



# Pure Lab Air

## ULT Extraction and Filtration Technology

Protecting personnel, ensuring clean processes

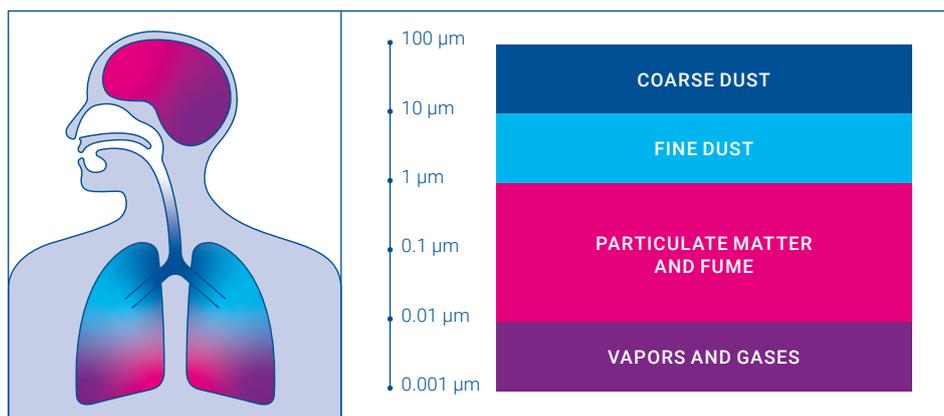


# The importance of air purification

The laboratory environment is a place of utmost precision and innovation. However, many processes generate airborne pollutants such as fumes, gases, odors, and dust, which pose a significant risk to people, products, and equipment.

## Health risks: The invisible danger

The danger posed by particles depends on their size. The so-called respirable A-fraction is particularly critical, as these smallest particles can cross the blood-lung barrier and enter the bloodstream, potentially leading to long-term health problems.



## Economic risks: Quality and system integrity

**Airborne pollutants not only harm health, but also sensitive processes and expensive laboratory equipment.**

- Reduced quality and rejects:  
Contaminated samples or substrates lead to faulty results.
- Damage to equipment:  
Corrosive fumes or abrasive dusts can drastically shorten the service life of analytical instruments and precision balances.

# Occupational safety as a duty

Optimal air quality in the laboratory is not an option, but a legal obligation based on several regulations.

## Regulation Focus

**Hazardous Substances Ordinance (GER) (GefStoffV)**

Protection against hazardous substances; Attention: TOP principle (Technical measures take precedence over organizational and personal measures).

**DIN EN 14175 (Fume Cupboards)**

The European standard for fume hoods. It regulates the requirements for the safety and performance of fume hood systems in laboratories.

**CEN/TS 17441**

European technical specification, focusing on safe, efficient, and risk-based air exchange rates.

**DIN EN 16000**

Regulates the measurement and assessment of indoor air pollutants (e.g. VOCs – volatile organic compounds).

**Occupational Exposure Limits (OEL)**

The EU sets legally binding occupational exposure limits (e.g., in Directive 2004/37/EC for carcinogens and mutagens). These were supplemented in 2024/2025 by new limits for substances such as benzene and cobalt.

**REACH (Regulation EC 1907/2006)**

Regulates the registration and evaluation of chemicals. New additions for 2026 include stricter limits for formaldehyde and PFAS ("perpetual chemicals").

# The process chain: From collection to filtration

## Effective capture triggers the filtration process

Before filtration, air pollutants must be captured, because only what is captured can be filtered. The capture rate forms the basis for the subsequent, optimal filtration. This ultimately results in the efficiency of the entire system and therefore the pollutant residues in the recirculated exhaust air. In this context, proximity to the source of the pollutants is crucial.

The selection of the appropriate capture element is also of great importance. ULT is partnering with its customers for expert advice.

