Our new fume hoods for high thermal loads and working with acids

EN 7

WALDNER

Safe and cost-effective working also under special conditions

We are a leading supplier in the field of laboratory equipment and laboratory fume hoods because we are constantly developing ourselves and our products. To achieve this, we combine our constructive know-how with the results of systematic investigation and testing of the flow technology of laboratory fume hoods. Energy efficiency and optimum ergonomics make our fume hoods safe and comfortable for the people working with them.

For years now, we have been introducing our expertise in laboratory design and construction to standardisation committees in order to improve the safety in laboratories even further. In our own certified testing laboratory, we test our fume hoods in accordance with EN 14175 – Part 3, 4, 6 and 7, but also in accordance with further standards, for example BSR/ASHRAE Standard 110P-2005.

We have always been searching for solutions that will make our fume hoods even safer and more energy efficient. The energy consumption is extremely low, whilst high safety standards are maintained, due to the continual optimisation of our flow technology.

EN 7

The new standard for working in the fume hood for high thermal and acidic loads

The new standard EN 14175-7:2012 regulates fume hoods for special application with high thermal load and/or acidic load. The use of these special purpose fume hoods instead of general purpose fume hoods is usually the result of a risk assessment.

The standard is applicable for the following special purpose fume hoods:

- **Fume hoods for high thermal loads**
- **Fume hoods for high thermal loads in combination with acid digestions**
- **Fume hoods for handling of perchloric acid**
- **Fume hoods for handling of hydrofluoric acid**

Additional objectives that are formulated in section 7 go beyond the safety and performance targets defined in EN 14175-2, for example:

Requirements for materials

In fume hoods for high thermal loads, the materials used must be able to meet the resulting demands. The materials must be chemically resistant to acids and acidic vapours and resistant to thermal deformation at the working temperatures.

Requirements on the cleanability

The construction of the fume hood must secure the necessary access to all air flow parts for cleaning purposes.

Requirements on the air flow and the monitoring

Impacts on the air current, caused by thermal loads and installed heating appliances, for example, must be taken into account and limited.

In addition to the fume hood function display with the acoustic and optical alarm, fume hoods for high thermal loads must be equipped with a temperature sensor that will trigger an alarm when the maximum temperature is reached.

While the previous standard series EN 14175 defines exclusively isothermal conditions in the fume hood, the newly issued part 7 offers the opportunity to evaluate the safety of fume hoods on incidence of high thermal loads. This closes a significant gap, as working with heat sources in the fume hood is part of the everyday routine work in many laboratories.

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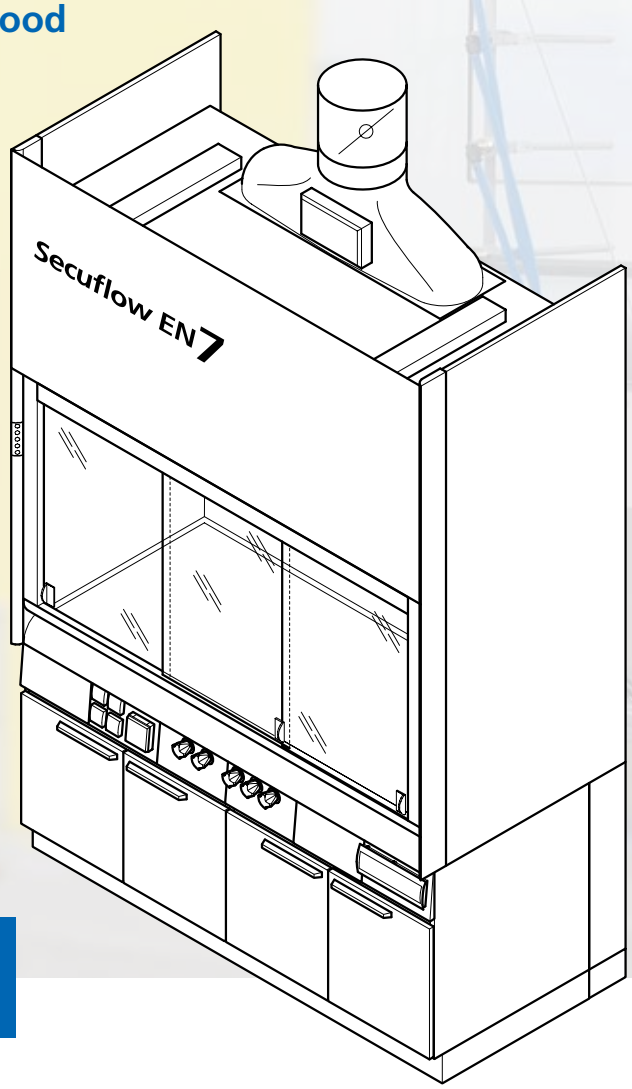
Secuflow EN7 bench-mounted fume hood
• for high thermal loads

