



# Breathe the Difference

High Quality Ventilation Equipment for  
Health, Safety and the Environment



Our competence for your benefit



People



Machinery



Environment

30

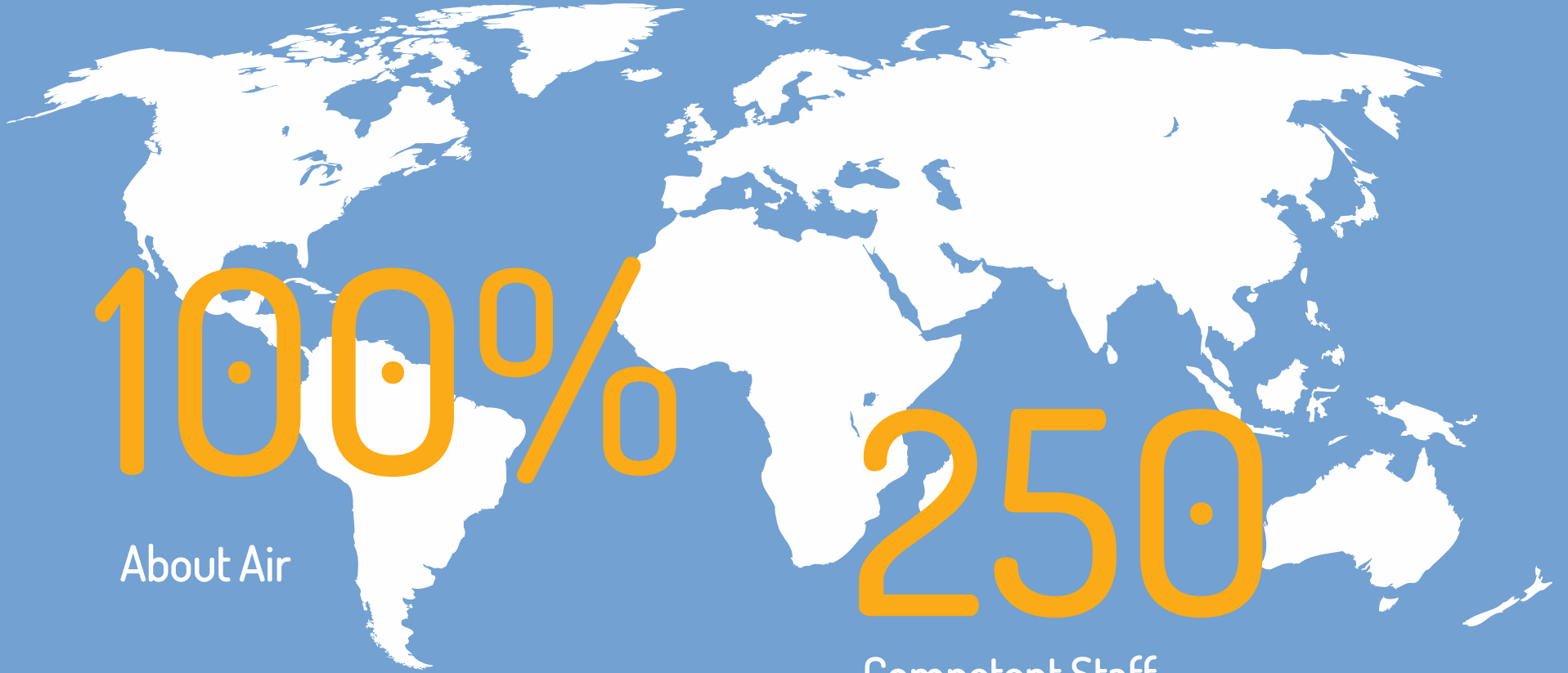
Subsidiaries  
& Representative Offices

100%

About Air

250

Competent Staff





**CFT GmbH**  
Compact Filter Technik  
100 %

**CST GmbH**  
Customer Savings Technology  
100 %

**DFT GmbH**  
Deichmann Filter Technik  
100 %

**Korfmann**  
Lufttechnik GmbH  
40,72%

**WAT GmbH**  
Wärme-Austausch-Technik  
36,7 %

**CFT France**  
S.A.R.L.  
100 %

**CFT Polska**  
Sp.z.o.o.  
80 %

**CFT Kasachstan**  
T.O.O.  
49 %

**CFT Sibir**  
O.O.O.  
50 %

**CFT-MMZ**  
O.O.O.  
50 %

**Shanxi Tiandi CFT**  
Technology Co. Ltd.  
49 %

# Subsidiaries and Shareholdings



# CFH, CFT & CST in Gladbeck, Germany



The main location includes both the Group Headquarters as well as the main office and workshop for the companies CFT and CST.

# DFT Filtertechnik in Bebra, Germany



Deichmann has been developing high-quality systems for industrial dedusting for more than 60 years and offers a wide range of solutions to for filtering solids and gaseous substances.

The company has been part the CFH group since 2015.

# Korfmann Lufttechnik in Witten, Germany



Korfmann Lufttechnik offers ventilation solutions for the mining and tunnelling industries. Since being re-established in 2001, all Korfmann branded fans and ventilation accessories have been manufactured exclusively by CFT in Gladbeck.

# WAT GmbH in Hamminkeln, Germany



WAT designs and manufactures cooling systems for climate control of air and cooling of water and has been a specialist for applications in mining and tunnelling for more than 40 years.

The CFH group has been a shareholder since 2017. All national and international sales activities for the products are provided by CFT (excluding China).

# CFT Polska in Tychy, Poland



CFT Polska was founded in 2008 to support service and sales activities in Poland, the Czech Republic and Slovakia. In the meantime, the company offers an extended product portfolio for the local market.

# CFT Kazakhstan in Karaganda, Kazakhstan



CFT Kazakhstan was founded in 2008 to provide the local market with technical support and service. It has 14 qualified staff and holds a comprehensive stock of original spare parts. In the meantime, they also offer their own product range for the local market.

# Shanxi Tiandi CFT Technology in Taiyuan, China



The Joint Venture was founded in 2014 and provides crucial support for the Chinese market for dust collection in cooperation with the domestic partner CCTEG.

# CFT France in Lyon, France



The branch office in Lyon was founded in 2016 in order to strengthen activities in the French speaking markets. CFT France develops technical solutions for dust separation and ventilation and also for monorail-mounted equipment.

# CFT Sibir in Novokuznetsk, Russia



The Joint Venture with Sibelektro was founded in 2016 in order to support the sales activities for dedusting systems in the Russian Kuzbass coalfield.

# CFT-MMZ in Prokopjewsk, Russia



The Joint Venture CFT-MMZ with the Russian partner MMZ was founded in 2017 to support the local sales activities for ventilation equipment – also in the Kuzbass coalfield.

An element of local manufacture is planned for the future.

# Representation

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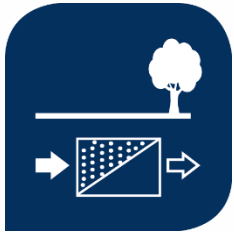
20 agencies are working worldwide to support the sales activities of the CFH group.



# Breathe the Difference

Engineered solutions for dedusting, ventilation  
and the heating and cooling of air

# Product Portfolio



Underground  
Dedusting



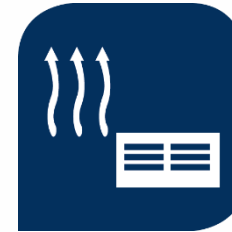
Temporary  
Tunnel Sites



Ventilation



Air Cooling  
Systems



Air Heating  
Systems



Gas Cleaning



Methane  
Drainage



Ducts



Pipework



Engineering

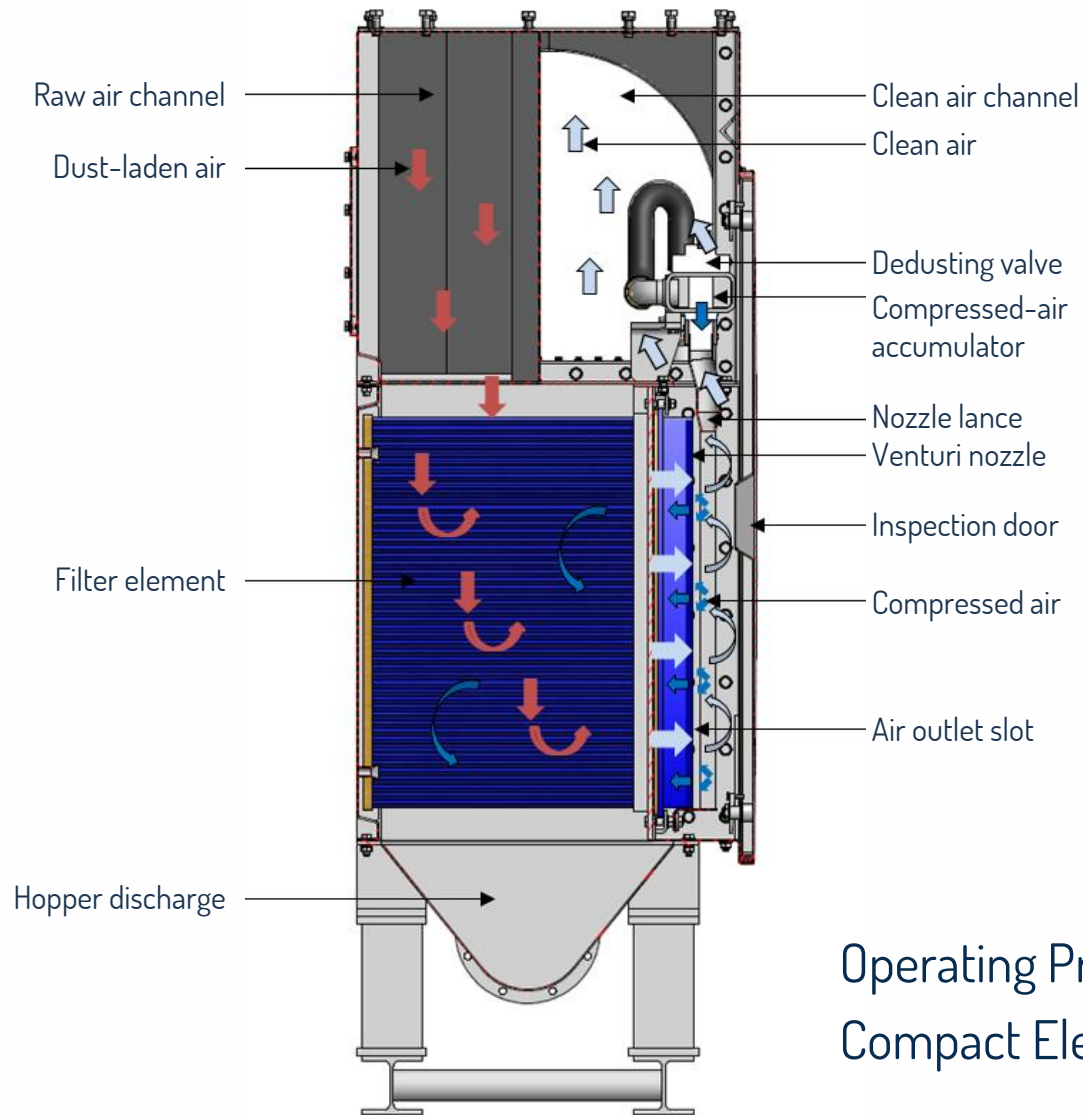
CFT provides its customers with innovative solutions for all aspects of dedusting, ventilation and the cooling and heating of air – primarily for mining, tunnelling, and tunnel refurbishment but also for other specialised industrial applications.