Further information on the collection  
of airborne pollutants:

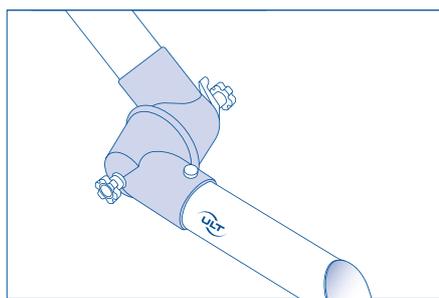


**EXPERTISE BROCHURE  
ON POLLUTANT CAP-  
TURE FROM ULT**

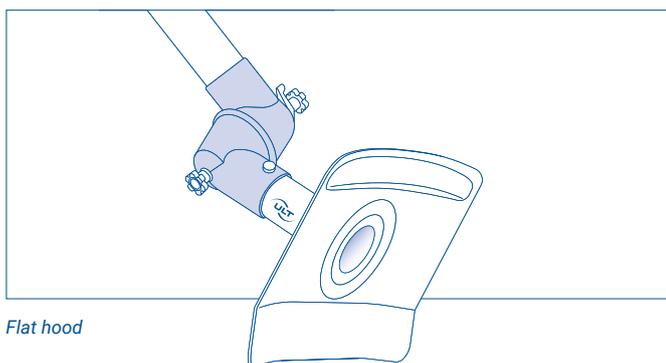


**BROCHURE BY THE  
GERMAN PROFESSIONAL  
ASSOCIATION VDMA**

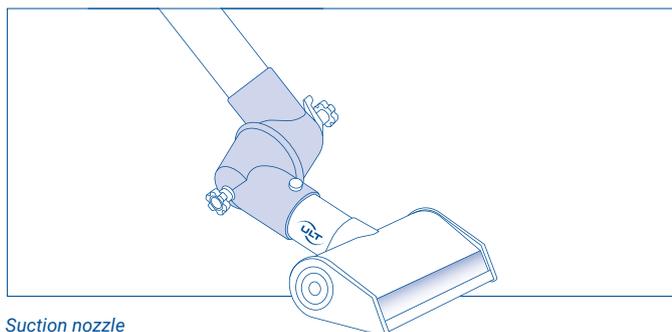
## Standard capture elements



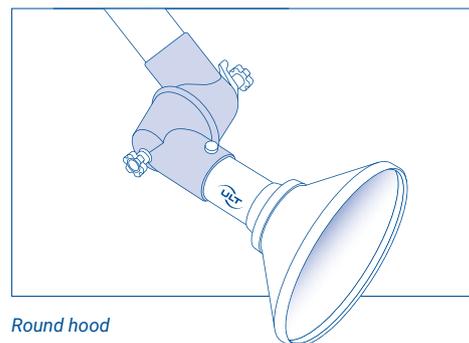
*Suction pen*



*Flat hood*



*Suction nozzle*



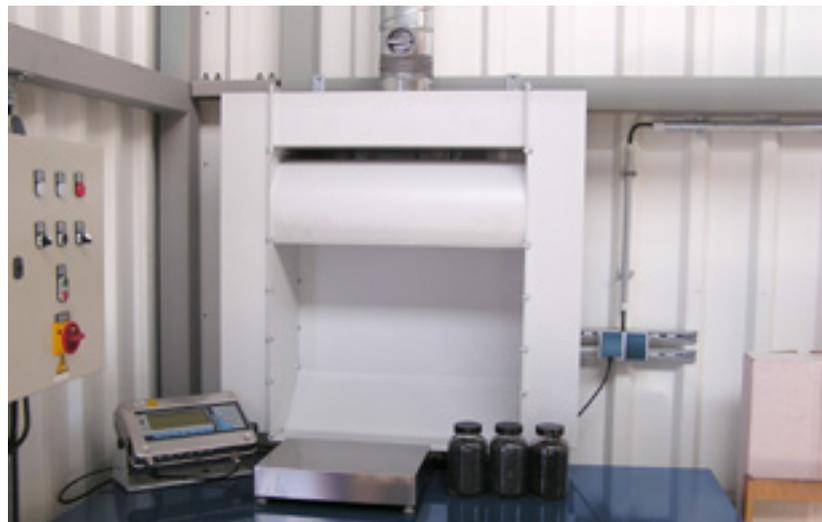
*Round hood*

# Closed systems and special solutions for pollutant capture

Closed collection systems are particularly suitable for optimal pollutant removal in laboratories. In many cases, special solutions are required due to local and application-specific conditions. ULT has gained comprehensive expertise and corresponding know-how through many years of practical experience in this field.



