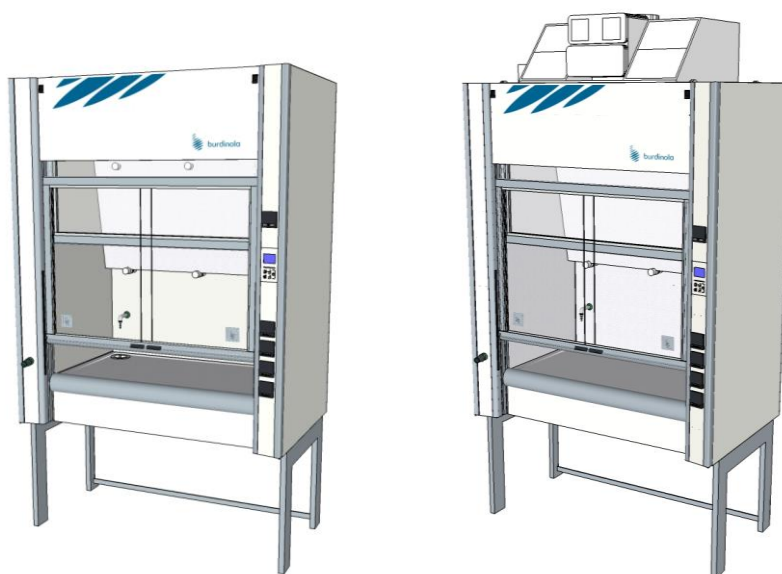


BECOME AC AND ACL FUME CUPBOARDS FUME CUPBOARDS FOR CONCENTRATED ACIDS

Laboratory fume cupboards are pieces of collective protection equipment that are useful for controlling environmental exposure to chemical pollutants in the laboratory.

Laboratory fume cupboards must be suitable for the products that are handled in them and the operations that are carried out, depending on its effectiveness of both in terms of its location and installation and its proper use and maintenance in accordance with EN 14175 parts 1 to 7.



BAC

Fume cupboard for concentrated acids

BACL

Fume cupboard for concentrated acids

- Structure**

Side structures made of steel pipes with side and front covers in 1 mm sheets. Cold rolled steel (fine carbon steels).

The protection comes from a powder coating based on polyester resins formulated without TGIC. Thickness $\geq 70 \mu$.

Properties

Adhesion	ISO 2409	Gt 0
Embossing	ISO 1520	> 5 mm
Impact	ASTM D 2794	OK
Salt spray test 1000 hours.	ISO 9227	Max. decrease ≤ 1 mm
Moisture resistance 1000 hours.	ISO 6270	Max. decrease ≤ 1 mm

Ref. manufacturer's technical specifications

- Work surface**

26 mm thick vitrified stoneware tile, with a marine edge for retaining liquids. White surface.

Stoneware surfaces remain as new, even after permanent exposure to chemicals, high thermal and mechanical loads, scratching, abrasion and cleaning operations. The non-porous surface of the ceramics prevents breeding grounds for viruses, bacteria or germs, in addition to having a high resistance to chemical attack.



Surface mounted directly on the structure using levellers-brackets.

Physical Characteristics

Property	Value	Standard	Result
Density	2.37 g/cm ³	DIN EN 993-1	
Weight of 26 mm tile with a ridged edge	65 kg/m ²		
Thermal conductivity	1.57 W/mK	DIN EN 821-2	
Burning behaviour	Class A1	DIN EN 13501-1 DIN 4102	Not combustible No thermal load

Mechanical Characteristics

Property	Value	Standard	Result
Cold crushing strength	159 MPa	DIN EN 993-5	
Flexural strength	41.3 MPa	DIN EN 993-6	
Static modulus of elasticity	39.0 GPa	DIN EN 993-6	
Wear	8.5 cm ³ /50 cm ²	DIN 52108	
Abrasion resistance	7	DIN EN 101	
Scratch resistance		DIN EN ISO 10545-11	No cracking

Thermal Characteristics

Property	Value	Standard
Thermal expansion	α25-400) 5.6 10-6K-1 (α25-800) 5.9 10-6K-1 (α25-1200) 6.3 10-6K-1	DIN 51045-2
Thermal shock	80°C	

Tolerance and planning

The tolerance for the length and width dimensions is +2mm for a cut tile and +1.5% of its dimensions for a non-cut tile. The levelling can have a dip/sag of 5mm maximum.

