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SIST EN 4408-002:2005

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4408-002

May 2005

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English version

**Aerospace series - Technical drawings - Representation of parts
made of composite materials - Part 2: Laminated parts**

Série aérospatiale - Dessins techniques - Représentation
des articles en matériaux composites - Partie 2 : Articles
drapés

Luft- und Raumfahrt - Technische Zeichnungen -
Darstellung von Teilen aus Verbundwerkstoffen - Teil 2:
Schichtstoffteile

This European Standard was approved by CEN on 15 July 2004.

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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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Contents

Page

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 General rules	4
5 Specific rules	4
5.1 Content of definition	4
5.2 Recommended workplan	4
5.3 Laminate representation	5
5.4 Analysis of the content of the laminate representation	8
5.4.1 Layer identification	8
5.4.2 Connection of plies and dimensions	9
5.4.3 Definition of laminate areas	12
5.4.4 Symbols	13
Bibliography	16

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SIST EN 4408-002:2005

<https://standards.iteh.ai/catalog/standards/sist/00a3046d-2c42-4372-9aa5-f51a7503f15b/sist-en-4408-002-2005>

Foreword

This document (EN 4408-002:2005) 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.

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 the United Kingdom.

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EN 4408-002:2005 (E)**1 Scope**

This standard specifies the rules for the representation of laminated parts as well as the information to be indicated in technical drawings.

It applies to aerospace structures using laminated parts. 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.*

3 Terms and definitions

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

4 General rules

The general rules for the representation of parts made of composite material are specified in standard EN 4408-001.

5 Specific rules

The representation of laminated parts basically differs from the others parts by the detailed representation of the different layers which make up the part.

5.1 Content of definition

The definition of a part includes:

- the list of the elements which make up the part;
- the notes and definition of the materials;
- the definition of the laminate areas;
- the representation and the lay-up diagram;
- the direction key(s) for laminating.

5.2 Recommended workplan

See Table 1.

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Table 1

Work order		Observations	Subclause
1	Show laminate representation	—	5.3 5.4.1 and 5.4.2
2	Define direction keys	—	EN 4408-001
3	Define laminate areas	—	5.4.3
4	Fill in lay-up diagram	—	5.4.4.2 and EN 4408-001
5	Make drawing of the definition of the part	This drawing can be done before or during laminate representation	EN 4408-001

5.3 Laminate representation

This representation, specifying the details of the layers making up the part and their individual identification, may be:

- a detailed view;
- a cross section;
- a perspective;
- ...

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The part is represented in an unmachined state.

For the representation of a section, see Figure 1.

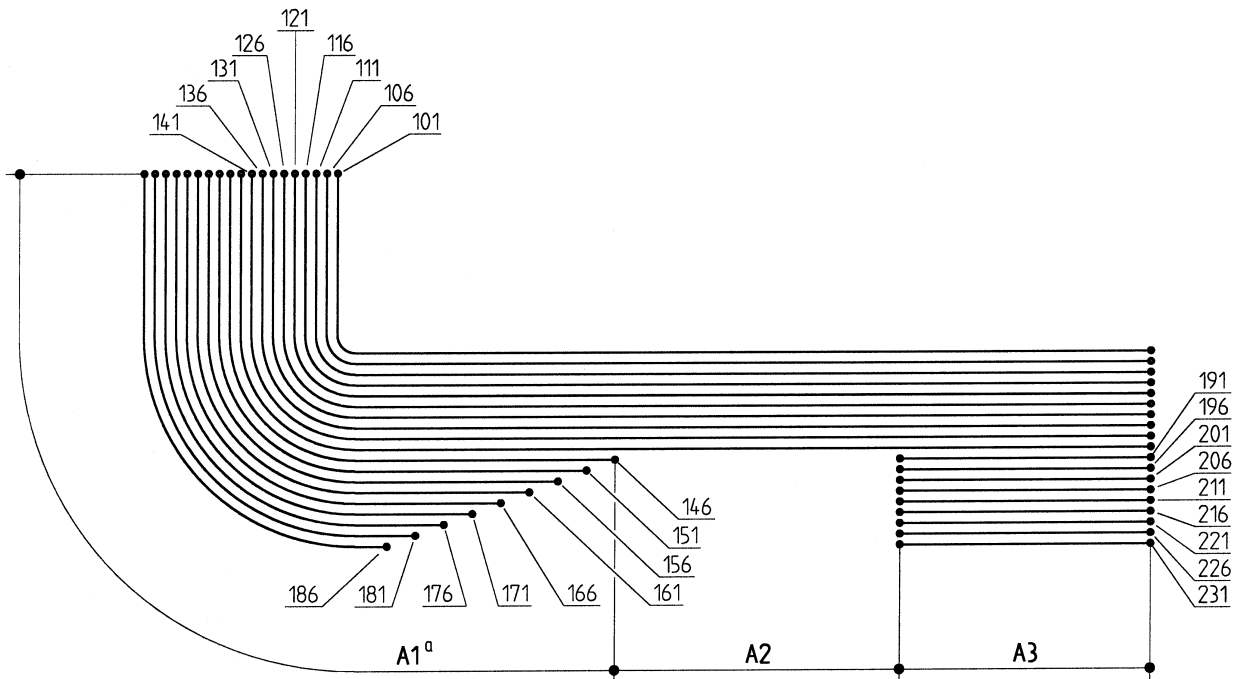
Each layer is represented by a continuous thick line which marks the middle line of the layer.

