR FILTER SYSTEMS: TECHNOLOGY WORKING FOR YOU

Industrial air cleaning systems from Zehnder Clean Air Solutions filter out dust and other airborne particles from the air, with very high levels of effectiveness. Our recipe for success includes high-performance technology and intelligent filter combinations, as individual as the needs of your operation.

How they work: Our air cleaning solutions in action

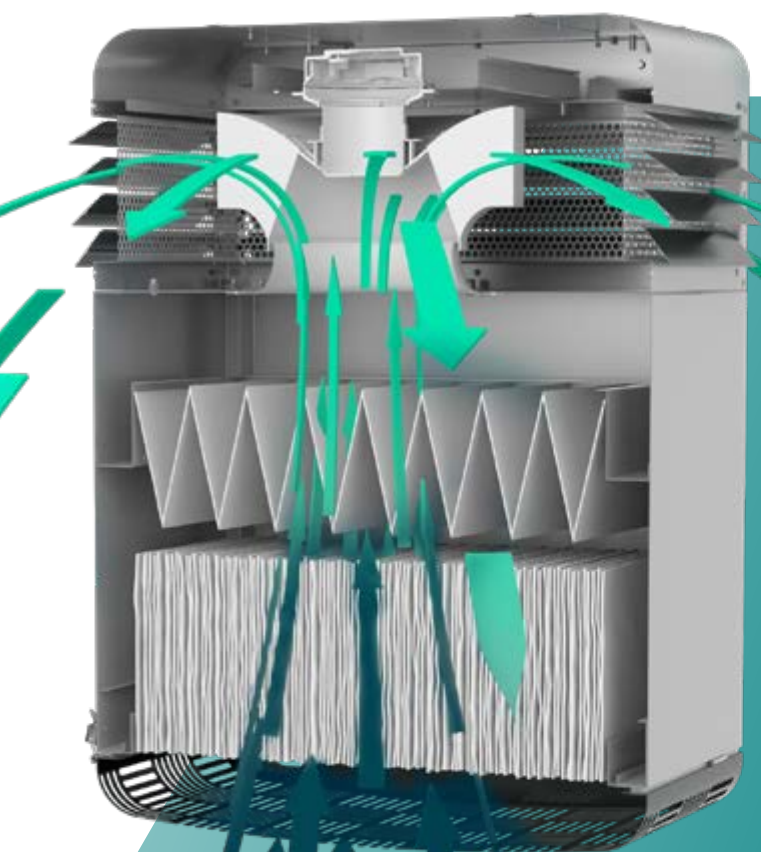
On one side, centrifugal fans draw polluted air into the system. As the air passes through the filters, dust particles are removed. Filtered, clean air then flows out of the other side.

The core component of each air cleaning unit is a Flimmer filter which attracts and binds dust with an electrical charge, from the smallest nanoparticles to easily visible coarse particulate matter. The downstream media filter mechanically absorbs particles that weren't caught by the Flimmer filter, in different filter classes.

This combination of filters, patented as FlimmerM®, makes the industrial air cleaning units from Zehnder Clean Air Solutions extremely effective. Because the load is split over two filters, FlimmerM® also has an exceptionally long life cycle.

Our filters: In a class of their own

For our air cleaning systems, we offer filter solutions matched to your individual requirements. The ability to combine different filter types of different classes and a range of air cleaning units means that hundreds of potential solutions are possible, covering virtually every type of particle.



TECHNICAL FEATURES

AT A GLANCE

- **Plug and play**
No tangled cables, no complications:
just switch on and go.
- **High clean air delivery rate**
Your guarantee for all-round excellent air
quality.
- **Programmable airflow control**
If the dust level increases, you can flexibly
adjust the air cleaning capacity.
- **Alarm function for filter replacement**
Ensures optimum filter performance.
- **Wide range of installation options**
Install on the ceiling, floor,
wall or pillars.
- **Sustainable and energy-efficient**
Low energy consumption thanks to
state-of-the-art motors, long-lasting filters and
reusable air cleaning units.

