



# Extraction and filtration technology for soldering fumes and vapors

Air pollution control in industrial and craft soldering processes



# Soldering processes and applications

Soldering processes are utilized in a wide range of industrial and craft sectors. It is an important and versatile technology for joining primarily metallic parts together, thus enabling the manufacture of various products.



## **SOLDERING PROCESSES ARE UTILIZED IN:**

- Electronics manufacturing
- Machinery and metalworking
- Aviation and aerospace
- Construction industry
- Jewelry making
- Instrument making
- Arts and crafts
- and more

## **CURRENTLY APPLIED SOLDER PROCESSES:**

- Dip soldering
- Piston soldering
- Wave soldering
- Reflow soldering
- Selective soldering
- Light soldering
- Induction soldering
- Resistance soldering
- Cold soldering
- Vacuum brazing
- Hot air brazing
- Laser soldering
- Diffusion soldering
- Vapor phase soldering
- Micro soldering
- Ultrasonic soldering
- and more

# Technologies and emissions

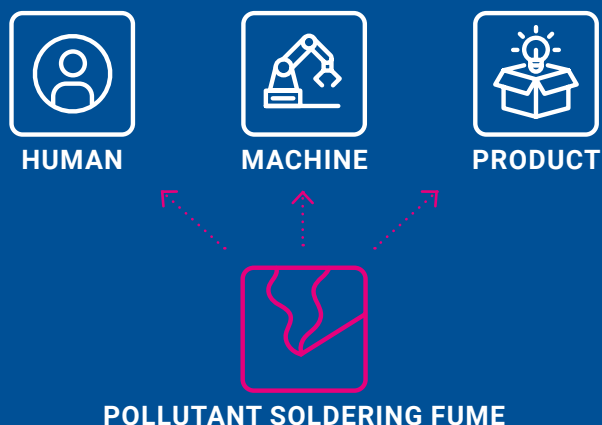
Soldering processes are also subdivided according to the liquidus temperature of the solder and are used in different areas:

	SOFT SOLDERING	HARD SOLDERING	HIGH TEMPERATURE SOLDERING
Liquidus temperature	< 450 °C/842 °F	> 450 °C/842 °F	> 900 °C/1,652 °F
Materials	<ul style="list-style-type: none"> <li>• Copper and copper alloys</li> <li>• Sheet steel</li> <li>• Aluminum</li> <li>• Zinc</li> <li>• Stainless steel</li> </ul>	<ul style="list-style-type: none"> <li>• Steel</li> <li>• Brass</li> <li>• Copper</li> <li>• Silver (alloys)</li> <li>• Gold (alloys)</li> </ul>	<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• Nickel</li> <li>• Cobalt</li> <li>• Ceramics</li> </ul>
Application examples	<ul style="list-style-type: none"> <li>• Electronics manufacturing</li> <li>• Electrical installation</li> <li>• Sanitary engineering</li> <li>• Jewelry and handicrafts</li> <li>• Heating construction</li> </ul>	<ul style="list-style-type: none"> <li>• Instrument making</li> <li>• Plumbing installation</li> <li>• Goldsmith work</li> <li>• Tool making</li> <li>• High frequency technology</li> </ul>	<ul style="list-style-type: none"> <li>• Electronics manufacturing</li> <li>• Jewelry making</li> <li>• Heating and air conditioning technology</li> <li>• Turbine production</li> </ul>
Use of flux	X	X	—

Depending on the application and requirements, solder alloys (solder wire, solder bars, solder paste) and halogen-free fluxes (mainly containing rosin) are used for soft and hard soldering. During the soldering process, large parts of the flux agent and a small portion of the solder are vaporized.