# Integrated Management System



For guaranteed quality assurance, workplace health and safety and environmental protection:  
ISO 9001 - BS OHSAS 18001 - ISO 14001

# Dry Dedusting



Operating Principles  
Compact Element Filter



# Dry Dedusting



Compact element filter for 'NorthConnex' tunnel project in Sydney, Australia

Air flowrate: 2100 m<sup>3</sup>/min



# Dry Dedusting



Independent test results for a CFT dry-deduster  
by Deutsche Montan Technologie (DMT):

Filter material: CFM / raw gas concentration: 10.000 mg / m <sup>3</sup>		
Air quantity ( density= 1.2 kg / m <sup>3</sup> )	m <sup>3</sup> / s	*10.0
Total pressure loss	Pa	*3,100
Raw gas concentration	mg / m <sup>3</sup>	10,000
Clean gas concentration	mg / m <sup>3</sup>	0.055
Efficiency factor	%	99.999
Air-to-cloth ratio	m <sup>3</sup> / (m <sup>2</sup> * min)	2.36

\* = average



# Dry Dedusting

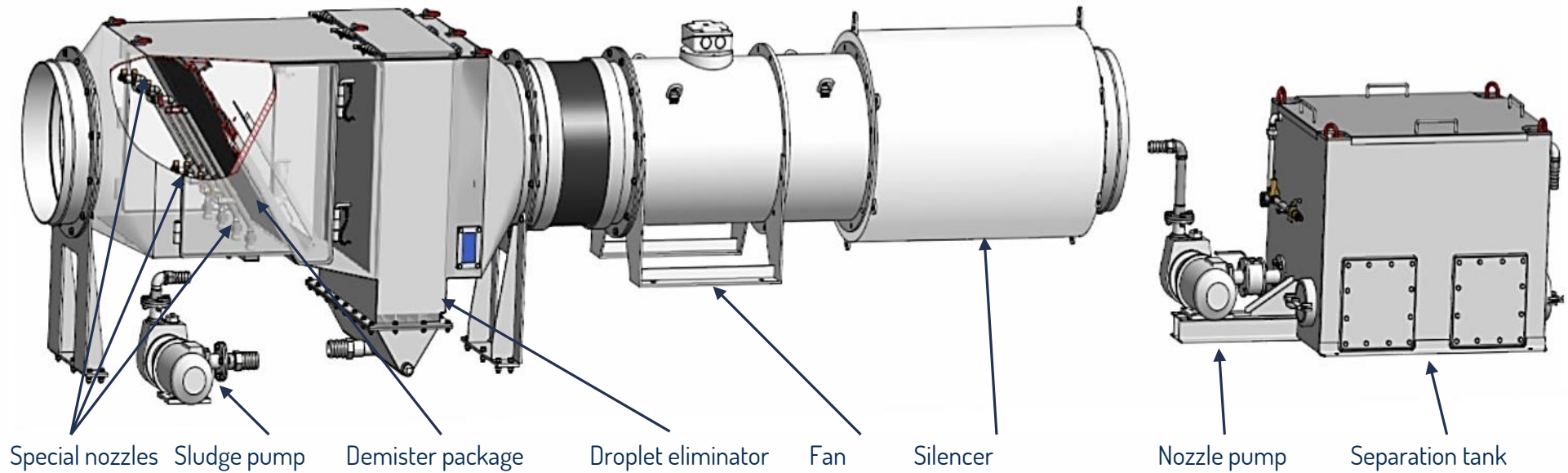


Compact filter elements with Venturi nozzles

Anti-static filter element certified for use in explosive atmospheres



# Wet Scrubbers



Operating principles: Hoeko-Vent wet scrubber



# Wet Scrubbers



Tunnel refurbishment in Avignon, France

Air flowrate: 400 m<sup>3</sup>/min



# Wet Scrubbers

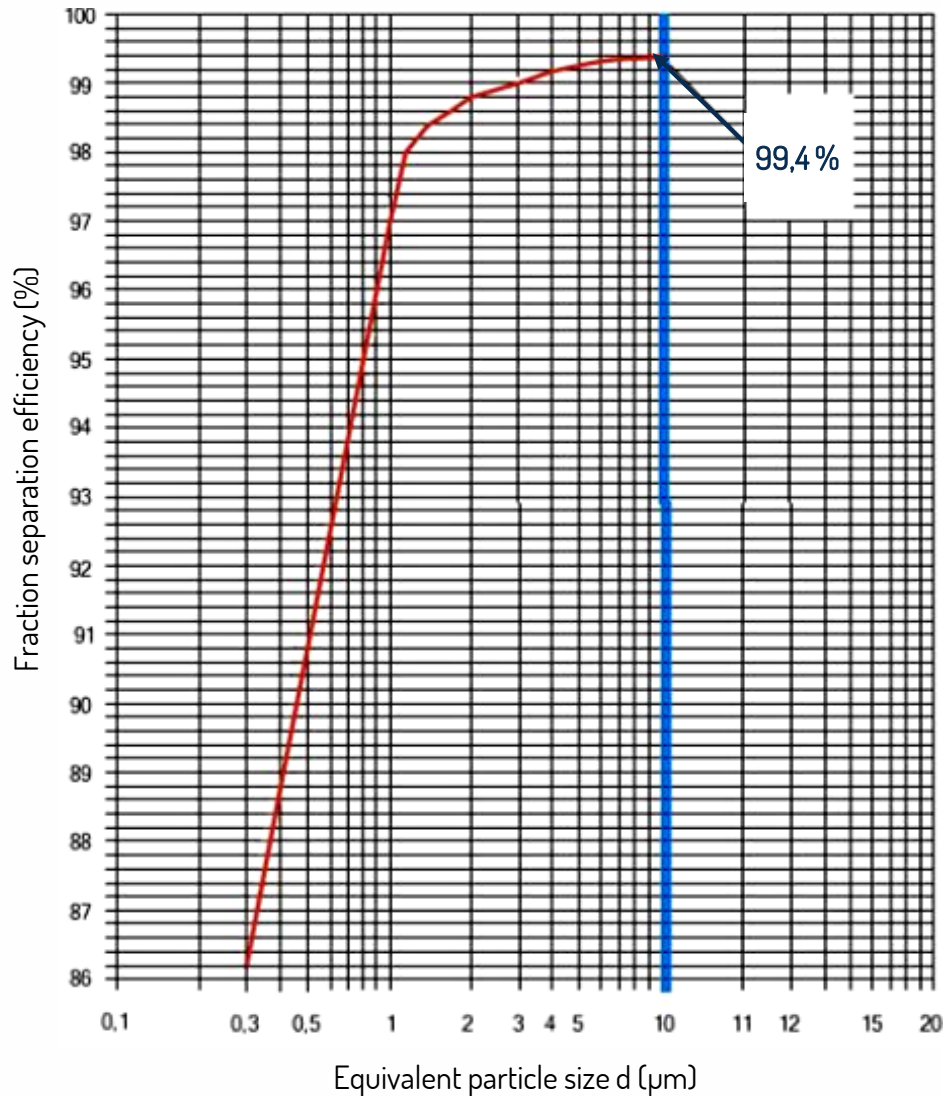


Diagram of Cumulative Fraction Separation Efficiency Depending on the Equivalent Particle Size



# Dry Cuttings Extraction

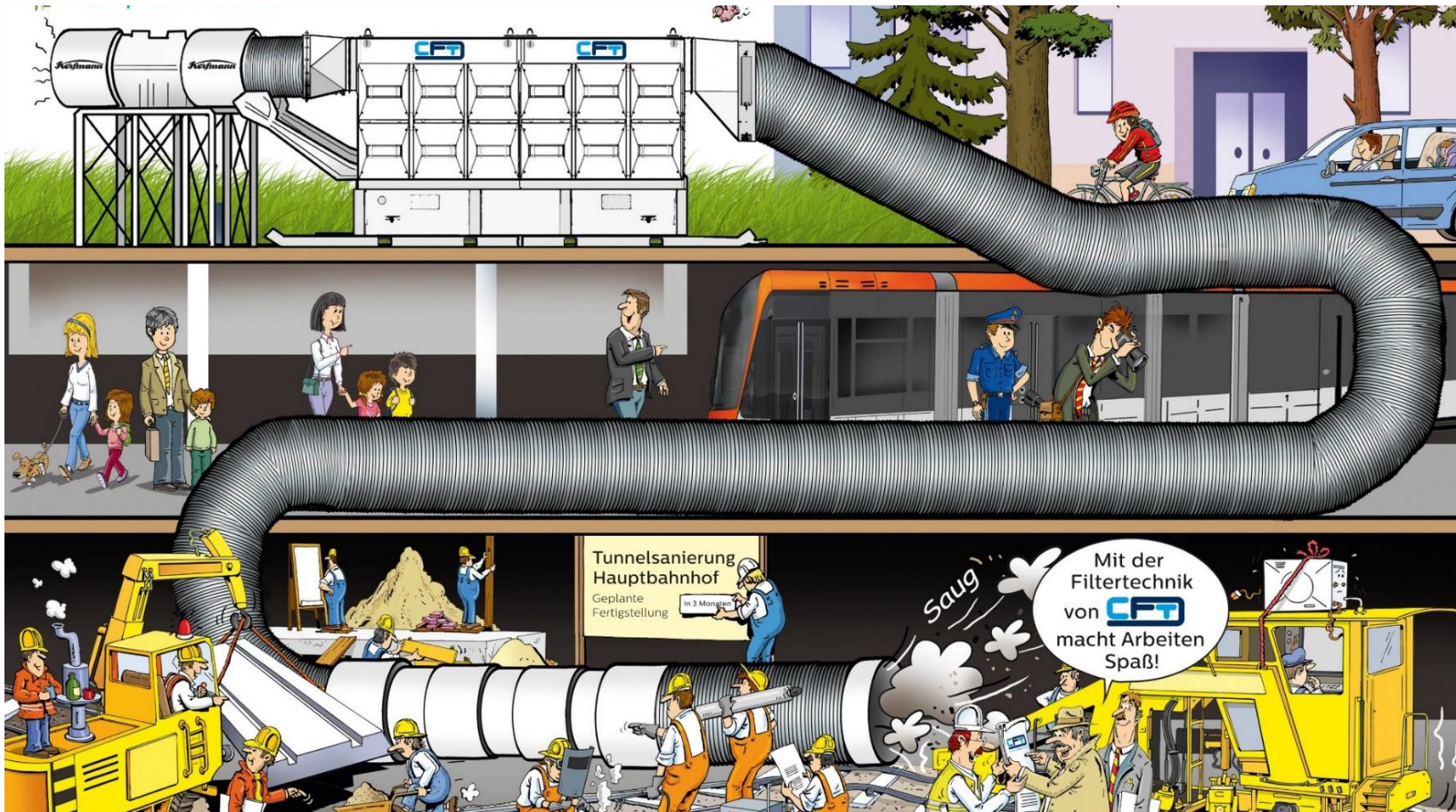


Tunnel Project „Stuttgart 21“ in Stuttgart, Germany

Air flowrate:  $2 \times 20 \text{ m}^3/\text{min}$



# Temporary Tunnel Sites



Dedusting and Ventilation during Tunnel Refurbishment  
Schematic



# Temporary Tunnel Sites



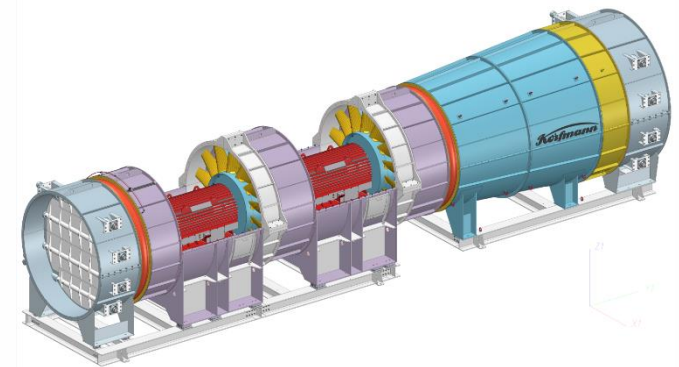
Dedusting and Ventilation during Tunnel Refurbishment

