

## Steel Cord

### Definition

#### Cord components

##### FILAMENT OR WIRE (1)

A metal fibre used as an individual element in a strand or cord.  
Standard filament diameters are 0.15/0.175/0.20/0.22/0.25/0.27/0.28/0.30/0.35 and 0.38 mm.

##### STRAND (2)

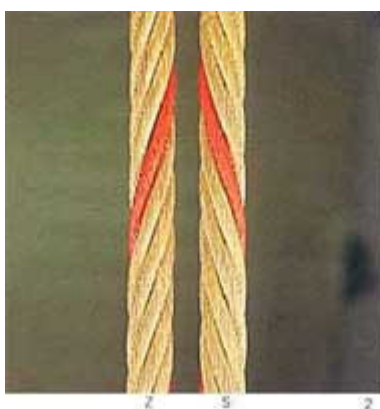
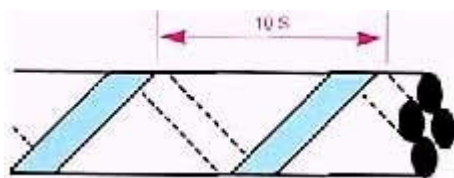
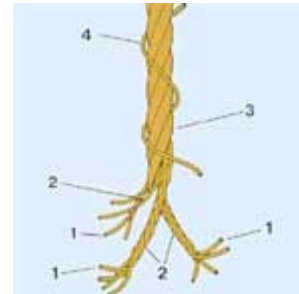
A group of filaments combined together to form a unit product for further processing.

##### CORD (3)

A formed structure composed of two or more filaments when used as an end product, or a combination of strands or filaments and strands.

##### WRAP (4)

A filament wound helically around a steel cord.



#### Physical properties

##### DIAMETER OF CORD

The diameter is determined by calculating the arithmetic average of the measured maximum and minimum thickness of the cord. The diameter is expressed in millimetres.

##### LENGTH OF LAY (1)

The axial distance required to make a 360 degree revolution of any element in a strand or in a cord and expressed in millimetres. The recommended lengths of lay are based on the ISO recommendation R-388-R20 series, ranging from 2.50 mm to 25.00 mm.

##### DIRECTION OF LAY(2)

The helical disposition of the components of

a strand or cord. The strand or cord has an 'S' or left-hand lay if, when held vertically, the spirals around the central axis of the strand or cord conform in direction of slope to the central portion of the letter 'S'; and 'Z' or right-hand lay if the spirals conform in direction of slope to the central portion of the letter 'Z'.

#### LINEAR DENSITY

The mass per unit length expressed in grams per metre.

#### ARC HEIGHT(1)

The amount of bending of a cord sample lying on a flat surface against two supports with an interdistance of 300 mm.

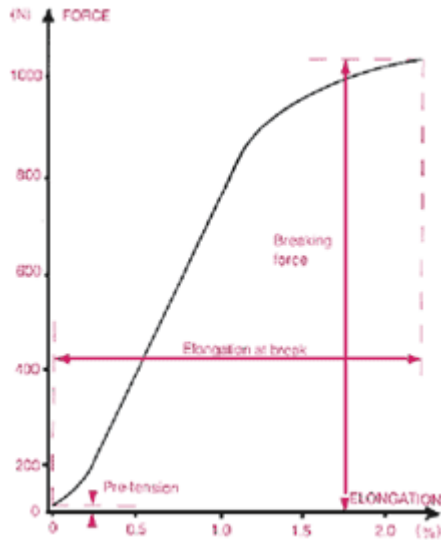
#### RESIDUAL TORSIONS

The number of revolutions made by a specific length of cord when one end is held in a fixed position and the other allowed to turn freely, expressed in turns per 6 metres.

#### FLARE(2)

The spreading of the filament ends or the strand ends at the cut end of a cord, expressed as the unraveled length in millimetres.





## Mechanical properties

### BREAKING FORCE

The maximum force or load expressed in Newtons, which a test specimen can support during a tensile test of loading to break.

### TENSILE STRENGTH

The breaking load of a filament per unit of unstrained cross-sectional area expressed in Newtons per square millimetre or Megapascals.

### ELONGATION AT BREAK (or breaking elongation)

The increase in length of a test specimen, which results from subjecting it to the breaking force in a tensile test, expressed as a percentage of the initial length of the specimen measured under a defined pre-tension.

### ELONGATION BETWEEN DEFINED FORCES (EDF)(1)

The increase in length of a test specimen, which results from subjecting it to a defined force from a defined pre-tension onward. The elongation is expressed as a percentage of the initial length of the specimen.

### ELASTICITY

The property of a material by virtue of which it tends to recover its original size and shape after removal of a deforming force.

## Chemical properties

### MASS OF COATING

The quantity of the covering layer applied to the surface of the wire, expressed in grams per kilogram of coated wire.

### THICKNESS OF COATING

The average thickness of the coating layer expressed in micrometers.

### COMPOSITION OF COATING

The quantity of each of the components expressed as a percentage of the total mass of the coating. Adhesion properties

### ADHESION STRENGTH

The force required to separate a steel tyre cord from the rubber compound.

The force is expressed in Newton.