The Secuflow is especially successful because it can be operated with lower extract air volumes, which means considerable saving in energy costs and in the investment costs for the ventilation system. The Secuflow is the safest and most ecologically sound variant.

We have developed the Secuflow EN7 to secure these benefits also for working with high thermal loads. Due to its sophisticated supply and extract air flow, the fume hood secures safe operation when working with thermal loads, whilst retaining all the benefits of the supportive flow fume hood Secuflow.

When the laboratory is equipped with Secuflow EN7 fume hoods, the user is ideally equipped for any kind of laboratory work: whether this is normal operation or working with thermal loads.



Secuflow EN7 bench-mounted fume hoods for high thermal loads

Intended use

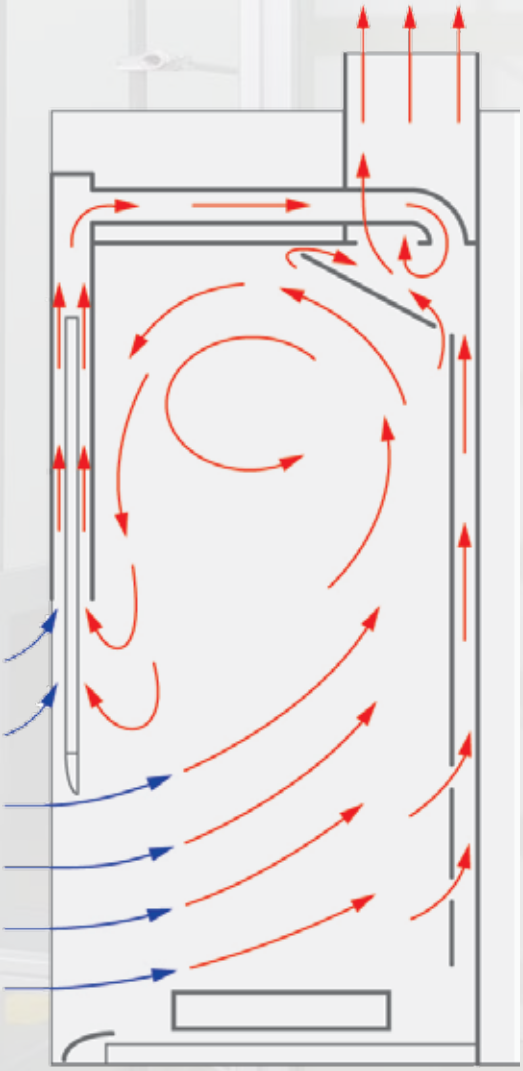
- For work with high thermal loads in the inside of the fume hood (Heat sources of 4 KW per meter inner width of the hood)
- Protective device for the user, tested in accordance with EN 14175-7:2012
- Extraction of fumes, aerosols and dust from the internal workspace to prevent dangerous amounts of pollutants from escaping into the laboratory
- Reduced risk of the formation of a high concentration of hazardous substances / hazardous explosive atmosphere in the internal workspace
- Protection from splashes of hazardous substances
- Protection from flying particles, bodies or parts escaping from the internal workspace
- General fume hoods constructed in acc. with EN 14175 are not suited for use with radioactive substances or microorganisms
- Not suitable for openly breaking down chemicals
- Active supportive flow technology (Secuflow technology) reduces the energy consumption while regulations and standards are observed
- Service outlets for sanitary supply in the rear panel of the internal workspace
- Control units located horizontally on the service rail of the support unit

