

Cooker hoods odour extraction according to EN 13 141-3



Cooker hoods odour extraction

It is tremendously important to eliminate water vapour and cooking fumes from the kitchen.

Naturally, the moisture needs to be ejected from the home, but the closer to the source this moisture is captured the better, and the lower the volume of air which needs to be extracted.

Cooking fumes are actually harmful particles, which may have a pleasing smell but need to be removed from the indoor air. To save energy, as little air as possible should be used in this process.

Hence, it is very important to have a well-functioning cooker hood which can capture the fumes from cooking. The following pages give a highly technical description of the measurement of fume capture according to EN 13 141-3, and a table shows the minimum amount of air necessary to achieve the desired capture rate of 75% in the various types of EXHAUSTO cooker hoods.

In the Danish BR18 Building Regulations it is a requirement that the hood effectively captures steam. If the hood has a steam capture efficiency of 75% or higher EN13 141-3, it will normally fulfil the requirement of sufficient efficiency of removing steam and odours from cooking. Thus, it has today been indirectly allowed that a hood should at least have a capacity of at least 75%.

EXHAUSTO



1. Scope

This European Standard specifies methods for measuring the main performance characteristics of range hoods for residential use. It applies to air extraction range hoods without fan. This European Standard does not specify:

- Values for performance characteristics;
- Safety requirements in relation with the use of methylethyl ketone (MEK).

For air extraction range hoods with fan see EN 61591.

3. Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792 and EN 13141 2 and the following apply.

3.1 Range hood

Range hood without fan – special type of the range hood designed for use in mechanical extract ventilation system with central or individual fan installed outside the range hood.

