



SLOVENSKI STANDARD

SIST EN 13084-8:2005

01-september-2005

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Free-standing industrial chimneys - Part 8: Design and execution of mast construction with satellite components

Freistehende Schornsteine - Teil 8: Entwurf, Bemessung und Ausführung von Tragmastkonstruktionen mit (angehängten Abgasanlagen)

Cheminées auto-portantes - Partie 8: Conception et mise en oeuvre des mâts intégrant des conduits systèmes métalliques

Ta slovenski standard je istoveten z: EN 13084-8:2005

ICS:

91.060.40 Dimniki, jaški, kanali Chimneys, shafts, ducts

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13084-8

April 2005

ICS 91.060.40

English version

Free-standing industrial chimneys - Part 8: Design and execution of mast construction with satellite components

Cheminées auto-portantes - Partie 8: Conception et mise en oeuvre des mâts intégrant des conduits systèmes métalliques

Freistehende Schornsteine - Teil 8: Planung und Ausführung von Tragmastkonstruktionen mit angehängten Abgasanlagen

This European Standard was approved by CEN on 1 March 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 13084-8:2005) has been prepared by Technical Committee CEN/TC 297 "Free-standing industrial chimneys", 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 October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

This European Standard is part 8 of the package of standards listed below:

- EN 13084-1, *Free-standing chimneys – Part 1: General requirements*
- EN 13084-2, *Free-standing chimneys – Part 2: Concrete chimneys*
- EN 13084-4, *Free-standing chimneys – Part 4: Brick liners – Design and execution*
- EN 13084-5, *Free-standing chimneys – Part 5: Material for brick liners - Product specifications*
- EN 13084-6, *Free-standing chimneys – Part 6: Steel liners – Design and execution*
- EN 13084-7, *Free-standing chimneys – Part 7: Product specifications of cylindrical steel fabrications for use in single wall steel chimneys and steel liners*
- EN 13084-8, *Free-standing chimneys – Part 8: Design and execution of mast construction with satellite components*
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Additionally applies:

- EN 1993-3-2, *Eurocode 3: Design of steel structures – Part 3-2: towers, masts and chimneys – Chimneys*

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

EN 13084-8:2005 (E)**1 Scope**

This document describes the method of specifying the design criteria and the installation method for a free-standing mast with satellite pipes using welded pipes in accordance with prEN 13084-7 or using prefabricated metal chimney elements in accordance with Table D.1 of EN 1856-1:2003.

2 Normative references

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

EN 1443:2003, *Chimneys - General requirements*

EN 1856-1:2003, *Chimneys - Requirements for metal chimneys - Part 1: System chimney products*

EN 1856-2, *Chimneys - Requirements for metal chimneys - Part 2: Metal liners and connecting flue pipes*

EN 1859:2000, *Chimneys - Metal chimneys - Test methods*

EN 1990, *Eurocode: Basis of structural design*

ENV 1991-2-4, *Eurocode 1: Basis of design and actions on structures - Part 2-4: Actions on structures - Wind actions*

ENV 1993-3-1, *Eurocode 3: Design of steel structures - Part 3-1: Towers, masts and chimneys - Towers and masts*

ENV 1993-3-2:1997, *Eurocode 3: Design of steel structures - Part 3-2: Towers, masts and chimneys - Chimneys*

EN 13084-1:2000, *Free-standing industrial chimneys - Part 1: General requirements*

EN 13084-6:2004, *Free-standing chimneys - Part 6: Steel liners – Design and execution*

prEN 13084-7, *Free-standing chimneys - Part 7: Product specifications of cylindrical steel fabrications for use in single wall steel chimneys and steel liners*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443:2003, EN 1856-1:2003, EN 1859:2000 EN 13084-1:2000, EN 13084-6:2004, and the following apply.