- Interior lining of the cabinet**

6mm ceramic plates, finished to minimize retention of liquids and pigments.

Flexural strength (MPa)	45
Scratch resistance	Excellent
Resistance to hot objects	Excellent
Thermal expansion coefficient (x10-6)	7
Typical thickness (mm)	5-8
Kg/m ²	20

Chemical

Resistance to chemical attack DIN EN ISO 10545-13, DIN EN ISO 10545-14



Resistance to chemical attack

01	Acetic anhydride		0
02	Acetone		0
03	Acetonitrile		0
04	Acidrine orange		0
05	Alzarin complexone dihydrate		0
06	Formic acid	(99%)	0
07	Ammonium hydroxide	(28%)	0
08	Amylacetat		0
09	Aniline blue, water soluble		0
10	Gasoline		0
11	Benzene		0
12	Butyl alcohol		0
13	Chloroform		0
14	Chromium(VI)oxide	(60%)	0
15	Dichlor acetic acid		0
16	Dichlormethane		0
17	Dioxane		0
18	Ferric(III)chloride	(10%)	0
19	Eosin B		0
20	Acetic acid	(99%)	0
21	Ethyl alcohol		0
22	Ethyl acetate		0
23	Ethylene glycol		0
24	Ethyl ether		0
25	Hydrofluoric acid	(48%)	3.0
26	Formaldehyde	(37%)	0
27	Fuchsin	(basic)	0
28	Furfural		0
29	Giemsa stain		0
30	Iodine solution	(0.1 N)	0
31	Iodine (crystals)		0
32	Tincture of iodine		0
33	Potassium iodite	(10%)	0
34	Potassium permanganate	(10%)	0
35	Carbol fuchsin		0
36	Carmine		0
37	Congo red		0
38	Cresol		0
39	Crystal violet (gentian)		0
40	Copper sulphate	(10%)	0
41	Malachite green oxalate		0
42	Methyl alcohol		0
43	Methylene blue		0
44	Methylethylketone		0
45	Methylisobutylketone		0
46	Methyl violet	2B	0
47	Mono Chlorobenzene		0
48	Naphtaline		0
49	Sodium chloride	(10%)	0
50	Sodium hydroxide	(10%)	0
51	Sodium hydroxide	(20%)	0
52	Sodium hydroxide	(40%)	0

53	Sodium hydroxide	(flakes)	0
54	Sodium hypochlorite	(13%)	0
55	n-Butyl acetate		0
56	n-Hexane		0
57	Perchloric acid	(60%)	0
58	Phenol		0
59	Phosphoric acid	(85%)	0
60	Safranine O		0
61	Nitric acid	(10%)	0
62	Nitric acid	(20%)	0
63	Nitric acid	(30%)	0
64	Nitric acid	(65%)	0
65	Nitric acid	(70%)	0
66	Nitric acid (65%): Hydrochloric acid (37%)		0
67	Hydrochloric acid	(10%)	0
68	Hydrochloric acid	(37%)	0
69	Sulphuric acid	(10%)	0
70	Sulphuric acid	(25%)	0
71	Sulphuric acid	(33%)	0
72	Sulphuric acid	(77%)	0
73	Sulphuric acid	(85%)	0
74	Sulphuric acid	(96-98%)	0
75	50% Sulphuric acid (77%): 50% Nitric acid (70%)		0
76	50% Sulphuric acid (85%): 50% Nitric acid (70%)		0
77	Silver nitrate	(1%)	0
78	Sudan III		0
79	Carbon tetrachloride		0
80	Tetrahydrofurane		0
81	Toluene		0
82	Trichlorethylene		0
83	Hydrogen peroxide		0
84	Xylene		0
85	Zinc chloride	(saturated)	0

Testing procedure

Carried out by applying 5 drops of each reagent to the surface of each panel.