*Round hood with wall mount*



*Backdraft panel*



*Closed collection system*

# Filtration and separation

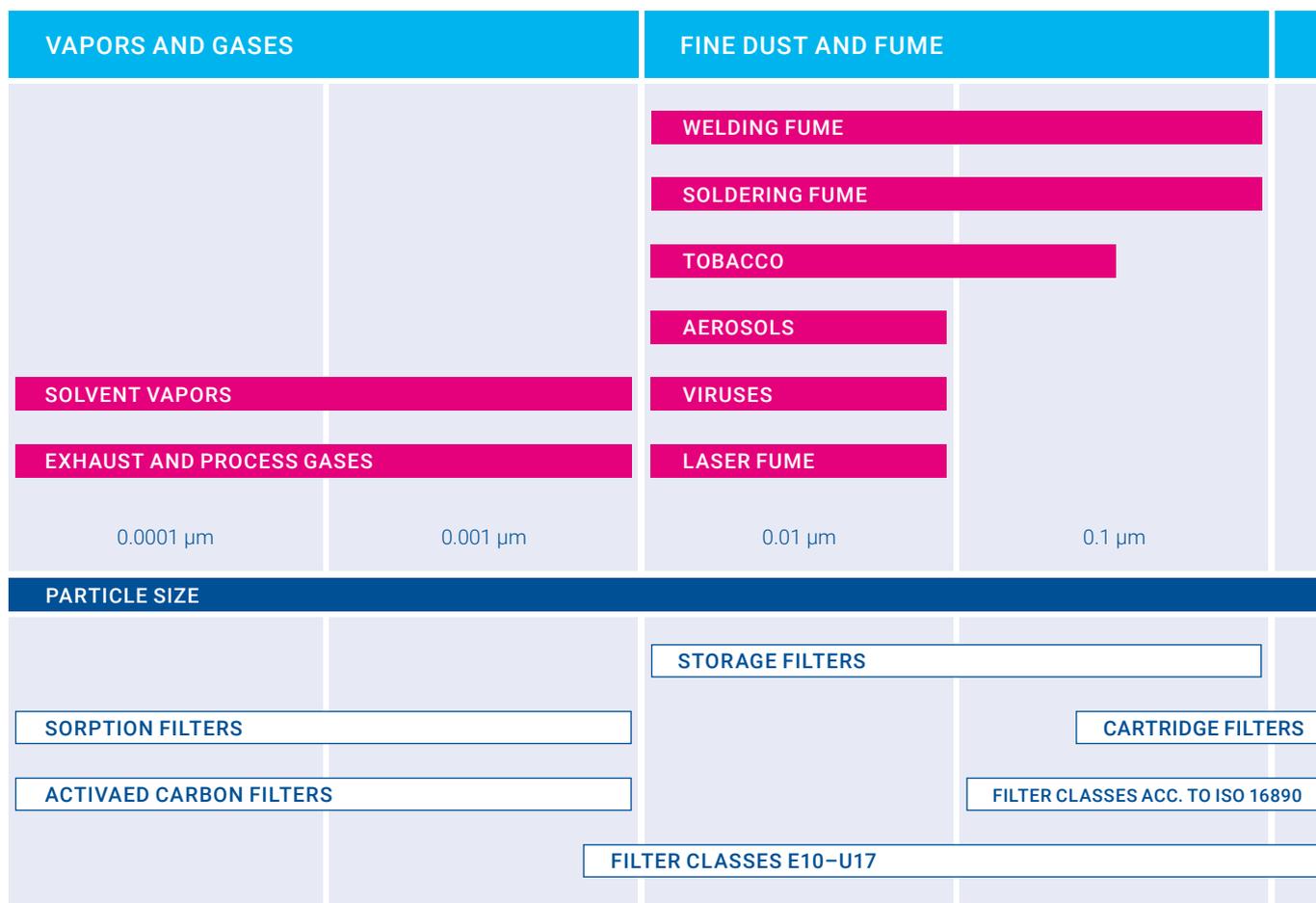
The selection of filters depends primarily on the physical state of the airborne pollutant. For the separation of particulate contaminants such as dust and aerosols, filtering separators/storage filters are used, whose operating principles are based on physical effects such as inertia, blocking, and diffusion.

In contrast, gaseous or vaporous pollutants require the use of sorption filters, typically activated carbon or chemically

impregnated granules (chemisorption filters), in which the molecules are chemically or physically bound to the surface of the filter material.