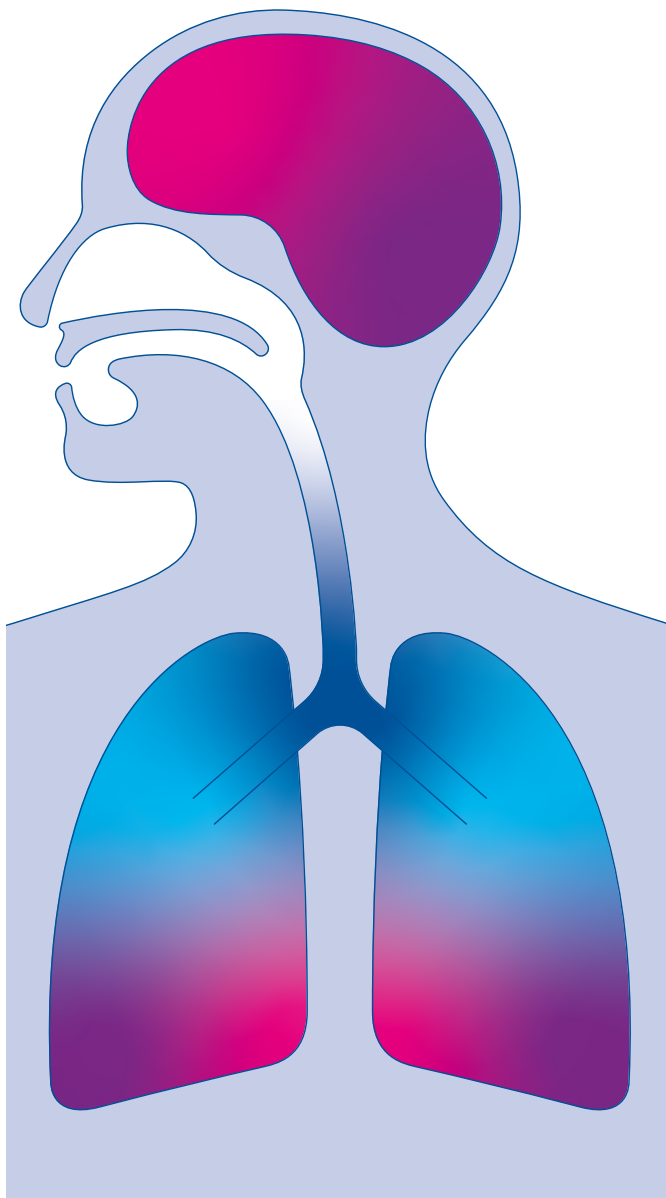
This produces aldehydes, gases and aerosols, among other things, which have been proven to be harmful to health. They also have a negative impact on manufacturing equipment and products.

## SOLDERING FUMES HAVE A THREEFOLD DAMAGING EFFECT



# Health risks and legal basis

In many countries there are a number of legal regulations that prescribe how airborne pollutants in the process air must be removed. A distinction is made as to whether the substances are harmful to the brain, nerves or respiratory tract, or whether they are inhalable or alveolar.



## Material processing releases pollutants



*The exact composition of the soldering fume depends on various factors, e.g. the solder used, flux, soldering temperature, and soldered materials. Therefore, an analysis of the specific emission should be carried out to assess the damage.*

The use of professional extraction and filtration technology is therefore imperative. Due to the different compositions of laser fume, a comprehensive analysis and implementation process is required to define the ideal collection, separation and exhaust solution.



# Pollutant collection

## The filtration process begins with the capture

Air pollutants are collected before filtration, because only what is captured can be filtered. The degree of capture forms the basis for the subsequent optimal filtration. Consequently, this results in the efficiency of the entire system and therefore the pollutant residues in the recirculated exhaust air.

The greatest proximity to the pollutant source is crucial here.

The selection of the best-suited collection element is also of great importance. ULT is at the customer's side to provide advice.

Further information on the capturing of airborne pollutants:



