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AGREEMENT

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English version

Engineering materials - Electronic data interchange - Instrumented indentation test data

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Foreword

This CEN Workshop Agreement (CWA 17552:2020) has been developed in accordance with the CEN-CENELEC Guide 29 “CEN/CENELEC Workshop Agreements – A rapid prototyping to standardization” and with the relevant provisions of CEN/CENELEC Internal Regulations - Part 2. It was approved by a Workshop of representatives of interested parties on 2018-11-13, the constitution of which was supported by CEN following the public call for participation made on 2018-10-17. However, this CEN Workshop Agreement does not necessarily include all relevant stakeholders.

The final text of this CEN Workshop Agreement was provided to CEN for publication on 2020-09-28.

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0 Introduction

CEN Workshops on engineering materials data have been taking place since 2009. Starting with CEN/WS ELSSI-EMD¹, development of a data model derived from the ISO 6892-1 tensile testing standard demonstrated that mechanical testing standards are amenable to use as specifications for data models, which are effectively machine-readable versions of the procedural standards on which they are based.

Thereafter, engagement with ISO/TC 164/SC 1 resulted in an informative annex on computer-compatible representation of standards (i.e. machine-readable data²) being added to ISO 6892-1. As shown in Figure 1, this trend continued with the 2018 revision of the ISO 204 creep testing standard³, which also includes an informative annex on computer compatible representation of standards. This circumstance highlights another valuable aspect of working with existing mechanical testing standards, insofar as existing standardisation structures allow opportunities to promote the longer-term prospects for technologies for engineering materials data i.e. beyond the term of any individual CWA.