Technical data

Dimensions	1200	1500	1800
Width [mm]	1200	1500	1800
Depth [mm]		900	
Height [mm		2700	
Clear width, internal workspace [mm]	1150	1450	1750
Clear height, internal workspace [mm]		1550	
Working height [mm]		900	

Standard fume hood with heating source

Secuflow EN7 with heating source



Flow pattern in the Secuflow EN7 with heating source

Design characteristics	1200	1500	1800
Supporting construction	Self-supporting underbench units or H-frame with push-in underbench units		
Sash	2 horizontal sashes		3 horizontal sashes
Max. number of devices for scaffold points, ø 12 mm to 13 mm	9		12
Service modules	2		3
Electrics			
Electrical supply	External sockets in service panels		
Fuse box, Sash controller SC	Optional		
Sanitary technology			
Sanitary supply	Service modules with take-off valves for vacuum, gases and/or waters and integrated sink (PP) as an option		
Ventilation technology	**1200**	**1500**	**1800**
Air flow range without / with thermal load [m³/h] [1)]	450 / 700	450 / 750	540 / 900
Airflow damper, variable, including detector of sash position	Airflow-Controller AC		
Function display with temperature monitoring	FAZ		
Connection height [mm] for AC with extract manifold Ø 250 mm	2950		
Underbench exhaust	As an option, depending on requirements and regulations		

[1)] All air volume specifications refer to an opening height of the sash window of 500 mm (test opening in acc. with EN 14175) and the maximum tracer gas values recommended by German Standard (BG Chemie). A maximum admission pressure of 600 Pa should not be exceeded in the case of fume hoods with airflow dampers. The indicated minimum air exchange rates were determined under specified test conditions in acc. with EN 14175-3. These minimum air exchange rates must be adapted when dimensioning the ventilation system.

If on-site extract air monitoring systems or airflow dampers are used, the required air volumes may be different. The operating limitations must be agreed upon with Waldner.

Material/surface	
Worktop	Stoneware, Polypropylene, Stainless steel, Epoxy
Internal lining	Melamine resin facing, Solid grade laminate, Stoneware

