

Australian Standard®

Methods of test for fibre ropes

Method 6: Resistance to abrasion

PREFACE

This Standard was prepared by the Standards Australia Committee TX/4, Ropes and Cordage, and supersedes AS 4143.6(Int)—1993, which was withdrawn in November 1995.

The changes to this Standard from AS 4143.6(Int) include the insertion of an objective clause, a slight modification to the conditioning and testing requirements for the rope samples to align with those in AS 4143.5, and the addition of dimensions for the abrasion testing apparatus shown in Figure 1.

METHOD

1 SCOPE This Standard sets out a method for measuring the resistance to abrasion of multiple-layer fibre rope.

2 OBJECTIVE The objective of this Standard is to provide users of multiple-layer fibre rope with a method of testing the resistance to abrasion of such rope in order to assist in determining the most suitable rope for applications where contact of a loaded rope with an abrasive surface may occur.

NOTES:

- 1 This method is based on a test developed by Blue Water/Rescue Systems, USA, and is intended to be used in the assessment of the life expectancy of rope used in extreme situations where contact of an unprotected, loaded rope with an abrasive surface may occur (e.g. when used for life rescue lines). A method for testing the resistance of fibre rope to flexion and surface abrasion is given in AS 4143.5 and is considered more appropriate for mooring ropes and cargo restraints.
- 2 Certain types of rope, e.g. aramid, are very prone to abrasion and require sheathing or water lubrication. These types of ropes should not be tested for abrasion resistance by the method in this Standard.

3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

4142 Fibre ropes

4142.3 Part 3: Man-made fibre rope for static life rescue lines

4143 Methods of test for fibre ropes

4143.5 Method 5: Resistance to flexion and surface abrasion

COPYRIGHT

4 DEFINITIONS For the purpose of this Standard, the definitions given in AS 4142.3 and the one below apply.

4.1 Multiple-layer rope—a rope consisting of a plaited sheath on a core. The strands in the core may be either plaited together, laid parallel to each other or twisted then laid parallel to each other.

5 PRINCIPLE Resistance to abrasion is indicated by abrading the rope to simulate local severe abrasion such as that which could occur when a loaded rope bears on an abrasive surface. Both the number of cycles needed to cause the sheath to break and the number of cycles needed to break the entire test specimen (sheath and core) are recorded.

6 APPARATUS The following apparatus is required:

- (a) A conditioning facility for providing and maintaining a standard atmosphere of temperature $20 \pm 2^\circ\text{C}$ and relative humidity $65 \pm 2\%$.
- (b) An abrasion tester (see Figure 1) for multiple-layer ropes, consisting of the following:
 - (i) A carborundum stone having a uniform texture of 30 grit and a diameter of 250 mm with a rotating brush placed beneath the stone so that it is able to clear away debris from the stone. The stone is rotated by a motor operating at a rate of 15 r/min so that it moves against the rope in the direction away from the mass suspended from the rope.
 - (ii) A crank driven at a rate of 30 r/min by a motor and designed so that when a rope is mounted on the crank and the crank is turned, the rope moves a distance of 130 mm.
 - (iii) A guide roller having an upper surface at the same level as the upper surface of the stone. This is used to ensure that the rope contacts the stone's surface over a full quadrant.
 - (iv) An 80 kg mass with a suitable rope attachment point.

7 SAMPLES AND TEST SPECIMENS

7.1 Sample A test sample shall be taken from one end of a coil selected for testing. Each sample shall be representative of the balance of the coil.

7.2 Conditioning Condition the sample for 24 h in the atmosphere described in Clause 6(a). Preparation of test specimens and subsequent testing shall, if possible, be conducted without removal from the standard atmosphere, otherwise testing shall commence within 10 min after removal from that atmosphere.

7.3 Test specimens Two test specimens shall be prepared.

8 PROCEDURE The procedure shall be as follows:

- (a) Mount the test specimen in the abrasion tester as shown in Figure 1.
- (b) Abrade the test specimen until the sheath breaks, and continue until the specimen breaks.
- (c) Note the number of strokes at which the sheath breaks, i.e. a hole is worn in the sheath, and the number of strokes at which the entire test specimen breaks, i.e. both sheath and core.
- (d) Examine the surface of the test specimen noting any special features.