Frankfurt/Main, Germany

Air flowrate: 2.500 m<sup>3</sup>/min each



# Ventilation



Main Mine Fans for Uvalnaya Coal Mine in Novokuznetsk, Russia

Impeller diameter: 3.00 m





Ventilation of an underground tipping station in Magadan, Russia

Capacity: 22 m<sup>3</sup>/s, operation temperature down to -56 degs. C

# Air Cooling



Direct evaporator with axial fan in the Gotthard Base Tunnel, Switzerland

Cooling capacity: 450 kW



# Air Heating



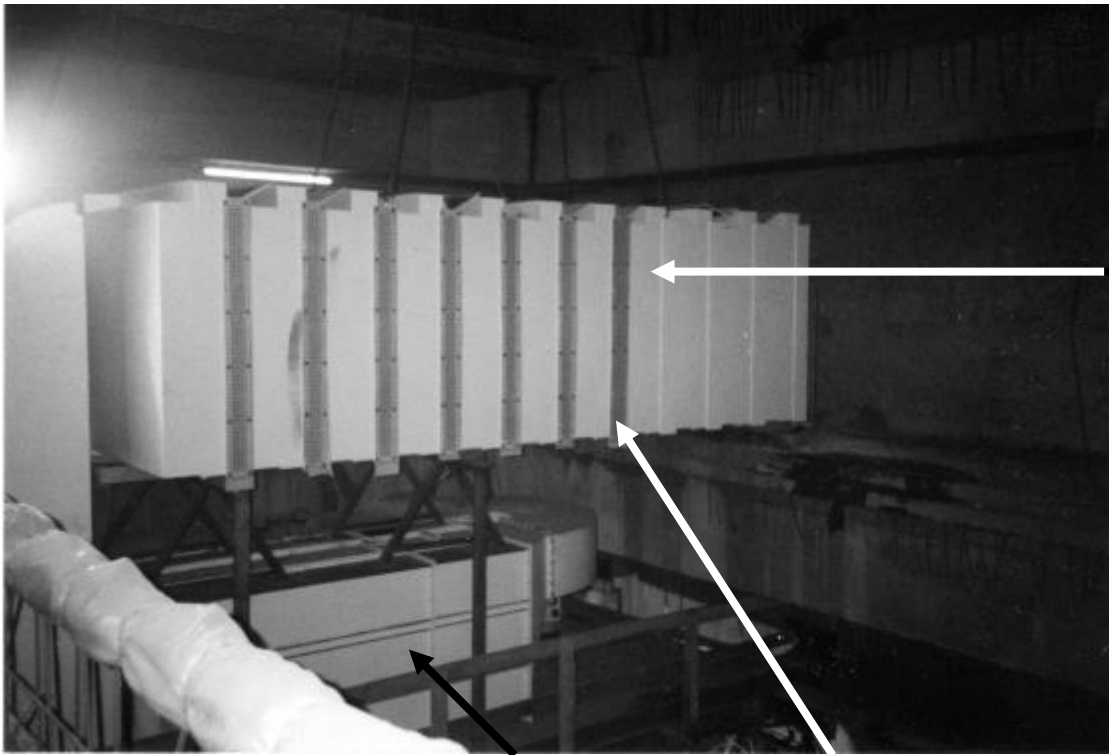
Greymachinsky Potash Mine in Kotelnikovo, Russia

Inlet temperature: -24 degs. C

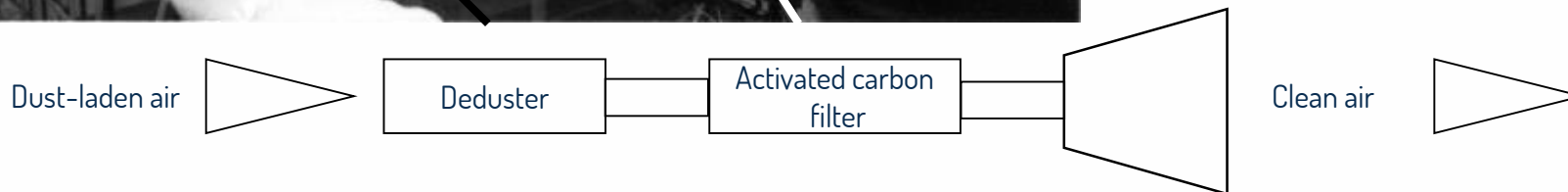
Outlet temperature: +2 degs. C



# Gas Cleaning



Activated carbon granulate



Activated carbon filter to remove nitrous fumes



# Methane Drainage



Methane drainage technology  
Schematic



# Methane Drainage

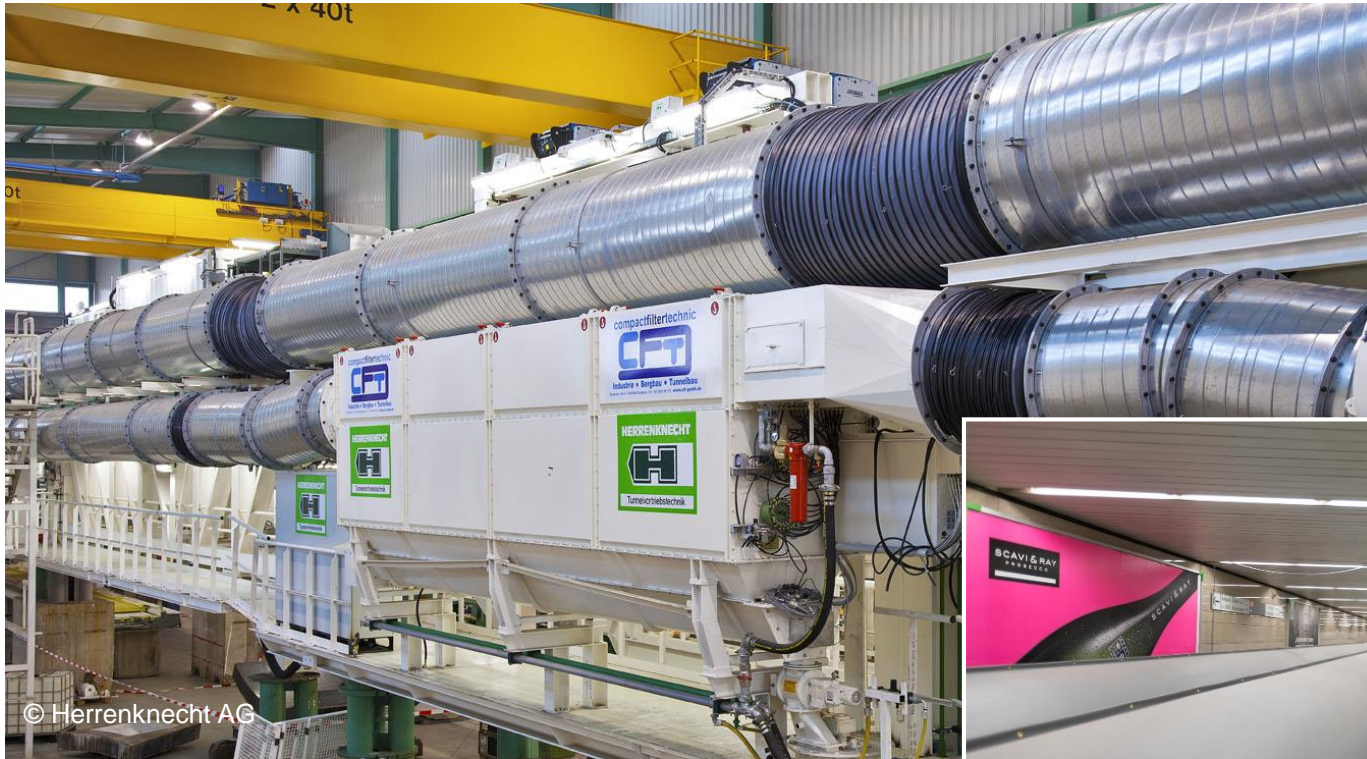


Methane drainage system with rotary piston compressor in Kuzbass, Russia

Gas flowrate: up to 30,000 m<sup>3</sup>/h ; pressure difference: 600 mbar



# Ducts



Lay-flat, steel and spiral ducts



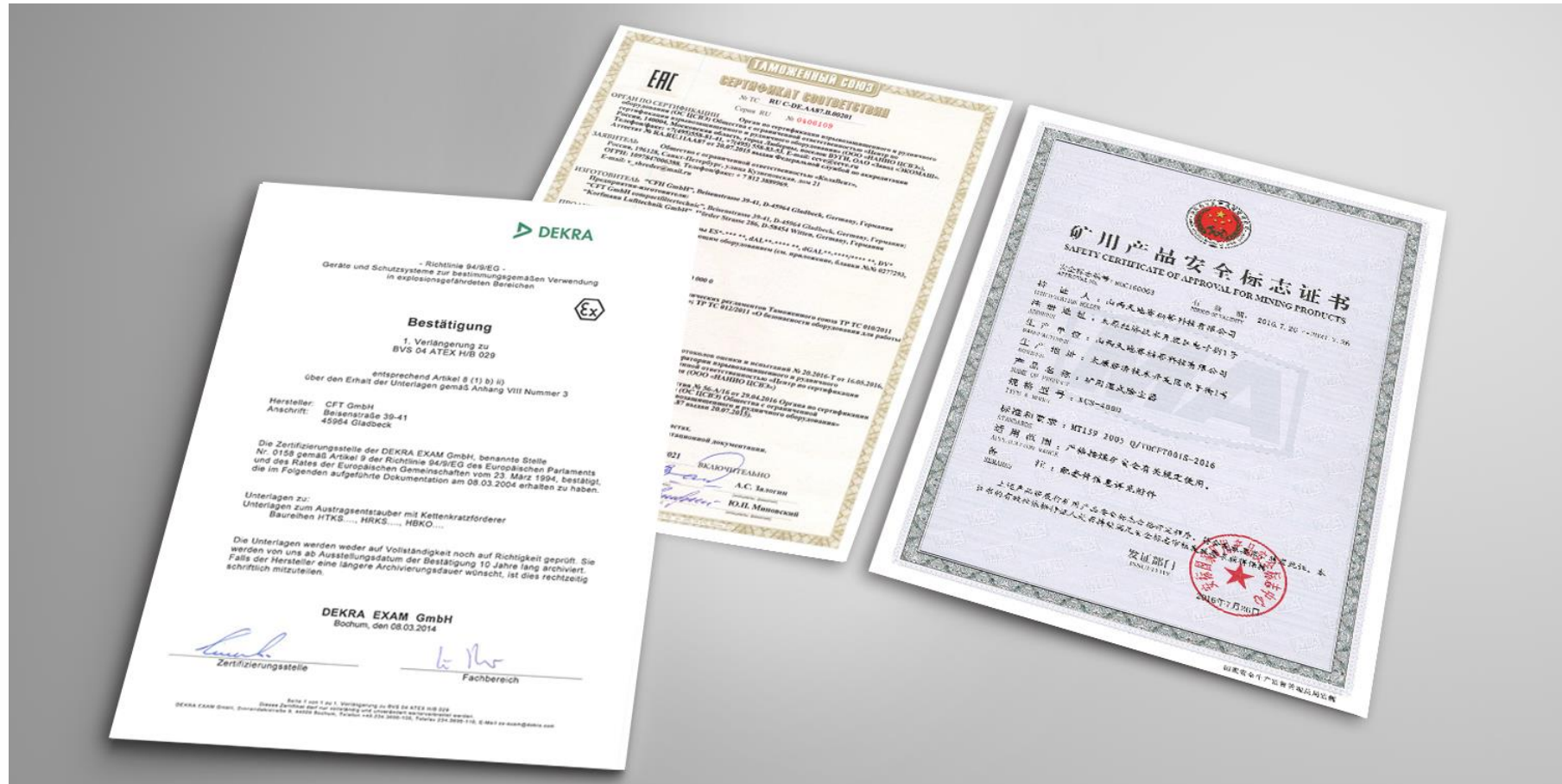
# Pipework



Pipework for dust collection at Asse salt mine, Germany

Total length of dedusting pipes: approx. 150 m





ATEX-certificates are available for all European countries and local approvals for our dedusters and fans, e. g. for China, Russia or the Ukraine.



