

Pure competence in air.



Air-cleaning systems

for the manufacturing
and food industries

REVEN 
SCHAKO Group



Professor Smart

Pure competence in air.



Nominiert für
Großer Preis des
MITTELSTANDES

Our air cleaners guarantee:

- Higher productivity through reduced downtime!
- Consistent ambient conditions can support product quality!
- Lower maintenance and cleaning costs due to improved air cleaning!
- Lower labour costs due to safer and more productive workplaces!
- Lower plant operating costs due to more efficient air cleaning!
- Lower consumption costs in your production processes due to recycling!
- Lower repair and maintenance costs of your production facilities due to highly efficient air cleaners!

- Considerably longer service life due to the use of 100% rustproof stainless steel!
- Lower operating costs due to energy-saving air cleaners!

That is what the REVEN® brand and our products stand for and what I am wholeheartedly committed to.

Sven Rentschler

CEO and great-grandson of the company founder Gustav Rentschler



INNOVATION BW
Award Winner
Innovation Award Baden-Württemberg
Dr.-Rudolf-Eberle-Preis



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Introduction

Our society is becoming increasingly aware of the importance of clean air, not only in connection with issues such as climate change, but particularly in areas where air purification has always been a priority yet was often not properly understood. Research into the effects of particulate matter and other forms of invisible air pollution on people and machinery is advancing and gaining greater recognition.

This makes it all the more important for ventilation designers, architects and facility managers to select the right ventilation technologies to ensure the desired air quality for different work processes, whilst complying with applicable standards. In line with today's Industry 4.0 principles, ventilation systems should be able to detect ventilation demand and regulate the ventilation rate automatically.

Apart from the actual air cleaning, other factors play a role, such as – when planning a ventilation ceiling – lighting design, noise minimisation, fire safety, integration with the building management system and maintenance requirements, to name but a few.

It's good to be able to rely on someone who is well-versed in all these areas.

With Rentschler REVEN, you have found a trusted partner who brings extensive expertise from over 120 years of ventilation engineering.

From ventilation concept design through to system commissioning, we provide everything from a single source.



Welcome to Rentschler REVEN

REVEN = REntschler VENTilation



Sven Rentschler, fourth-generation CEO

"Our aim is not only to be at the cutting edge. We want to shape the future of air purification."

"We are committed to transparency and trust."

"To be recognised as a technology leader in air pollution control, we provide our networks with valuable content and knowledge via digital and analogue platforms."

"Raising awareness of air pollution – and eliminating it – that is our mission."

Clean indoor air and a healthy working environment – capturing and separating airborne pollutants is our core competence!

Based on decades of experience in the field of air cleaning, Rentschler REVEN has developed the mechanical X-CYCLONE® separation system. Air pollutants such as vapour, mist and similar process emissions are separated to the highest possible extent. The system works purely mechanically without any auxiliary energy. It is easy to clean and contains no disposable products that need to be replaced regularly. Consequently, maintenance, operating and servicing costs can be significantly lower than with conventional air cleaners!

Pure competence in air.

Thanks to our modern ventilation technology, we create a pleasant and healthy working environment in your commercial kitchen or production facility.

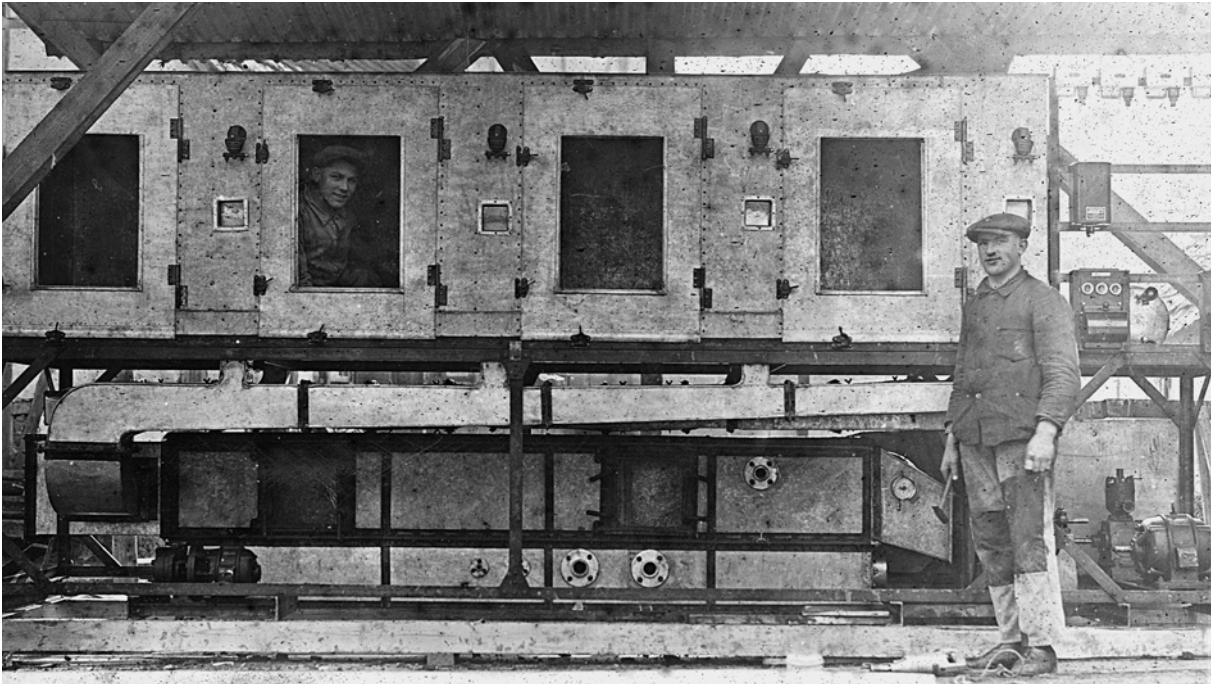
TYPICAL APPLICATIONS FOR OUR AIR CLEANERS INCLUDE:

- Food processing
- Production and machining processes in the mechanical engineering industry
- Commercial kitchens in restaurants, hotels and canteens
- Production processes in the oil and gas industry
- Painting and coating processes
- Finishing processes in the textile industry
- Impregnation processes in electric motor manufacturing
- Plastics processing, such as injection moulding and film extrusion
- Rubber processing and vulcanisation processes
- and many more applications



Rentschler REVEN since 1905

Over 120 years' experience in ventilation



Construction of an exhaust air duct system in the early days

The history of Rentschler REVEN began as early as 1905, when Gustav Rentschler, the great-grandfather of the current CEO Sven Rentschler, had the 'Gustav Rentschler Flaschnerei und Apparatebau' (Plumbing and Equipment Manufacturing) registered in the Sersheim trade register. Even in the early days, the company was involved in the construction of equipment and systems for the ventilation of production facilities and halls.

The family business has always remained true to this field of activity and, over the decades, has specialised in industrial air cleaning. As a result, a unique body of expertise in the field of air cleaning has been built up and developed over generations.

Numerous internationally protected patents, brand names, design protection rights and technologies bear witness to this history and development spanning more than 120 years.



**DECADES OF EXPERIENCE IN
PLANT ENGINEERING CREATE
A SOLID FOUNDATION FOR
SOPHISTICATED PRODUCTS
THAT SET THE STANDARD.**

Historical development

Milestones in the company's history

- 1905 Foundation of the craft business
'Plumbing and Equipment Manufacturing'.
- 1990 First patent application for the X-profile
as the basis for X-CYCLONE® technology.
- 2013 Baden-Württemberg State Innovation Award
for the X-CYCLONE® technology
featuring arrow-shaped geometry.
- 2016 Joined the SCHAKO Group, one of Europe's leading corpo-
rate groups in the ventilation and air-conditioning sector.
- 2017 The LÜKK (Ventilation, Air-Conditioning and
Refrigeration Industry) Customer Confidence Price is
awarded to Rentschler REVEN in the ventilation category
by cci Dialog GmbH.
- 2022 First podcast, 'Misconceptions in Ventilation Technology
and Pollution Control', is very well received.
The accompanying book is published a year later.
- 2024 The REVEN BIM Configurator
for the company's own air cleaners goes live.
- 2025 REVEN offers comprehensive international solutions
for kitchen ventilation and the manufacturing industry
in line with the Industry 4.0 principles.
- 2026 Nomination for the 'Grand Prize for Medium-Sized
Enterprises 2026' by the Oskar Patzelt Foundation.
- REVEN focuses on digital services
for customers, suppliers, sales and staff.



INNOVATION BW
2013
Innovation Award Baden-Württemberg
Dr.-Rudolf-Eberle-Preis



Nominiert für
Großer Preis des
MITTELSTANDES

Trade fairs, seminars & workshops

For everyone who loves face-to-face interaction



The SCHAKO Group's stand at the ISH trade fair

We are regular exhibitors at the ISH trade fair, where we showcase our latest technologies at the SCHAKO Group stand. We also take part in smaller trade fairs both at home and abroad.

Workshops also provide the opportunity to experience our technologies, systems and products first-hand in a practical setting. Furthermore, we offer training courses in our in-house seminar room.

Through our seminars, we offer ventilation designers, operations managers and plant engineers a comprehensive programme of talks and a wealth of expertise on the subject of air quality control in workshops, production halls and commercial kitchens.



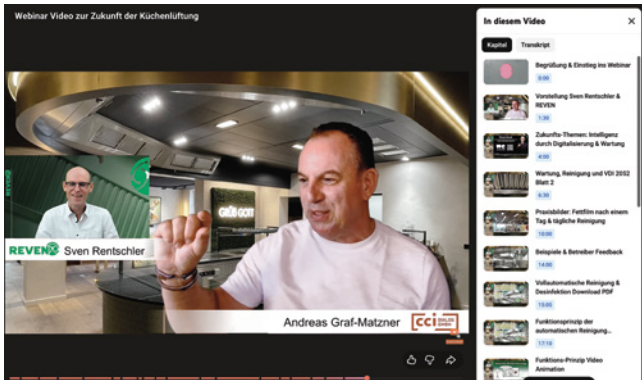
Seminars held in selected venues



Training in our in-house seminar room

Webinars, videos, podcasts

Social media presence



Webinar in collaboration with cci Dialog GmbH on the future of kitchen ventilation

Through our regular webinars and our podcast, we have now built up a loyal audience of interested listeners who actively follow topics relating to ventilation and air quality.

The same applies to our second **podcast, 'Luftpost'** (in German), which is all about healthy air.

In **videos on our YouTube channel**, we demonstrate how our air cleaners work and explain the benefits they offer, as well as what to bear in mind for effective ventilation.



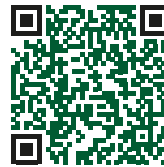
Our social media posts offer:

- In-depth knowledge
- Case studies
- Examples
- Videos
- Expert discussions
- and more

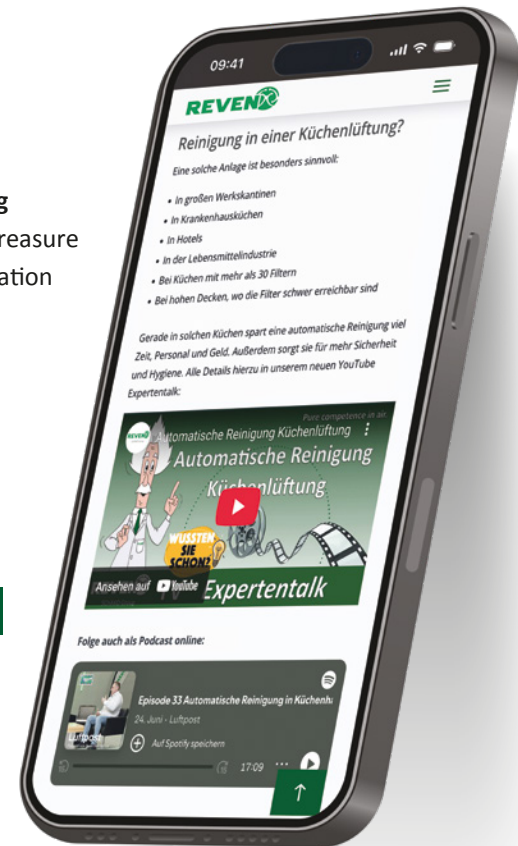


The REVEN Blog

has become a treasure trove of information on ventilation over the years.



To the blog ...