COMPLETE DESIGN & PACKAGING

SUCCESS STORY

“The effectiveness of the particle reduction was noticeable right away. The team were thrilled with the result. Cleaning can now be easily handled by one person instead of two. Our valuable high-tech equipment is now better protected. And our business’ reputation is benefiting from this new cleanliness.”

Keith Furr, Plant Manager



LOCATION

Concord, NC, USA



SECTOR

Packaging printing



81%

Dust reduction

CHALLENGES

Complete Design & Packaging (CDP) is a leading provider of high-quality printing for retail packaging.

The company uses state-of-the-art technologies including an expensive and extremely sensitive high-tech digital printing machine. Cutting and die-cutting the packaging produces a lot of paper dust, which affects both the machinery and the quality of the end products. Two full-time employees were needed for cleaning alone, since for a flagship company like CDP, which regularly shows visitors around, a clean and professional appearance is extremely important.

BENEFITS

A healthy working environment and clean, low-particle air are enhancing employee motivation, increasing productivity and improving the overall quality of the end products. The time required for cleaning has also been cut in half. What’s more, particle reduction has made a crucial contribution to investment protection, dramatically reducing the strain on the high-value digital printing machine and other equipment.



FREQUENTLY ASKED QUESTIONS

1. GENERAL

How big is your company?

As part of the Zehnder Group, a specialist for indoor climate solutions, Clean Air Solutions is active in more than 20 countries with a customer base exceeding 3,000 worldwide. We pride ourselves on being the leading company for air cleaning in the world.

Which industries do you work with?

Clean Air Solutions is suitable for all kinds of industrial sectors where processes favour the emergence of dust and other airborne particles. We work with logistics businesses, heavy industrial businesses, or companies operating in sensitive environments like food, beverage or medical – just to mention a few.

2. TECHNICAL

What kind of particles do you deal with?

Our air cleaning units absorb any kinds of solid airborne particles. These include coarse particles, fine dust, fumes, bacteria and germs. Moreover, the units are able to capture oil and mist particles and odours. In scientific terms, this means our air cleaners can absorb particle sizes of PM10, PM2.5 and PM1.

What are the technical specifications of the air cleaners?

We offer air cleaners in four different sizes with varying dimensions and weights that are suitable for different kinds of working environments.

How loud are the air cleaners?

The noise level of the air cleaners depends on the airflow setting. Usually, you do not notice any noise during ongoing business operations. At optimum airflow setting, the noise level ranges from 59 dB(A) (CleanAir 2) to 64 dB(A) (CleanAir 12).

What are the different installation options?

Every facility is different. That is why we offer flexible installation options including ceilings, walls, shelves or pillars. Air cleaners can also be placed on the floor.

How much energy do your air cleaners consume?

The energy consumption of each air cleaner depends on the airflow setting. Usually, it ranges from 78 W (CleanAir 2) to 410 W (CleanAir 12). This means their electrical consumption is approx. 25 % of a traditional exhaust system.

Are the air cleaners covered by a guarantee?

We provide a full guarantee concept that applies as long as the units are in use.

3. SERVICE

How do you measure the air quality?

Dust measurements are performed by our technical business support team. Our pre-studies consist of dust measurements before the installation of our air cleaning systems, which enable us to quantify dust levels in our customers' facilities. Our post-studies measure air quality after installation and prove the effectiveness of our units. All dust measurements are carried out with the help of an appliance called DustTrak™ – our partner TSI.

How do you determine how to install?

Before we install our air cleaning units, we conduct static dust measurements to determine the dust concentration in your facility. Based on this, we determine a solution that suits your individual needs. Usually, we install our units nearest to the dust source to ensure particles do not affect employees, machinery or goods.

Will installation disrupt my business?

Our team strives to install the air cleaning units without affecting daily business. We offer installations outside peak times, in the evenings and even on weekends.

How often do filters need to be changed?

Filter changes depend on the level of dust in your facility. Usually, filter changes need to be made every 3, 6 or 9 months.

Is there a buying option?

Zehnder Clean Air Solutions offers a service for clean air that implies the renting of air cleaning units. Improvements in air quality require holistic and consistent care over time; that's why our units are not for sale.