An effective overall system often requires multi-stage filtration that combines mechanical pre-filters to increase service life with main filters for particles or gases in order to ensure both compliance with legal limits and system efficiency.

## Filter types and particle sizes





## The right system design for optimum air pollution control

The correct dimensioning/design of an extraction system is crucial. It is derived from a fundamental analysis of the pollutant and production situation. Extraction capacity, emission characteristics, and environmental conditions are important parameters – both for clean air and for significant energy-saving potential.



1) Analysis stage

2) Collection determining

3) Transmission element determining

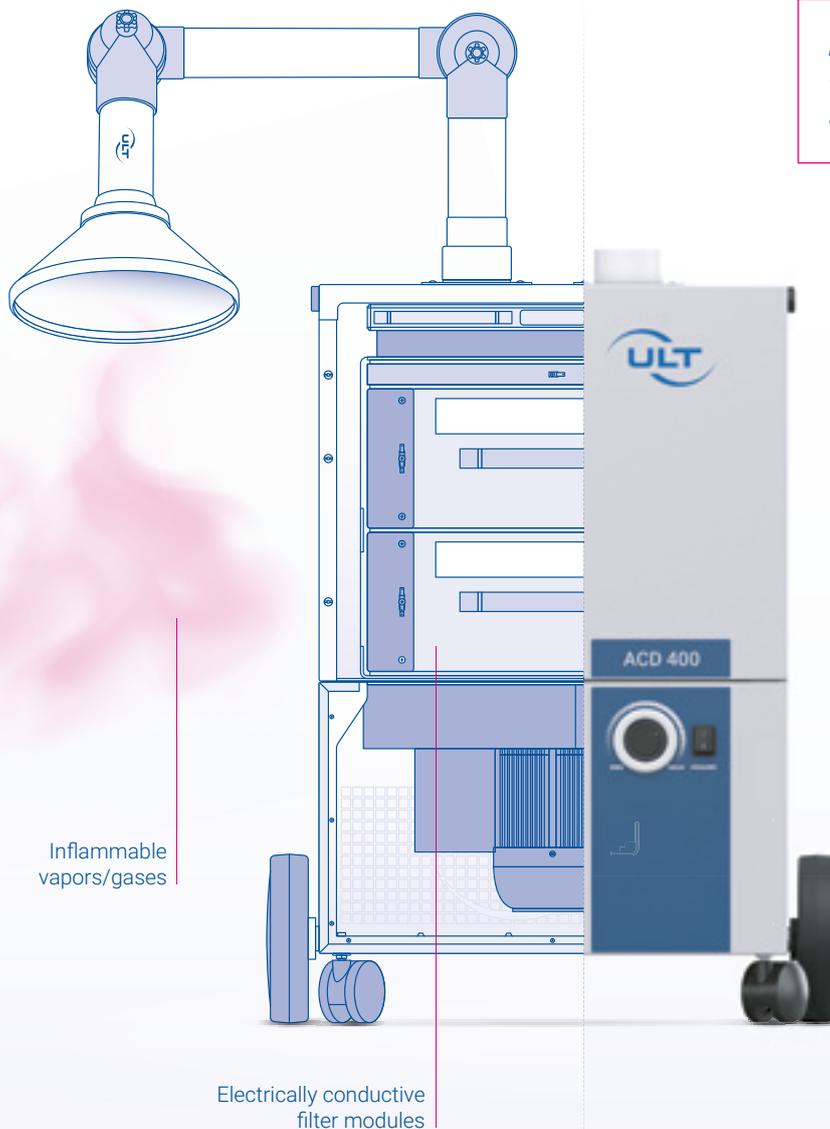
4) Device and technology determining

5) Waste handling and maintenance

# Safe extraction of combustible substances

In everyday laboratory work, flammable vapors and gases are often released, especially from solvents and adhesives. This places increased demands on extraction and filtration technology. Flammable gases can ignite in inadequately protected filter devices. If the lower explosion limit (LEL) is exceeded inside the device, creating an explosive atmosphere, this can even lead to an explosion in the worst case.