Sales

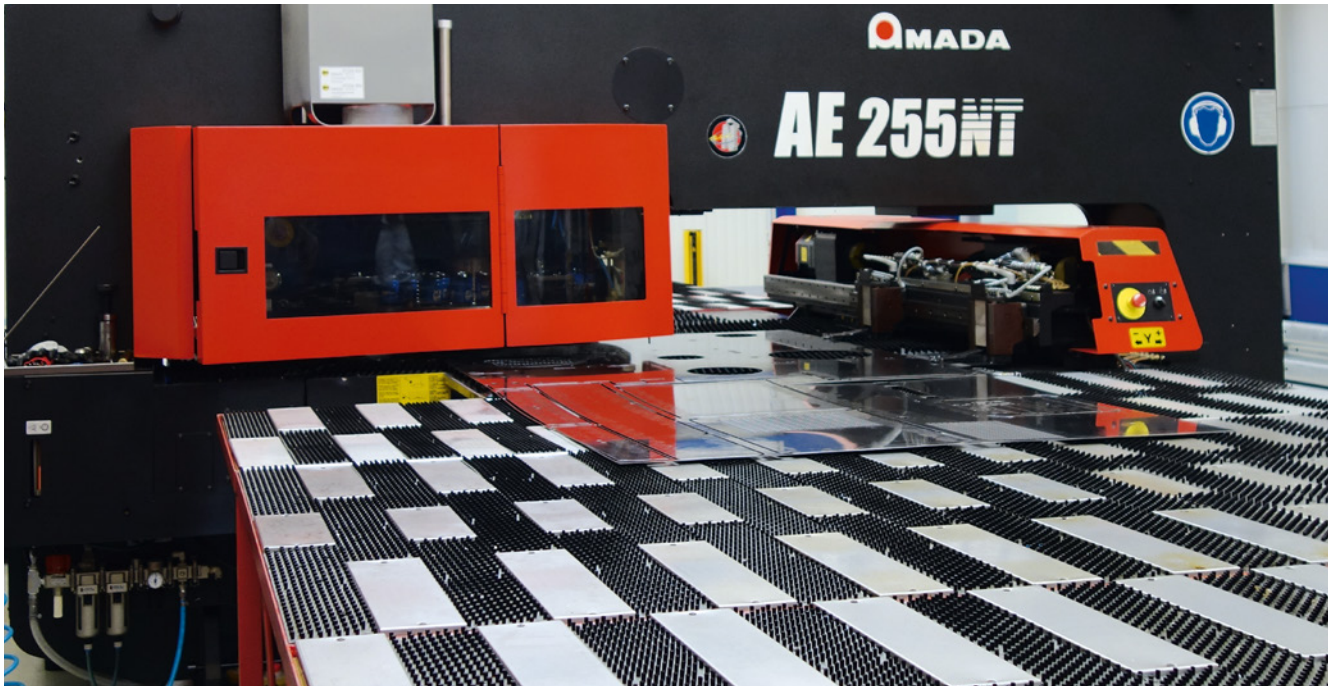
From our headquarters in the heart of Baden-Württemberg, we serve customers all over the world. A global network of authorised Rentschler REVEN dealers and service centres, as well as our website featuring information and documentation – supplemented by brochures and guides – ensures optimal customer support.



Headquarters of Rentschler REVEN GmbH

Manufacturing

Made by REVEN – Made in Germany



Automated sheet metal working machine in operation



Our production facilities are located in Sersheim in Baden-Württemberg, around 30 km north of Stuttgart. All our air cleaners are manufactured at this site.

Automated production machinery and a high-bay warehouse enable very short delivery times. Up to 80% of our product range is available for immediate delivery from stock!



Computer-controlled sheet-metal processing machines work exclusively with stainless steel and aluminium sheets. This ensures a very high and consistent standard of quality and guarantees fully corrosion-proof products.

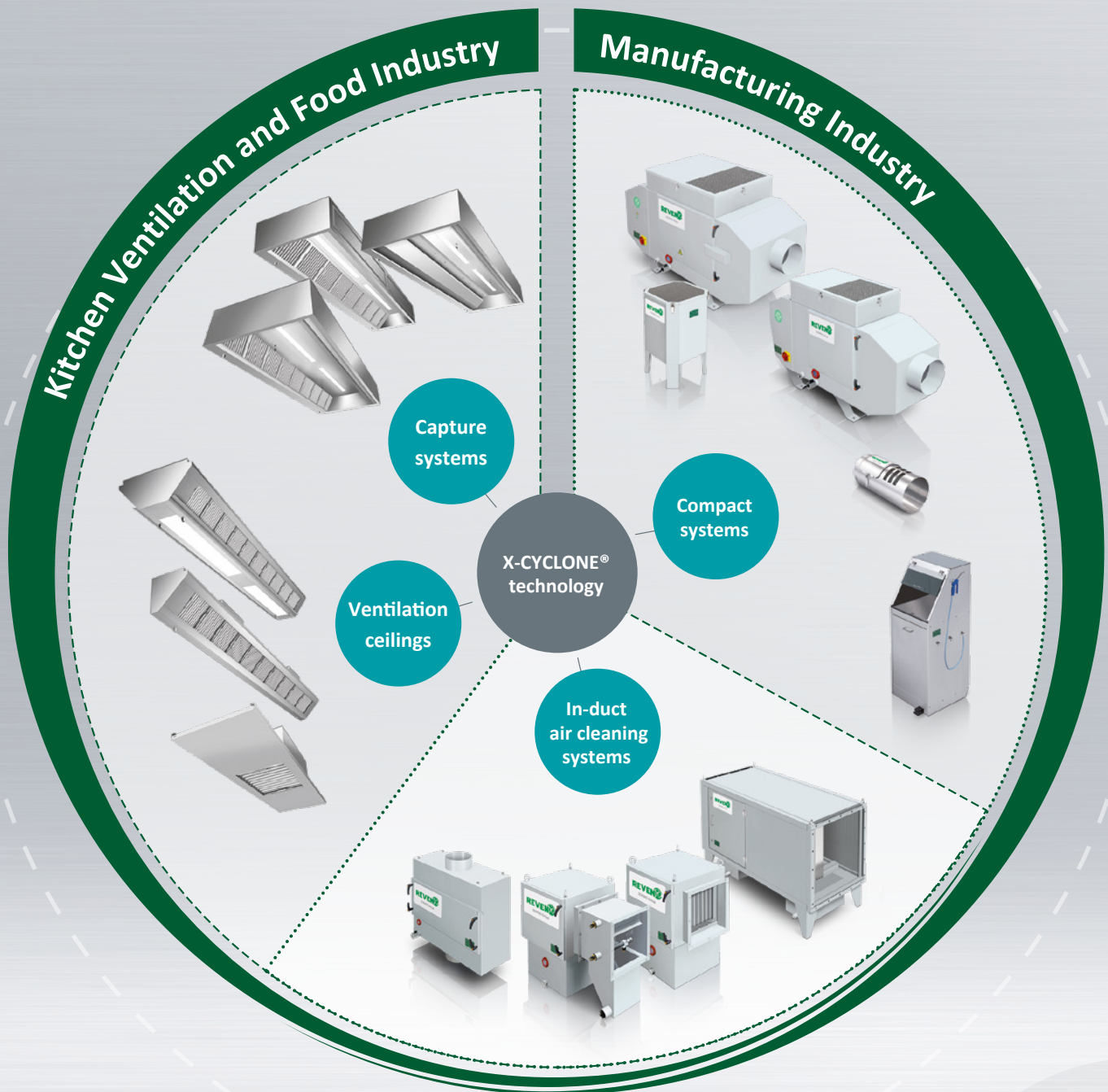
Accessories such as agglomerators, condensers, filter attachments, odour filters and even LED lights for kitchen hoods and ventilation ceilings, amongst many others, are manufactured in-house. This enables us to ensure high quality and short supply chains.

Product range

Overview

Rentschler REVEN provides a broad product range.

In addition to configurable standard products, we also provide individual solutions.



References

Manufacturing industry



Use of X-CYCLONE® CE-XSC series electrostatic air cleaners in Swiss watch manufacturing



Hall ventilation with fume capture modules from the X-CYCLONE® E2S series



Oil mist separator with coolant return



X-CYCLONE® C-XSC oil mist separator installed in a decentralised location



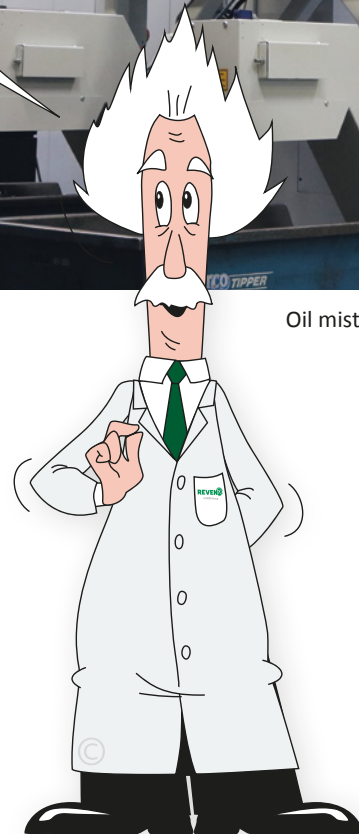
Oil mist separator in the machining industry



Oil mist separator with REVEX® spray system



X-CYCLONE® RJ air cleaner in tool manufacturing



More ...



References

Commercial kitchens and the food industry



Black ventilation ceiling in a canteen



Single kitchen hood in the serving area



Induction hood with integrated fire-extinguishing system



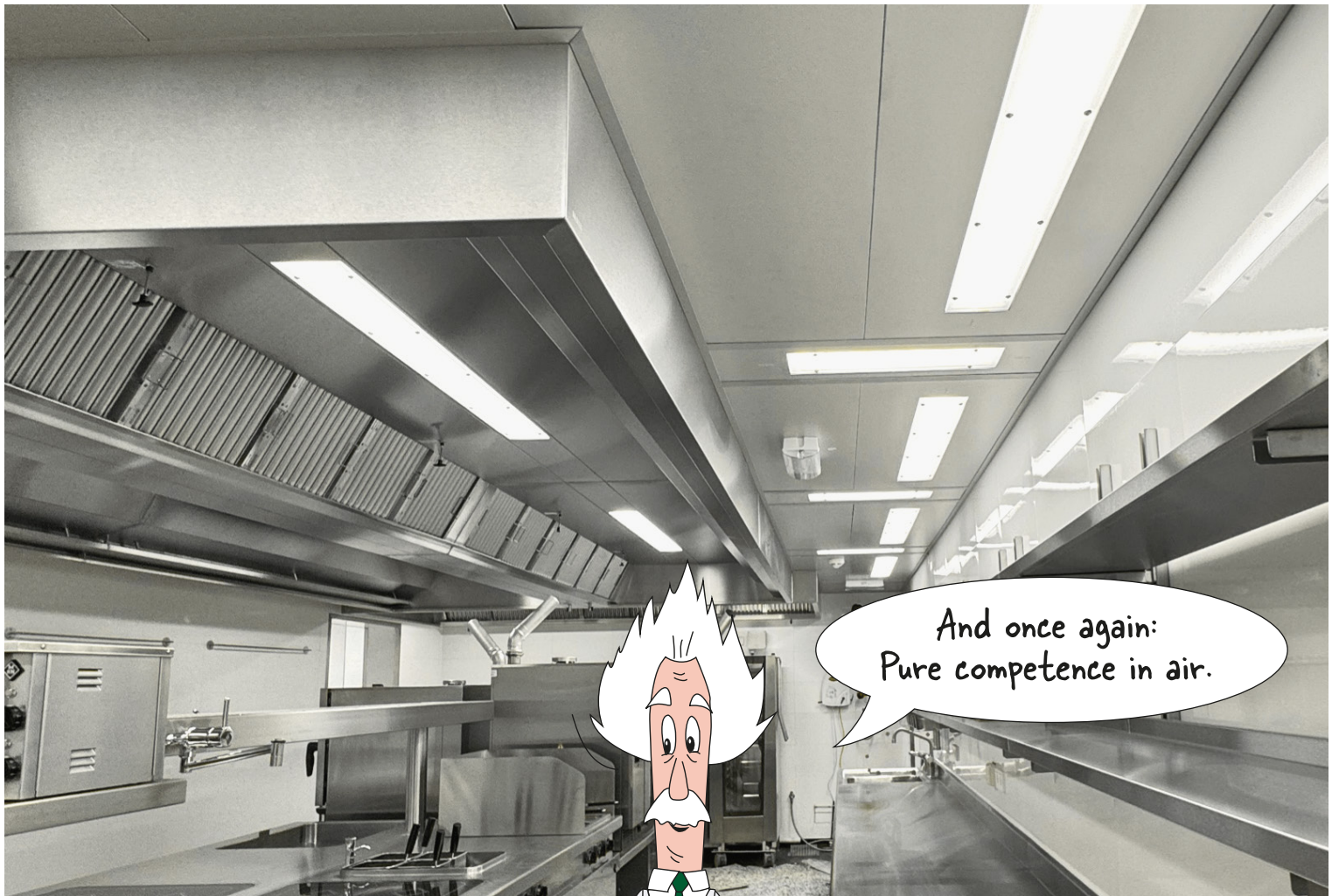
Kitchen ventilation ceiling with RSC and fire-extinguishing system



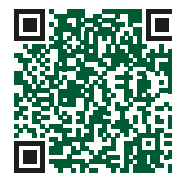
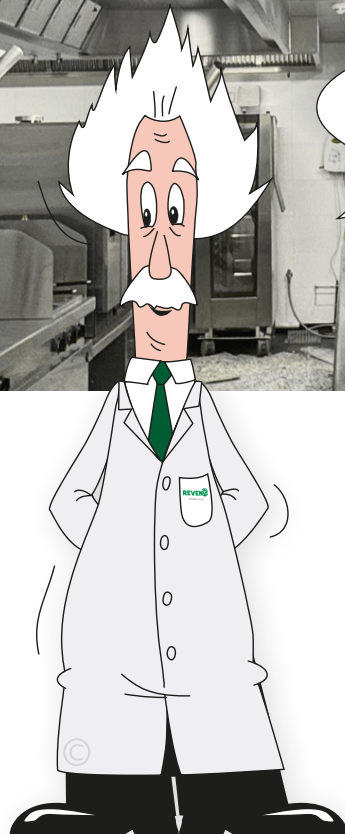
Ventilation ceiling for a canteen serving area



In-duct exhaust-air cleaner for food industry applications



Ventilation ceiling with induction hood as an island design



More ...