CFT is your innovative partner for ventilation systems. More than 80 national and international registered patents are evidence of our commitment to research and development.



## Reference Projects

Global activities for optimised health, safety and environment protection

# Applications



Mining



Tunnelling



Temporary tunnel sites



Mobile dust sources



Prevention of air pollution in road tunnels

Our long-standing experience in dedusting, ventilation and the heating and cooling of air is founded on a wide range of applications worldwide.

# Dedusting of TBM Headings



© Herrenknecht AG

Compact element filter for a rail tunnel project in Guadarrama, Spain

Air flowrate: 600 m<sup>3</sup>/min



# Dedusting of TBM Headings



Compact element filter for a water tunnel project in Gansu Province, China

Air flowrate: 400 m<sup>3</sup>/min



# Dedusting of TBM Headings



Dedusting of a TBM spray booth in Linth-Limmern, Switzerland

Air flowrate: 600 m<sup>3</sup>/min



# Dedusting of Roadheader Headings



Without dust removal



With dust removal



Compact element filter in Sochi, Russia

Air flowrate: 1500 m<sup>3</sup>/min



# Dedusting of Roadheader Headings



Bag filter system for portal dedusting  
during the construction of a metro tunnel in Paris, France  
Air flowrate: 1500 m<sup>3</sup>/min



# Dedusting of Roadheader Headings



Roadheader with wet scrubber for Chinese mining



# Dedusting of Roadheader Headings



Wet scrubber with radial fan and water tank

Air flowrate: 400 m<sup>3</sup>/min



# Dedusting of Roadheader Headings



Scrubber for Yangquan Mine, China

Air flowrate: 1300 m<sup>3</sup>/min



# Dedusting of Roadheader Headings

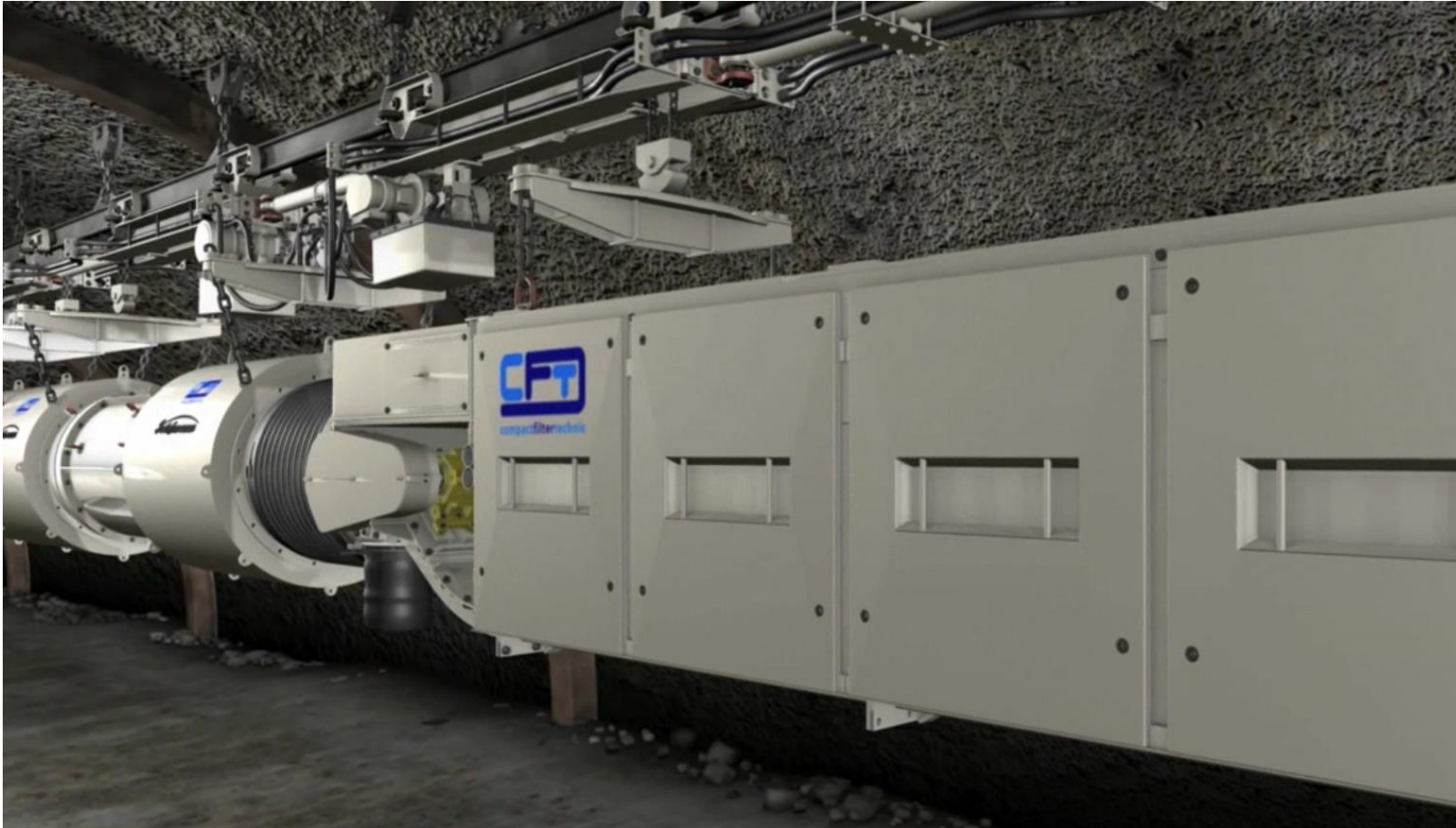


Integrated scrubber incl. radial fan

Air flowrate: 400 m<sup>3</sup>/min



# Dedusting of Roadheader Headings



Animation



# Dedusting of Roadheader Headings

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Video clip



# Dedusting of Continuous Miner Headings



Integrated wet scrubber at a salt mine in Heilbronn, Germany

Air flowrate: 1300 m<sup>3</sup>/min



# Continuous Miner Dedusting



Video clip



# Dedusting of Blasting Headings



Compact element filter in Tokyo, Japan

Air flowrate: 1500 m<sup>3</sup>/min



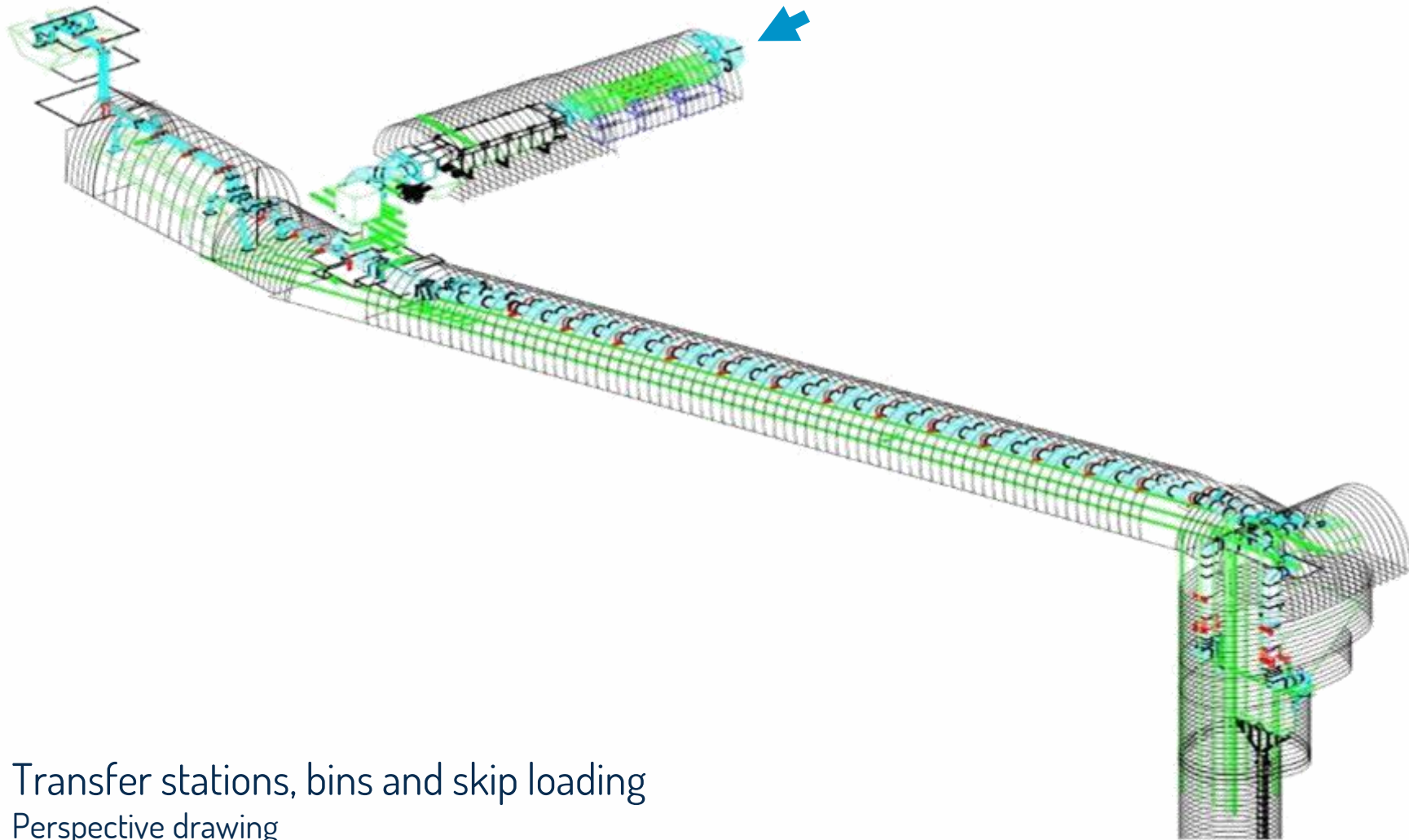
# Dedusting of Shaft Sinking Operations



Customised dedusting system on a shaft sinking machine for the development of the Jansen potash mine in Saskatchewan, Canada  
Air flowrate: 400 m<sup>3</sup>/min



# Dedusting of Material Transfer Systems



Transfer stations, bins and skip loading  
Perspective drawing



# Dedusting of Material Transfer Systems



Compact element filter for skip loading at the East coal mine, Germany

Air flowrate: 800 m<sup>3</sup>/min



# Dedusting of Material Transfer Systems



Dry deduster for a belt discharge point from a TBM heading – Islisberg Tunnel, Switzerland

