

# SVENSK STANDARD

## SS-EN 14175-7:2012

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### **Dragskåp –**

### **Del 7: Dragskåp för hög värme- och syrabelastning**

### **Fume cupboards –**

### **Part 7: Fume cupboards for high heat and acidic load**

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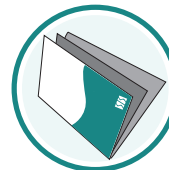
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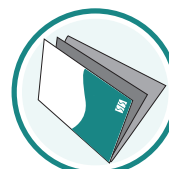
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EUROPEAN STANDARD

**EN 14175-7**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2012

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ICS 71.040.10

English Version

## Fume cupboards - Part 7: Fume cupboards for high heat and acidic load

Sorbonnes - Partie 7: Sorbonnes pour charge thermique et acide élevée

Abzüge - Teil 7: Abzüge für hohe thermische und Säurelasten (Abrauchabzüge)

This European Standard was approved by CEN on 27 April 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 14175-7:2012) has been prepared by Technical Committee CEN/TC 332 "Laboratory equipment", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

EN 14175 consists of the following parts, under the general title *Fume cupboards*:

- *Part 1: Vocabulary*
- *Part 2: Safety and performance requirements*
- *Part 3: Type test methods*
- *Part 4: On-site test methods*
- *Part 6: Variable air volume fume cupboards*
- *Part 7: Fume cupboards for high heat and acidic load*

Part 5 (*Recommendations for installation and maintenance*) has been published as Technical Specification CEN/TS 14175-5.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

The objective of this document is to consider fume cupboards classified for special applications involving high heat load and/or strong acidic load requiring additional construction, safety, operating and maintenance features to those identified in EN 14175-1 to EN 14175-6.

The use of these special application fume cupboards instead of general purpose fume cupboards is usually the result of a risk assessment.

## 1 Scope

This European Standard applies for

- fume cupboards for high heat load;
- fume cupboards for high heat load in combination with acidic digestions;
- fume cupboards for handling of perchloric acid;
- fume cupboards for handling of hydrofluoric acid.

This European Standard applies in conjunction with EN 14175-1 to EN 14175-4 and, where appropriate, to EN 14175-6 and specifies supplementary information relevant to vocabulary, safety and performance requirements, type test methods, on-site test methods and marking of the listed special purpose fume cupboards.

**NOTE** EN 14175-6 applies for variable air volume fume cupboards. Experience shows that fume cupboards for high heat load offer much safer working conditions when operated with fixed air volume flow.

This European Standard does not apply for microbiological safety cabinets, recirculatory filtration fume cupboards and fume cupboards for carrying out work on radioactive materials.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14175-1:2003, *Fume cupboards — Part 1: Vocabulary*

EN 14175-2, *Fume cupboards — Part 2: Safety and performance requirements*

EN 14175-3, *Fume cupboards — Part 3: Type test methods*

EN 14175-4, *Fume cupboards — Part 4: On-site test methods*

EN 14175-6, *Fume cupboards — Part 6: Variable air volume fume cupboards*



### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14175-1:2003 and the following apply.

#### 3.1

##### **fume cupboard for high heat load**

special purpose fume cupboard designed to withstand high heat loads within the workspace

EXAMPLE Heat sources of 4 kW and above per meter inner width of the fume cupboard can be considered as high heat loads.

#### 3.2

##### **fume cupboard for high acidic load**

special purpose fume cupboard designed to withstand high heat loads in combination with acidic digestions within the workspace

EXAMPLE Hydrochloric acid/nitric acid digestions for atomic absorption spectroscopy (AAS) or Kjeldahl digestions.

#### 3.3

##### **fume cupboard for perchloric acid**

special purpose fume cupboard designed to withstand the use of perchlorates within the workspace

#### 3.4

##### **fume cupboard for hydrofluoric acid**

special purpose fume cupboard designed to withstand the use of fluorides within the workspace

#### 3.5

##### **acid scrubbing eliminator**

device, method or process to remove or reduce acid contained within the extract air

#### 3.6

##### **acid wash down**

device, method or process to remove or reduce the effects of acid on the ductwork, including the build-up of deposits

## 4 Fume cupboards for high heat load

### 4.1 Basic safety and performance objectives

In accordance with EN 14175-2 with the following supplement:

- the design and construction of the fume cupboard shall ensure the safety and performance objectives when high heat loads are present in the workspace.

### 4.2 Materials

In accordance with EN 14175-2 with the following supplements:

The selection of materials, whether they are glass, plastics or from other kind, shall ensure suitability against chemical erosion and thermal deformation at the temperature of use.

NOTE If glass is used for the front sash, authorities or purchasers in some European countries require laminated safety glass in accordance with the definition given in EN ISO 12543-1:2011, 3.2.

## SS-EN 14175-7:2012 (E)

### 4.3 Safety requirements

#### 4.3.1 Construction

In accordance with EN 14175-2 with the following supplement:

Sash materials and design shall be such that the temperature within the workspace does not affect the sash operation and safety.

#### 4.3.2 Airflow

In accordance with EN 14175-2 with the following supplement:

Effects on airflow caused by thermal loads and location of heating appliances within the workspace shall be considered and limited. Type testing shall be performed in accordance with 4.4.