3.1**support mast construction**

free-standing steel construction of a support mast and one or more attached satellite pipes (see Figure 1)

3.2**support mast**

component manufactured from a hollow-section or profile-cross-section which is free-standing, supported by guy wires or a building to which are attached the satellite pipes (see Figure 1)

3.3**satellite pipe**

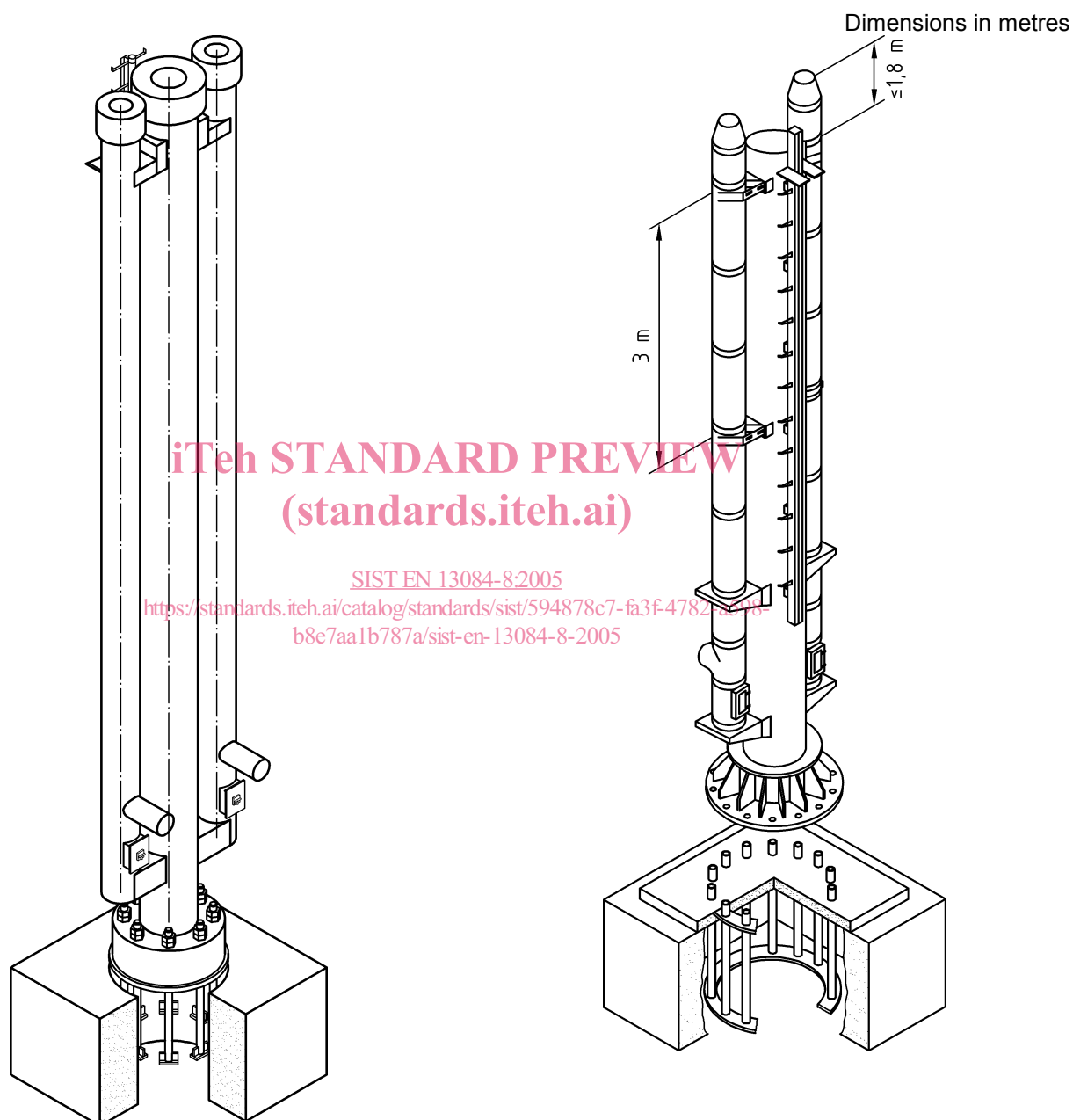
component attached to the outside of the support mast carrying the flue gases (see Figure 1)

3.4**fixing band**

fixed structural attachment between the support mast and satellite pipes to take the horizontal loads (see Figure 1)

3.5**guide**

structural attachment between the support mast and satellite pipes which provides lateral support but also allows vertical movement of the satellite pipe (see Figure 1)



a) construction using welded pipes in accordance with prEN 13084-7

b) construction using prefabricated metal-chimneys elements in accordance with Table D.1 of EN 1856-1:2003

Figure 1 — Examples of support mast construction with attached satellite pipes

EN 13084-8:2005 (E)**4 Requirements for components****4.1 Support mast**

Design, materials and construction of the support mast shall comply with ENV 1993-3-1 and ENV 1993-3-2.