The acids, bases, salts, specific chemical products and biological stains were covered with a downward-facing concave watch glass to confine the reagent.

The test with solvents is conducted by placing a saturated cotton ball covered with an inverted wide neck bottle to prevent evaporation.

At the end of the 24-hour test period, chemical products are washed with water and the usual detergents.

Evaluation

- 0 There is no change in colour and / or brightness
- 0.5 Slight change in colour and / or brightness, but no change on the surface
- 1.0 Slight change in colour and / or brightness, but no change on the surface
- 2.0 Slight change in colour and / or brightness slight damage on the surface
- 3.0 Slight change in colour and / or brightness, and damage / corrosion on the surface

- **Sash and windows**

Sash window made of extruded aluminium profiles with panes of safety glass (3+3 bi-laminate glass).

The sash is balanced by means of a counterweight fixed by two steel cables 3 mm in diameter sheathed in 1 mm plastic which protects them from corrosion; if one of the cables breaks, the sash is locked preventing it from falling, in accordance with the EN 14175 standard.

Total sash opening of 860 mm (tolerance ± 15 mm); for safety reasons a mechanical stop is incorporated for the sash opening for maximum operational opening.

All aluminium sections are protected against acids, bases and alkalis, as well as against knocks and abrasion, thanks to a powder coating based on polyester resins formulated without TGIC.

Properties

Adhesion	ISO 2409	Gt 0
Embossing	ISO 1520	> 5 mm
Impact	ASTM D 2794	OK
Salt spray test 1000 hours.	ISO 9227	Max. decrease ≤ 1 mm
Moisture resistance 1000 hours.	ISO 6270	Max. decrease ≤ 1 mm

Ref. manufacturer's technical specifications

• Services

The Become fume cupboard has service panels on both sides, with taps usually installed on the left and electrical sockets on the right.

• Access to installations

Access to the upper part of the cabinet is via a removable front cover made of an epoxy-polyester coated steel sheet. The lower part of the fume cupboard has inspection covers for access to the service tunnels, with the possibility of incorporating modules with a height of 650 mm.

Power sockets

- 4 x 230 V. 50 Hz (P+N+PE), 16 A.
- Magneto-thermal protection of 16 A. Type C

EO25 monitor

- Power 6 W
- Power supply 230 V, 50 Hz (P+N+T)
- Current 25 mA

LED lighting

Power 20 W

Extraction Depends on the system – Refer to the final extraction design

Temperature

- Work temperature range of $-10^{\circ}\text{C} + 63^{\circ}\text{C}$
- Temperature alarm and auto power off (EO25 only), $70^{\circ}\text{C} (\pm 10\%)$

• Trap for concentrated acids

The acid trap prevents any condensate that may be produced during extraction from returning to the fume cupboard, creating unwanted situations.

The acid vapours generated in these fume cupboards have a higher temperature than the environment so that when they hit the walls of the duct they would condense, producing a drop that could fall into the cabinet. The drops generated remain at the base of the trap without returning to the fume cupboard.



The acid effluent is covered with a fine layer of water, diluting the concentration of the acid and facilitating its evacuation to the drainage system.

This fine layer of water must be constantly renewed, for which reason the water inlet is adjusted so that a small amount of water appears through the shower whenever the acid fume cupboard is running.

Water flow solenoid valve

When the fume cupboard is switched on, the water flow solenoid valve is activated to allow water to enter the trap.



