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TENSILE TEST

FOR LIGHT METAL AND LIGHT METAL ALLOY WIRES

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TENSILE TEST

FOR LIGHT METAL AND LIGHT METAL ALLOY WIRES

1. SCOPE

This ISO Recommendation relates to the tensile testing of light metal and light metal alloy wires.

2. PRINCIPLE OF TEST

The test consists in subjecting a length of wire to tensile stress, generally to fracture, with a view to determining one or more of the mechanical properties enumerated in clauses 7.1, 7.4, 7.5 and 7.6.

The test is carried out at ambient temperature unless otherwise specified.

3. DEFINITIONS

- 3.1 *Gauge length*. At any moment during the test, the prescribed length of the test piece on which elongation is measured. In particular a distinction should be made between the two following lengths :
- 3.1.1 *Original gauge length (L_o)*. Gauge length before the test piece is strained.
 - 3.1.2 *Final gauge length (L_u)*. Gauge length after the test piece has been fractured and the fractured parts have been carefully fitted together so that they lie in a straight line.
- 3.2 *Percentage permanent elongation*. Variation of the gauge length of a test piece subjected to a prescribed stress (see clause 3.7) and, after removal of the same, expressed as a percentage of the original gauge length. If a symbol is used for this elongation, it should be supplemented by an index indicating the prescribed stress.
- 3.3 *Percentage elongation after fracture (A)*. Permanent elongation of the gauge length after fracture, $L_u - L_o$, expressed as a percentage of the original gauge length L_o .
- 3.4 *Percentage reduction of area (Z)*. Ratio of the maximum change in the cross-sectional area which has occurred during the test, $S_o - S_u$, to the original cross-sectional area S_o , expressed as a percentage.
- 3.5 *Maximum load (F_m)*. The greatest load which the test piece withstands during the test.

- 3.6 *Final load* (F_u). Load imposed on the test piece at the moment of complete fracture.
- 3.7 *Stress* (actually "nominal stress"). At any moment during the test, load divided by the original cross-sectional area of the test piece.
- 3.8 *Tensile strength* (R_m). Maximum load divided by the original cross-sectional area of the test piece, i.e. the stress corresponding to the maximum load.
- 3.9 *Permanent set stress* (R_r). Stress at which, after removal of load, a prescribed permanent elongation, expressed as a percentage of the original gauge length, occurs (see clause 3.2 and Fig. 3a).
- 3.10 *Proof stress (non-proportional elongation) or yield strength (offset)** (R_p). Stress which produces, while the load is still applied, a non-proportional extension equal to the specified percentage of the original gauge length L_0 .

When a proof stress or yield strength is specified, the non-proportional elongation should be stated, e.g. 0.2 % (see Fig. 3b).

The symbol used for this stress should be supplemented by an index giving the prescribed percentage of the original gauge length, e.g. 0.2 %.

* This last term is used in the United States of America and in Canada.