

**Metallic materials - Tensile testing at high strain rates -  
Part 2: Servo-hydraulic and other test systems (ISO  
26203-2:2011)**

## EESTI STANDARDI EESSÕNA

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English Version

**Metallic materials - Tensile testing at high strain rates - Part 2:  
Servo-hydraulic and other test systems (ISO 26203-2:2011)**

Matériaux métalliques - Essai de traction à vitesses de déformation élevées - Partie 2: Systèmes d'essai servo-hydrauliques et autres systèmes d'essai (ISO 26203-2:2011)

Metallische Werkstoffe - Zugversuch bei hohen Dehngeschwindigkeiten - Teil 2: Servohydraulische und andere Systeme (ISO 26203-2:2011)

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## Foreword

This document (EN ISO 26203-2:2011) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 101 "Test methods for steel (other than chemical analysis)" the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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## Introduction

The deformation behaviour of many technical materials shows a positive strain-rate effect up to ductile failure, i.e. with increasing strain rate, an increase of yield stress and strain to failure can be observed. This information is of great importance for the reliable assessment of crashworthiness of automobile structures, which is increasingly determined by numerical methods to minimize the need for cost-intensive and time-consuming crash tests. For the numerical simulation of crash-type loads, stress-strain curves determined at higher strain rates are required. The quasi-static values determined according to ISO 6892-1, i.e. strain rates lower than or equal to  $0,008 \text{ s}^{-1}$ , are not suitable for the description of the behaviour of the material of a component under dynamic load, i.e. at strain rates higher than those in quasi-static tests.

# Metallic materials — Tensile testing at high strain rates —

## Part 2:

## Servo-hydraulic and other test systems

### 1 Scope

This part of ISO 26203 gives requirements for the testing of metallic materials. Only examples for testing flat geometries are given; however, other geometries can be tested. The area of application spans a range of strain rates from  $10^{-2} \text{ s}^{-1}$  to  $10^3 \text{ s}^{-1}$ . Tests are carried out between  $10^\circ\text{C}$  and  $35^\circ\text{C}$  and, unless otherwise specified, using a servo-hydraulic-type test system.

NOTE 1 Measurements at strain rates lower than  $10^{-2} \text{ s}^{-1}$  can be performed using machines designed for quasi-static testing.

NOTE 2 For test piece geometries other than those shown in 7.1 and Annex B, see ESIS P7 (Reference [1]) and FAT Guideline (Reference [2]).

### 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.

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6892-1 apply.

### 4 Symbols

For the purposes of this document, the symbols given in ISO 6892-1 apply. Additional symbols, units and descriptions are provided in Table 1.

Table 1 — Symbols

Symbol	Unit	Description
<b>Test piece</b>		
$a_o$	mm	Original thickness of a flat test piece
$b_o$	mm	Original width of the parallel length of a flat test piece
$b_k$	mm	Width(s) of the clamping area of the test piece
$L_o$	mm	Original gauge length
$L_c$	mm	Parallel length
$L_e$	mm	Extensometer gauge length
$r$	mm	Transition radius
$S_o$	mm <sup>2</sup>	Original cross-sectional area of the parallel length
$S_D$	mm <sup>2</sup>	Dynamometer area: area on the fixed side of the test piece where only elastic deformations are required during the test