The steel construction shall be protected against corrosion in accordance with ENV 1993-3-1 and ENV 1993-3-2.

4.2 Satellite pipes

Welded pipes shall comply with prEN 13084-7.

Prefabricated metal chimneys elements for satellite pipes shall comply with EN 1856-1.

5 General design and structural design**5.1 General design****5.1.1 General**

The inner diameter of satellite pipes shall be calculated in accordance with Annex A of EN 13084-1:2000. Up to a height of 20 m EN 13384-1 may be used.

The satellite pipes shall be attached to the mast without any offset.

Each satellite pipe shall be fitted with a cleaning door and drain point connection.

Each satellite pipe shall have only elements of the same type of pipe and same inner diameter.

The outer surface temperature shall conform with that stated in EN 13084-6.

Construction shall inhibit contact corrosion between different materials.

Bolted connections shall have a minimum bolt size of M 12.

5.1.2 Welded pipes

For welded satellite pipes the distance between the fixing bands/guides to the support mast and the length of free pipe above the last support/guide shall be defined by static calculation.

5.1.3 Prefabricated metal chimney elements

The maximum height of the complete construction with prefabricated metal chimney elements designed in accordance with EN 1856-1 shall not exceed 30 m above ground level.

The connection of prefabricated elements to the mast should be placed close to the joints of the elements and close the connecting tee and inspection element. The fixing bands or guides designed by manufacturer of the satellite pipe shall be used.

For prefabricated metal chimneys the distance between horizontal supports shall not exceed 75 % of the manufacturers declared value as defined in EN 1856-1 and EN 1856-2 with a maximum of 3,0 m (maximum 1,5 m if no wind load test results from tests according to EN 1859 are available). Their free unsupported height above the last support shall not exceed 66 % of the manufacturers declared value as defined in EN 1856-1 and EN 1856-2 with a maximum of 2,0 m (maximum 1,0 m if no wind load test results from tests according to EN 1859 are available).

The maximum vertical unsupported height shall be declared by the manufacturer of the prefabricated metal chimney elements. Where necessary additional intermediate support shall be installed.

5.2 Structural design

5.2.1 General

The basic design principles of EN 1990 shall apply. Calculation shall be undertaken for each assembly or design type.

The mast with attached satellite pipes shall be designed in their final state as well during construction phases in accordance with ENV 1993-3-1 and ENV 1993-3-2.

The attached satellite pipes shall be designed in accordance with EN 13084-6 and prEN 13084-7. Prefabricated metal chimney elements shall comply with the requirements of EN 1856-1 and be certified for the intended use.

5.2.2 Actions

5.2.2.1 General

EN 13084-1 applies.

The action of wind shall be calculated with the enveloping diameter D (see Figure 1 of Annex A.1).

5.2.2.2 Wind actions in the direction of the wind

Wind actions on the support mast construction in the direction of the wind shall be calculated in accordance with ENV 1991-2-4.

An aerodynamic force coefficient of $c_f = 1,2$ shall be used if no other value can be proven.

For attached satellite pipes the aerodynamic force coefficient $c_f = 1,5$ shall be used. If for prefabricated metal chimney elements the 3-second-wind-speed at top of the construction is more than 30 m/s additional evidence is required for the use of elements according to EN 1856-1 as they are tested according to EN 1859 with a maximum load of 1,5 kN/m².

The gust reaction factor φ_B shall be calculated using a logarithmic damping decrement of $\delta_B = 0,1$.

5.2.2.3 Vortex excitation

Wind induced vibrations due to vortex excitation shall be calculated in accordance with A.1 of Annex A.

5.2.2.4 Classical galloping

The stability of the support mast construction against classical galloping vibration has to be proved in accordance with A.2 of Annex A.

6 Installation requirements

For site activities reference shall be made to ENV 1993-3-2 and EN 13084-1.

Manufacturers' installation instructions shall be taken into account when using prefabricated metal chimney elements.