3.2 Grease absorption performance

Measure of the percentage of grease retained within a filter

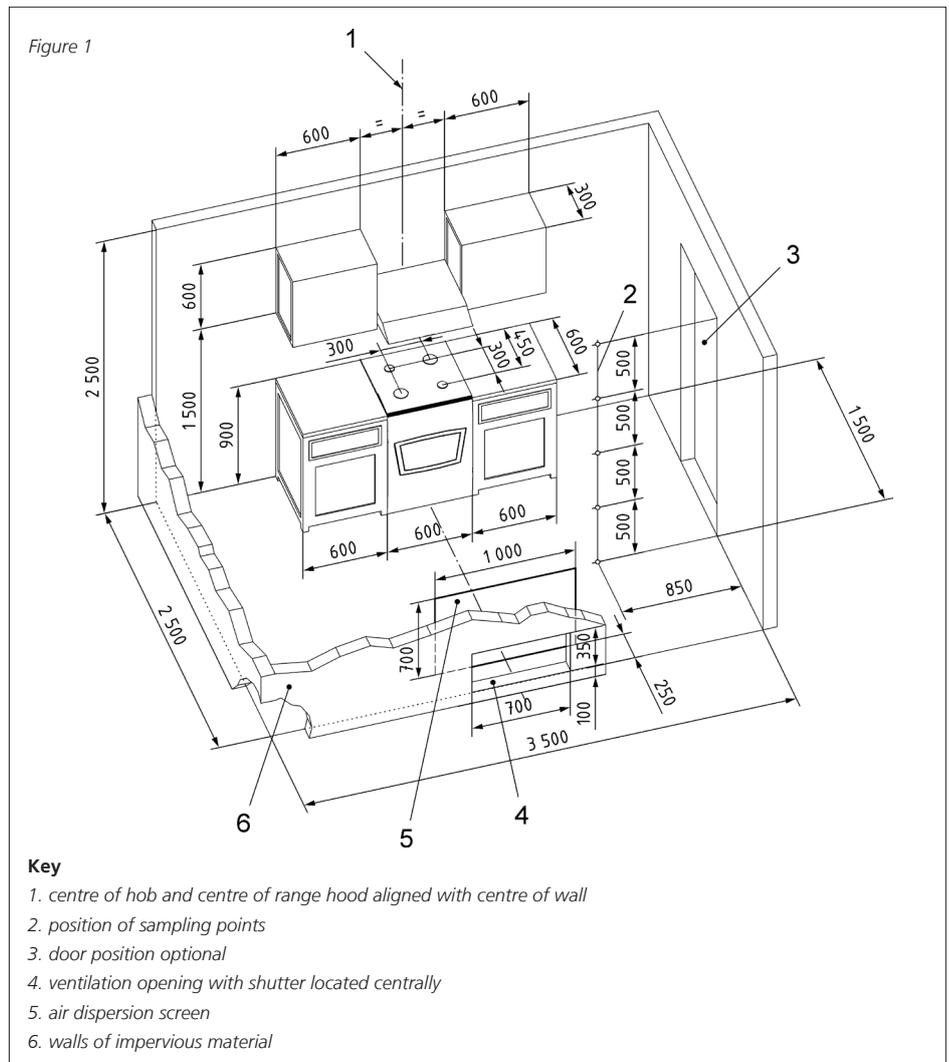
3.3 Odour reduction factor

Efficiency of the reduction of odour by a device

7. Performance testing of odour extraction

The odour extraction test shall be carried out at an airflow given by the manufacturer including an airflow giving an odour extraction $\geq 75\%$ under following conditions:

In a sealed test room with the following characteristics:



- The test room shall have a volume of $(22 \pm 2) \text{ m}^3$; and
- The walls shall be impervious to methylethyl ketone (MEK).

The range hood under test shall be installed:

- Along one of the longer walls of the test room together with kitchen cabinets; and
- Centrally above the hob and between wall cabinets at a height of:
 - 600 mm above the hob; and
 - At any other heights specified by the manufacturer.

Specific cases:

- Range hoods not intended to be installed in a cabinet or between cabinets shall be tested without wall cabinets;
- Island range hoods shall be tested as wall mounted range hoods.

The kitchen furniture cabinets shall be sealed from the rest of the air in the test room. The test room shall include a ventilation opening which can be closed and an air dispersion screen. The test room shall

Be connected to an exhaust air duct system incorporating a shut-off valve, an airflow meter and an auxiliary fan. The desired air-flow rate, in accordance with the manufacturer specification, shall be achieved using the auxiliary fan. The test room, kitchen furniture, ventilating opening and associated screen, together with the layout, are shown in Figure 1.

When testing range hoods, measures should be taken to prevent the inlet air from being contaminated with methylethyl ketone (MEK) from the outlet air.

A disturbing element (see Figure 2) which work in an intermittently way is used to simulate a real situation with air movements in the kitchen. The disturbing element shall have a width of (500 ± 2) mm and a height of $(1\ 000 \pm 2)$ mm. The distance between the disturbing elements middle point and the floor shall be $(1\ 000 \pm 2)$ mm and the distance to the wall shall be $(1\ 000 \pm 2)$ mm. The disturbing element shall be moved from one end to the other every 4 s with a constant speed of 0,5 m/s, except the acceleration and deceleration within the first 100 mm from each end position.