The X-CYCLONE® high-performance separation system

The heart of almost all REVEN air cleaners



The X-CYCLONE® technology

is internationally protected under the PCT



Made entirely of stainless steel



Stainless steel frame with aluminium profiles

X-CYCLONE® technology was developed for the separation of airborne substances such as aerosols, liquid mists, spray mists, vapour and fine dust released during production processes in the food and manufacturing industries.

Thanks to decades of continuous research and development, the fifth generation of X-CYCLONE® separators features an arrow-shaped geometry, which has not only increased separation efficiency by 20% but has also been awarded the Innovation Prize of the State of Baden-Württemberg. This new X-CYCLONE® technology is protected by international PCT patent rights.

In practice, the X-CYCLONE® system in our products consists of one or more rectangular base elements 50 mm thick,

known as X-CYCLONE® aerosol separator base elements or, for short, simply X-CYCLONE® separators.

The X-CYCLONE® aerosol separator is available in two versions:

- Made entirely of stainless steel for the food industry
- With a frame of rustproof stainless steel fitted with profile sections made of seawater-resistant aluminium alloy for the manufacturing industry

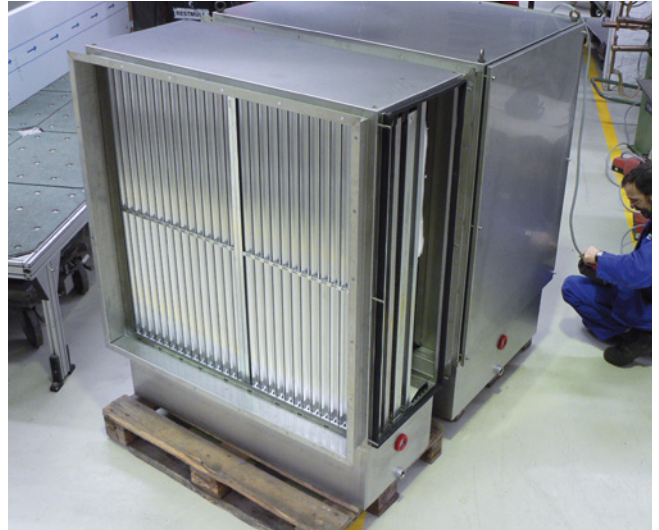
The X-CYCLONE® aerosol separator

with a lifetime guarantee

The X-CYCLONE® aerosol separator is completely maintenance-free and self-cleaning! The aerosols separated in the separator flow as a fluid mass from top to bottom along the X-CYCLONE® profiles. The draining liquid also washes away any accumulated solids and flushes them out of the profiles of the base element.

However, should fats or other substances build up on the profiles over time, the separators can simply be removed from the air cleaners and cleaned either with a high-pressure washer or in industrial washing machines.

The X-CYCLONE® separator is not a disposable product that needs to be replaced regularly. If treated correctly, it will last a lifetime. Consequently, its upkeep, operation and maintenance are much more cost-effective than with conventional air cleaners.



Installation of a duct-mounted air cleaner with four X-CYCLONE® separators



X-CYCLONE® high-performance separator guide
(in German)

PDF ...



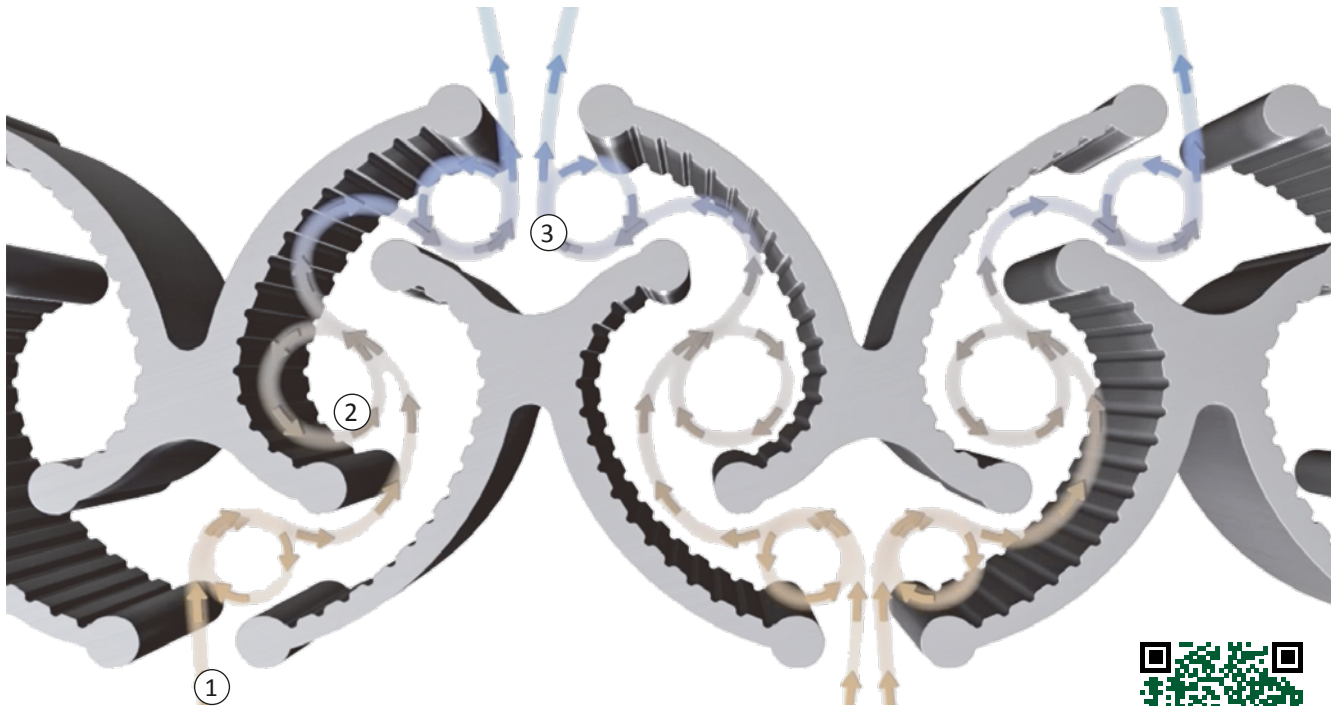
The X-CYCLONE® separator can easily be pulled out of an industrial air cleaner.



Stainless steel handles make it easier to handle the X-CYCLONE® separators in kitchen hoods.

The X-CYCLONE® separation process

How aerosol separation works in four stages



Video ...

STAGE 1

The extracted air polluted by aerosols flows into the X-CYCLONE® basic element. When entering the element (1), the airflow is accelerated considerably. The acceleration produces a first separation.

STAGE 2

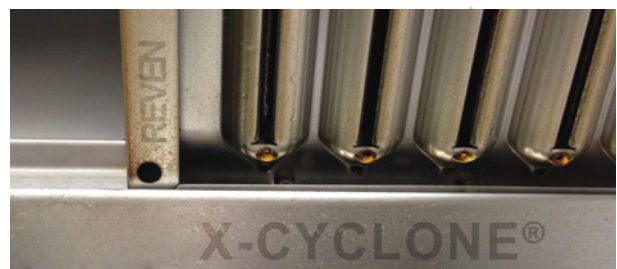
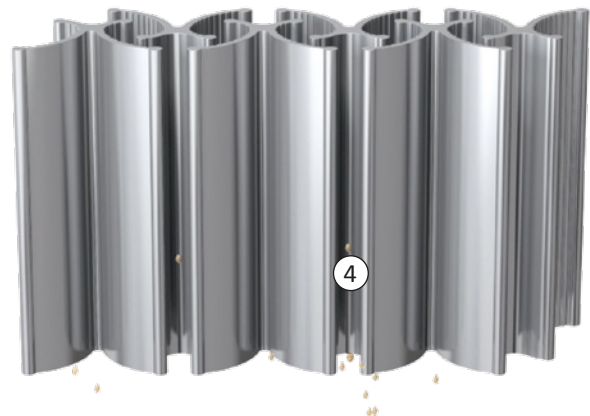
The highly accelerated airflow starts swirling (2) inside the profile sections. The rotational vortex flow ejects airborne aerosols.

STAGE 3

The rotational vortex flows collide with non-rotational airflows at the air outlet (3) of the X-CYCLONE® basic aerosol separator element, thus resulting in an agglomeration and further separation of smaller aerosol particles.

STAGE 4

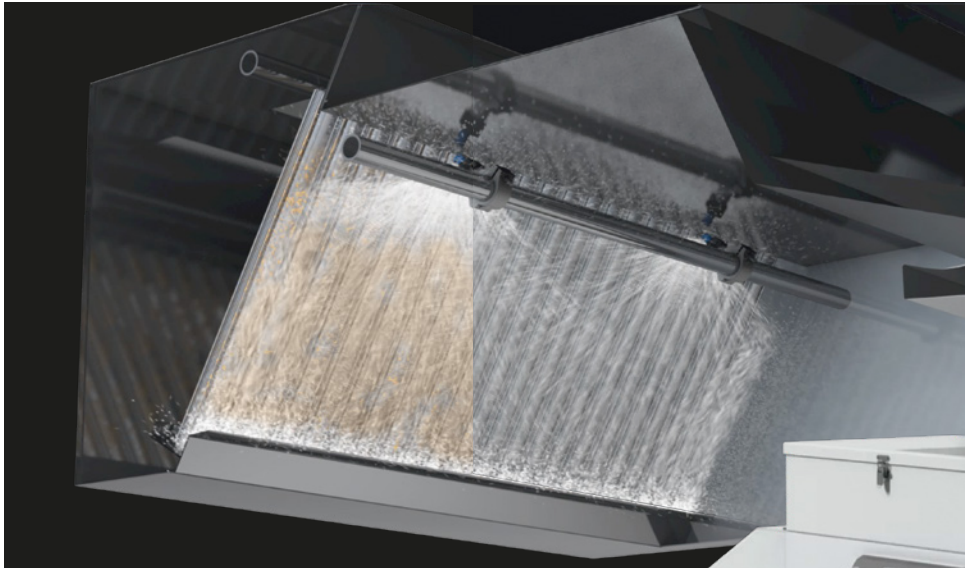
The aerosols separated in the X-CYCLONE® basic aerosol separator element accumulate on the profile surfaces and run down as fluid mass (4) to the bottom of the element.



Section of an X-CYCLONE® separator. The separated oil particles coalesce into larger droplets and drain away.

The REVEX® spray system

The patented spray technology for cleaning, disinfection and air washing



A) Schematic illustration of the cleaning process for a separator in a kitchen extractor hood. Left: at the start; right: at the end of the main rinsing process.

As dry and sticky fine dust particles do not flow downwards through the separator profiles of the X-CYCLONE® aerosol separator in the same way as fluids, the REVEX® system must be integrated to capture them. The REVEX® system is a patented spray technology that fulfils two functions:

A) It is used primarily in kitchen ventilation for the automatic cleaning and, if required, also the disinfection of the X-CYCLONE® separators.



B) CR-XSC oil mist separator with integrated REVEX® system

B) It cleans the air in a similar way to an air scrubber used in the chemical industry. The continuous REVEX® air-scrubbing function washes even the smallest aerosols and harmful gases out of the airstream, for example in our compact X-CYCLONE® air cleaners of the CR-XSC series.



REVEX® spray system for kitchen ventilation – a guide
(in German)

PDF ...