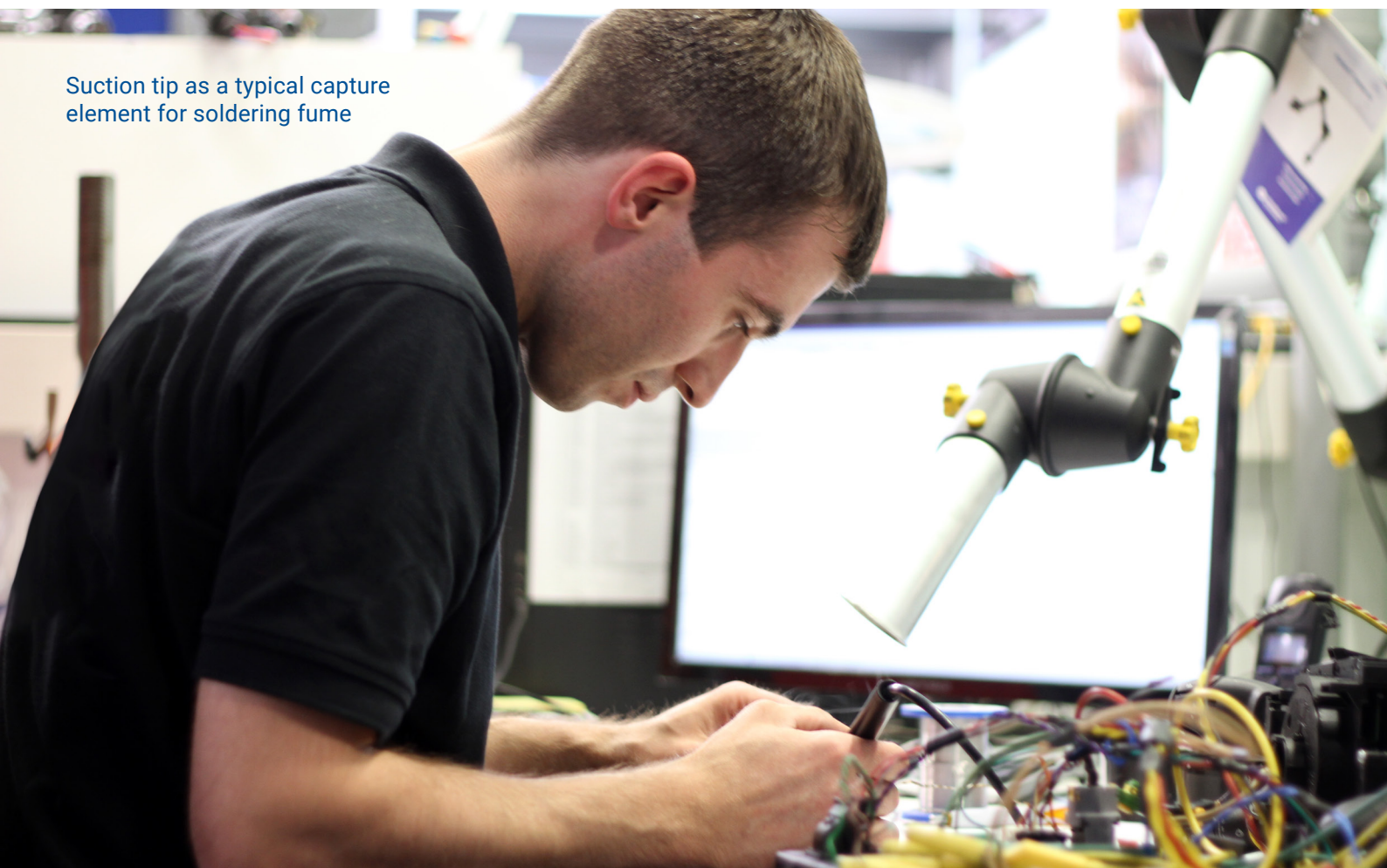
**COMPETENCE BROCHURE ON POLLUTANT CAPTURING FROM ULT**



**BROCHURE BY THE GERMAN PROFESSIONAL ASSOCIATION VDMA**

*Rule of thumb: doubling the distance between the collecting element and the pollutant source means quadrupling the energy requirement of the filter system.*