Installation and regulation of the flow rate

WATER INLET

A stopcock and a flow regulator (optional) must be provided for the water inlet ($\varnothing 1/2$ " polypropylene connection) to avoid pressure differences.



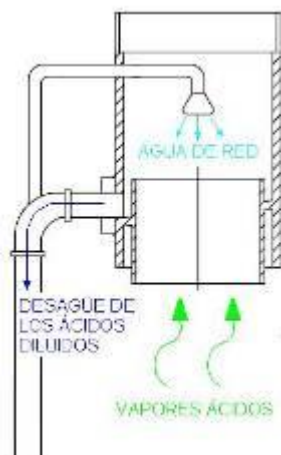
WATER FLOW REGULATOR

The water inlet flow rate must be set with a regulator, including the supply, at a pressure of 1 bar, to avoid splashing and excess water inside the trap.



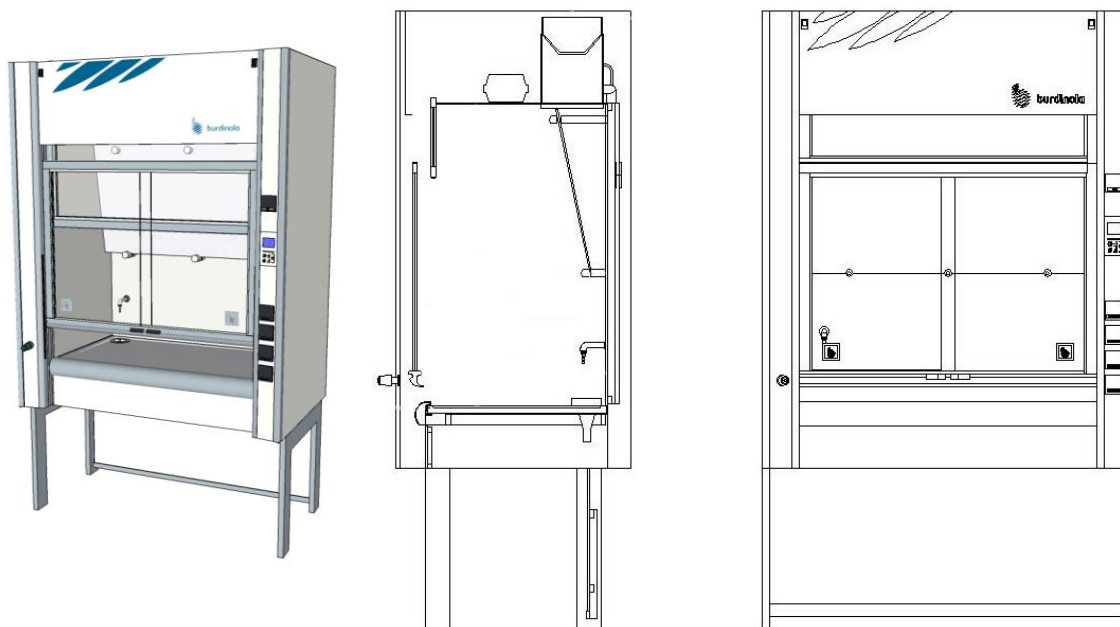
DRAINAGE

The water inside is drained through an outlet pipe (Ø32 mm) made of polypropylene.



Note: To be environmentally friendly, it is advisable to treat the water before it returns to the general drainage system.