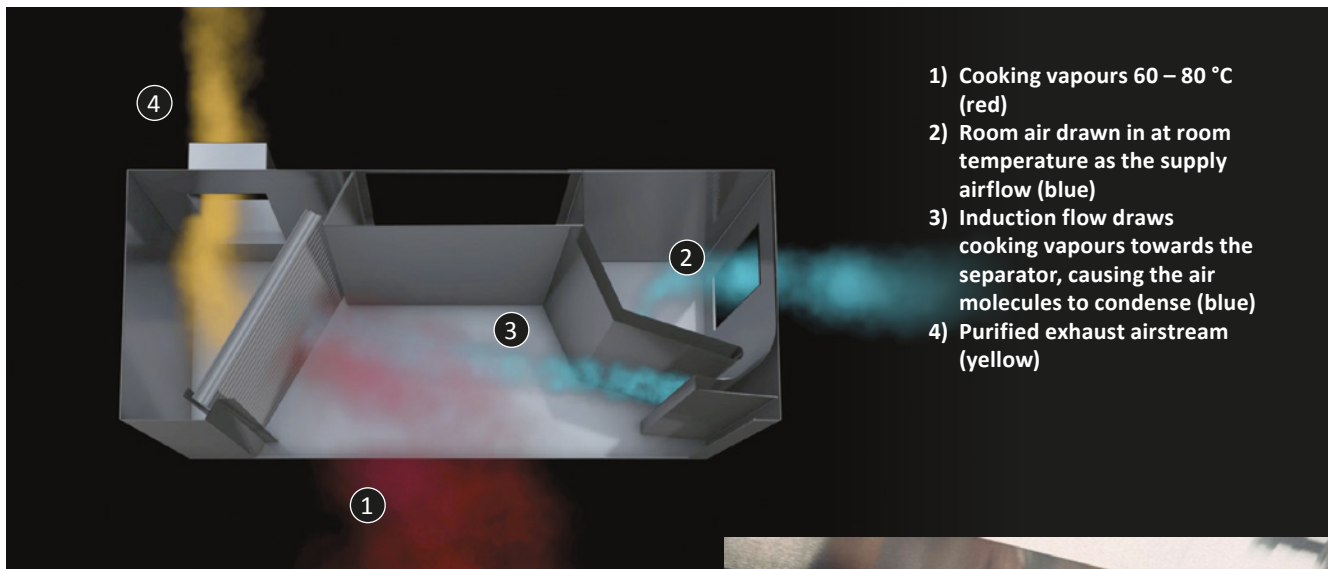


REVEX® spray technology

Videos and more ...

The REVEN[®] induction system

Tried and tested for decades and further developed through CFD analysis



- 1) Cooking vapours 60 – 80 °C (red)
- 2) Room air drawn in at room temperature as the supply airflow (blue)
- 3) Induction flow draws cooking vapours towards the separator, causing the air molecules to condense (blue)
- 4) Purified exhaust airstream (yellow)

When cooking intensity is high, such large quantities of cooking fumes can be produced temporarily or continuously that the extraction performance of a kitchen hood alone is too weak and cooking fumes can enter the room air.

An induction airflow ensures that all exhaust air is captured and guided through the separators. It also cools the captured exhaust air, which promotes the condensation of vapour-phase molecules at the separator and increases separation efficiency.

In combination with the automatic control system RSC, this ensures significant cost savings (see next page).

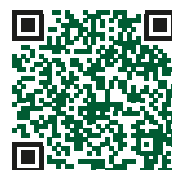


Final inspection of a fitted induction hood



REVEN[®] induction technology

Videos and more ...



Smart kitchen ventilation
(in German)

Read the blog post ...

RSC for smart kitchen ventilation

Demand-based control of supply and extract airflow rates



Use of the RSC control system in an induction hood



To improve the energy efficiency of ventilation systems in commercial kitchens, Rentschler REVEN offers the intelligent automatic control system RSC (REVEN® Speed Control). The system continuously adjusts the speed of the supply and extract air fans to match cooking activity, fully in line with the innovative Industry 4.0 principles.

The temperature and humidity sensors ① are designed for operation in commercial kitchens and can detect the cooking activity ②. The controller increases or decreases the supply and extract airflow rates in accordance with the requirements. At the same time, the required airflow rates ③ are distributed over the respective cooking zones via air dampers.

This can reduce energy costs of the ventilation system by up to 50% and extend the service life of downstream air cleaners. It can also help reduce draughts.



The control system RSC reduces energy costs.

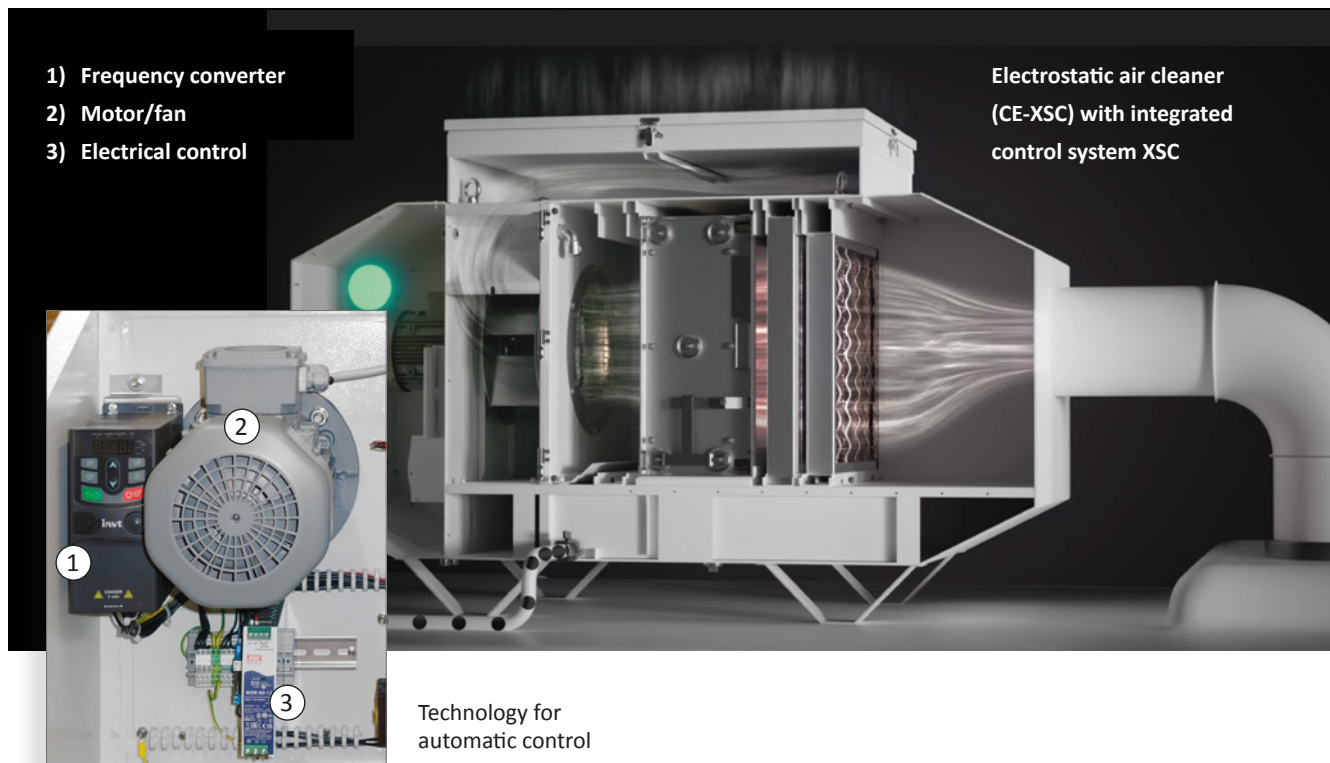


REVEN® control technology

Videos and more ...

XSC for oil mist separators

Control system in line with Industry 4.0 principles



In line with the Industry 4.0 principles, the control system XSC (X-CYCLONE® Speed Control) for airflow rate regulation, featuring a frequency converter and function display, is fitted as standard in all compact units of the C-XSC, CE-XSC and CR-XSC types.

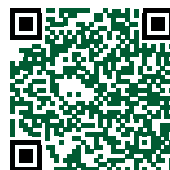
The intelligent control system, featuring a microprocessor, ensures stepless regulation of the extraction capacity via the frequency converter. The XSC control system communicates with the machine interface and adjusts the extraction airflow accordingly. This enables the power consumption of the extraction system to be reduced by up to 50%.

A further advantage of this variable control is the extension of the cleaning intervals for the X-CYCLONE® separators, agglomerators, collectors and filters, as well as an increase in their service life.

When used in conjunction with the patented Venturi ventilation and condensation system, separation efficiency can be increased by up to 50%.



C-XSC series oil mist separator with integrated Venturi ventilation and condensation system



REVEN® control technology

Videos and more ...

Capture systems and ventilation ceilings

Ventilation systems for commercial kitchens and the food industry

We offer individual complete solutions for kitchen ventilation, from the initial consultation through to commissioning – including planning, manufacture and installation.

Whether for catering establishments, hotel kitchens, canteens, bakeries, coffee roasters, butchers, or production lines for foodstuffs such as ready meals or confectionery – REVEN has the right complete solution for you.

Depending on your requirements, we utilise our various technologies and optional equipment:

- X-CYCLONE® high-performance separation system (standard)
- REVEN® induction system
- REVEX® spray system
- EGN 99 odour filter
- UV system
- RSC control system
- REVEN® protect fire-extinguishing system
- and other options

You can find our entire product range in the REVEN Configurator.

Every kitchen ventilation product can be configured in a 3D view and downloaded as a BIM file in 3D and 2D, complete with the relevant tender specifications (see also page 32–33).

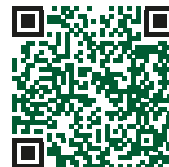
If you have any special requirements, such as a coloured finish in the front cooking area, please do not hesitate to contact us.

If you are unsure whether a kitchen hood or a room-spanning ventilation ceiling is the better solution for your project, please get in touch with us.

We'll be happy to advise you: +49 7042 373-0



[Go to the configurator ...](#)



Future-proof kitchen ventilation
(in German)

[Read the blog post ...](#)



A wide-angle photograph of a modern industrial kitchen. The ceiling is a complex system of stainless steel ducts and grilles, with long fluorescent lights integrated into the design. Below the ceiling, a network of pipes and sensors is visible. The kitchen features multiple stainless steel workstations with sinks, large induction cooktops, and deep fryers. The walls are covered in white square tiles, and a dark door is visible in the background. The overall atmosphere is clean and professional.

Ventilation ceiling in a factory canteen with the REVEN® induction system, the control system RSC and the REVEN® protect fire-extinguishing system

In-duct air-cleaning systems

Duct-mounted air cleaners for commercial kitchens, food production and industrial manufacturing

Our in-duct air cleaning systems are installed in exhaust-air ducts indoors and outdoors. They are suitable for cleaning exhaust air from machine tools, coating systems and production machines in the manufacturing industry, in the food industry and in commercial kitchens – to mention just a few examples.

We have the right duct-mounted air cleaner for your production process: whether for pre-separation directly on the processing machine, for centralised extraction in industry with large exhaust airflow rates of up to 80,000 m³/h, or for exhaust-air post-treatment in a commercial kitchen to reduce odours.

REVEN offers the optimum solution for exhaust air purification – from consulting and planning through to manufacturing and installation.

Depending on the requirements, our various technologies are used:

- X-CYCLONE® high-performance separation system (standard)
- REVEX® spray system
- EGN 99 odour filter
- UV system
- and others

You can find our entire product range in the REVEN Configurator.

Every exhaust air duct cleaner can be configured in a 3D view and downloaded as a CAD file in 3D and 2D with the associated tender specification (see also page 32–33).

Are you unsure which in-duct air cleaner is suitable for your process? Would you like to know whether several units can be installed in series? Please contact us.

We'll be happy to advise you: +49 7042 373-0



[Go to the configurator ...](#)



Explanation of the use and benefits of our exhaust duct cleaners
(in German)

[Read the blog post ...](#)





X-CYCLONE® RKM exhaust duct cleaner made from high-alloy stainless steel grade 1.4571 for use with very high exhaust airflow rates



Two X-CYCLONE® RKM exhaust duct cleaners connected in series

Compact systems

Compact air cleaners for the manufacturing industry

For the manufacturing industry, we offer plug-and-play air cleaners that can be installed directly on or next to the machine tool.

We supply the oil mist and emulsion mist separators of the X-CYCLONE® C-XSC, CR-XSC and CE-XSC series as standard with an integrated XSC control system. In line with the Industry 4.0 principles, the extraction capacity is automatically adjusted to the actual airflow rate to be extracted.

REVEN industrial air cleaners have a particularly wide range of applications, such as in the metalworking industry, on food processing production lines, in plastics processing, in coating plants, and in impregnation processes ...

Depending on requirements, we utilise our various technologies, cascaded filter stages and optional equipment:

- X-CYCLONE® high-performance separation system (standard)
- Agglomerators in various designs
- EUREVEN® F2011 filter
- HEPA final-filter stage
- REVEX® spray system
- Chip guard
- Condensers
- Coolant return
- and others



Go to the configurator ...



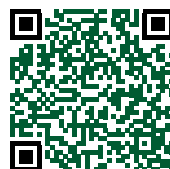
You can find our entire product range in the REVEN Configurator.

Each industrial air cleaner can be configured in a 3D view and downloaded as a CAD file in 3D and 2D with the associated tender specification (see also page 32–33).

Are you unsure which industrial air cleaner is right for your machine tool or processing operation? Would you like to know whether the selected oil mist separator is suitable for use with several machines? Or do you have further questions? Then please contact us.

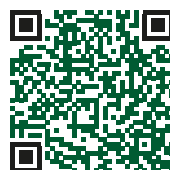
If you cannot configure a suitable industrial air cleaner for your production process, we will find a solution together with you or manufacture an individual variant specifically for your application.

We'll be happy to advise you: +49 7042 373-0



Check list for oil and emulsion separators

PDF ...



