

# DIN EN ISO 6892-3:2015-07 (E)

## Metallic materials - Tensile testing - Part 3: Method of test at low temperature (ISO 6892-3:2015)

---

<b>Contents</b>	<b>Page</b>
Foreword .....	4
Introduction .....	5
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Symbols and designations .....	7
5 Principle .....	8
6 Test piece .....	8
7 Determination of original cross-sectional area ( $S_0$ ) .....	8
8 Marking the original gauge length ( $L_0$ ) .....	8
9 Apparatus .....	8
9.1 Force measuring system .....	8
9.2 Extensometer .....	8
9.3 Cooling device .....	8
9.3.1 General .....	8
9.3.2 Permitted deviations of temperature .....	9
9.3.3 Measurement of temperature .....	9
9.3.4 Verification of the temperature-measuring system .....	10
10 Test conditions .....	10
10.1 Setting the force zero point .....	10
10.2 Gripping of the test piece, fixing of the extensometer and cooling of the test piece, not necessarily in the following sequence .....	10
10.2.1 Method of gripping .....	10
10.2.2 Fixing of the extensometer and establishing the gauge length .....	10
10.2.3 Cooling of the test piece .....	11
10.3 Testing rate based on strain rate control (Method A) .....	11
10.3.1 General .....	11
10.3.2 Strain rate for the determination of the upper yield strength ( $R_{eH}$ ) or proof strength properties ( $R_p$ and, if required, $R_t$ ) .....	11
10.3.3 Strain rate for the determination of the lower yield strength ( $R_{eL}$ ) and percentage yield point extension ( $A_e$ ) if required .....	12
10.3.4 Strain rate for the determination of the tensile strength ( $R_m$ ), percentage elongation after fracture (A), percentage reduction area (Z), and, if required, percentage total extension at the maximum force ( $A_{gt}$ ), percentage plastic extension at maximum force ( $A_g$ ) .....	12
10.4 Method of testing with expanded strain rate ranges (Method B) .....	12
10.4.1 General .....	12
10.4.2 Rate for the determination of yield strength or proof strength properties .....	12
10.4.3 Rate for the determination of tensile strength .....	13
10.5 Choice of the method and rates .....	13
10.6 Documentation of the chosen testing conditions .....	13

11	Determination or calculation of the properties .....	13
12	Test report .....	13
13	Measurement uncertainty .....	14
14	Figures .....	15
15	Annexes .....	16
	Annex A (informative) Addition to ISO 6892-1:2009, Annexes B and D .....	17
	Annex B (informative) Example for cooling curves of steel depending on test piece dimensions and the specified test temperature in ethanol and liquid nitrogen .....	22
	Annex C (informative) Measurement uncertainty .....	26
	Bibliography .....	27