Australian Standard®

METHODS FOR BEND AND RELATED TESTING OF METALS

TORSION AND WRAPPING TESTS ON WIRE

This Australian standard was prepared by Committee MT/6, Mechanical Testing of Metals. It was approved on behalf of the Council of the Standards Association of Australia on 27 August 1982 and published on 8 November 1982.

The following interests were represented on the Committee responsible for the preparation of this standard:

Aluminium Development Council
Australasian Institute of Metals
Bureau of Steel Manufacturers of Australia
Commonwealth Scientific and Industrial Research Organization
Confederation of Australian Industry
Department of Defence
Federal Chamber of Automotive Industries
Metal Trades Industry Association of Australia
National Association of Testing Authorities
Railways of Australia Committee
Society of Automotive Engineers—Australasia
University of Melbourne
University of New South Wales
University of Sydney

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PREFACE

This standard was prepared by a subcommittee of the Association's Committee on Mechanical Testing of Metals at the request of the Metals Standards Board to provide standard methods whereby the ductility of wire can be assessed.

This standard is Part 5 of a five-part standard covering bend and related tests on metal products. Others in the series are as follows:

Part 1— Sheet, strip and plate
Part 2— Bars, rods and solid shapes*
Part 3— Tubular products*
Part 4— Wire

During preparation of the standard, consideration was given to current Australian practice in carrying out torsion tests on metals and to the following publications, to which acknowledgement is made of the assistance obtained therefrom:

BS 4545 Methods for Mechanical Testing of Steel Wire

DIN 51212 Torsion Test for Wires

ISO 136 Steel—Simple Torsion Testing of Wire

*In course of preparation.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS FOR BEND AND RELATED TESTING OF METALS

PART 5—TORSION AND WRAPPING TESTS ON WIRE

1 SCOPE. This standard sets out methods for torsion and wrapping tests on round and shaped wire having a nominal diameter or thickness of 0.4 mm up to and including 10 mm.

NOTES:

1. It is not practicable to test wire below 0.4 mm by the methods specified in this standard.
2. Criteria for assessment of the result for compliance are not included; such requirements are within the province of the product standard, or determined by agreement between the purchaser and the supplier.

2 DEFINITIONS. For the purpose of this standard, the following definitions apply:

2.1 Test sample—a portion of metal or product or a group of items selected from a batch or group by a sampling procedure.

2.2 Test specimen—a portion or a single item taken from each product in the test sample for the purpose of testing.

2.3 Test piece—a piece taken from each test specimen and suitably prepared for testing.

2.4 Torsion test—a test in which a test piece of wire is twisted about its longitudinal axis.

2.5 Wrapping test—a test in which a test piece of wire is closely coiled around a mandrel of specified diameter.

2.6 Even twist—uniform twisting during a test over the entire length of a test piece.

2.7 Local twist—non-uniform twisting of a test piece during a test.

2.8 Straight fracture—smooth breaking of a test piece normal to the test piece axis.

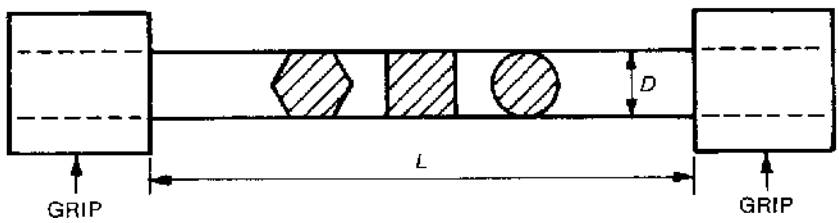
2.9 Ragged fracture—fragmented breaking of a test piece.

3 PRINCIPLE.

3.1 Torsion Test. A test piece is twisted in one direction round its own axis until the test piece breaks or until a specified number of twists has been made.

3.2 Wrapping Test. A test piece is closely coiled around a mandrel of specified diameter for a specified number of turns and if necessary uncoiled. The wire is then examined for evidence of splits, cracks and fractures.

4 SYMBOLS AND DESIGNATIONS. For the purpose of this standard, the designations shown in Fig. 1 apply.



Legend:

D = nominal original dimensions of wire, diameter or width across flats

L = free length of test piece between grips (for wrapping test only)

Fig. 1. SYMBOLS AND DESIGNATIONS

5 TEST APPLIANCE.

5.1 Torsion Test. The general arrangement of the test appliance shall be such as to comply with the following requirements:

(a) Test grips shall be axially aligned.