- Fume cupboard for concentrated acids – Become AC



Dimensioning (mm)		
Total width	1500	1800
Total height	2500	2500
Total depth	950	950
Usable interior width	1225	1525
Usable interior height	1215	1215
Usable interior depth	740/620	740/620
Height of the work surface	900	900
Height of the extraction outlet	2470	2470

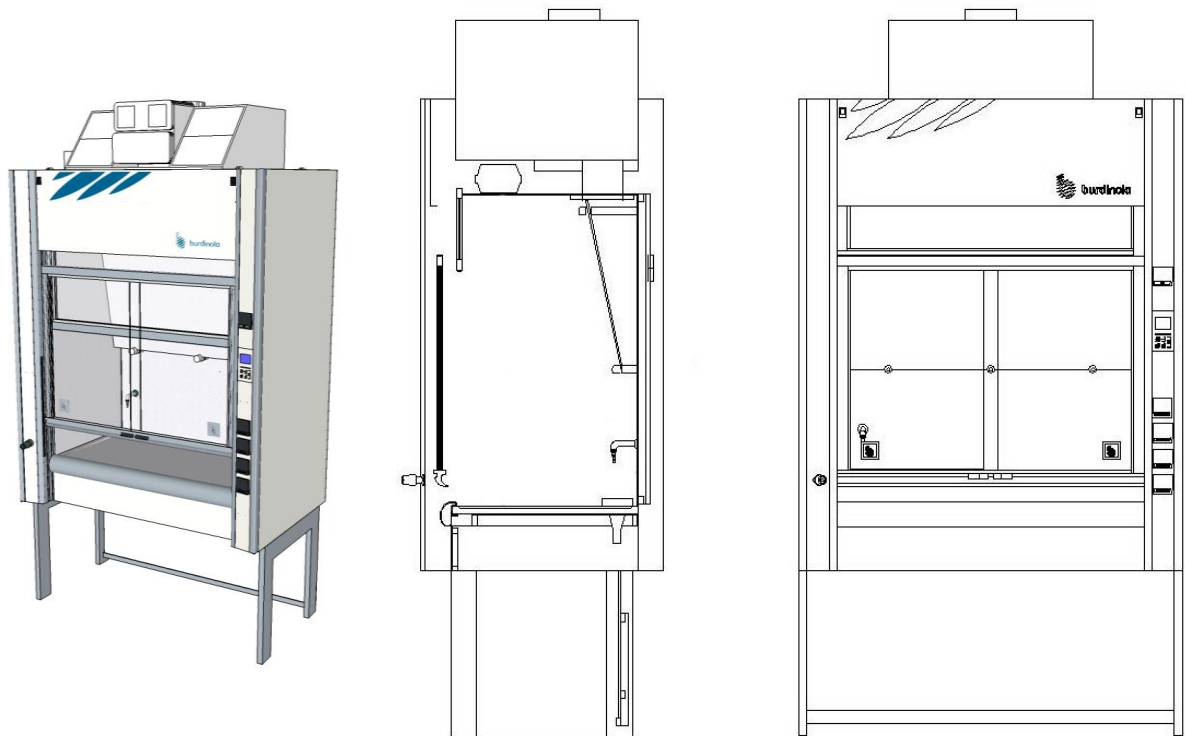
Characteristics		
Configuration	1500	1800
230V/16A IP55 electrical sockets	4	4
Magneto-thermal protection	1 x 16 A	1 x 16 A
Fume cupboard control	EO 25	EO 25
Worktop	Stoneware	Stoneware
Sink with water tap (*)	1	1
Lighting	2 LEDs	2 LEDs
Extraction outlet (**)	1 x Ø250	1 x Ø250
Support for busbar	-	-
No. of sash windows	1	1
No. of sliding windows	2	2

Notes: Dimensional data (Tolerance ±5 mm)

(*) Standard without sink, optional.

(**) The diameters of the outlet may vary depending on the installation.

• Fume cupboard for concentrated acids – Become ACL



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Total depth	950	950
Usable interior width	1225	1525
Usable interior height	1215	1215
Usable interior depth	740/620	740/620
Height of the work surface	900	900
Height of the extraction outlet	2850	2850

Characteristics		
Configuration	1500	1800
230V/16A IP55 electrical sockets	4	4
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Fume cupboard control	EO 25	EO 25
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No. of sash windows	1	1
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Notes: Dimensional data (Tolerance ±5 mm)
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