Suction tip as a typical capture element for soldering fume

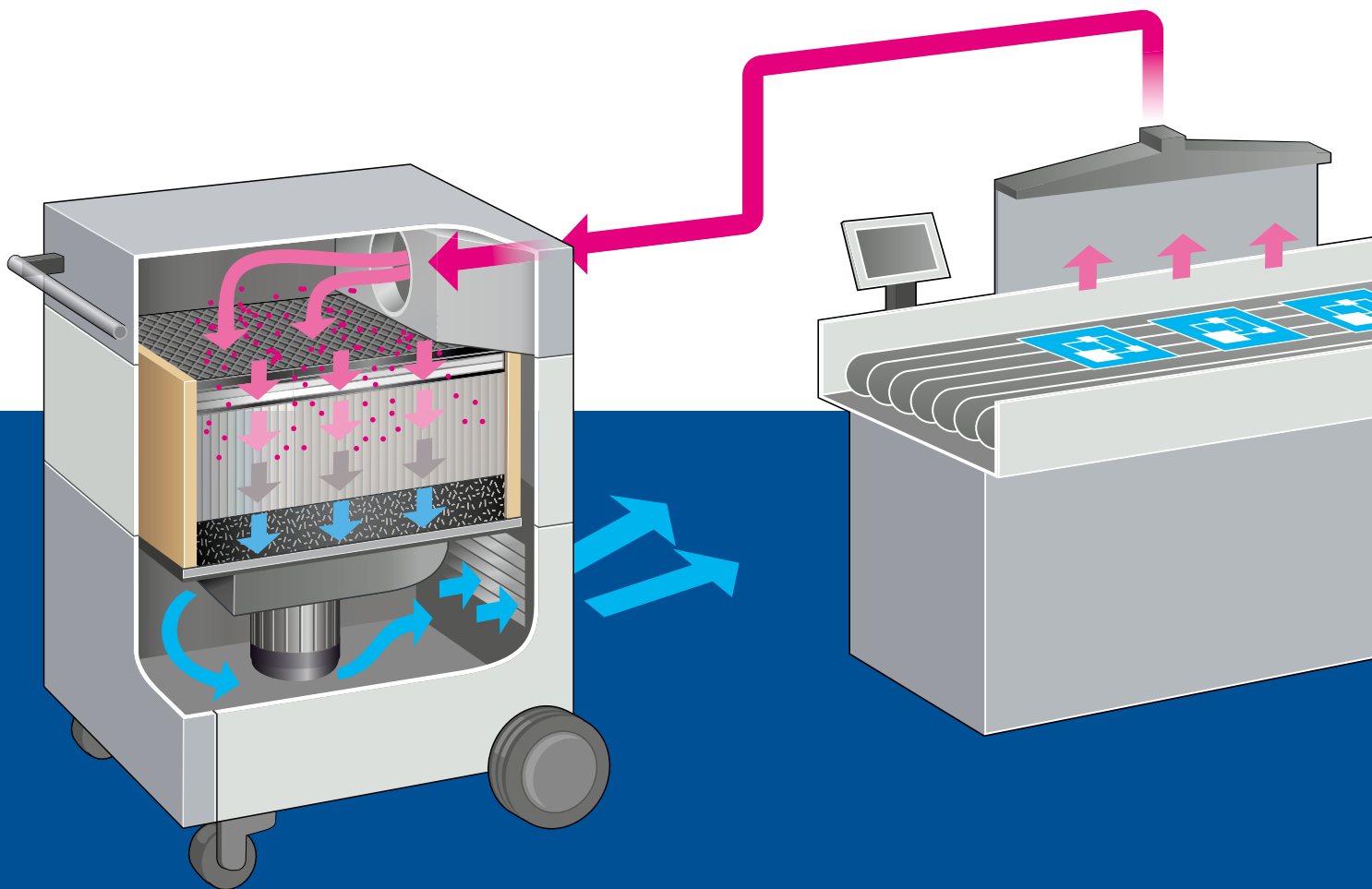


# Separation principle storage filters

Storage filter systems are almost exclusively used to remove soldering fume and vapor.

## BENEFITS:

- Low investment and operating costs
- High flexibility
- Easy maintenance
- High separation performance
- Compact, often modular design



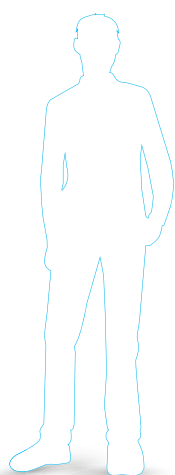
# ULT systems for soldering fume extraction

ULT offers a wide range of mobile and stationary systems for solder fume extraction. Depending on the application, the modular extraction systems of the LRA series can be expanded or adapted. ULT is happy to advise its customers on this.

Based on our extensive experience, we know that every process needs to be analyzed specifically. Different parameters play a role that are crucial for selecting the optimum filtration device.

## Storage filter systems

*Thanks to the specially developed "Silent Technology", ULT's extraction and filtration systems are considered to be the quietest on the market.*



Device	LRA 160.1	LRA 200.1	LRA 400.1	LRA 1200
<b>Tech. specifications</b>				
Max. air flow in m <sup>3</sup> /h	190	320	1,000	1,500
Max. vacuum in Pa	3,200	9,000	9,800	3,250
Noise level in dB	49	47	60	55
Connections for extraction arms (DN 50)	1	4	8	12
Vacuum stabilization by means of "EcoFlow® Technology"	–	X	X	X



## The right plant design for optimum air pollution control

The dimensioning of the plant technology is derived from a fundamental analysis of the production and pollutant situation. This should be prepared by experts together with the users



1) ANALYSIS  
STAGE

2) COLLECTION  
DETERMINING

3) TRANSMIS-  
SION ELEMENT  
DETERMINING

4) DEVICE AND  
TECHNOLOGY  
DETERMINING

5) WASTE HAN-  
DLING AND  
MAINTENANCE



# 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 standard products to individual systems.

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



Solder fume extractor LRA 1200  
utilized for automated soldering  
processes



## Solutions – unique and customer-oriented

What makes our solutions for soldering fume  
extraction special:

- Complete system solutions:  
filter types, safety technology, accessories
- Low-noise operation
- Low operating costs



**EXTRACTION SYSTEMS FOR  
SOLDERING FUME AND VAPOR**





## EXPERT CENTER



Information on the practical use of ULT air technology for solder fume extraction can be found in our ULT Expert Center.



ULT EXPERT CENTER





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