In order to prevent these mixtures from being ignited by technical equipment, the ATEX directive requires precise classification of hazardous areas into zones (gas: 0, 1, 2; dust: 20, 21, 22). This necessarily implies the use of extraction systems whose components (e.g. fans and electrically conductive filters) must be designed to be free of ignition sources and correctly grounded for equipotential bonding.

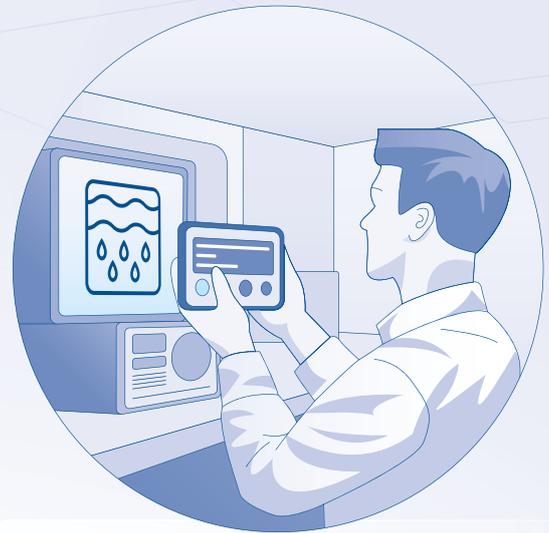


# Targeted control of cleanroom air

Precise air flow: Guaranteeing clean conditions and consistent process stability.

## Cleanroom – briefly explained

Controlled working environments reduce particles, gases, and contaminants, protecting people, products, and sensitive processes.



## Added benefit

Targeted process air treatment supports humidity control and ensures constant, stable environmental conditions.



## Standard and requirements

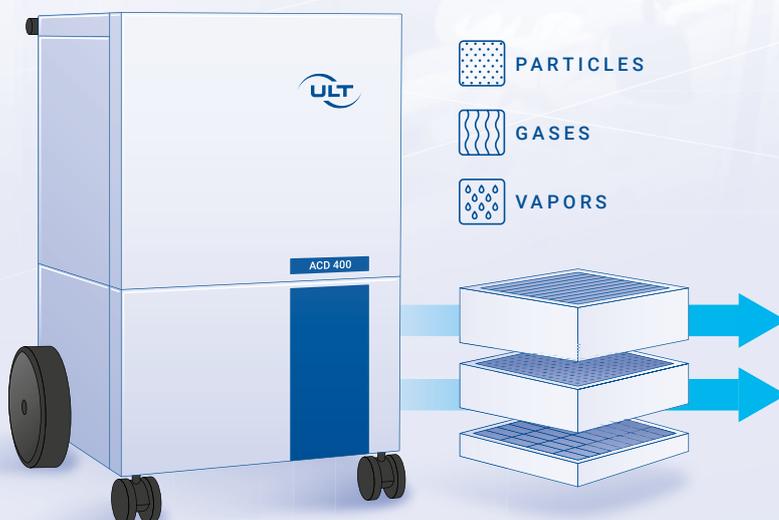
Cleanroom quality is classified according to ISO 14644, where air handling technology, processes and emission capture at the source are crucial.

## Source capture

Source capture at the workstation extracts contaminants as they arise, ensuring they do not disperse into the cleanroom environment

## Modular filter concept

Multi-stage filter systems up to ULPA filtration enable flexible adaptation to cleanroom class and process requirements.



# ACD series devices: Modular. Reliable. Efficient.

ULT offers a wide range of mobile and stationary air filtration systems. Depending on the application, the modular extraction systems in the ACD series can be expanded or customized to meet specific customer requirements. Safety aspects also play an important role here.

Based on many years of experience, we know that each process must be analyzed specifically in order to select the optimal extraction system. ULT supports its clients with comprehensive consultancy and technical expertise to ensure the best possible solutions.

