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METHODS OF TEST FOR TYRE YARNS, CORDS AND TYRE CORD FABRICS MADE FROM MAN-MADE FIBRES

PART VI DEFINITIONS OF TERMS

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Indian Standard

METHODS OF TEST FOR TYRE YARNS, CORDS AND TYRE CORD FABRICS MADE FROM MAN-MADE FIBRES

PART VI DEFINITIONS OF TERMS

0. FOREWORD

0.1 This Indian Standard (Part VI) was adopted by the Indian Standards Institution on 11 May 1970, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 In the preparation of this standard, due weightage has been given to the testing practices being followed in the country in this field. Assistance has also been derived from the following publications:

Rules for rayon tyre yarns and cords, and rules for continuous filament polyamide tyre yarns and cords. The International Bureau for the Standardization of Man-Made Fibres. 1963.

ASTM Designation D : 885-64T Tests for tyre cords from man-made fibres. American Society for Testing and Materials.

0.3 This standard has been prepared with a view to eliminating ambiguity or confusion arising from various interpretations of definitions of terms commonly used in tyre cord industry and trade. This standard forms a part of the series of standards under the title 'Methods of test for tyre yarns, cords and tyre cord fabrics made from man-made fibres' and covers terms used in different standards covered in this series.

1. SCOPE

1.1 This standard (Part VI) prescribes the definitions of various terms used in the testing of tyre yarns, cords and tyre cord fabrics made from man-made fibres.

2. DEFINITIONS

A

Adhesion — The property of treated tyre yarns or cords by which they tend to adhere to the rubber. It is expressed in terms of kilogram force for a fixed denier of the yarn.

B

Breaking Length — The length of a specimen such as fibres, yarns, twines and cordages of uniform area of cross-section, the weight of which is equal to the breaking load. The breaking length expressed in km is numerically equal to the breaking tenacity expressed in grams per tex.

Breaking Load — The maximum load (or force) supported by a specimen in a tensile strength test carried to rupture. It is commonly expressed in grams and kilograms.

Breaking Tenacity — The breaking load of a material under test divided by the linear density of the unstrained material expressed as grams per tex or grams per denier.

C

Commercial Moisture Regain — An arbitrary value formally adopted as the regain to be used with the oven-dry weight when calculating:

a) the linear density,

b) the commercial or legal weight of a shipment or delivery of any specific textile material, or

c) the weight of specific component in the analysis of fibre blends.

Conventional Allowance — A fixed percentage to be added to the oven-dry weight of yarn freed from normal finish in order to calculate the commercial weight and linear density.

This allowance is determined for each textile so as to include both the moisture content which corresponds approximately to equilibrium under standard atmosphere and substances removable during normal handling, for example, the finish normally applied to impart the required properties to the textile.

Cord — A plied or cabled thread suitable for reinforcement of tyres.

D

Denier — The unit for expressing the linear density of man-made fibres and silk filaments, yarns and cords which is equal to the weight in grams per 9 000 m of material.

Dip Pick up — The amount of dipping material present in the specimen. It is expressed as the percentage of the weight of oven-dry dip-free specimen.

Dipping — (a) (verb) — The process of impregnating tyre yarns, cords or tyre cord fabrics with a compound to improve its adhesion to rubber.

b) (noun) — The material itself.

E

Elongation — The difference between the length of a stretched specimen and its initial length (under pre-tension) in a tensile test usually expressed as a percentage of the latter.

Elongation at Break — In a tensile test, the difference between the length of a stretched specimen at breaking load and its initial length, usually expressed as a percentage of the latter.

Elongation Under a Given Load — The increase in length of a yarn or cord which results from subjecting it to a certain desired load and generally expressed as a percentage of the initial length of the specimen.

F

Filament — Elementary continuous constitutent of yarn.

Finish — (a) (verb) — The process of treating yarns with a substance to facilitate further processing.

b) (noun) — The substance used for finishing.

H

Header — *See* 'Tab'.

Heat Degradation — The loss in strength of tyre yarns or cords on exposure to an elevated temperature for a pre-determined time. It is expressed as the percentage of the initial strength of the specimen.

Heat Shrinkage — The maximum shrinkage in length of yarn or cord when exposed to an elevated temperature under a pre-tension; it is expressed as a percentage of the original length of the specimen.

Heat Shrinkage Force — The maximum force developed in the yarn or cord of fixed length when exposed to an elevated temperature. It is expressed as force per unit linear density (grams per tex or grams per denier).

L

Linear Density — Mass per unit length (the quotient obtained by dividing the mass of yarn or cord by its length). It is usually expressed in denier or tex.

M

Moisture Equilibrium — The condition reached by a sample or specimen in a controlled atmosphere when the net difference between the amount of moisture absorbed and the amount desorbed, as shown by a change in weight, shows no trend and becomes insignificant.