High-tech air cleaners for machine tools
(in German)

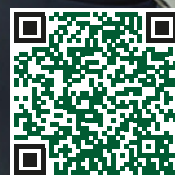
Watch the video ...



REVEN
SOLUTION GROUP

(In German)

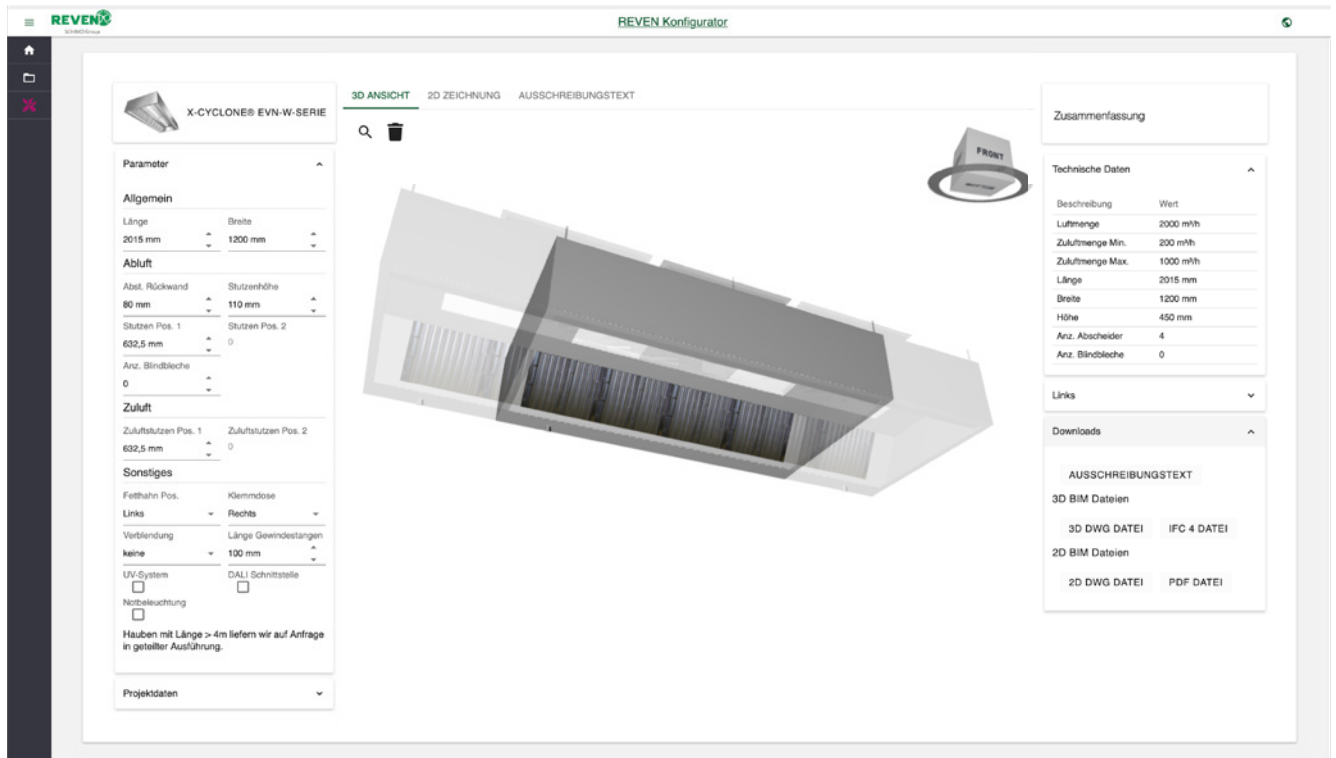
[Read the blog post ...](#)



Emulsion mist separator for grey cast iron machining at MAN Energy Solutions

The REVEN BIM Configurator

Select and customise our products online



The German version of the REVEN Configurator is shown. To switch to English, click the globe icon in the top right.

The innovative REVEN BIM Configurator is revolutionising the way designers, contractors and operators can customise industrial ventilation technology and solutions for commercial kitchens, for the food industry and for the manufacturing industry.

The intuitive user interface enables simple navigation.

You can individually set the predefined parameters, set the dimensions of products for kitchen ventilation to the nearest millimetre, or select a larger variant for air cleaners for the manufacturing industry, and see the changes directly in the 3D model. At the same time, the technical data show whether the dimensioning is sufficient for the required air-flow rate or whether the parameters need to be increased or decreased.

During configuration, the product can be rotated at any time and viewed from all sides.

A particular highlight is the option to download the selected and individually configured product directly as 3D BIM/CAD data and 2D CAD drawings with completed project data, together with the appropriately generated tender specification.

The REVEN BIM Configurator simplifies the planning and tendering of ventilation concepts in many ways.

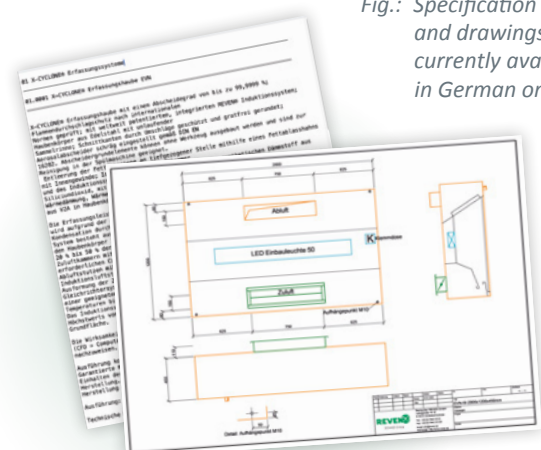


Fig.: Specification text and drawings are currently available in German only

The REVEN BIM Configurator

The information tool for the selected product



The German version of the REVEN Configurator is shown.

Another feature is the range of information available on the selected product via the 'Links' button, such as:

- Integrated technologies
- Intelligent ventilation systems
- Supply air topics
- How oil mist is formed
- Energy costs of air cleaners in industrial manufacturing
- Airflow calculation tools
- Operating manuals
- and more

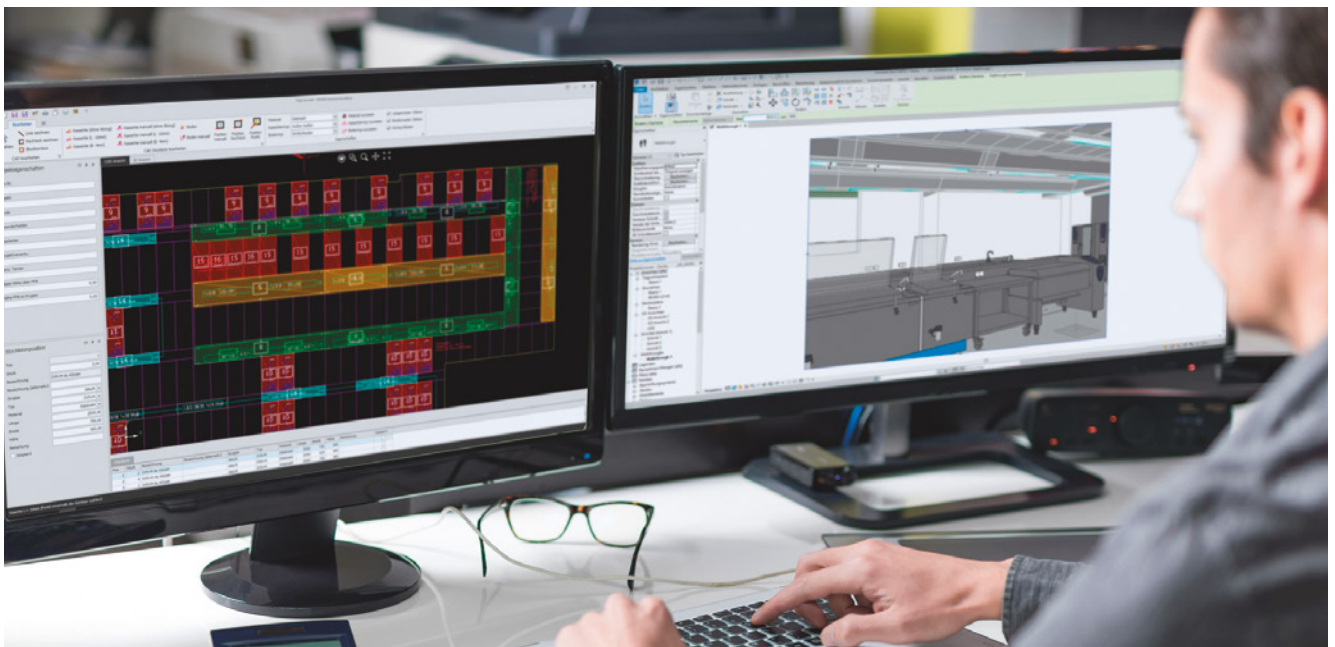


To the configurator ...

Fig.: Some documents are currently available in German only.

Planning and visualisation

Rentschler REVEN – a strong partner



REVEN knows exactly what must be taken into account in ventilation concepts. To avoid unpleasant surprises later, REVEN plans the entire kitchen ventilation system together with architects, ventilation planners and operators and leaves nothing to chance.

With the REVEN BIM App, the construction of your kitchen ventilation system can be individually planned and visualised. This has several advantages, for example:

Creating a cleaning concept

VDI 2052 Part 2, Section 7.1

VDI 2052 requires a cleaning concept to be prepared before construction. A cleaning system¹⁾ such as REVEX® can be incorporated into this concept.

Consideration of sound insulation

VDI guidelines and DIN EN 16282

Noise minimisation through the use of REVEN® DSD sound-absorbing ceiling panels²⁾.



Lighting calculation according to EU standard

EN 12464-1:2021, 5.3

You are also welcome to contact us for a lighting calculation before a project or conversion. With the REVEN BIM App, we can visualise the results of a new planning project or conversion in great detail³⁾.

Planning a fire extinguishing system

Placement of pipework and fire extinguishing tank.

In line with these topics, we offer the following guides for download on page 55:

- 1) REVEX® spray system
- 2) REVEN® sound-absorbing ceiling
- 3) REVEN® LED series

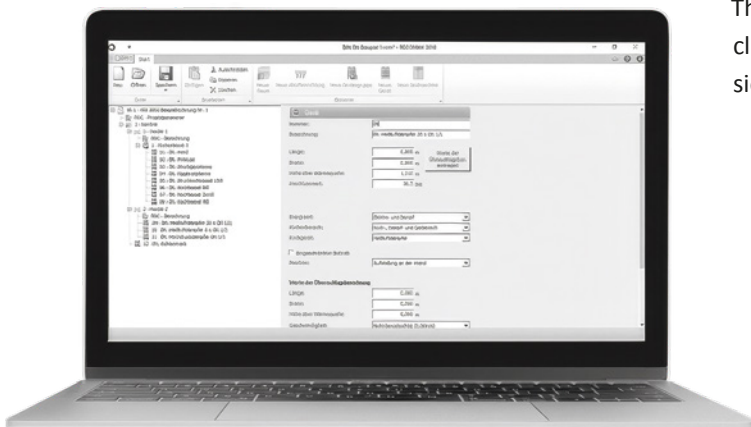
Airflow calculation

REVEN makes it easy for you

One of the most important criteria for selecting the right ventilation systems is the airflow rate that needs to be treated and the type of air pollution generated during the cooking or work processes.

The RECOMAX App for the catering and food industry

To calculate the correct airflow rate, we recommend our RECOMAX App, developed in accordance with DIN EN 16282-8:2017, 12 for ventilation systems in the food industry and in commercial kitchens.



The RECOMAX App is available as a German or English version for free download. It enables anyone to determine precise ventilation requirements without assuming extensive specialist knowledge.



RECOMAX design program

To the app ...



Airflow rate calculation
in commercial kitchens
(in German)

Read the blog post ...

Criteria for selecting an air cleaner in the processing industry

As a rule, the exhaust airflow rate to be handled by machine tools is stated in the operating manual. Different production processes on different materials, and the cooling lubricants used in each case, require different extraction performance.

In general, the finer the dusts and aerosols to be extracted and separated, the higher the air velocity must be – and the heavier the particles, the higher the suction force must be.

The criteria to be considered when selecting the right air cleaners can be found in our checklist for oil mist and emulsion mist separators.



Check list for oil and
emulsion separators

PDF ...

We are happy to assist you from the planning stage right through to commissioning.

Please contact us on: +49 7042 373-0

Brewhouse in Siegen

Reopening thanks to customised kitchen ventilation from REVEN



After a long break, 'Brauhaus Irle' celebrated its grand reopening on 26 February 2025. The traditional establishment shines in new splendour while remaining true to its roots. Guests can look forward to freshly tapped beer, convivial gatherings and a genuine brewhouse atmosphere – just as it used to be.

But in the run-up to the reopening, REVEN had to make the impossible possible! 'Can't be done' isn't in our vocabulary! Under this motto, Rentschler REVEN GmbH rose to a real challenge: the installation of a state-of-the-art kitchen ventilation system at the 'Brauhaus Irle' in Siegen.

THE PROBLEM:

Not enough headroom! A conventional kitchen ventilation system with air ducts running through a false ceiling was simply not possible.