#### 4.3.3 Air flow indicator

Fume cupboards for high thermal load shall be equipped with a fume cupboard function display with an acoustic and a visual alarm according to EN 14175-2. A red light located in the optical field of the fume cupboard's user for example, can be used for the visual alarm. It should be possible to relay the alarm.

NOTE General requirements for visual danger warnings are specified in EN 842.

When choosing and placing sensors, special attention should be turned to the heat influence on and the corrosion resistance of sensors and, if need be, control elements within the extract air system.

#### 4.3.4 Maximum temperature alarm

Fume cupboards for high thermal load shall be equipped with a temperature sensor in the top of the fume cupboard with an alarm showing when the maximum exhaust air temperature as specified in the product manual is exceeded. It should be possible to relay the alarm.

### 4.4 Testing

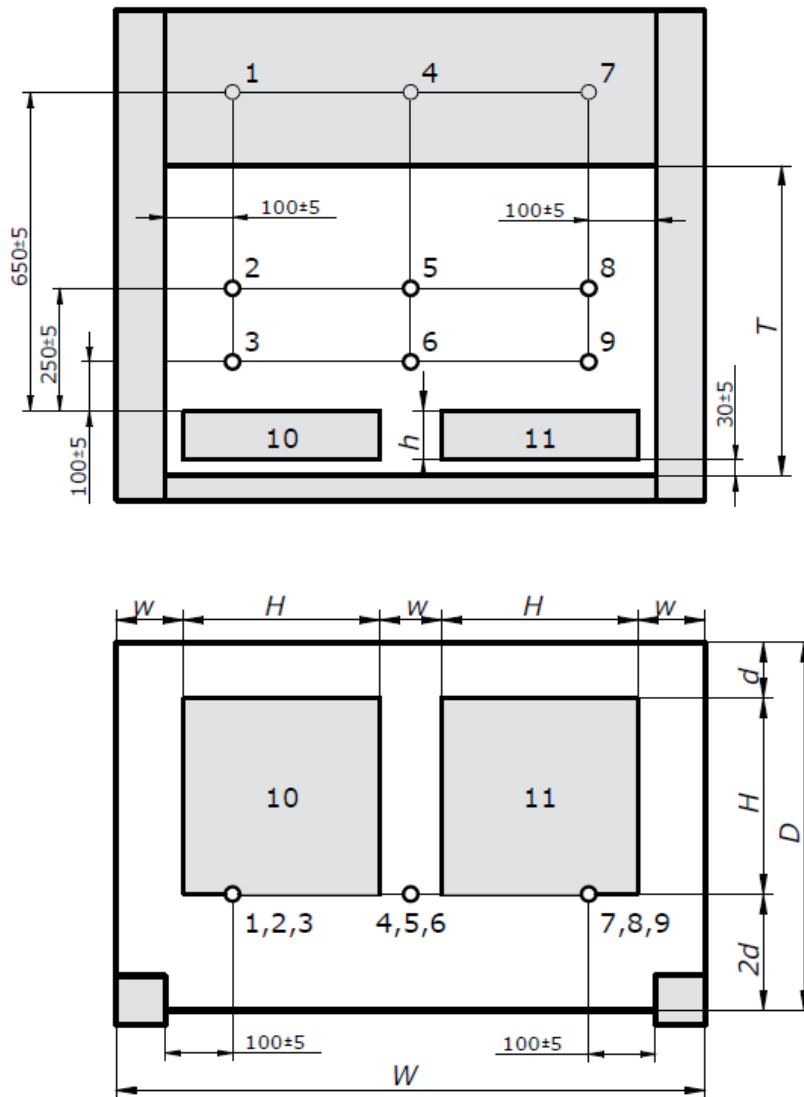
Type testing shall be performed according to EN 14175-3 and on-site testing according to EN 14175-4 with the following supplement.

During the tests two heating plates shall be in the fume cupboard's workspace. These heating plates with a height of about 100 mm shall be designed and arranged as shown in Figure 1. Containment and robustness shall each be tested without thermal load (heating plates switched-off) and with a thermal load of 4 kW per meter internal clear width.

The test gas injectors in accordance with EN 14175-3 shall be positioned in one level going through the front edge of the heating plates. When appropriate, the two outside test gas injectors may be turned. Select the heating plate surface as the reference height for the test gas injector grid in accordance with EN 14175-3.

Switch-on the heating plates and allow the temperature inside the workspace of the fume cupboard to stabilize before performing the tests in accordance with EN 14175-3 or EN 14175-4, usually about 1 h.

Dimensions in millimetres



**Key**

- 1 to 9 test gas injectors and grid in accordance with EN 14175-3:2003, 5.3.1.5 and 5.3.4.1
- 10,11 heating plates
- $H$  heating plate width and depth,  $(430\pm 10)$  mm
- $h$  heating plate height,  $(100\pm 10)$  mm
- $W$  internal clear width of the fume cupboard
- $D$  internal clear depth of the fume cupboard from the plane of the sash to the rear (wall or baffle), measured at the height of the upper surface of the heating plates
- $T$  test sash opening (height)
- $w = (W - (2 \times H)) / 3$
- $d = (D - H) / 3$

**Figure 1 – Arrangement of heating plates and test gas injectors**