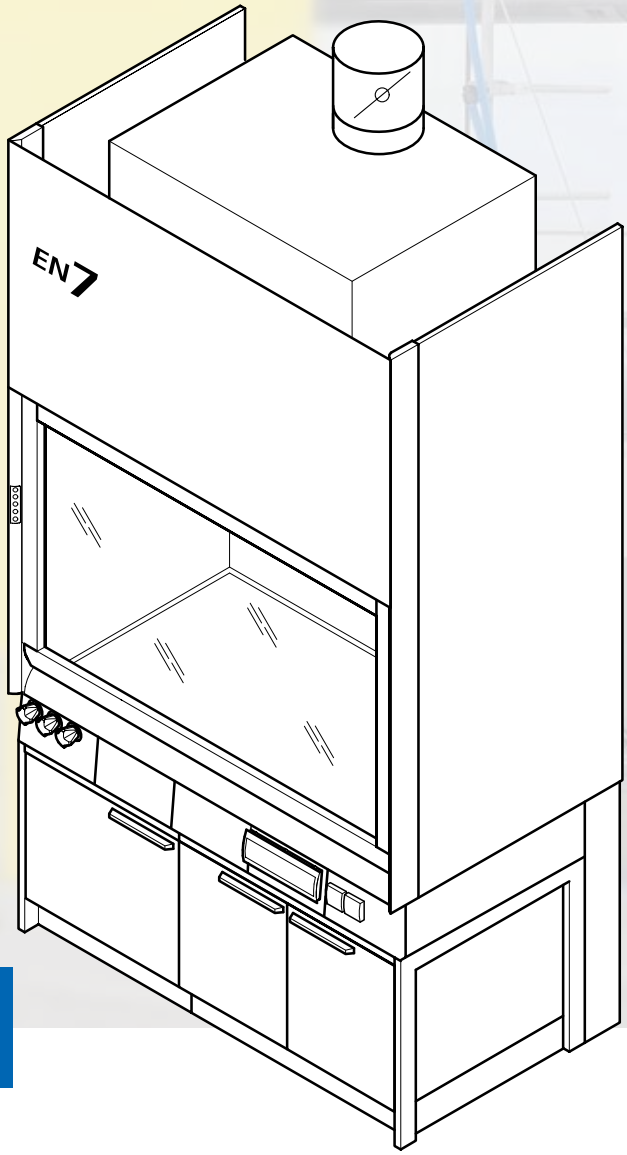
EN7 Bench-mounted fume hoods

- **for high thermal loads in combination with acid digestions**
- **Fume hoods for handling of perchloric acid**
- **Fume hoods for handling of hydrofluoric acid**

These three types of fume hoods are designed for safe operation under high thermal load in combination with acidic digestions and for the handling of perchloric and hydrofluoric acid.

The special cladding of the inside of the fume hoods is resistant to extreme strain. A compact fume scrubber and a neutralisation unit can be optionally integrated into our fume hoods at any time.

If the maximum admissible temperature is exceeded, the integrated alarm can be relayed to the building management system.



Fume hoods for high heat and acidic loads

Intended use

- Protective device for the user, tested in accordance with EN 14175-7:2012
- Suitable for open, thermal processes of breaking down chemicals with aggressive media such as e. g. sulphuric acid, perchloric acid, hydrofluoric acid or aqua regia
- The construction of the fume hood and the materials of the inner lining of the internal workspace determine which aggressive media the device can be used for
- Extraction of fumes and aerosols from the internal workspace to prevent dangerous amounts of pollutants from escaping into the laboratory
- Reduced risk of the formation of a high concentration of hazardous substances / hazardous explosive atmosphere in the internal workspace
- Protection from splashes of hazardous substances in the internal workspace
- Protection from flying particles, bodies or parts escaping from the internal workspace
- Fume hoods constructed in accordance with EN 14175-7:2012 are not approved for working with radio-active substances and for working with microorganisms
- For work with high thermal loads in combination with acid digestions in the inside of the fume cupboaed (Heat sources of 4 KW per meter inner width of the hood)

Technical data

Dimensions	**1200**	**1500**	**1800**
Width [mm]	1200	1500	1800
Depth [mm] / Height [mm	900 / 2700		
Clear width, internal workspace [mm]	1150	1450	1750
Clear height, internal workspace [mm] / Working height [mm]	1060 / 900		

Design characteristics	**1200**	**1500**	**1800**
Supporting construction	Self-supporting underbench units or H-frame with push-in underbench units		
Fume-scrubber, Extract manifold, Extract manifold with sprinkler (for working with perchloric acid), Neutralisation unit underbench unit	Optional		

Electrics			
Electrical supply	External sockets in service panels		
Fuse box, Sash controller SC	Optional		
Sanitary technology			
Sanitary supply	With take-off valves for vacuum, gases and/or waters and drip cup integrated in the worktop as an option		
Ventilation technology	**1200**	**1500**	**1800**
Minimum air exchange rate [m³/h] [1]	650	800	950
Function display with temperature monitoring	FAZ		
Airflow damper, constant with temperature monitoring	Airflow-Controller AC		
Connection height [mm] for FAZ and AC with extract air spigot Ø 250 mm with fume-scrubber	3080		
Connection height [mm] for FAZ with extract manifold Ø 250 mm without fume-scrubber	2348		
Connection height [mm] for AC with extract manifold Ø 250 mm without fume-scrubber	2710		
Underbench exhaust	As an option, depending on requirements and regulations		

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Material/surface	
Internal lining including worktop	Polypropylene for working with hydrofluoric acid
	Stoneware, for working with perchloric acid, with sulphuric acid, with hydrochloric acid and aqua regia, for example