Air flowrate: 1500 m<sup>3</sup>/min



# Dedusting of Processing Plants

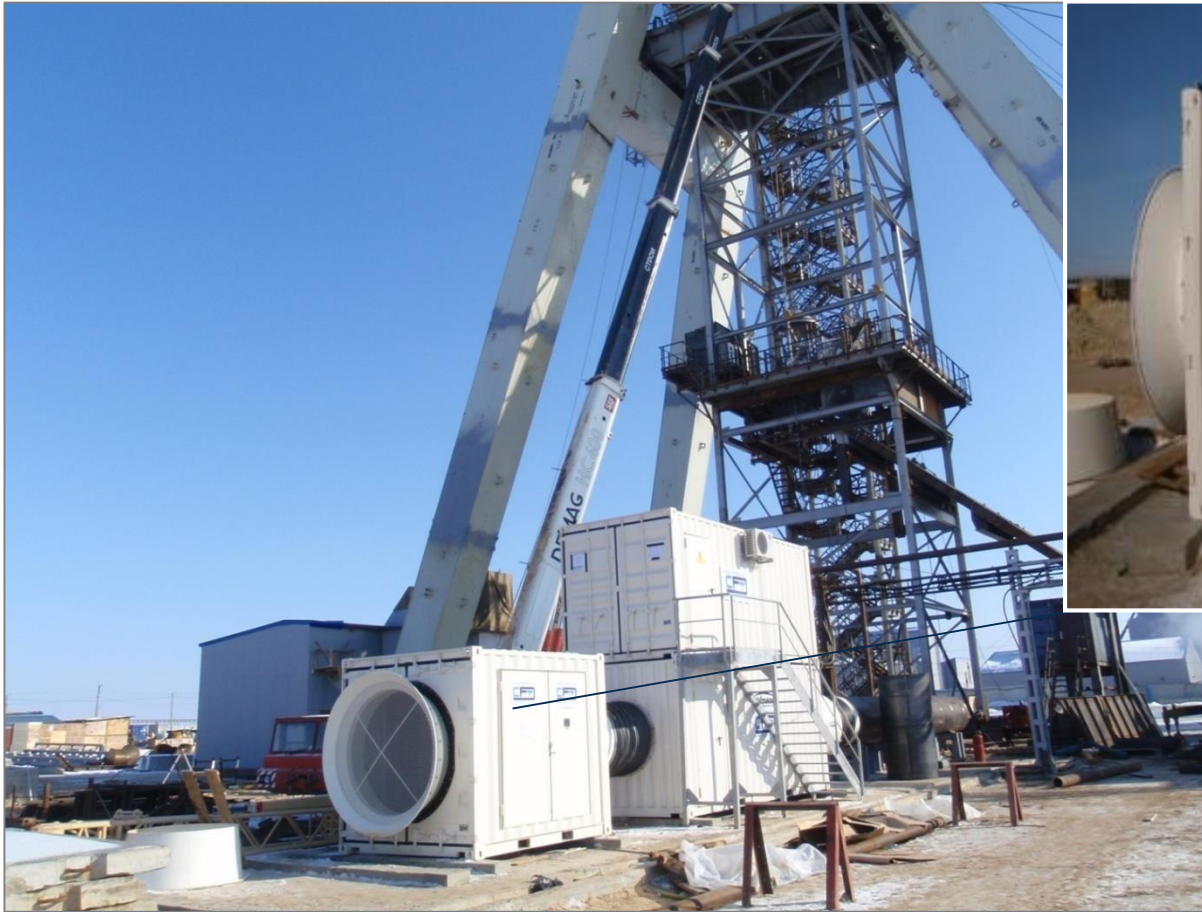


Wet Scrubber at a diamond mine in Jwaneng, Africa

Air flowrate: 250 m<sup>3</sup>/min



# Mine Air Heating & Ventilation



Potash mine in Gremyachinsk, Russia

Inlet temperature: -15 degrees Celsius

Outlet temperature: +10 degrees Celsius



# Ventilation of Temporary Tunnel Sites



Ventilation of a high-speed rail line  
Kelsterbacher-Spange-Tunnel, Germany



# Ventilation of Temporary Tunnel Sites



Temporary ventilation of a high speed rail tunnel, Limburg, Germany

Mobile fan: remote controlled, reversible, adjustable



# Ventilation of Temporary Tunnel Sites



Dedusting and ventilation in a metro tunnel in Munich, Germany



# Ventilation of Temporary Tunnel Sites



Dedusting and ventilation in a metro tunnel in Munich, Germany



# Dedusting During Dry Drilling



Example of a drilling rig



# Dry Cuttings Extraction



Video clip



# Dedusting of Material Transfer Systems



Wet dedusting of a crusher and transfer station in open cast lignite mine  
Hambacher Forst, Germany  
Air flowrate: 400 m<sup>3</sup>/min



# Dedusting of Material Processing



Compact element filter on top of a mobile crusher  
for the operation at Rohtang Tunnel, India  
Air flowrate: 600 m<sup>3</sup>/min



# Dedusting of Mobile Plant



Customised compact element filter for the application in a heavy-duty sweeper for street cleaning.



# Dedusting of Mobile Plant



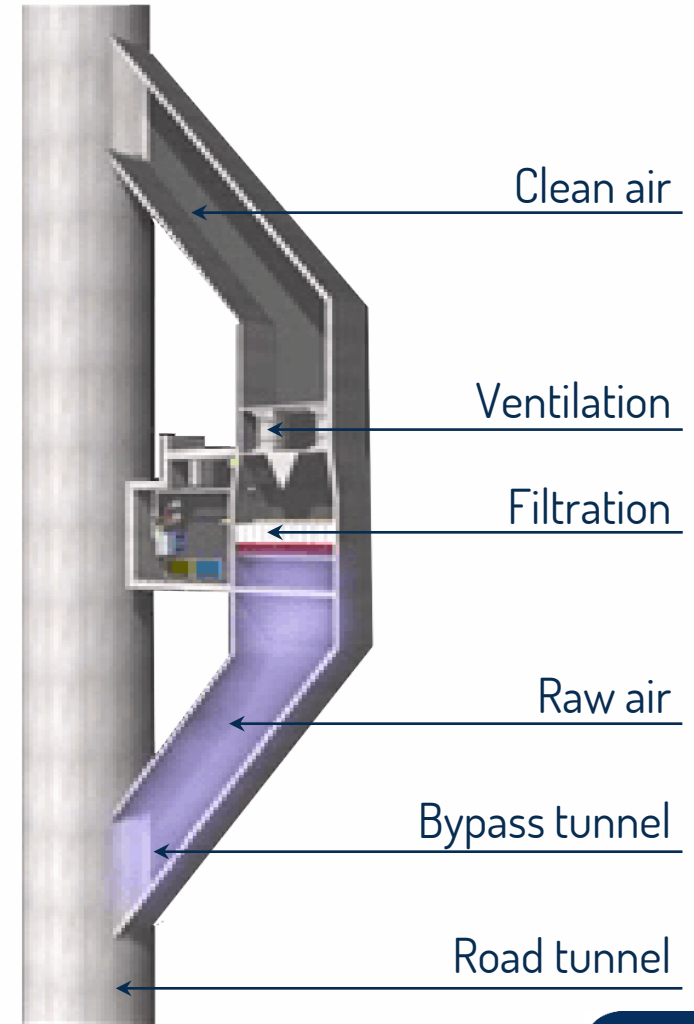
Customised compact element filter for the application on top of a road-planer



# Prevention of Air Pollution in Road Tunnels



Activated carbon filter ECCO NOxCAT





## Service

Support at every level: assembly, commissioning, maintenance, measurement technology

# Service

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Whether during the initial assembly or commissioning, for routine maintenance or rapid response in emergencies, you can count on us!





To keep your system running:  
inspection, repairs, maintenance and overhauls



# Measurement Kit



We take care of safety – fast and reliable risk assessment by monitoring the ambient air





Supplementary Product Range

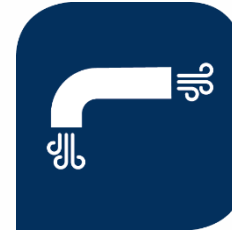
# Supplementary Product Portfolio



Polska



Vending machines



Fibreglass ducts



Kasachstan



Shaft sinking



Ropes



Mobile hydraulics



France



Overhead monorail systems



Aerial platforms

# Vending Machine 'KAZIK'



Polska



For controlled issue of personal protective equipment  
for mining and tunnelling



# Ducts Made of Glass Fibre Reinforced Plastic



Polska



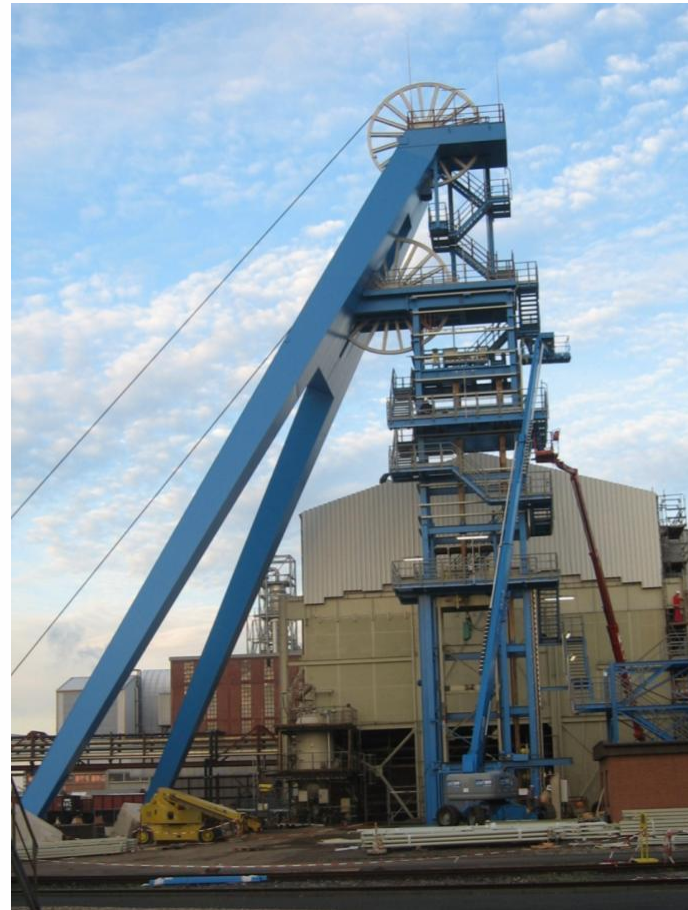
Fibreglass ducts produced by Schauenburg Technical Solutions available in round and oval shapes



# Shaft Sinking



Kasachstan



Sinking, lining and refurbishment of shafts,  
roadheading and excavation of cross-passages  
by the company TOO SCHACHTBAU Kasachstan



# Wire Ropes



Premium mining ropes and steel ropes for material transport ropeways produced by Teufelberger





Hydraulically driven mobile generators made by Dynaset generate high-quality power for requirements at various working places



# Overhead Monorail Systems



GTA tunnel support installation system in the Gotthard base tunnel, Switzerland

Loading capacity: 2.400 kg at manipulator



# Aerial Platforms



Mobile lifting platform from GTA used on the 'Stuttgart 21' Project in Stuttgart, Germany

Lifting capacity: 750 kg/cage





Breathe the Difference

Systematic Industrial Dedusting

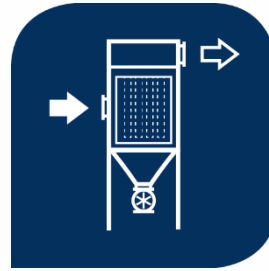
# Product Portfolio



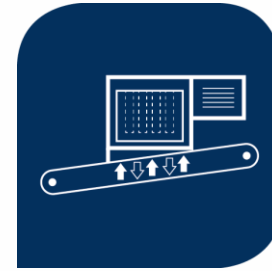
Bag filters



Gas cleaning



Compact dedusters



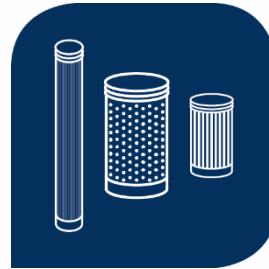
Top-mounted transfer station filters



Complete solutions



Engineering



Filter elements and accessories



Assembly Supervision Service

Deichmann Filtertechnik has been supplying innovative solutions for its customers in all types of industrial dedusting for more than 6 decades.