The extremities of each layer are represented by a point, while keeping the drawing readable.

No point shall be at direction changes or at intersections.

- To avoid any reprography or microfilming problem, the minimum distance between two consecutive lines shall not be less than 0,8 mm or twice the line width (refer to the values in the table).
- A complete representation at a more representative scale shall be considered to improve the readability of the drawing, especially in areas with sudden changes in profile or connection, ...

EN 4408-002:2005 (E)



^a The laminate representation does not define the ply or layer dimensions.

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Figure 1

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For a detailed view, see Figure 2.

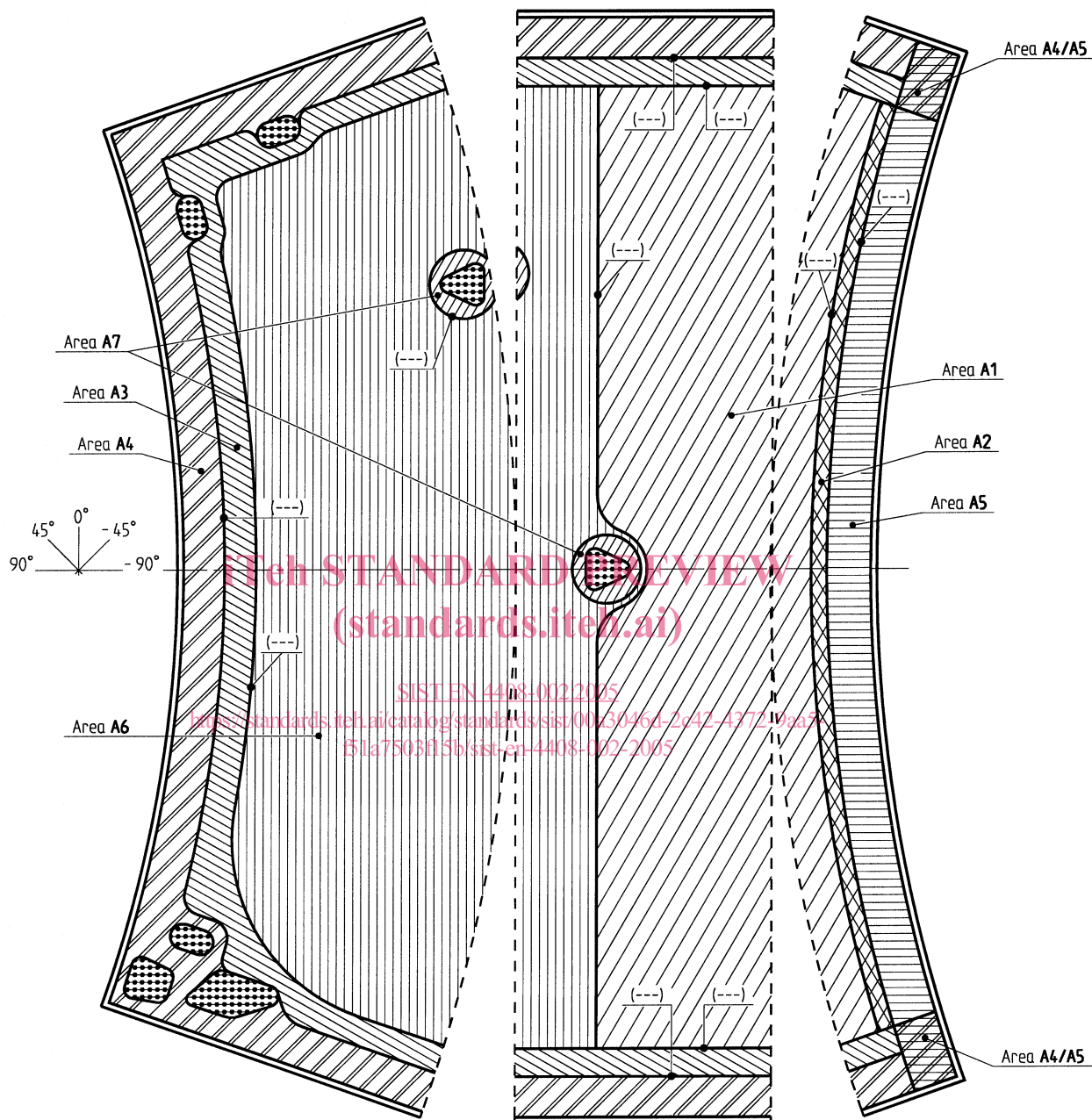


Figure 2