P

Package — The units from which the yarn is to be unwound, and which together constitute the consignment. The packages may be of various sizes, shapes and winding appearance; for example, bobbins, cones, copes, cakes, tubes, hanks, pirns and cheeses.

Plying — The operation of twisting together two or more single yarns of the same length maintained under the same tension.

Pre-Tension — The initial low tension applied to remove kinks and crimp when mounting a specimen preparatory to making a test and to establish the nominal gauge length.

S

Splice

a) *Rolled Splice* — The term used for tying knot in two single threads of cords. Two single yarns of each of two cords to be spliced are pulled apart and held tight. Knots are tied in single yarn of one cord with single yarn of the other in such a way that two knots in singles have at least 8 cm distance between them.

b) *Sewn Splice* — The term used for sewn joints in tyre cord trade. This is made by applying a zig-zag stitch on two cord ends lying side by side (*see* Fig. 1).

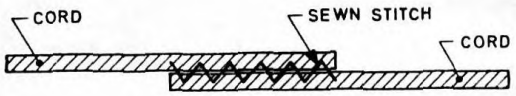

FIG. 1 SEWN SPLICE

T

Tab (or Header) — A short length of plain weave fabric, normally woven at each end of a roll of tyre cord fabric for the purpose of supporting and holding the cords in proper position with respect to each other.

Tabby — The sample section of tyre cord fabric between 2 tabs or headers which have been woven with a distance of 0·5 to 1·0 metre between them.

Tenacity — *See* 'Breaking Tenacity'.

Thickness Gauge — The thickness, in mm, of tyre yarns or tyre cords.

Twist

a) The spiral disposition of the components of a yarn which is usually the result of relative rotation of the two ends.

b) The number of turns per unit length of a yarn expressed as turns per metre (tpm) or turns per inch (tpi).

c) *'S' Twist* — The twist in yarn due to which its spirals are in line with central portion of letter S, when the yarn is held in a vertical position (*see* Fig. 2).

d) *'Z' Twist* — The twist in yarn due to which its spirals are in line with central portion of letter Z, when the yarn is held in a vertical position (*see* Fig. 3).

FIG. 2 S-TWIST

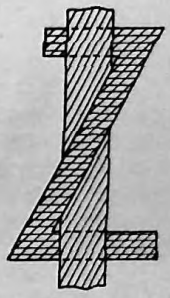

FIG. 3 Z-TWIST

Tex — The primary unit in a system of units for expressing the universal count of yarn; the weight in grams per kilometre of yarn or cord. The multiples and sub-multiples of tex are:

Milli-tex = 1 mg per 1 000 m
Deci-tex = 1 dg per 1 000 m
Kilo-tex = 1 kg per 1 000 m

Tyre Cord Fabric — A fabric consisting of tyre cord warp with widely spaced weft threads.

W

Weight

a) *Gross Weight* — The total weight of a consignment, case, roll or sample; includes the weight of packing materials, containers and of supports, such as cones and bobbins and shell rolls.

b) *Tare Weight* — The weight of all external and internal packing materials of a case, roll or other type of containers including the weight of bobbins, tubes, etc.

c) *Net Weight* — The difference between the gross weight and the tare weight determined at the same time.

d) *Oven-Dry Weight* — The weight of a sample of textile material (after removal of normal finish) dried to substantially constant weight in an oven maintained at 105° to 110°C and supplied with air at the standard atmospheric conditions (65 ± 2 percent RH and 27° ± 2°C).

In case of dipped yarns, the oven-dry weight does not include the dipping material, the weight of dipping material shall, therefore, be deducted.

e) *Commercial Weight*

1) *For undipped yarns and cords* — The sum of the oven-dry weight (after removal of normal finish) and the weight corresponding to the conventional allowance.

2) *For dipped cords* — The sum of the oven-dry weight and the weight corresponding to the conventional allowance for the textile plus an increase for dipping.

f) *Invoiced Weight* — The weight indicated on the seller's invoice.

Wet Contraction — The maximum shrinkage in length of yarn or cord when dipped in water under a pre-tension. It is expressed as percentage of the original length of a specimen.

Wet Contractile Force — The maximum force developed in yarn or cord of fixed length when dipped in water. It is expressed as force per unit linear density (grams per tex or grams per denier).

Y

Yarn — A continuous strand of textile fibres or filaments with or without twist, suitable for plying, knitting, braiding, weaving or otherwise intertwining to form a textile end product. Yarn occurs in the following forms:

a) *Spun Yarn* — A yarn composed of fibres (short length or staple) twisted together.

b) *Filament Yarn* — A yarn composed of continuous filaments assembled with or without twist.

c) *Monofilament* — A single filament with or without twist.

d) *Narrow Strip of Material* — Such as paper, cellophane or metal foil, with or without twist.

NOTE — Varieties include single yarn, plied yarn, cabled yarn, cord, thread, fancy yarn, etc.