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Ropes and cordage — Equivalence between natural fibre ropes and man-made fibre ropes for use in the mooring of vessels

Cordages et articles de corderie — Équivalence d'emploi pour l'amarrage des navires entre cordages en fibres naturelles et cordages en fibres chimiques

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3505 was drawn up by Technical Committee ISO/TC 38, *Textiles,* and circulated to the Member Bodies in June 1974.

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0 INTRODUCTION

The Classification Societies have long-established specifications for the size and number of natural fibre ropes to be used on vessels according to their tonnage.

Ropes made from man-made fibres are now very widely used for mooring and towing and it is important that sizes of the various man-made fibre ropes which are equivalent to natural fibre ropes should be specified in an international agreement. This is a logical development from the publication of ISO specifications for the man-made fibre ropes themselves.

Man-made fibre ropes to ISO specifications have properties which are superior to ropes made from natural fibres. Typically, they have considerably greater strength per unit mass and a greater capacity for absorbing energy in shock-loading. When these newer types of rope were first used, these attractive properties were sometimes over-emphasized. Experience has shown that the table of equivalence shown in this International Standard allows the best advantage to be taken of the properties of man-made fibre ropes, and ensures a good safety margin and a greater length of life of rope than those previously obtained. This table is the result of co-operative work between technical specialists of rope manufacturers and man-made fibre manufacturers, the representatives of shipowners, naval authorities and the Classification Societies.

It is not satisfactory simply to supply a man-made fibre rope to the same breaking load as the hard fibre rope it replaces. Many factors have been taken into account in arriving at the table, the main ones being as follows :

a) If a man-made fibre rope of equivalent strength to natural fibre were substituted, it would be much smaller in diameter and could, by virtue of its smaller cross-sectional area, lose a higher proportion of its strength due to the external abrasion, chafing, cuts and other forms of surface damage which occur during use.

b) The use of deck equipment not specifically designed for man-made fibre ropes could result in the possibility of excessive wear and breakage.

c) Internal abrasion between the strands of the rope may be caused by the characteristically high extension of man-made fibre ropes under load, and the corresponding recovery.

d) Some man-made fibre ropes are vulnerable to melting due to frictional heat.

e) Most man-made fibres lose strength whilst in hot conditions, and of the ropes quoted in this International Standard this particularly applies to polyolefins. Much depends, however, on the relationship between the operating temperature and the melting point of the material.

f) In the case of polyamide ropes, there is some loss of strength on wetting.

g) All textile fibres lose strength on exposure to sunlight. The effect depends on the type of fibre, the cross-sectional area of the rope, the geographical location of use, the time of exposure, and the amount and type of stabilizer used.

h) In the event of rope breakage, the energy released causes high re-coil speeds which can be dangerous to personnel.

i) Due to the hysteresis effect, all ropes suffer a reduction in their energy absorption once the rope has been in use.

This International Standard deals only with ropes for mooring, the subject of towing not yet having been studied.

Despite this limitation, a table of equivalence for some ropes has been included as being of value; this can be used as a guide for rope users until a more complete document on this subject becomes available.

It is recommended that rope users obtain from their supplier or competent organization advice on the care and treatment of ropes in use.

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