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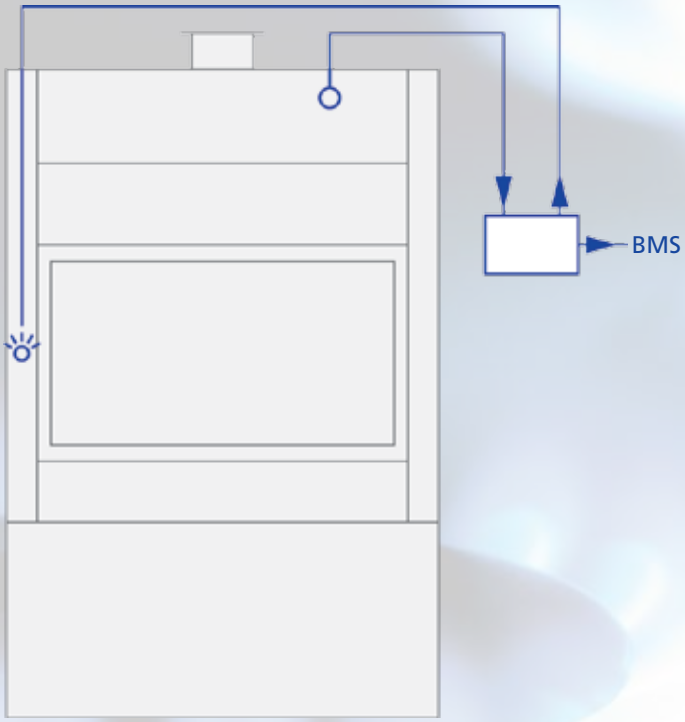
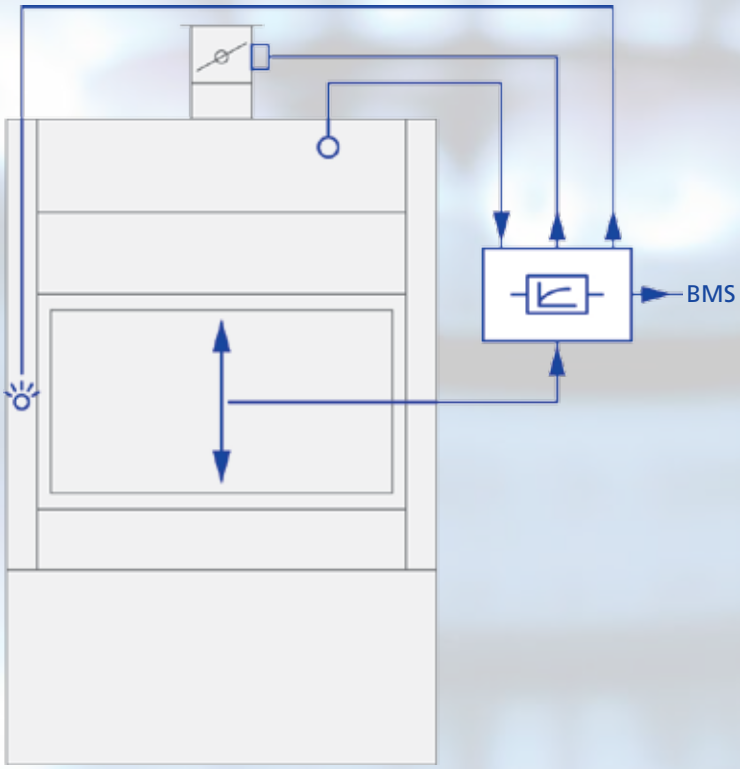


Temperature monitoring



Variable extract air volume control dependent on sash setting and extract air temperature

Temperature monitoring and extract air volume control

An optical and acoustic alarm is activated when the maximum admissible temperature in the top of the fume hood is exceeded, which can be relayed to the building management system if desired.

The extract air of the Secuflow EN7 can be controlled with our variable Airflow Controller AC dependent on the setting of the sash and the extract air temperature inside the fume hood.

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