# Application Areas



Waste recovery and recycling



Thermal processes



Combustion processes



Food and beverages

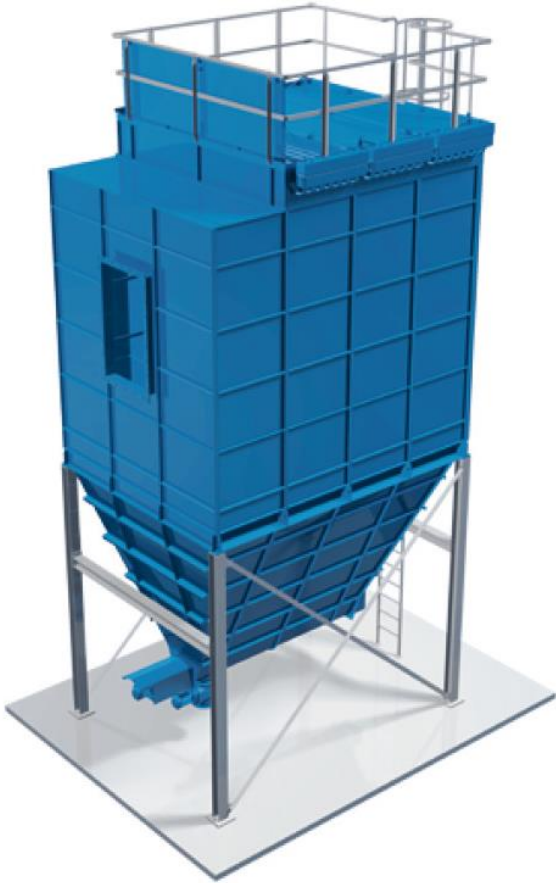


Bulk materials



Metallurgy

Depending on the industrial sector and the applicable procedures, there can be a wide range of dedusting problems to be solved. Deichmann Filtertechnik tailors the solutions down to the last detail to meet these specific requirements



## Versions:

- Vertical or horizontal filter bags
- Circular filters
- Top-mounted filters

Bag filter unit type SJV



# Dedusting for Recycling



Bag filter system in a waste sorting plant in Neuss, Germany  
Air flowrate: 130.000 m<sup>3</sup>/h



# Dedusting in Metallurgical Processes



Bag filter systems in a non-ferrous foundry  
in Villingen-Schwenningen, Germany

92 Air flowrate: 3 filter units each rated 150,000 m<sup>3</sup>/h



# Dedusting for Bulk Materials



Bag filter systems in a surface mine in Mauretania  
Air flowrate: 22 filter units with a total volume of 631,600 m<sup>3</sup>/h





## Versions:

- Vertical or horizontal filter elements
- Circular filters
- Top-mounted filters
- Spot filters

Compact filter unit type KJF



# Dedusting for Bulk Materials



Compact filter unit for train unloading and ship loading  
Harbour facility in Port Moody, Canada  
Air flowrate: 5 filter units with a total volume of 66,000 m<sup>3</sup>/h



# Dedusting of Thermal Processes



Compact filter unit for a thermal coating plant  
in Barchfeld, Germany  
Air flowrate: 15,000 m<sup>3</sup>/h, ATEX compliant explosion proofing





## DELA-Cleaning System

- **D**ecentralised, integrated on-demand supply of compressed air
- **E**nergy efficient, > 40 % savings in power consumption for compressed air
- **L**ow pressure cleaning system (patented)
- **A**TEX explosion proof

Type BAF with DELA-Cleaning-System



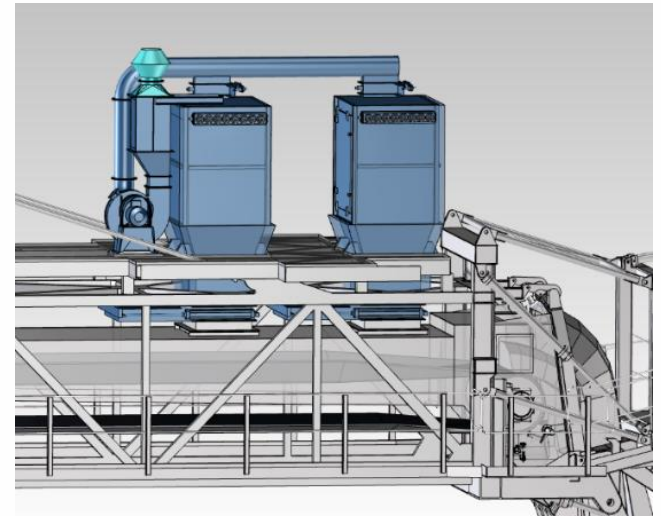
# Top Mounted Filter for Belt Transfer Stations



Top-mounted filter for a belt transfer station as presented at 'Steinexpo' trade fair in Homberg, Germany  
Air flowrate: 3,000 m<sup>3</sup>/h



# Dedusting for Bulk Materials



Top-mounted filters at the discharge jib of a ship loader,  
2 product-dependent filter units, Port Moody, Canada  
Air flowrate: 4,000 m<sup>3</sup>/h each





# Breathe the Difference

Field-tested Equipment for Mining and Tunnelling

# Range of Products and Services



Sales



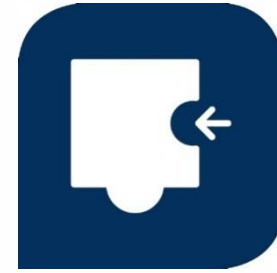
Leasing



Repairs



Service



Accessories

Field-tested, high quality equipment is a cost-saving alternative for mine operators and tunnelling companies and their suppliers. Also part of the portfolio are services such as site assembly, commissioning, repairs and project engineering and planning.



# Customer-orientated solutions



## Repair basis

The equipment is cleaned and conserved and repair costs are available.



## Operational readiness

The equipment is made ready for operation and can be used.



## General overhaul

The equipment is overhauled to an 'as new' condition and full functionality is guaranteed.



# Available Equipment



## Production

- Powered supports
- Shearer loaders
- Face conveyors
- Power trains

## Development

- Roadheaders
- Dedusting systems
- Roof support machines
- Mobile drilling rigs
- Mobile loaders

## Infrastructure

- Material supply systems
- Cooling systems
- Belt conveyors
- Chain conveyors
- Dinter loaders
- Ventilation

## Logistics

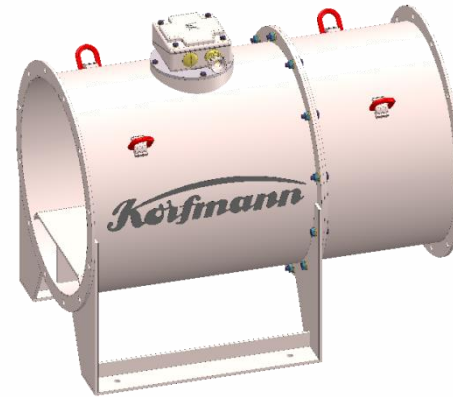
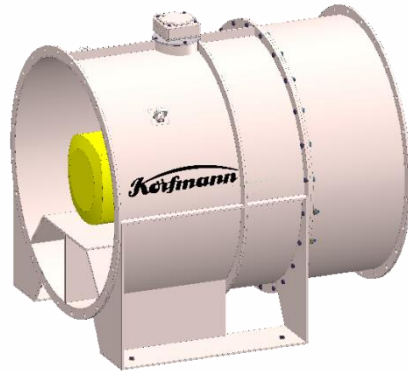
- Diesel locomotives
- Battery locomotives
- Diesel trollies
- Shunting trollies





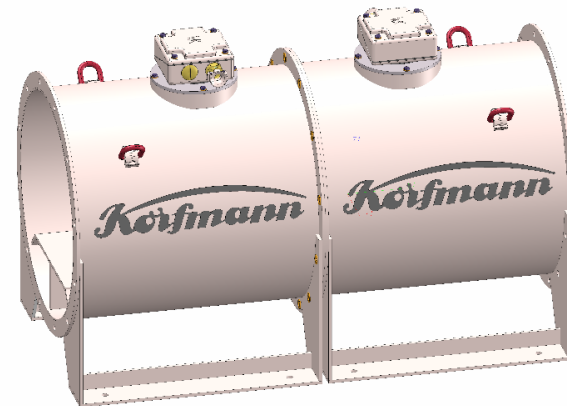
Breathe the Difference

Fans and accessories for mining and tunnelling



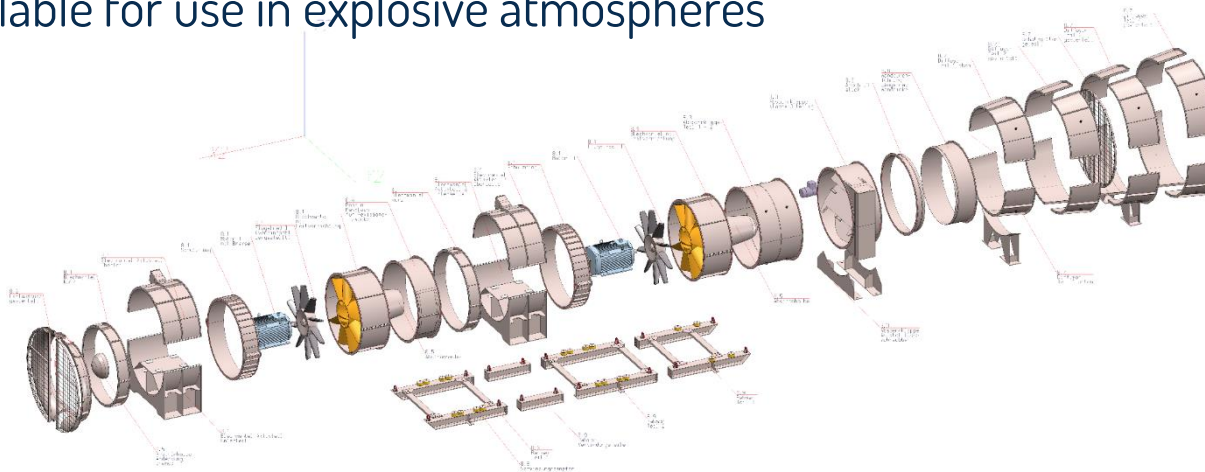
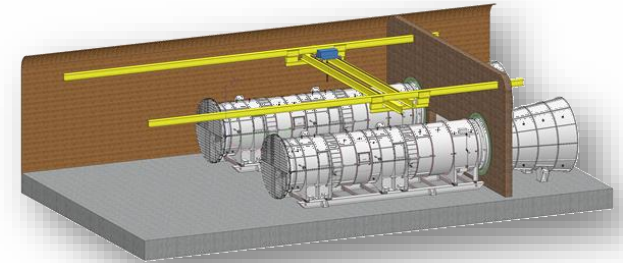
## Types ES, ESN, AL and GAL

- Diameters from 300 mm to 1,800 mm
- Flowrate per single station: up to 150.0 m<sup>3</sup>/s
- Pressure per single station: up to 5,200 Pa
- Power per single station: up to 700 kW
- Also available for use in explosive atmospheres