A project that seemed almost impossible – yet thanks to clever planning, a wealth of experience and a good dose of tenacity, it became a reality.

Step by step, Anne and Holger Reul worked out the optimal solution – and found it! Despite all the difficulties, a state-of-the-art kitchen ventilation system featuring innovative induction technology was installed.

THE SOLUTION:

The air ducting was not concealed, but laid openly and visibly alongside the kitchen hoods.

The success of this project was so impressive that, at the opening ceremony, the client even welcomed Anne and Holger Reul with a red carpet! The joy and gratitude were immense – because without their dedication, the new brewhouse kitchen would not have been possible.

The entire REVEN team from Sersheim congratulates them on this outstanding job! Compare the pictures and see for yourselves what an impressive solution this is!



X-CYCLONE® EVN-M extraction hood, viewed from the front, with an air duct running around the left-hand side (shown in green)



Air duct (shown in green)



New charm with a genuine brewery atmosphere

Induction technology is used to precisely direct the airflows in the kitchen of the 'Brauhaus Irle' in Siegen, meaning that a lower total airflow rate is required. This not only reduces energy costs but also allows for a more compact design of the entire ventilation system.

This case study is based on the REVEN blog post dated 24 February 2025.



Further information
(in German)

[Read the blog post ...](#)

Odour reduction

REVEN's duct separator saves restaurant from closure



The Thai restaurant Aroydee is located in a prime city centre location and was recently extended. At mealtimes the restaurant is always packed. During peak times, the extractor hood could barely cope with the fumes, heat and odours released by the woks, so the exhaust air flowed outdoors only partly cleaned.

THE PROBLEM:

A high odour load in the exhaust air led to the local authority threatening to close the restaurant.

As a result, the Armani suits of bankers working in the surrounding buildings sometimes smelled of Peking duck in the evening. It started with complaints from bank employees; then the public order office contacted the restaurant owner

and threatened to close the restaurant. Should the kitchen be remodelled and a larger hood with new filters installed?

The solution to the problem was much simpler and more effective. The building services company Klimaberatung Rolf Nagel GmbH in Offenbach is familiar with such cases and recommended installing a duct separator in the existing exhaust air duct. The compact separator can be installed in just one day and removes the last residual particles and odour molecules from the exhaust air. It also improves structural fire protection.

Thai restaurateur Bunrung was convinced by reference projects and invested around EUR 25,000 in the new separator, including a more powerful exhaust air fan and highly effective X-Cyclone grease filters* for the ageing kitchen hood.

The multi-stage duct separator was integrated into the horizontal exhaust air section on the roof of the building.

* X-Cyclone grease filters refer to the X-CYCLONE® separators from Rentschler REVEN as described from page 18 onwards.

**More about odour reduction
with potassium permanganate**
(in German)

[Read the blog post ...](#)



STAGE 1

X-CYCLONE® separator
for separating
grease particles

STAGE 2

Bag filter



STAGE 3

Filter cartridges
with potassium
permanganate for
odour absorption

Fig.: Multi-stage X-CYCLONE® RKGN duct separator



Fully installed duct separator and fan in the exhaust air section of Thai restaurant Aroydee on the roof.

THE SOLUTION:

Installation of an RKG duct separator with a multi-stage filter/separation system and filter cartridges with potassium permanganate for odour absorption.

As the first cleaning stage it also contains stainless steel X-Cyclone grease filters, as the second stage a bag filter and as the final stage filter cartridges containing the oxidising agent potassium permanganate (KMnO_4).

Due to its strongly oxidising effect, potassium permanganate initiates a chemical reaction process that eliminates

molecular odour substances. The active ingredient is non-flammable (although, according to EU hazardous substance labelling it is classified as oxidising, because spontaneous ignition can occur when mixed with certain substances), inexpensive and changes colour when regeneration is due.

The removable X-Cyclone grease filters clean themselves due to the centrifugal principle and are placed in the dishwasher for basic cleaning only once a year. The filter cartridges can be regenerated twice and are replaced every one to two years, depending on cooking intensity. Cost: around EUR 3,000. In return, the restaurateur has satisfied guests and no trouble with the public order office.

This article was published in the magazine 'TGA Fachplaner', issue March 2016, in the section 'Air Conditioning'.

Author: Peter Göhringer



Fig.: EGN 99 granules, with potassium permanganate: new on the left and saturated on the right.

Impregnation processes for electric motors

Evaporated resins pose no problem for X-CYCLONE® air cleaners



In the production process, the quality of an electric motor depends not only on materials and workmanship but, above all, on effective impregnation. There are various methods for this. One of them is 'hot dipping'. In this process, the stator (the stationary part of the motor) or the rotor (the moving part of the motor) is immersed in a bath of liquid resin.

The resin performs several important tasks:

- It insulates the electrical windings.
- It ensures better thermal conductivity.
- It mechanically stabilises the components.
- It improves the service life of the electric motor.

To allow the impregnating resin to penetrate deep into the windings, the motor component or the resin itself is often heated before immersion (hot dipping). Especially during immersion of the motor components and subsequent drying or curing, aggressive hot resin vapours and aerosols are produced and can condense very quickly. These properties place special requirements on ventilation technology.



THE PROBLEM:

Vapours from impregnating resin are aggressive and condense very quickly. They can damage impregnation and ventilation systems and may pose a health risk.

If plant operators do not control these vapours, various problems can occur, such as:

- Resin deposits in pipework.
- Health hazards for production personnel.
- Gummed-up ventilation systems.
- Damaged seals.
- Contaminated plant areas.

For this reason, simple hall ventilation is not sufficient in many cases. Instead, the impregnation system requires targeted extraction of impregnating resin vapours from electric motors directly at the process. In a modern impregnation system, a ventilation system with an extraction system is installed in the upper part, extracting the impregnating resin vapours directly at the source and conveying them to the air cleaner. This helps prevent vapours and aerosols from spreading through the production area and causing damage there.



AI-visualised representation of an impregnation system with a ventilation system installed on the roof

Furthermore, a ventilation system for impregnation processes using impregnating resin must meet high requirements, such as:

- Handling large volumes of air, so that the resin vapours are captured safely.
- Having a condensation system as a preliminary stage, where cooling promotes condensation and the resulting droplets can then be separated.
- Providing highly efficient aerosol separation for the remaining aerosols through special air cleaner systems.
- Having housings made from welded stainless steel to withstand aggressive media.

In many modern plants for the production of electric motors, such air cleaning systems are now standard equipment.

THE SOLUTION:

Our X-CYCLONE® C-XSC series air cleaners with integrated condensation system meet all the requirements necessary in the production of electric motors.

The industrial air cleaners designed by REVEN meet the required criteria and are also used in impregnation systems. For example, REVEN industrial air cleaning systems are installed as standard in the complete hot-dipping systems of a well-known manufacturer for stators.

The text is based on the REVEN blog post from 11 March 2026.



Further information
also on the subject of 'Blue Haze'
(in German)

[Read the blog post ...](#)

Research & Development

The functionality of our products is scientifically proven

All our air cleaners are the result of decades of research and development. Our technicians and engineers use measuring instruments, software and development tools of the highest standard for development and optimisation. All our products undergo a development process lasting several years, during which the following equipment and facilities are used, amongst others:

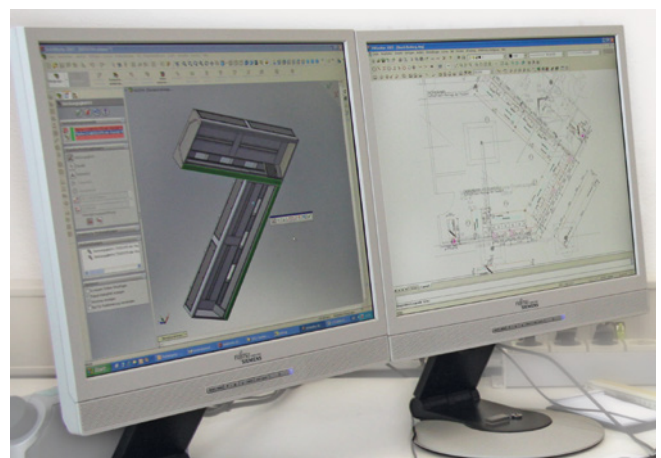
- Aerodynamic laboratory with scattered-light spectrometer system for precise and reliable measurement of particle concentrations and sizes.
- Fire exposure test stands for tests in accordance with DIN EN 16282, DIN 18869 and VDI 2052.
- Flame ionisation detector (FID) for the measurement of the total hydrocarbon content.
- Mobile, battery-powered handheld laser photometer with scattered light measurement and data logging for real-time measurements of aerosol masses.
- Thermographic high-resolution camera systems for flow analysis.
- Software systems for computational fluid dynamics, the only way to analyse and understand airflows and use these findings for development.
- SolidWorks 3D-CAD systems for development and simulation.



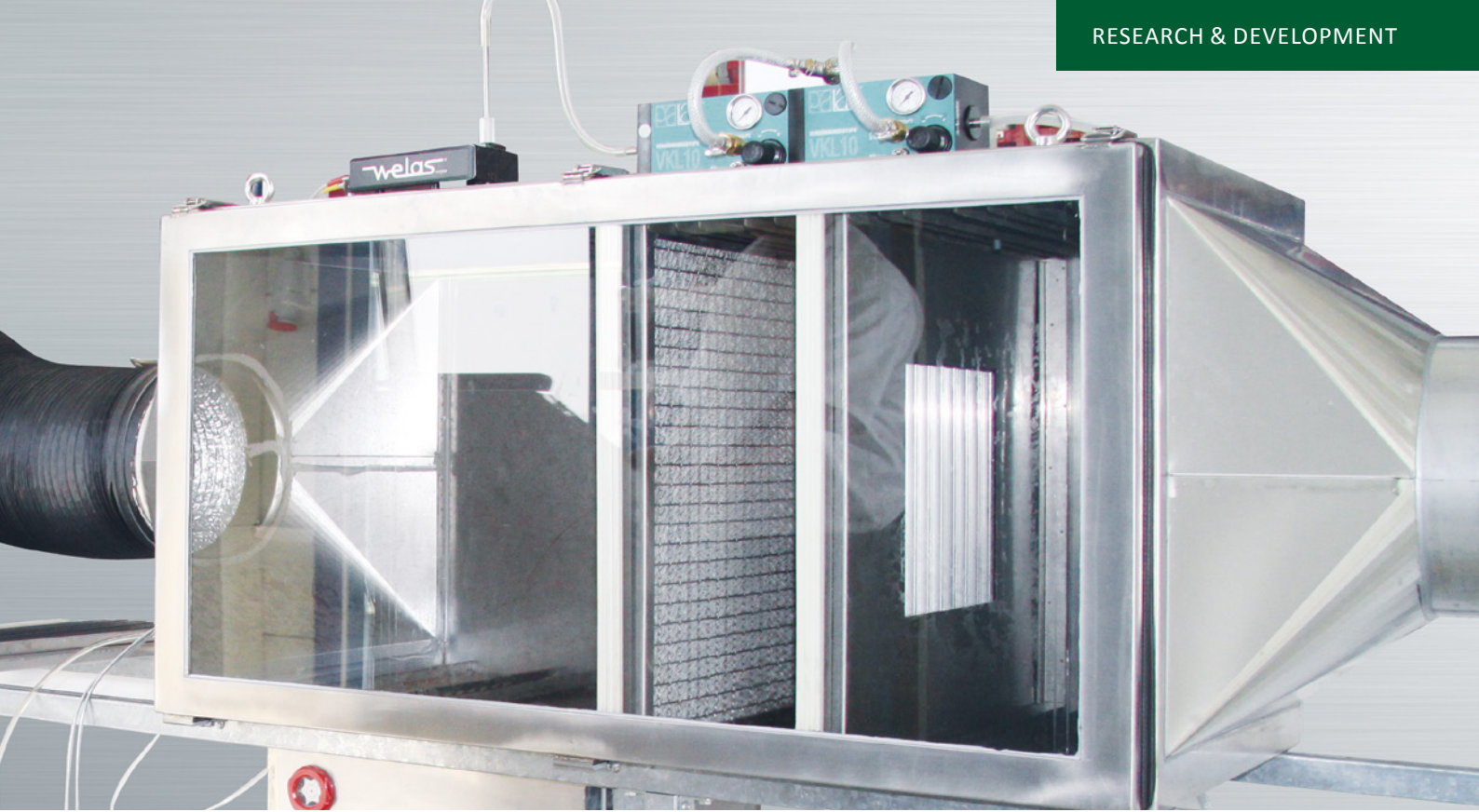
Result displays from a particle measurement