## Storage and sorption filter systems



<b>ACD 160.1</b>	
Max. air flow in m <sup>3</sup> /h .....	190
Max. vacuum in Pa .....	3,200
Dimensions (W×D×H) in mm .....	405×355×545
Noise level in db(A) .....	49



<b>ACD 200.1</b>	
Max. air flow in m <sup>3</sup> /h .....	320
Max. vacuum in Pa .....	9,000
Dimensions (W×D×H) in mm .....	390×400×620
Noise level in db(A) .....	47



<b>ACD 400.1</b>	
Max. air flow in m <sup>3</sup> /h .....	600–1,000
Max. vacuum in Pa .....	2,600–9,800
Dimensions (W×D×H) in mm .....	652×600×867/1,140
Noise level in db(A) .....	< 60



<b>ACD 1200</b>	
Max. air flow in m <sup>3</sup> /h .....	1,500
Max. vacuum in Pa .....	3,250
Dimensions (W×D×H) in mm .....	790×820×1,040
Noise level in db(A) .....	55

# Filtration systems with explosion protection



Industrial vapors and gases can be highly explosive and therefore pose a significant potential hazard to people and machinery. To safely counter these risks, ULT offers specialized extraction and filter systems that have been specifically developed for effective explosion protection.



## ACD 220 EX

Max. air flow in m <sup>3</sup> /h .....	420
Max. vacuum in Pa .....	1,100
Dimensions (W×D×H) in mm .....	390×380×690
Noise level in db(A) .....	50



## ACD 400.1 EX

Max. air flow in m <sup>3</sup> /h .....	900
Max. vacuum in Pa .....	1,650
Dimensions (W×D×H) in mm .....	670×600×872
Noise level in db(A) .....	< 60



## ACD 1200 EX

Max. air flow in m <sup>3</sup> /h .....	1,700
Max. vacuum in Pa .....	2,600
Dimensions (W×D×H) in mm .....	790×820×1,040
Noise level in db(A) .....	< 62

*The explosion protection in our filtration systems complies with the ATEX Ex II 2G standard. They are therefore suitable for extracting combustible gases in concentrations of up to 20% of the lower explosion limit (LEL).*

# JUMBO Filtertrolley LabCat

## The flexible multi-talent

The JUMBO Filtertrolley LabCat mobile extraction and filtration system was specifically developed for use in laboratories.

Due to its compact size and flexibility, the JUMBO LabCat is ideal for rapid relocation and precise extraction.

The filtration system effectively and sustainably removes coarse particles, fine dust, odors, and gases. The unit operates whisper-quietly to minimize noise disturbances.



## JUMBO LabCat



Max. air flow in m <sup>3</sup> /h .....	190
Max. vacuum in Pa .....	3,200
Dimensions (W×D×H) in mm .....	450×340×530
Noise level in db(A) .....	49

# Proven solutions in practice

The following examples show how ACD series systems, in conjunction with appropriate capture solutions, master real challenges in the laboratory.



## 1) Protection against fine powders (particle separation)

- Situation: Weighing of extremely fine, harmful powders. The particles spread throughout the room.
- Solution: Use of an ACD 400.1 extraction system with particle filter (HEPA-H13) and a precise scale extraction system (mini hood). Collection takes place directly above the weighing pan in order to reduce the particle concentration to a minimum.



## 2) Solvent vapors and ATEX protection (gas separation)

- Situation: Use of flammable solvents in a small laboratory cell. Risk of an explosive atmosphere forming.
- Solution: Use of an ACD 400.1 filtration system with activated carbon filter. The extraction system captures the vapors directly at the source. Potential equalization ensures that no ignition source can arise.

## 3) Optimization of energy efficiency

- Situation: An exhaust air system extracts enormous amounts of conditioned room air every hour. This results in high operating costs.
- Solution: Review the application. For non-critical substances, switch to an ACD recirculating air extraction system. The purified air is returned to the room, which significantly reduces heating and cooling costs.