## Types KGL/AL

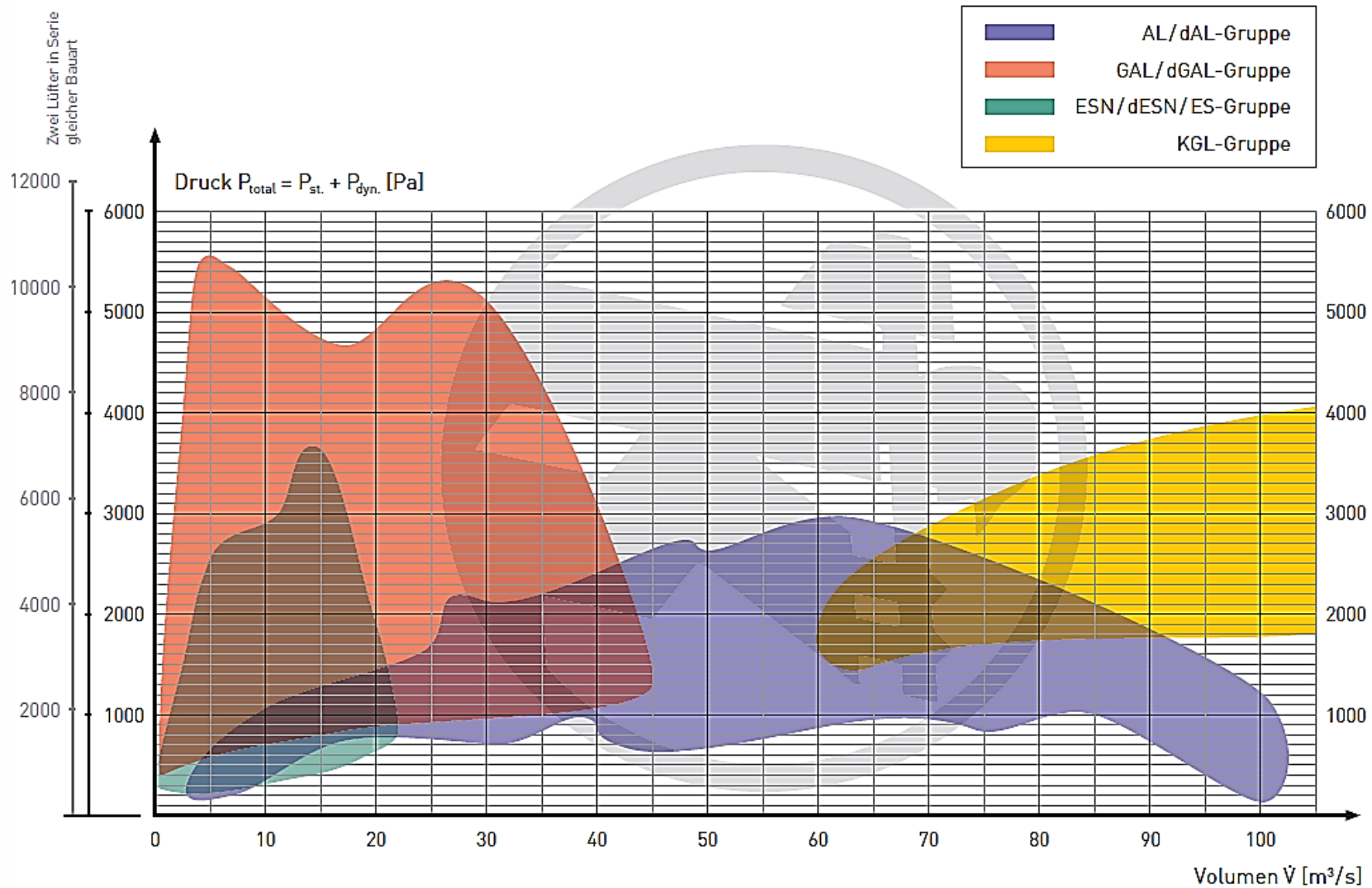
- Diameters from 2,000 mm to 3,700 mm
- Flowrates per single station 3,000 mm dia.: up to 450.0 m<sup>3</sup>/s
- Pressure per single station 3,000 mm dia.: up to 4,500 Pa
- Power per single station: up to 3.7 MW
- Also available for use in explosive atmospheres



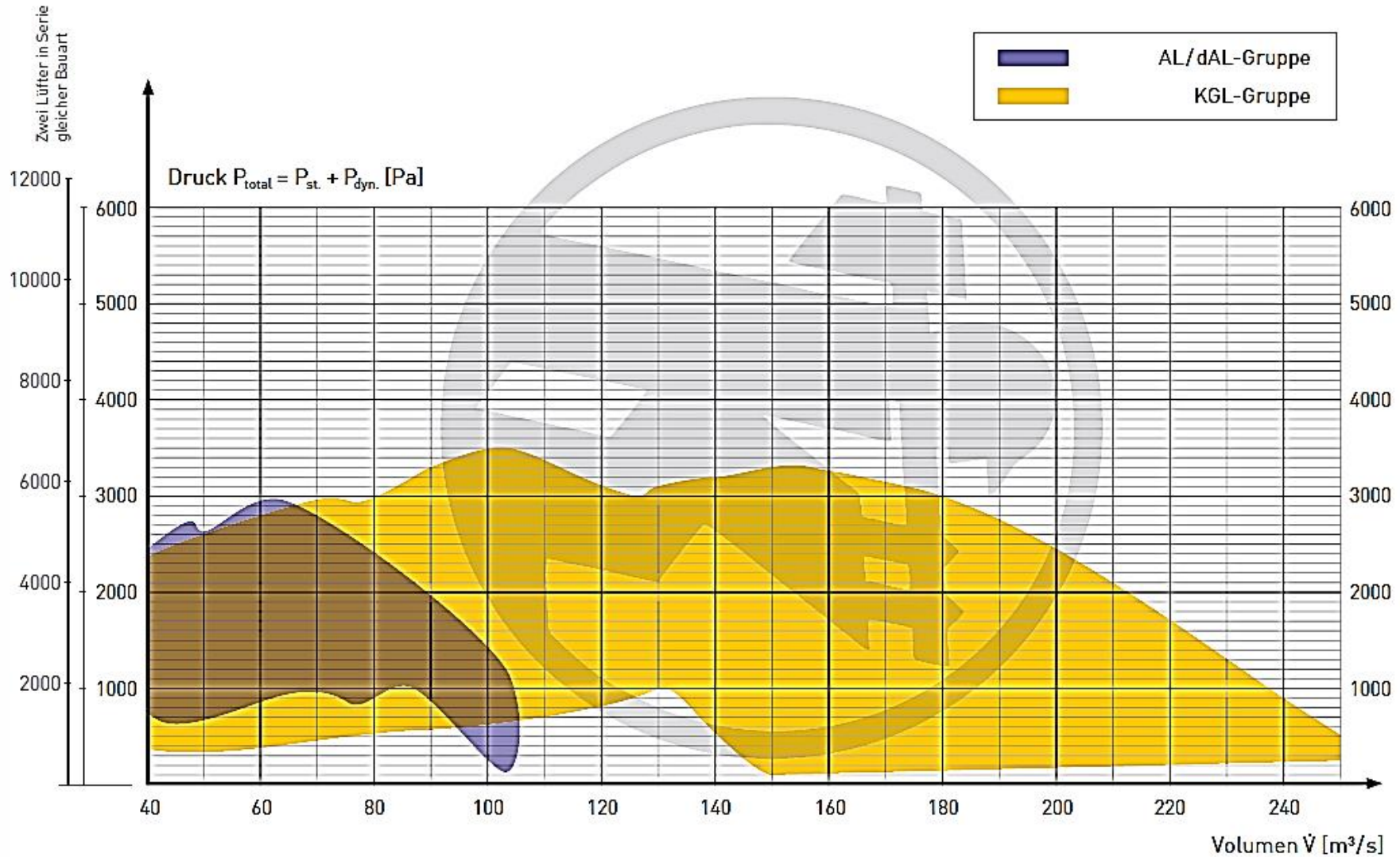
Explosion drawing



# Performance Range



# Performance Range



# Main Mine Ventilation



Main fan in the Gotthard base tunnel, Switzerland  
Impeller diameter: 1.80 m; power: 630 kW; speciality: 100 % reversible



# Main Mine Ventilation



Axial fans for a salt mine in the Werra region, Germany

Impeller diameter: 2.50 m; power: 4 x 545 kW



# Tunnel Ventilation



Axial fan for the tunnel project 'NorthConnex' in Sydney, Australia

Impeller diameters: 1.60 m & 1.40 m; power: 110 kW & 2 x 90 kW





Copyright: Arge Tunnel Albstieg

Axial fans at the Dornstadt portal of the Alb descent tunnel in Ulm, Germany

Impeller diameter: 1.70 m; power: 2 x 250 kW



# Portal Ventilation

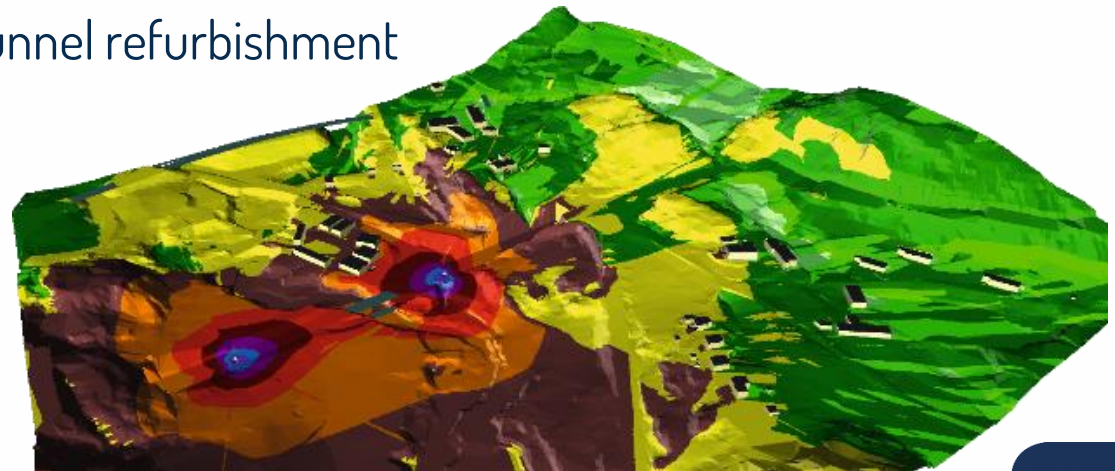


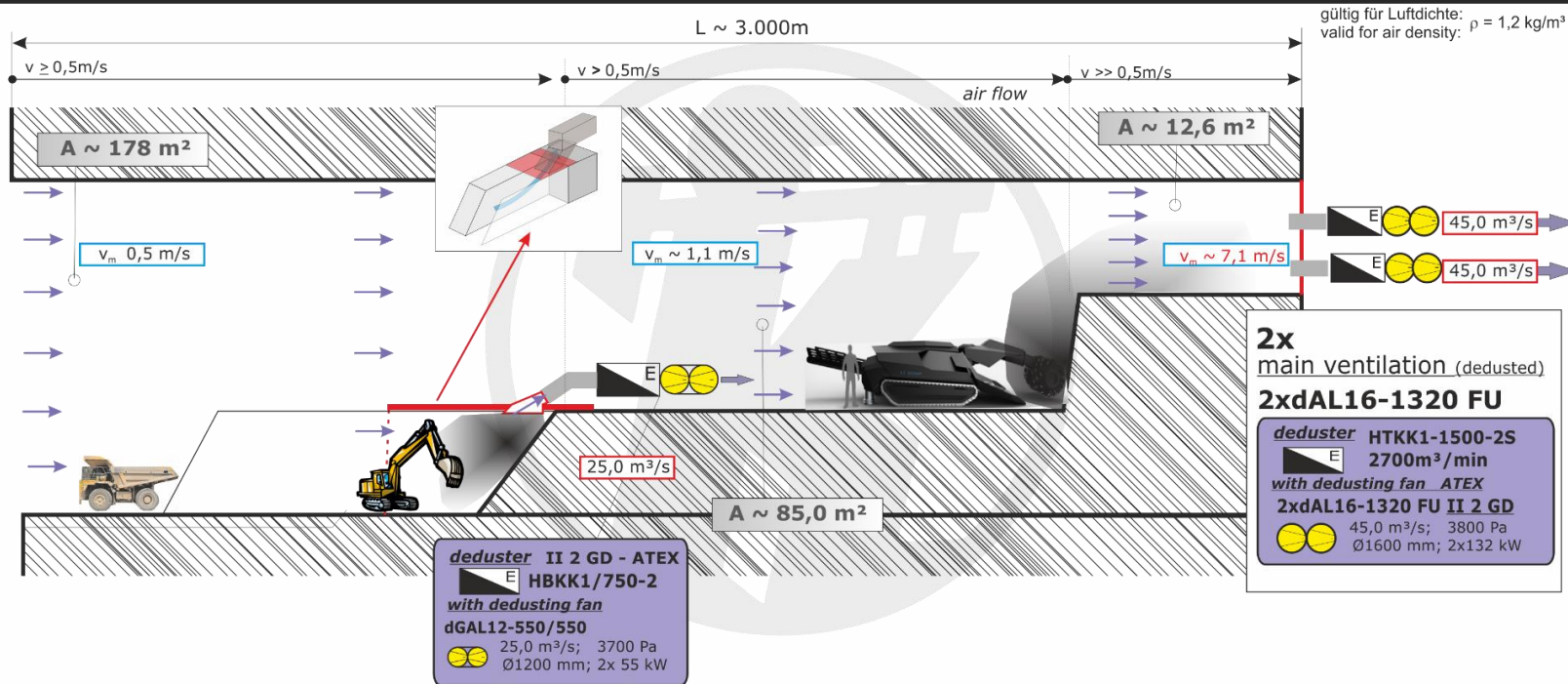
Axial fans for a road and railway tunnel project in Sochi, Russia

