

**Aerospace series - Technical drawings -  
Representation of parts made of  
composite materials - Part 4: Items  
obtained by winding**

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materials - Part 4: Items obtained by winding

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 4408-004:2005 sisaldab Euroopa standardi EN 4408-004:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 15.07.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 4408-004:2005 consists of the English text of the European standard EN 4408-004:2005.</p> <p>This document is endorsed on 15.07.2005 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>
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<p><b>Käsitlusala:</b></p> <p>This standard specifies the rules for the representation of items in composite materials obtained by winding as well as the information to be indicated in technical drawings.</p>	<p><b>Scope:</b></p> <p>This standard specifies the rules for the representation of items in composite materials obtained by winding as well as the information to be indicated in technical drawings.</p>
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**ICS** 01.100.99, 49.020

**Võtmesõnad:**

ICS 01.100.99; 49.020

English version

**Aerospace series - Technical drawings - Representation of parts  
made of composite materials - Part 4: Items obtained by winding**

Série aérospatiale - Dessins techniques - Représentation  
des articles en matériaux composites - Partie 4 : Articles  
obtenus par enroulement

Luft- und Raumfahrt - Technische Zeichnungen -  
Darstellung von Teilen aus Verbundwerkstoffen - Teil 4: Im  
Wickelverfahren hergestellte Teile

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## Foreword

This document (EN 4408-004:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

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 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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.

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## Introduction

The proposed representations only provide the definition of parts made up of cylinders, i.e. surfaces created by a straight (generator) line which moves while remaining parallel to a given direction, along a (directing) curve. These representations are insufficient to describe parts especially including truncated cones, cores or elliptic bottoms.

This standard is intended:

- for items obtained by winding helicoidal filaments of a basic yarn;
- for items obtained by winding plies (or layers).

## 1 Scope

This standard specifies the rules for the representation of items in composite materials obtained by winding as well as the information to be indicated in technical drawings.

It is applicable to aerospace structures using items in composite materials obtained by winding.

It shall be used together with EN 4408-001.

## 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 4408-001, *Aerospace series – Technical drawings – Representation of parts made of composite materials – Part 1: General rules.*

EN 4408-002, *Aerospace series – Technical drawings – Representation of parts made of composite materials – Part 2: Laminated parts.*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4408-001 and the following apply.

### 3.1

#### **angle of the spiral**

angle formed by the basic yarn, or the laid ply, and the 0° direction of the direction key (this 0° direction corresponds to the direction of the cylinder's axis in the case of rotational parts)

### 3.2

#### **lap**

set of fibres and/or filaments and/or yarns and/or fibrillated laminates arranged in an orderly manner or not, sufficiently cohesive to ensure easy handling and a slight thickness with respect to other dimensions.

### 3.3

#### **layer**

in the winding of filaments, the layer is specifically defined as being made up of the smallest whole number of winding motives such that the surface described is entirely covered

### 3.4

#### **spiral pitch**

axial advance of the yarn or ply lay device corresponding to a whole turn of the part

### 3.5

#### **tape**

preimpreg fibrous composite supplied in different widths the fibres of which are arranged in an unidirectional manner lengthways

### 3.6

#### **to-and-fro**

by winding filaments, elementary figure made up of two spirals of opposite pitches