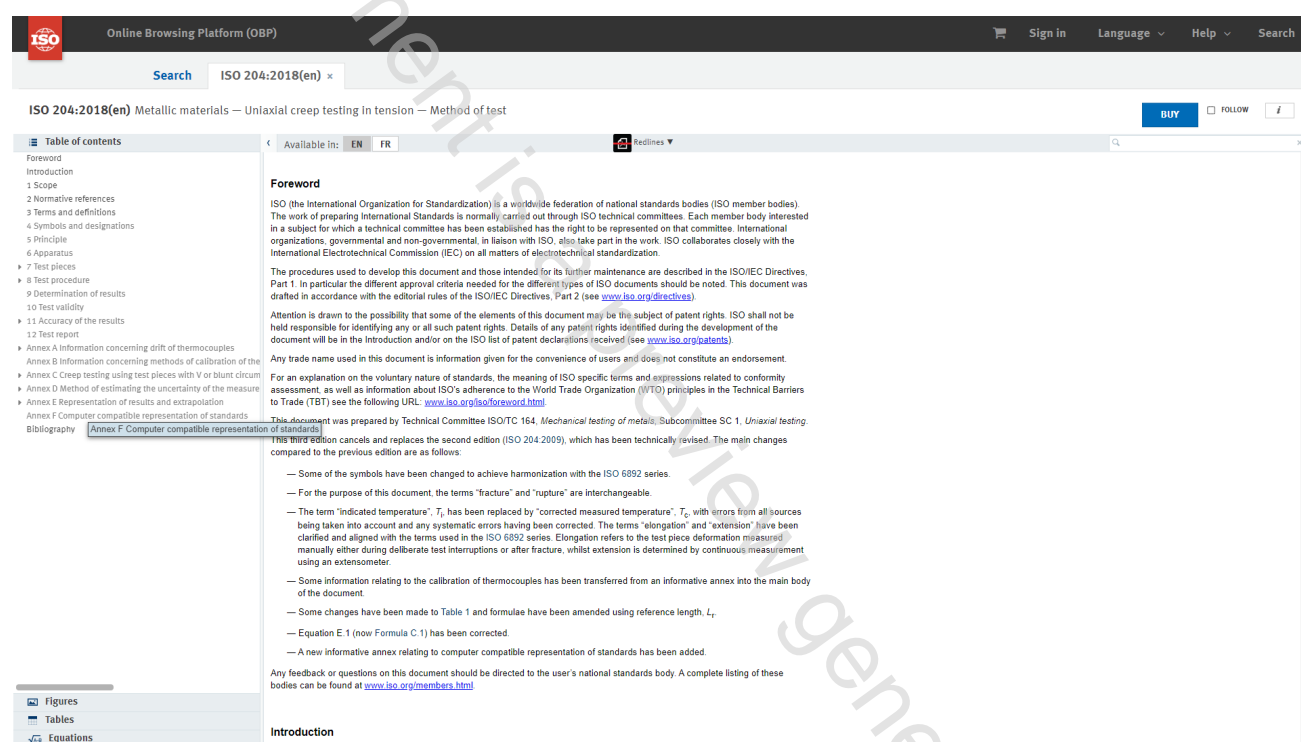


Figure 1 — Screen capture showing the ISO 204:2018 informative annex on machine-readable data. Source: ISO Online Browsing Platform.

¹ Workshop on Economics and logistics of standards-compliant schemas and ontologies for interoperability of engineering materials data (CEN/WS ELSSI-EMD). Retrieved 21 March, 2019 from <https://www.cen.eu/work/areas/ICT/eBusiness/Pages/WS-ELSSI-EMD.aspx>.

² Machine-readable data - Wikipedia. Retrieved 21 March, 2019 from https://en.wikipedia.org/wiki/Machine-readable_data.

³ ISO - ISO 204:2018 - Metallic materials — Uniaxial creep testing in tension — Method of test. Retrieved 23 April, 2020 from <https://www.iso.org/standard/67737.html>.

Subsequent CEN Workshops demonstrated the possibility to utilize product standards to develop technologies for materials pedigree data (CEN/WS SERES, 2013-2014⁴) and to extend the methodology to more complex test types (CEN/WS FATEDA, 2016-2017⁵) and multiple test types (CEN/WS METEDA, 2016-2019⁶).

Having refined the methodology for deriving data models from procedural testing standards over the course of the four CEN Workshops on engineering materials data that have taken place to date, CEN/WS NATEDA extends the scope to the instrumented hardness test type, as defined by ISO 14577:2015.

With prior CEN Workshops on engineering materials data typically having followed three strands of activity, namely technology (concerned with the development of the data formats), standardisation (investigating topics such as publication and ownership) and business (case studies investigating commercial impacts), CEN/WS NATEDA was implemented similarly and this document is authored accordingly.

0.1 How to read this document

This document is entirely concerned with the derivation of a data model from the ISO 14577:2015 testing standard. In this respect, while it is recommended to read the entire document, certain clauses will be of particular interest depending on your domain of activity, as follows:

- **Materials professionals**—the Clause 7.3 tables map fragments of text from the ISO 14577:2015 testing standard to fields in the data model. A data file compliant with the data model is included in Annex B. The engineering materials database application at <https://odin.jrc.ec.europa.eu> has also been enabled to export (and import) nanoindentation data files compliant with the data model.
- **Software developers**—to implement the data model as an XML import or export feature, the XSD (XML schema definition) is published at <http://uri.cen.eu/cen/cwa/17552/1/xsd/iso-14577.xsd>, with a corresponding listing in Annex A.

⁴ Standards for Electronic Reporting in the Engineering Sector (WS SERES). Retrieved 21 March, 2019 from <https://www.cen.eu/work/areas/ICT/eBusiness/Pages/WS-SERES.aspx>.

⁵ CEN Workshop on Standards Compliant Formats for Fatigue Test Data - FATEDA. Retrieved 21 March, 2019 from <https://www.cen.eu/work/areas/ICT/eBusiness/Pages/WS-FATEDA.aspx>.

⁶ CEN Workshop on Mechanical Test Data - MeTeDa. Retrieved 21 March, 2019 from <https://www.cen.eu/work/areas/ICT/eBusiness/Pages/WS-METEDA.aspx>.

1 Scope

In the absence of any widely-adopted, systematic means for representing and exchanging nanoindentation test data electronically, this CWA specifies a data model (and accompanying reference implementations) derived from the ISO 14577-1:2015 instrumented indentation testing standard.

This document is a preview generated by EVS

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.

ISO 204:2018, *Metallic materials — Uniaxial creep testing in tension — Method of test*

ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 10303-21:2016, *Industrial automation systems and integration — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure*

ISO 14577-1:2015, *Metallic materials — Instrumented indentation test for hardness and materials parameters — Part 1: Test method*

ISO 23718:2007, *Metallic materials — Mechanical testing — Vocabulary*