Impeller diameter: 0.90 m & 1.40 m; power: 75 kW & 2 x 90 kW



- Design of ventilation systems
- Design of main mine systems
- Design of regulation and control systems for ventilation equipment
- Complete package solutions
- Bespoke solutions for sound sensitive sites
- Site monitoring systems
- Fan leasing
- Special ventilation solutions for tunnel refurbishment





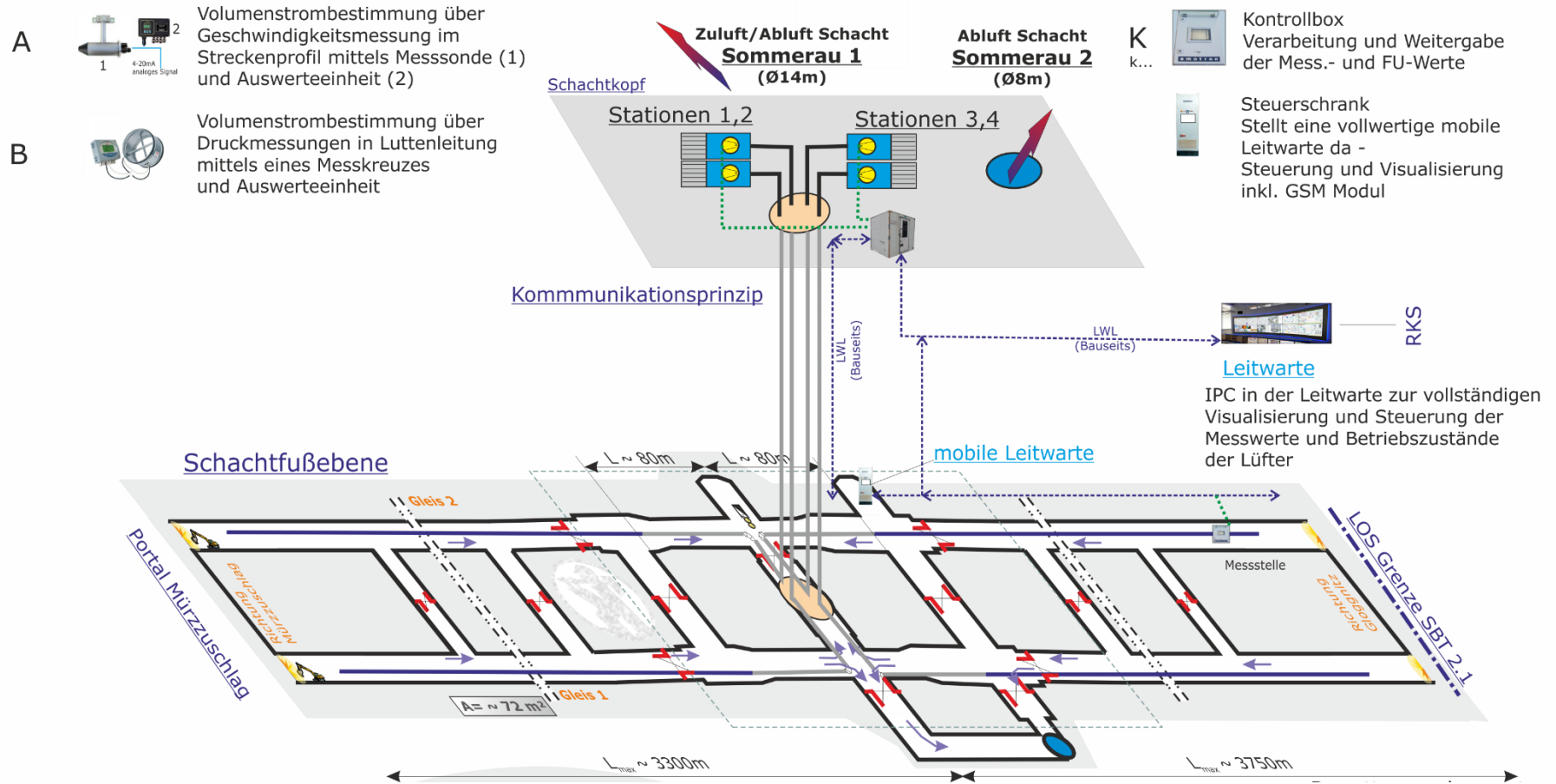
Berechnung und Auslegung auf Basis kundenseitiger Informationen Stand der Revision

201601-020-D\_Gubrist\_Tunnel

	<b>Dedusterstation (Strosse)</b>	<b>portalstation (deduster)</b>	<b>Spezifikationen:</b>
	fan- volume    -P <sub>tot</sub> (pressure)    -power	fan- volume    -P <sub>tot</sub> (pressure)    -power	air velocity in free profile confirm SUVA (2002) - Gefahrenstufe I:
	$\dot{V}_v = 25,0 \text{ m}^3/\text{s}$ P <sub>TOT</sub> = ~3700 Pa    N <sub>erf</sub> ~110 kW	$\dot{V}_v = 2x 45,0 \text{ m}^3/\text{s}$ P <sub>TOT</sub> = 2x 3800 Pa    N <sub>erf</sub> ~2x190 kW	„normal mode“:                    v ≥ 0,3 m/s
	<b>Type: dGAL12-550/550</b> inner diameter: 1200 mm    power: 2x55 kW	<b>Type: 2x 2dAL16-1320 FU</b> inner diameter: 2x 1600 mm    power: 2x2x 132kW	„gas mode“:                        v ≥ 0,5 m/s
			<b>DIN EN 16191 gas possible</b> <b>power line: 400V 50Hz</b>

## Design of ventilation schemes





Concept design of control systems



# WAT

## Breathe the Difference

Cooling and air-conditioning technology for mining and tunnelling



- Cooling capacity : 1 MW – 4 MW
- Central cooling system with indirect evaporation
- Unique features:
  - ✓ Injection evaporator up to 4 MW
  - ✓ High-pressure condenser up to 160 bar



# Compact Water Chillers

WAT



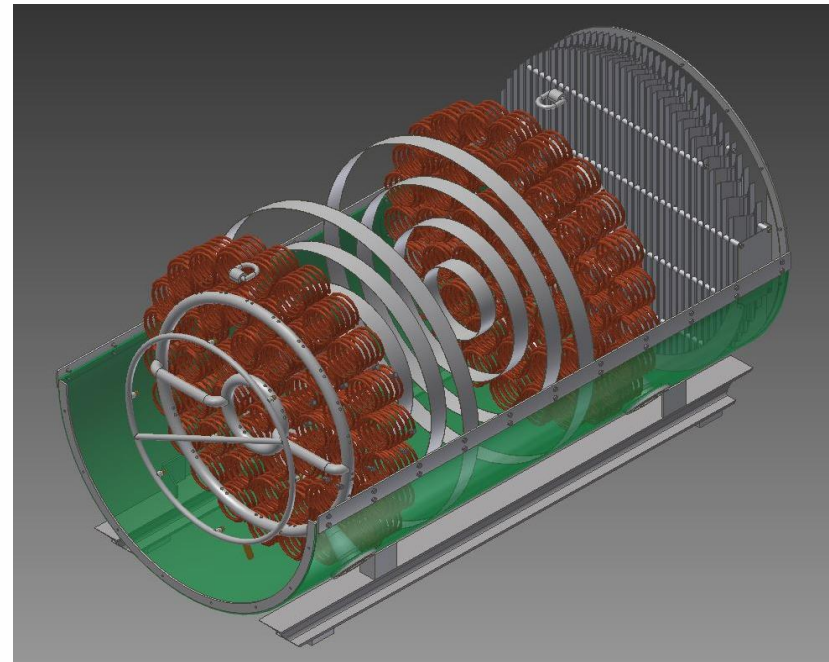
- Cooling capacity: 100 kW – 1,000 kW
- Local cooling system with indirect evaporator
- Wide range of applications in mining & tunnelling



# Air/Water Heat Exchangers



- Cooling capacity: 25 – 2.000 kW
- Roadway cooler (variable design)
- Face cooler (smallest design)
- Re-cooler



# Roadway Coolers

# WAT



# Face Coolers



# Re-coolers



- Re-cooling capacity: 100 kW – 1,500 kW
- Special re-cooling options for underground



# Air Cooling Systems

vaporizer

fan

Machine composition  
(motor, compressor, condenser)

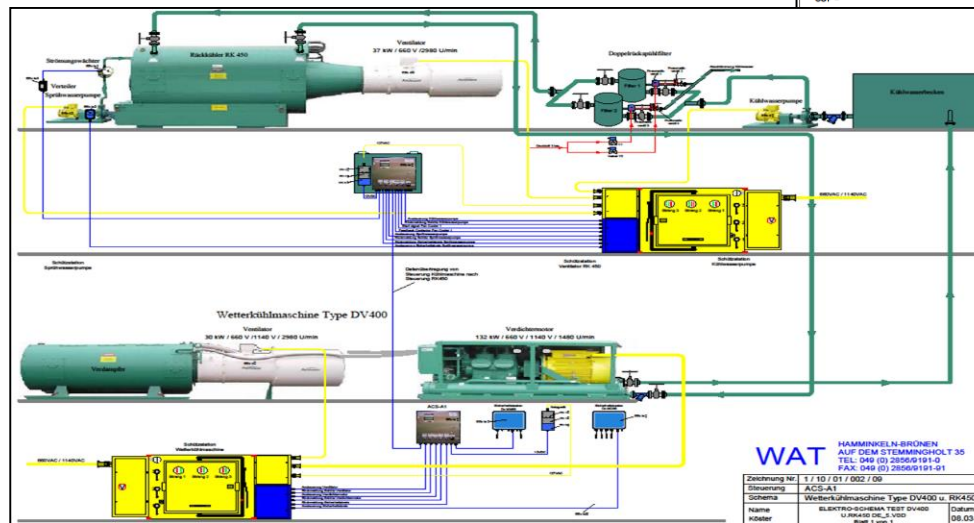
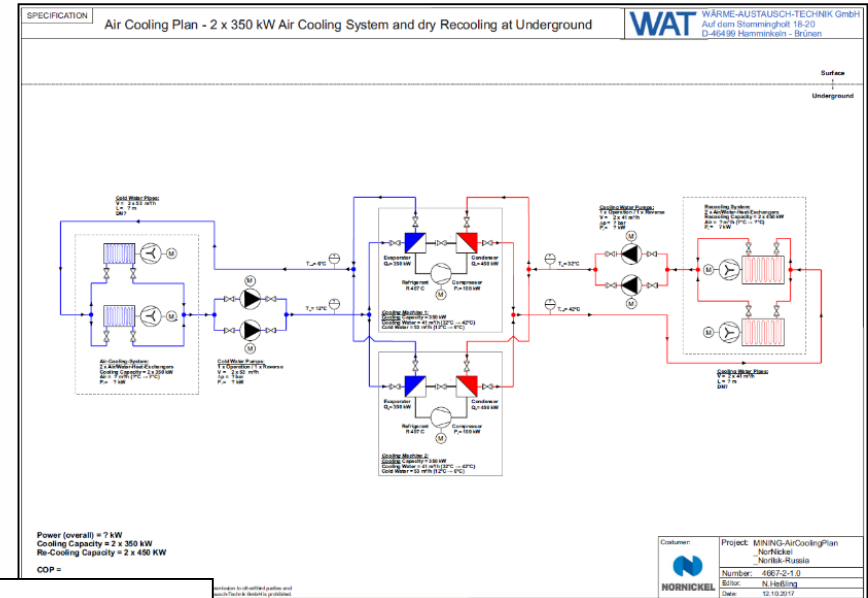


max. 9.0 m

- Cooling capacity: 150 kW – 450 kW
- Local cooling with direct evaporation
- Air cooling without additional water circuit



- Climate projection
- Dimensioning of air cooling systems
- Dimensioning of cooling water systems
- Project design of the refrigeration systems
- PLC programming



# Breathe the Difference

High Quality Ventilation Equipment for Health, Safety and the Environment