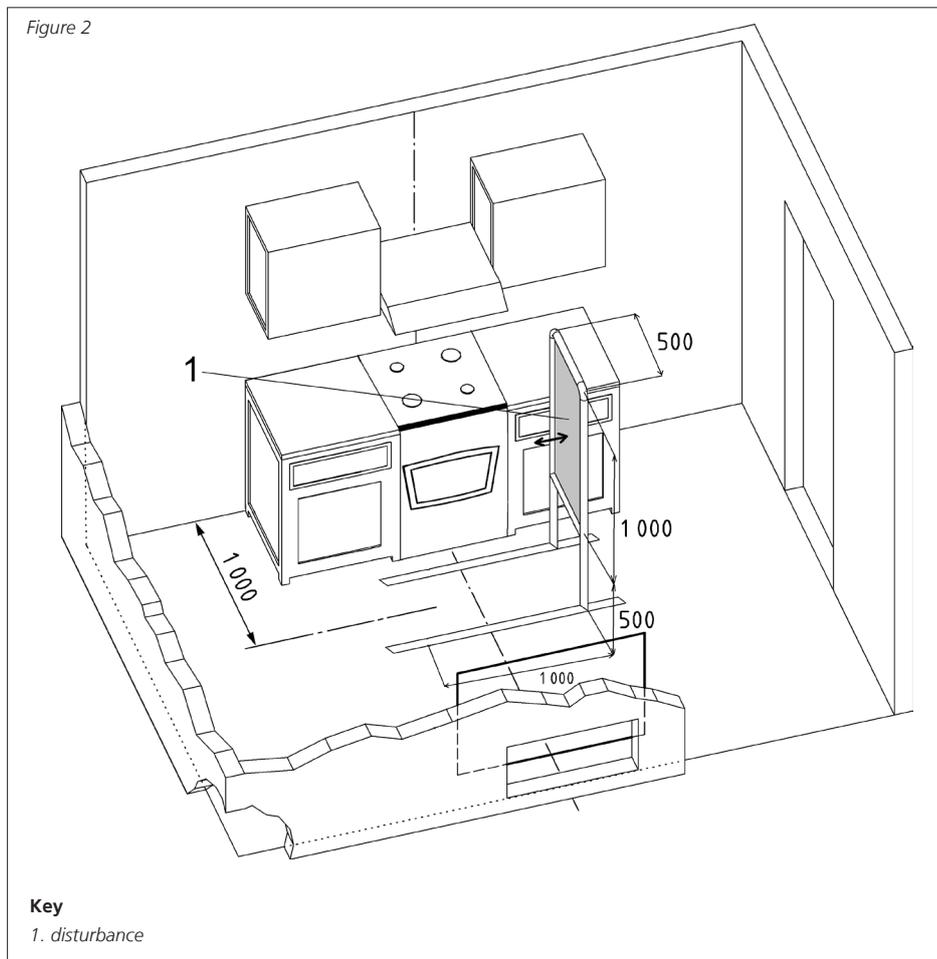
A pan, see Figure 3, with a diameter of (200 ± 20) mm with copper base and a height of (45 ± 2) mm, is placed on the front, left-hand hob element, having the same base diameter as the pan. The temperature in the base of the pan, 40 mm from its side, shall be maintained at $170 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$.

The concentration of methylethyl ketone (MEK) shall be detected using four sampling points each separated by 500 mm vertically, as shown in Figure 1. The detection equipment for measuring the methyl-ethyl ketone (MEK) concentration shall be located outside the room. An example of tubes suitable to link the sampling points to the measuring equipment is the following:
PTFE tubes with the following characteristics:

- 2,5 mm in diameter; and
- Of equal length; and
- Connected to each other.

The characteristics of the test room are established without the range hood being operated. The auxiliary fan shall be switched

Figure 2



off, the ventilating opening and the shut-off valve closed.

100 g of a solution containing $(12 \pm 0,1)$ g of methyl-ethyl ketone (MEK) in (300 ± 1) g of distilled water shall be continually dripped onto the pan at such a rate that all the solution shall be used after 10 min. The solution shall be evenly dispersed throughout the room by means of a fan.

The concentration of methylethyl ketone (MEK) in the test room (C1) shall be measured at the end of the application period. The concentration C1 can be measured without range hood being installed.

The test room is considered to be adequately sealed if the concentration of methyl-ethyl ketone (MEK) in the test room drops by less than 5 % 1 h after the solution has been distributed.

The test room is ventilated until the concentration of methylethyl ketone (MEK) is less than 1 % of C1.

