

**Tuuleturbiinid. Kaitsemeetmed.
Projekteerimis-, käitlemis- ja
hooldusnõuded**

Wind turbines - Protective measures - Requirements
for design, operation and maintenance

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 50308:2004 sisaldab Euroopa standardi EN 50308:2004+AC:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 16.11.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 50308:2004 consists of the English text of the European standard EN 50308:2004+AC:2005.</p> <p>This document is endorsed on 16.11.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala: This standard is concerned with the risk to personnel during operation and maintenance of the turbines and is not related to the structural integrity of the turbine. This standard specifies requirements and measures relating to the health and safety of personnel, relevant to commissioning, operation and maintenance of wind turbines.</p>	<p>Scope: This standard is concerned with the risk to personnel during operation and maintenance of the turbines and is not related to the structural integrity of the turbine. This standard specifies requirements and measures relating to the health and safety of personnel, relevant to commissioning, operation and maintenance of wind turbines.</p>
---	---

ICS 27.180

Võtmesõnad:

EUROPEAN STANDARD

EN 50308

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2004

ICS 27.180

Incorporates Corrigendum February 2005

English version

**Wind turbines –
Protective measures –
Requirements for design, operation and maintenance**

Aérogénérateurs –
Mesures de protection –
Exigences pour la conception,
le fonctionnement et la maintenance

Windenergieanlagen –
Schutzmaßnahmen –
Anforderungen für Konstruktion,
Betrieb und Wartung

This European Standard was approved by CENELEC on 2004-03-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees 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.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 88, Wind turbine systems. This standard concerning protective measures stands in conjunction with the set of European standards for wind turbines (EN 61400 series).

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50308 on 2004-03-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2005-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-03-01

NOTE Revision of this standard will be undertaken as soon as possible.

The contents of the corrigendum of February 2005 have been included in this copy.

This document is a preview generated by EVS

Contents

Introduction.....	4
1 Scope.....	5
2 Normative references.....	5
3 Definitions - Terminology	6
4 Safety requirements and protective measures	7
4.1 General requirements	7
4.2 Passages	7
4.3 Rooms / working areas	9
4.4 Floors, platforms, standing-, working places.....	9
4.5 Climbing facilities	10
4.6 Moving parts, guards and blocking devices	13
4.7 Lighting	13
4.8 Noise.....	14
4.9 Emergency stop.....	15
4.10 Power disconnection.....	15
4.11 Fire protection	16
4.12 Warning signs	16
4.13 Offshore installation.....	16
4.14 Requirements for manuals and warnings.....	17
4.15 Requirements for operation and maintenance (Information for use)	19
Annex A (informative) National informative annexes	21
A.0 Introduction.....	21
A.1 Germany (DE).....	21
A.2 Denmark (DK).....	22
A.3 Spain (ES)	22
A.4 France (FR)	23
A.5 United Kingdom (GB)	24
A.6 Greece (GR)	24
A.7 Ireland (IE).....	24
A.8 Italy (IT).....	24
A.9 The Netherlands (NL).....	25

Introduction

For the determination of the hazards described in this standard EN 1050 should be applied.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is indicated in Clause 1 (Scope).

This standard is a product (family) standard (according to EN 292-1) giving common requirements for the wind turbines mentioned in Clause 1 (Scope).

The document contains a standard part and an informative annex.

Annex A consists of national normative documents and/or regulations that specify either the present safety requirements for personnel or give the national supplements to these minimum requirements at the time this standard was prepared (January 2000).

The format of the standard is based, where possible, on a practical approach for

- manufacturers and designers who have to meet the requirements,
- authorities who have to check the design,
- owners who have legal responsibilities.

1 Scope

This European Standard specifies requirements for protective measures relating to the health and safety of personnel, relevant to commissioning, operation and maintenance of wind turbines.

It does not describe instructions and provisions for safe working during manufacture, transport, assembly and installation of the wind turbine.

Requirements are specified regarding

- hardware provisions being a part of the turbine such as platforms, ladders, lighting,
- manuals and warning signs to accommodate safe and quick operation, inspection and maintenance.

The requirements and/or measures specified account for the hazards

- of mechanical origin such as falling, slipping, locking in,
- of thermal origin (fire) such as burns by flames or explosions,
- of electricity such as contact with live parts,
- generated by noise such as stress and loss of hearing,
- generated by neglecting ergonomic principles in machine design such as unhealthy postures or human errors.

This standard is prepared for horizontal axis, grid connected wind turbines. For other concepts (e.g. vertical axis turbines) the principles are still valid, but the specific rules or requirements have to be adjusted to the actual concept.

Additional provisions and procedures are necessary for turbines installed in water or offshore. The present document only draws attention to these.

Provisions and procedures for lifts and Suspended Access Equipment (SAE) in the turbine tower are not included in this standard.

This standard is not applicable to wind turbines manufactured before the date of its publication by CENELEC.

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 292-1		Safety of machinery - Basic concepts, general principles for design Part 1: Basic terminology, methodology
EN 292-2	1991	Part 2: Technical principles and specifications
EN 418		Safety of machinery - Emergency stop equipment, functional aspects Principles for design
EN 457	1992	Safety of machinery - Auditory danger signals General requirements, design and testing (ISO 7731:1986, mod.)
EN 547-1		Safety of machinery - Human body dimensions Part 1: Principles for determining the dimensions required for openings for whole body access into machinery

EN 547-3		Safety of machinery - Human body dimensions Part 3: Anthropometric data for whole body access into machinery and access openings
EN 563		Safety of machinery – Temperatures of touchable surfaces Ergonomics data to establish temperature limit values for hot surfaces
EN 795		Personal protective equipment against falls from a height Anchorage devices - Requirements and testing
EN 953		Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards
EN 981		Safety of machinery – System of auditory and visual danger information signals
EN 982		Safety of machinery - Safety requirements for hydraulic and pneumatic systems and parts - Hydraulics
EN 983		Safety of machinery - Safety requirements for hydraulic and pneumatic systems and parts - Pneumatics
EN 1037		Safety of machinery – Prevention of unexpected start up
EN 1050		Safety of machinery – Principles for risk assessment
ISO 4871	1996	Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane
EN ISO 11202	1995	Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Survey method in situ
EN ISO 11688-1	1998	Acoustics – Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning
EN ISO 14122-1	¹⁾	Safety of machinery Part 1: Permanent means of access to machines and industrial plants - Choice of a fixed means of access between two levels
EN ISO 14122-2	¹⁾	Part 2: Working platforms and gangways
EN ISO 14122-3	¹⁾	Part 3: Stairways, stepladders and guard-rails
EN ISO 14122-4	¹⁾	Part 4: Fixed ladders
EN 50160		Voltage characteristics of electricity supplied by public distribution systems
EN 50172		Emergency escape lighting systems
EN 50199		Electromagnetic compatibility (EMC) - Product standard for arc welding equipment
ENV 1070		Safety of machinery – Terminology
ENV 61400-1		Wind turbine generating systems - Part 1: Safety requirements
EN 61400-11	1998	Wind turbine generator systems – Part 11: Acoustic noise measurement techniques (IEC 61400-11:1998)
HD 472		Nominal voltages for low-voltage public electricity supply systems (IEC 60038, mod.)

3 Definitions – Terminology

For the purpose of this standard the definitions given in EN 292, ENV 61400-1 and EN ISO 4871 apply.

¹⁾ At draft stage.