IEC 61400-8

Edition 1.0 2024-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Wind energy generation systems –
Part 8: Design of wind turbine structural components

Systèmes de génération d'énergie éolienne –
Partie 8: Conception des composants structurels des éoliennes

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WIND ENERGY GENERATION SYSTEMS –

Part 8: Design of wind turbine structural components

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IEC 61400-8 has been prepared by IEC technical committee 88: Wind energy generation systems. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
88/1010/FDIS	88/1023/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

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A list of all parts of the IEC 61400 series, under the general title: *Wind energy generation systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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INTRODUCTION

This part of the IEC 61400 series outlines the minimum requirements for the design of wind turbine nacelle-based structures and is not intended for use as a complete design specification or instruction manual.

Several different groups can be responsible for undertaking the various elements of the design, manufacture, assembly, installation and maintenance of a wind turbine nacelle and for ensuring that the requirements of this document are met. The division of responsibilities between these parties is a contractual matter and is outside the scope of this document.

The requirements stated in this document may be altered if it can be sufficiently demonstrated that the structural integrity of the system is not compromised.

The specific scope of the document is provided in Clause 1. For cases out of the scope of this document, reference should be made to relevant IEC/ISO standards.

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WIND ENERGY GENERATION SYSTEMS –

Part 8: Design of wind turbine structural components

1 Scope

This part of IEC 61400 outlines the minimum requirements for the design of wind turbine nacelle-based structures and is not intended for use as a complete design specification or instruction manual. This document focuses on the structural integrity of the structural components constituted within and in the vicinity of the nacelle, including the hub, mainframe, main shaft, associated structures of direct-drives, gearbox structures, yaw structural connection, nacelle enclosure. It also addresses connections of the structural components to control and protection mechanisms, as well as structural connections of electrical units and other mechanical systems. This document focuses primarily on ferrous material based nacelle structures but can apply to other materials also as appropriate. The design of bolted and welded joints in the nacelle structures is included, as well as cast and forged components. Material testing requirements to use in the design process for nacelle structures are specified. While the structural connections of the gearbox and the main shaft are in the scope, the design of the gears and bearings are not included.

The safety level of the wind turbine designed according to this document shall be at or exceed the level inherent in IEC 61400-1:2019. Probabilistic methods to calibrate partial safety factors and for use in the design process are provided.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 61400-1:2019, *Wind energy generation systems – Part 1: Design requirements*

IEC 61400-3-1:2019, *Wind energy generation systems – Part 3: Design requirements for fixed offshore wind turbines*

IEC TS 61400-3-2:2019, *Wind energy generation systems – Part 3-2: Design requirements for floating offshore wind turbines*

IEC 61400-5:2020, *Wind energy generation systems – Part 5: Wind turbine blades*

IEC 61400-6:2020, *Wind energy generation systems − Part 6: Tower and foundation design requirements*

IEC 61400-13:2015, *Wind turbines – Part 13: Measurement of mechanical loads*

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

ISO 148-1:2016, *Metallic materials – Charpy pendulum impact test – Part 1: Test method*

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