The range hood shall be operated and the methylethyl ketone (MEK) solution dripped onto the heated pan so that 100 g of the solution has evaporated within 600 ± 5 s. The auxiliary fan shall be switched off, the ventilating opening closed, the shut-off valve closed and a fan having an airflow of (70 ± 14) l/s positioned on the center of the floor

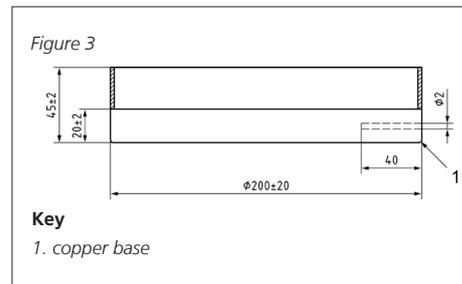
operated. The concentration of methylethyl ketone (MEK) in the room (C2) shall be measured when the value has stabilized.

The odour reduction factor (Of) is calculated in percent using Formula (1).

Where

C1 is the concentration of methylethyl ketone at the end of application without the range hood operating;
C2 is the concentration of methylethyl ketone at the end of application with the range hood operating.
The odour reduction factor, air flow and installation height are stated.

Figure 3



Cooker hood	Description	Installation height [cm]	Airflow		Odour extraction %	
			l/s	m ³ /h		
	ESL141WMR. White cooker hood with mechanical forcing, LED lighting, mechanical timer and potential-free relay.	65 cm	52	188	≥75%	
		60 cm	51	184	≥75%	
		50 cm	47	170	≥75%	
	ESL141WMR / ESL142WER + HW-ESL140. Volume screen 70 mm white finish. (accessory for increasing cooker hood extraction).	65 cm	51	184	≥75%	
		60 cm	50	180	≥75%	
		50 cm	44	159	≥75%	
	ESL141WMR / ESL142WER + HWH-ESL140. Volume screen 200 mm white finish. (accessory for increasing cooker hood extraction).	65 cm	45	162	≥75%	
		60 cm	42	152	≥75%	
		50 cm	35	126	≥75%	
	ESL142SER / ESL142WER. Stainless steel or white cooker hood with automatic forcing, SAFE Alarm function, LED lighting, filter guard, electric timer and potential-free relay.	65 cm	52	188	≥75%	
		60 cm	51	184	≥75%	
		50 cm	47	170	≥75%	
	ESL142SER + HS-ESL142. Volume screen 70 mm, stainless steel. (accessory for increasing cooker hood extraction).	65 cm	51	184	≥75%	
		60 cm	50	180	≥75%	
		50 cm	44	159	≥75%	
		ESL235SER / ESL235WER. Extractor hood with stainless or white front, with forced air option. Incl. mounting fittings and potential-free relay. Built-in, electric damper and aut. boost with telescopic bar.	65 cm	51	184	≥75%
			60 cm	47,8	172	≥75%
			50 cm	42,5	153	≥75%
	ESL245AER / ESL245WER. Extractor hood with aluminium or white front, with forced air option. Incl. mounting fittings and potential-free relay. Built-in, electric timer.	65 cm	53	191	≥75%	
		60 cm	51,2	184	≥75%	
		50 cm	45,9	165	≥75%	
	ESL160SE. Designer cooker hood for integration, in stainless steel with LED lighting. Integral potential-free relay switch (230 V/900 W) for demand control.	65 cm	53	191	≥75%	
		60 cm	53	191	≥75%	
		50 cm	48	173	≥75%	
	ESL315. Wall-mounted designer cooker hood in stainless steel with LED lighting. Integral potential-free relay switch (230 V/900 W) for demand control.	65 cm	53	191	≥75%	
		60 cm	52	188	≥75%	
		50 cm	46	166	≥75%	
	ESL345/445. Wall-/ Chimney mounted designer cooker hood in glass/ stainless steel with LED lighting. Integral potential-free relay switch (230 V/900 W) for demand control.	65 cm				
		60 cm	53	191	≥75%	
		50 cm	47	170	≥75%	
	ESL170A50. Design cooker hood, almost invisible, integrated, with LED lighting. Integrated potential-free relay switch (230 V/900 W) for demand control.	65 cm				
		60 cm	53	191	≥75%	
		50 cm	48	173	≥75%	

Highlighted product: Product is verified by a third party and recommended for sustainable construction in Denmark
We reserve the right to make changes without notice