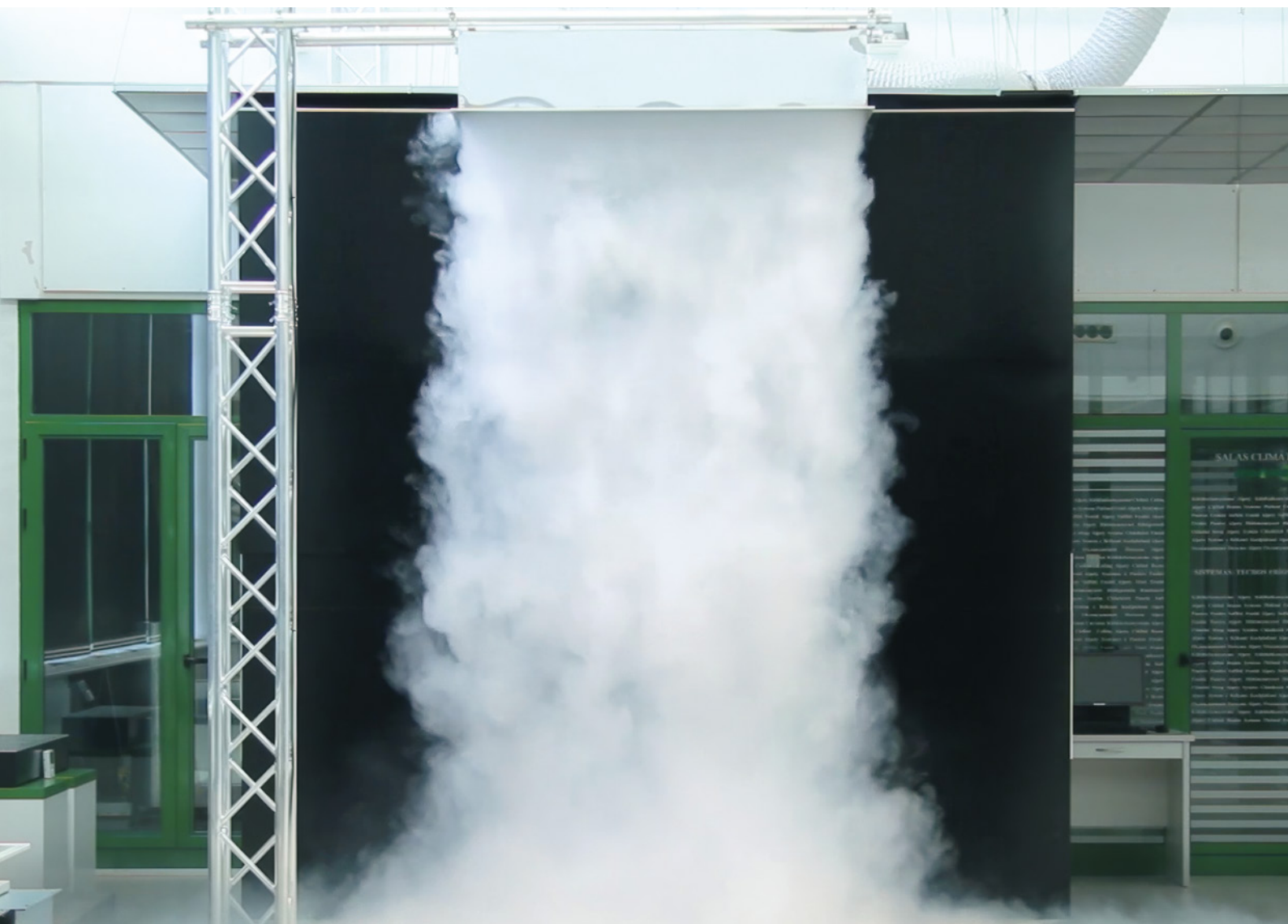
Test rig for assessing the flame-through resistance of separators



SolidWorks 3D CAD system in use



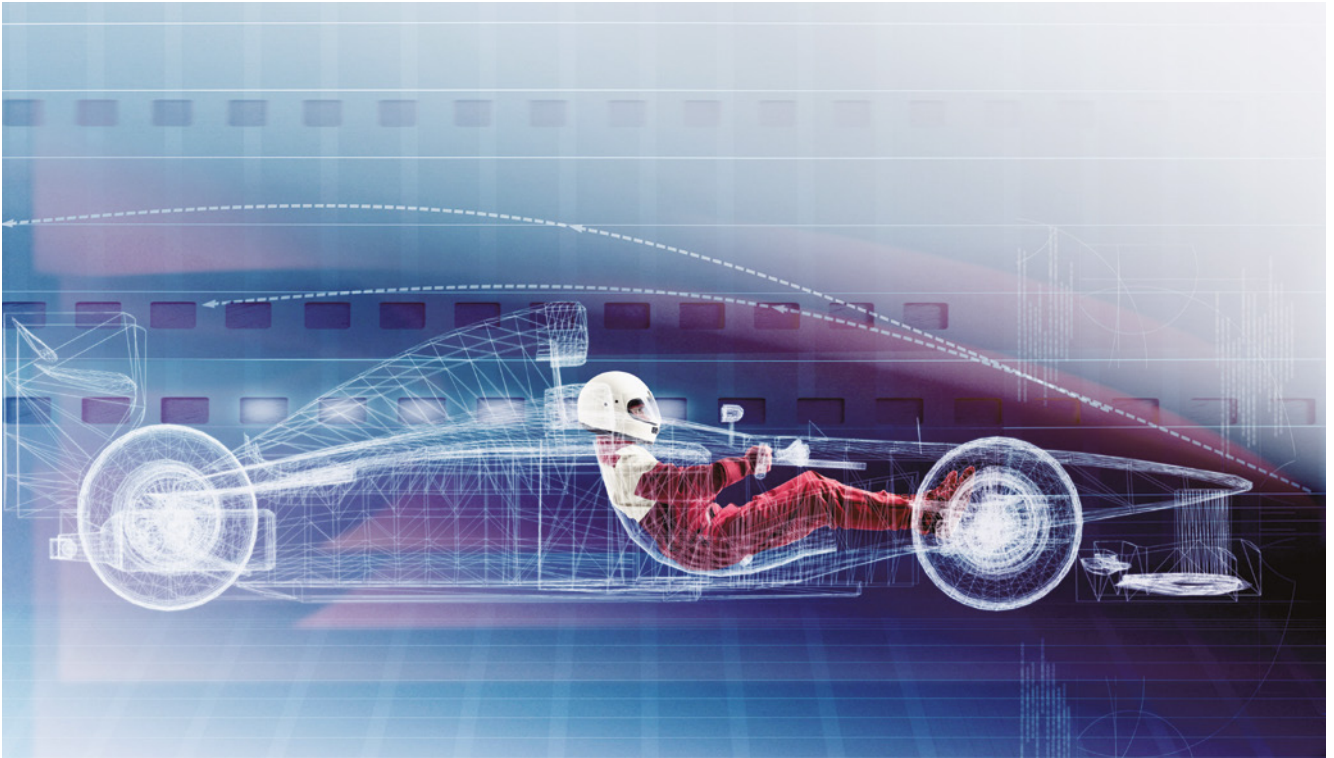
Exhaust air duct separator on the test bench



Supply air outlet from the REVEN® ECOJET series in the flow laboratory

CFD simulation

Visualisation and analysis of airflows



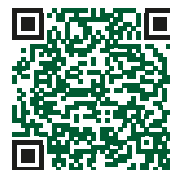
Flows are complex and cannot be analysed analytically. The only way to calculate and understand them and make them usable for process and product development is flow simulation, also known as computational fluid dynamics (CFD).

Even highly complex airflow patterns around the front and rear wings of modern Formula 1 racing cars are now analysed and optimised by racing teams using CFD simulation.

Whether a Formula 1 car, an industrial air cleaner or an induction hood operates efficiently depends to a large extent on the airflow inside and around it. CFD simulation models these invisible yet highly important and extremely complex processes using well-founded physical and mathematical models.

The major advantage of CFD simulation compared with experimental methods and measurements is that it does not merely provide values at selected points, but captures all physical quantities at once and can therefore also prove functionality.

For this reason, we have been analysing and developing our systems for years using CFD flow simulation methods!



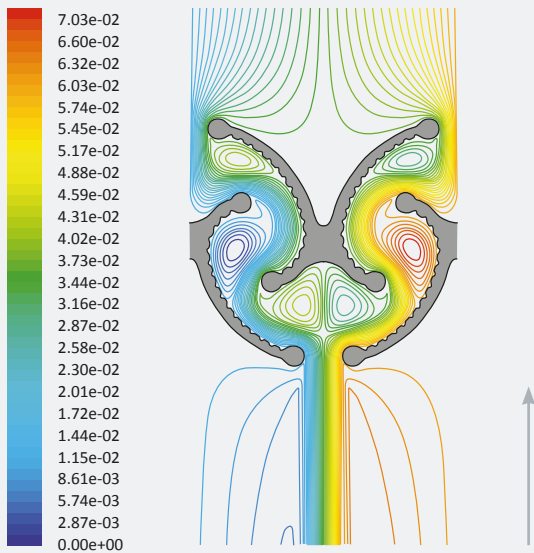
CFD in exhaust air technology
(in German)

[Read the blog post ...](#)

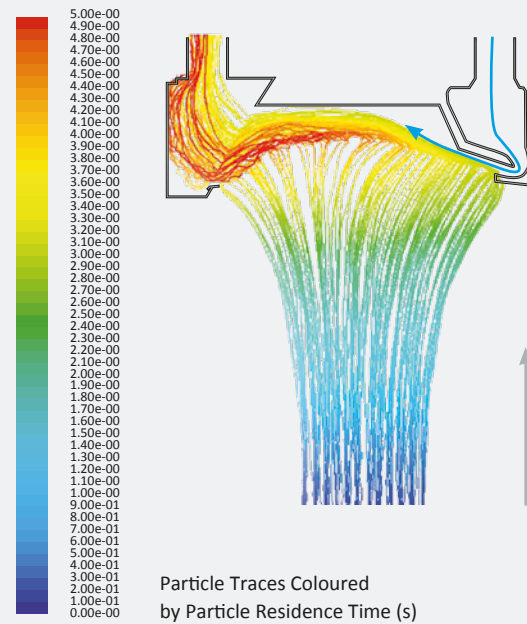
CFD analysis

Further development of systems and products using CFD

X-CYCLONE® Separator



REVEN® Induction System



REVEN® ECOJET Supply Air Unit

Horizontal cross-section of the supply air unit

Vertical cross-section of the supply air unit and kitchen area

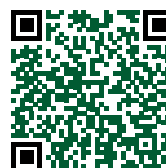
Velocity (m s⁻¹)

1.939
1.818
1.697
1.576
1.455
1.333
1.212
1.091
0.970
0.848
0.727
0.606
0.485
0.364
0.242
0.121
0.000

Kitchen
Height = 3.50 m

The different colours indicate flow paths with different velocities in the supply air.

Both our X-CYCLONE® high-performance separation system and our REVEN® induction system, as well as our REVEN® ECOJET supply air unit, have been continuously analysed and further developed over many years using CFD!



Understanding kitchen ventilation – measuring and controlling airflows

PDF ...

Test rig for flame penetration testing

in accordance with DIN 18869-5 and DIN EN 16282-6



Detailed explanation
of flame penetration with video
(in German)

[Read the blog post ...](#)

In connection with manufacturing and finishing processes in mechanical engineering and the food industry, high concentrations of highly flammable aerosols often have to be extracted and separated.

If the aerosols ignite in the exhaust air duct, the flames can spread into the whole building via the duct and set entire building complexes on fire within a few minutes.

To prevent this, all our X-CYCLONE® aerosol separators are tested on our test benches for flame-breakthrough resistance in accordance with national and international standards.

REVEN[®] oil mist separators pass explosion tests

This means that our X-CYCLONE[®] separators meet all German and European requirements for flame penetration safety. Their behaviour under explosion conditions has also been tested and documented.



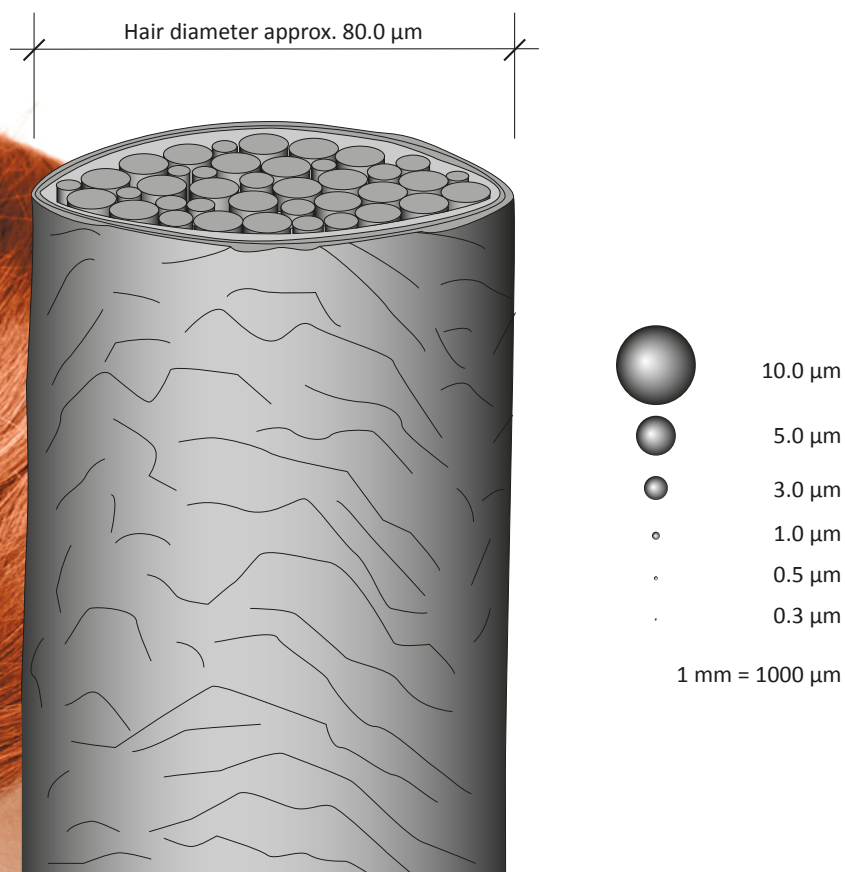
Air-quality limits

Clean air for industrial workers

Machining processes on machine tools and in food processing generate high concentrations of PM10 aerosols. PM10 aerosols are defined as airborne particles with an aerodynamic diameter of approximately 10 μm or less.