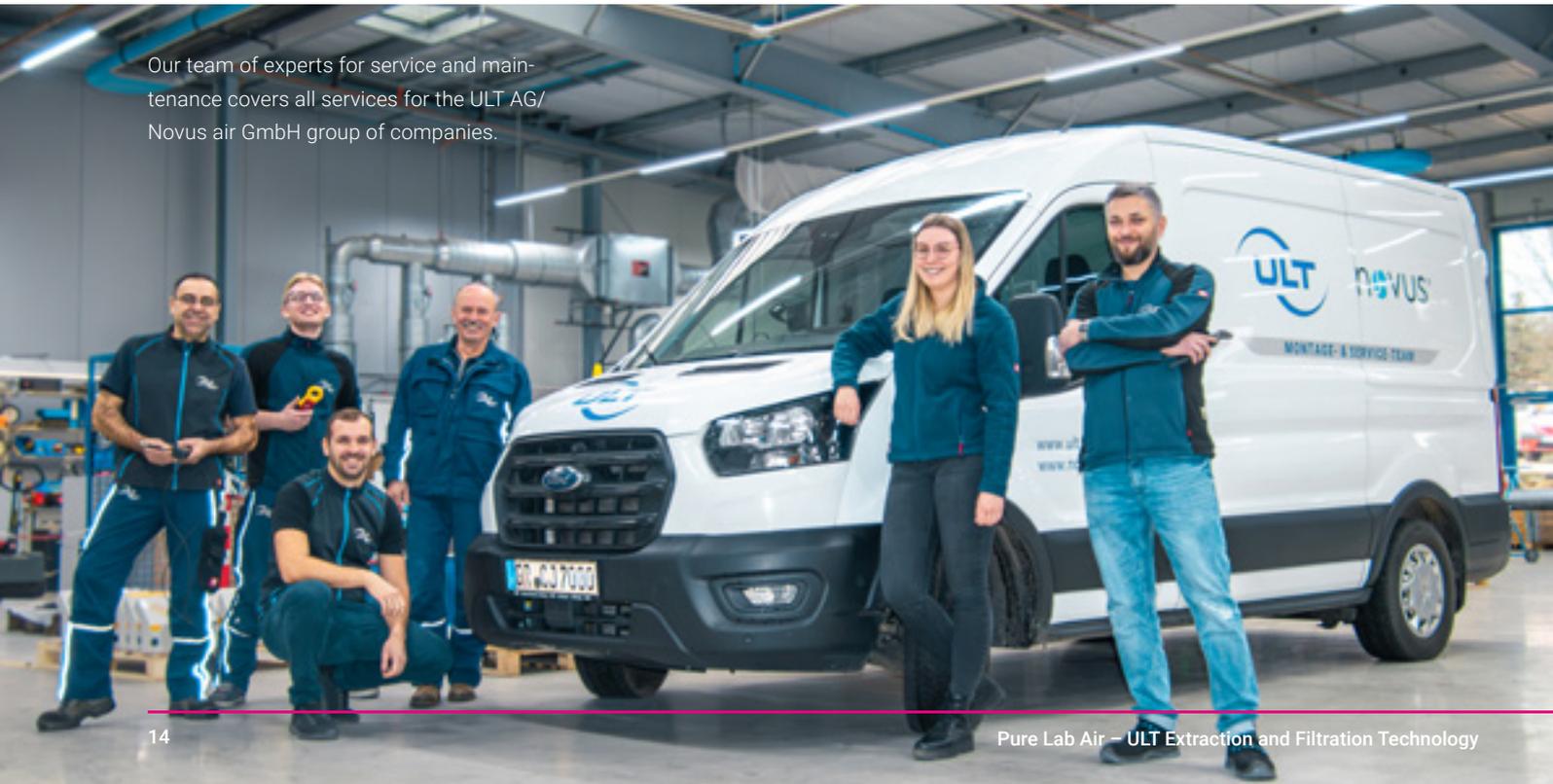


# We are your partner!

Our performance promise



Our team of experts for service and maintenance covers all services for the ULT AG/ Novus air GmbH group of companies.



# Intelligent solutions for best air quality

## ULT – air quality

Since the air quality is of fundamental importance for work and production processes, ULT, as a full-service provider, develops air purification solutions for the highest demands – to protect employees, equipment, products, and the environment.

The reliability of our products ensures manufacturing processes and the profitability of our customers.

The proximity of the ULT experts to the processes and requirements of our customers enables the development of tailor-made and needs-oriented solutions – from the standard product to the individual system.

Our own research and development department as well as numerous cooperations with professional associations, education institutions and industry form the basis for the permanent further development of our ventilation systems and solutions for the best air quality of tomorrow.



ULT AG

ULT headquarters in  
Löbau/Germany



**ULT AG**

Am Göpelteich 1  
02708 Löbau  
Germany

Phone: +49 3585 4128 0  
Fax: +49 3585 4128 11  
Email: [ult@ult.de](mailto:ult@ult.de)  
Web: [www.ult-airtec.com](http://www.ult-airtec.com)

