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Title: Draft BS ISO 21143 Technical product documentation (TPD). Requirements on digital mock-up virtual assembly test for mechanical products.

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT INTERNATIONAL STANDARD

ISO/DIS 21143.2

ISO/TC 10/SC 6

Secretariat: SAC

Voting begins on:
2019-05-09

Voting terminates on:
2019-07-04

Technical product documentation (TPD) — Requirements on digital mock-up virtual assembly test for mechanical products

Exigences d'essai d'assemblage virtuel sur les produits mécaniques

ICS: 21.020

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviations	3
5 VAT process	3
5.1 General principles.....	3
5.2 Workflow process.....	3
6 VAT preparation requirements	4
6.1 General.....	4
6.2 Test plan.....	4
6.3 Model preparation.....	5
6.3.1 Product modelling.....	5
6.3.2 Environment modelling.....	5
6.3.3 Virtual operator modelling.....	5
6.3.4 Model qualification.....	5
6.4 Configuration and initialization.....	6
7 VAT implementation requirements	6
7.1 General.....	6
7.2 Interference inspection.....	6
7.2.1 Inspection tasks.....	6
7.3 Static interference inspection.....	7
7.3.1 Process.....	7
7.3.2 Dynamic interference inspection.....	9
7.4 Assembly feasibility analysis.....	10
7.4.1 Analysis tasks.....	10
7.4.2 Assembly process analysis.....	11
7.4.3 Ergonomics evaluation.....	13
8 VAT review requirements	14
8.1 General.....	14
8.2 Preparation.....	15
8.3 Plan.....	15
8.4 Process.....	15
8.5 Report.....	15
Annex A (informative) A VAT airplane workflow process	17

Foreword

The ISO (International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing international standards is normally performed by ISO technical committees. Each member body with an interest in a given subject for which a technical committee has been established has the right to be represented on that committee. International organizations, both governmental and non-governmental, in liaison with the ISO, also take part in this work. The ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters related to electrotechnical standardization.

The procedures used to develop this document and those intended for its ongoing maintenance are described in the ISO/IEC Directives, Part 1. In particular, the approval criteria required for different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For explanations regarding the voluntary nature of standards, the meaning of specific ISO terms and expressions related to conformity assessment, and information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), refer to the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, Subcommittee SC 6.

This second edition cancels and replaces the first edition (ISO/DIS 21143), which has been technically revised.

The major changes made from the previous edition are as follows:

- The function, significance and scope of this standards (DIS) were underlined in [Section 1](#);
- Four definitions, namely “simplifications”, “lightweight”, “clearance” and “contact” were added; Four definitions, namely “tool model”, “spatial model”, “assembly process planning” and “collision” were removed, and the others except [3.1](#) “design model” were all modified in [section 3](#);
- Three abbreviations, namely “QC”, “STEP” and “IGES” were removed, and a new one, namely “DOF” were added in [section 4](#);
- Section “5, 6, 7, 8” were condensed and rearranged into a more readable edition;
- Four pictures were expanded in detail to better illustrate the workflow in sections “7.2.2.1, 7.2.3.1, [7.3.2.1](#), 7.3.3.1”;
- Most of the sections about “Responsibility” were removed.

Technical product documentation (TPD) — Requirements on digital mock-up virtual assembly test for mechanical products

1 Scope

This document specifies the requirements of a digital mock-up virtual assembly test for mechanical products, which is suitable for guiding virtual assembly testing before physical production. The application of this standard should result in an effective virtual assembly test and efficient on-site assembly. This test is applicable to 3D nominal models with theoretically exact dimensions.

Hereby, the digital mock-up virtual assembly test is a computer simulation procedure in lieu of performing a physical prototype test for a product to verify the compatibility of the mechanical interface and the feasibility of assembly. This test can be used to explore and resolve interface or/and assembly problems before physical product assembly. Virtual assembly test activities typically include virtual interference inspection, assembly process analysis and ergonomic evaluation based on 3D nominal models in the design phase. It can be helpful to consider the results of a virtual assembly test to predict and provide early warnings regarding the risk of interference or assembly problems, although the virtual assembly test cannot completely replace all the tests in on-site assembly testing.

The objectives of the virtual assembly test are as follows:

- a) Verify the mechanical interface compatibility of units, sub-systems and products;
- b) Ensure that the design output is intended to interference-free and that all contacts or clearances are acceptable;
- c) Validate layout design at every assembly level;
- d) Verify assembly feasibility in the manufacturing and operational environments;
- e) Evaluate assembly process to optimize assembly plan.

2 Normative references

The following documents are referred to in the text for which some or all of their content constitutes the 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.

ISO 17599:2015, *Technical product documentation (TPD) — General requirements of digital mock-up for mechanical products*

ISO 29845:2011, *Technical product documentation — Document types*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in 17599, 29845 and the following apply.

3.1

design model

portion of the data set that contains models and supplemental geometry

[SOURCE: ISO 29845:2011]