The graphical comparison with a human hair clearly illustrates the size ratio between a five-micrometre particle and the diameter of a human hair.

The concentration of these airborne PM10 particles can reach considerable levels. In a volume of air of one thousand cubic metres, PM10 concentrations of up to 500 grams can occur!



The WELs (Workplace Exposure Limits) for air pollution in the manufacturing industry differ considerably from country to country. The same applies to the verification and control of compliance with these limits. Numerous studies have shown that even outdoor air pollution in cities has a decisive influence on the health and mortality rate of exposed people. For this reason, Rentschler REVEN bases the design and dimensioning of its equipment on the far more stringent outdoor exposure limits adopted in the metropolises of the world. In many large cities, the maximum permitted concentration of fine dust is 50 micrograms per cubic metre of air. Rentschler REVEN is committed to the following quality objective: the air quality demanded for people in large cities and the limit values that apply there should also be achieved for the industrial workers.

The illustration shows the city centre of Brussels. The air in industrial factories should comply with the same standards of purity!

** According to EU directives, the value will be reduced to 45 micrograms of fine dust from 2030.*

Please also refer to the following interview with our CEO, Sven Rentschler, in Germany's leading mechanical engineering magazine 'maschine + werkzeug', issue August 2011, page 72.



Ventilation technology from Rentschler REVEN for healthy air in the workplace

The X-CYCLONE[®] system complies with safety regulations

Protection of people and machinery

INHALATION

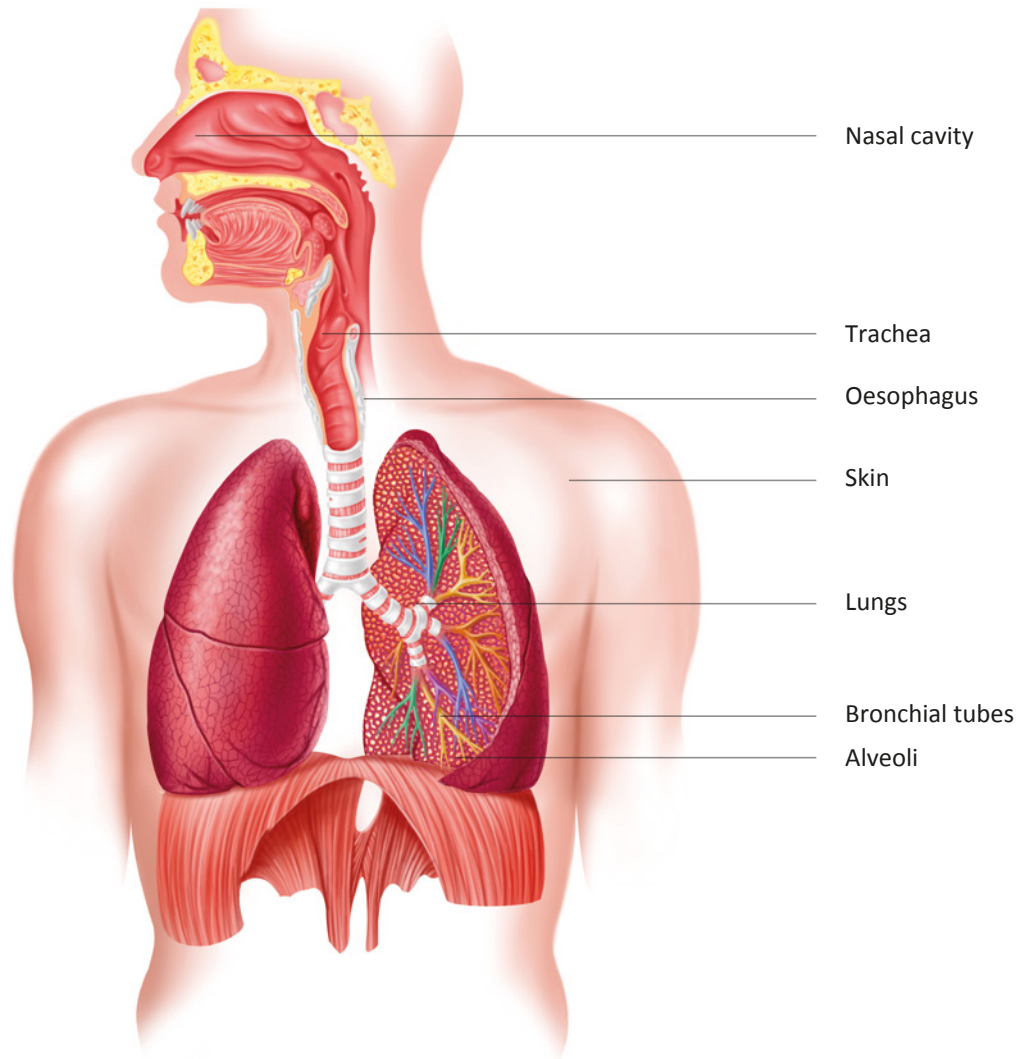
Gases, vapours,
dusts, aerosols

INGESTION

Dusts and liquids

SKIN ABSORPTION

Dusts and liquids



According to scientific findings, fine dust as well as airborne aerosols with a droplet diameter of less than 5.0 µm pose an increased health risk to workers. These particles can enter the lungs directly through breathing and trigger asthma, pulmonary fibrosis or other serious respiratory diseases. They can also be transported directly to the brain via the olfactory system, where they can, amongst other things, cause inflammation. Furthermore, fine particles are risk factors for a wide variety of cancers. The particles are absorbed not only via the respiratory tract, but also via the oesophagus and the skin.

Nor should we overlook the potential damage to sensitive plant and machinery, as well as to buildings, and, of course, the impact on the environment.

Our systems have been certified on multiple occasions by independent institutes, including the German Social Accident Insurance (Berufsgenossenschaft). These certifications guarantee that all statutory occupational exposure limits (Arbeitsplatzgrenzwerte) are complied with.

Interview with Sven Rentschler

Excerpt on the topic of limit values

What are the limits of pollutant concentrations in air treated with air cleaners?

The fine dust pollution in the outside air has been a matter of discussion for several years now. Vehicle and industry emissions are the focus of attention. The term 'fine dust' refers to the mass of all particles with a diameter of less than 10 micrometres included in the total dust quantity. According to the findings of the World Health Organisation, respiratory and cardiovascular ailments increase with exposure to high concentrations of these fine particles. In order to ensure health protection, exposure limits for outside air concentrations have been introduced by the authorities. Since 2005, a limiting value for daily exposure of 50 micrograms per cubic metre of air has been adopted throughout Europe. In the wake of this regulation, the badge system for urban traffic was one of the measures introduced in Germany.

And which exposure limits apply at the workplace?

The permissible air pollution WEL is 10 milligrams per cubic metre for cooling lubricant vapours and aerosols with a flash point above 100 degrees Celsius that are emitted during metal processing. The same exposure limit applies to processing machines with a minimum lubrication system. This WEL is two hundred times higher than the limit for outdoor air pollution!

Is fine dust always the same?

Fine dust in city traffic pollution is certainly not the same as that generated on processing machines. The latter is not fine dust in the traditional sense. It consists of cooling lubricant particles that are emitted during machining processes. However, those cooling lubricant vapours and aerosols are very similar to fine dust with regard to the particle sizes and the health hazards involved. With a diameter of less than 10 micrometres, these cooling lubricant particles enter the vascular system via the lungs. They are therefore considered particularly harmful. Even though several studies have proven that a fine dust load of 50 micrograms in the outdoor air measurably reduces the life expectancy of exposed people, we still allow processing machine operators to be exposed to indoor levels that are

200 times higher. I can hardly understand that. These regulations are not consistent.

Is there only a health risk in the immediate proximity of the machine?

No. In metal processing workshops, the indoor air is extracted frequently, cleaned and returned to the workshop. In our experience, many of these extraction systems achieve a filtering performance of only two milligrams of cooling lubricant vapours and aerosols per cubic metre of cleaned air. The concentration of pollutants imposed on the operators is still 40 times higher than the permissible limit concentration for outdoor air. Professional associations should take the matter in hand without delay and update and harmonise the WEL regulations to a reasonable level.

You also conduct measurements in companies. What are your findings there?

The total bandwidth of air pollution can be found, from exemplary manufacturing companies with clinically clean workplace air to factories where the WEL of 10 milligrams is exceeded by far. The processing machines may have the CE marking applied to them, but they can still be put into operation without an efficient filter because many manufacturers offer the filters as an optional extra. I cannot understand that.

Are there positive examples too?

Yes, of course. Groups of companies increasingly adopt their own standards and apply them to their sites all over the world. Volkswagen, for example, maintains a very high standard of air quality in its production facilities. I also know that GM and Ford have internal guidelines in this area that go far beyond government regulations.

Interview in Germany's leading mechanical engineering magazine 'maschine + werkzeug', issue August 2011, page 72.

Despite being some time ago, the interview remains as relevant as ever. The daily limit value for particulate matter, which is still in force, has been in place for more than 20 years and was only reduced from 50 µg/m³ to 45 µg/m³ for 2030 under the latest EU directive, based on scientific findings regarding the health effects of particulate matter.



Aerosols with a diameter of less than 10 micrometres are often invisible. If particulate matter were visualised in mechanical engineering, it might look exactly as shown in the illustration above.



Example of a particulate matter measurement – live during a webinar

REVEN offers particle measurements

Are you unsure about the air quality in your production hall? Would you like to know whether all the air is actually being extracted in your commercial kitchen or food processing facility. Are you interested in clean indoor air? Then please get in touch with us.

We'll be happy to advise you: +49 7042 373-0

Comparison of PM10 limit values

The guideline value in metalworking, at $10,000 \mu\text{g}/\text{m}^3$, is 200 times the amount of PM10 pollutant particles that a person should inhale per day, according to EU guidelines.

$50 \mu\text{g}/\text{m}^3$ per day*

$10,000 \mu\text{g}/\text{m}^3$ per day

Guideline value
in the EU for urban air

Guideline value
in metalworking

* From 2030, the new limit value of $45 \mu\text{g}/\text{m}^3$ per day will apply.

Misconceptions

in ventilation technology and air pollution control

With the beginning of the pandemic in 2020, correct ventilation became one of the top topics in Germany. Discussions about healthy indoor air took place throughout the country. The ventilation effect, filter performance and efficiency of many solutions are barely understandable – especially for laypeople – and led to misconceptions in the debate, comparable to the misconceptions about clean air and indoor air purification that have become entrenched as half-truths in industry for many decades.

As a ventilation engineer with decades of experience in air cleaning, Sven Rentschler took this as an opportunity to explain these misconceptions and offer solutions in his first podcast.

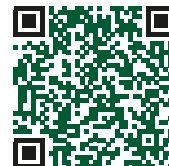
The book accompanying the podcast

The book provides an overview of misconceptions and solutions on the following topics:

- Extraction
- Filtering and separation
- Vapours and odours
- Viruses
- Visualising airflows
- Measuring air pollution



Fig.: The book was published as a cci book by cci Dialog GmbH.

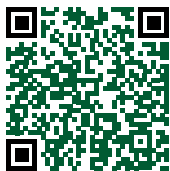


The book is available for download in many languages.

PDF ...

Find out more

Our publications available for free download



Understanding kitchen ventilation
Measuring and controlling airflows



Misconceptions in ventilation technology and air pollution control
eBook in many languages



X-CYCLONE® high-performance separator
Guide *(in German)*
Application and performance of the patented aerosol separator



Electrical interfaces
Cabling instructions *(in German)*
Which cable type for which circuit



REVEX® spray system
Guide *(in German)*
Automated cleaning and disinfection of the ventilation system



REVEN® sound-absorbing ceiling
Guide *(in German)*
Noise reduction for commercial kitchens and other facilities



REVEN® LED series
Guide *(in German)*
The importance of lighting management for working in commercial kitchens

REVEN Linktree

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Visit our Linktree (*in German*) – your central entry point to all the topics on the REVEN blog, our website and in social media.

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