

STRETCH IN WIRE ROPE

*For More Information Contact
American Rigging Supply, Inc.*

All wire ropes and strands stretch under load. The amount of stretch is determined by two components, permanent stretch and elastic stretch.

PERMANENT STRETCH is caused by settling of the wires in the rope or strand when the initial load is applied. DYFORM strand gives very little, if any, permanent stretch as this is removed during the manufacturing process.

ELASTIC STRETCH is typical of any metallic material under load and elastic stretch will be proportional to the applied load (Hookes Law). Resistance to stretch is determined by the “modulus of elasticity” .

Rather than using Youngs Modulus for the material of the strand, we quote a STRAND MODULUS. Load extension data from an actual strand is used together with the nominal diameter of the strand to calculate the cable modulus. This gives a direct comparison between strand types.

ELASTIC STRETCH MAY BE CALCULATED FROM THE FORMULA:-

$$\text{Elastic stretch (mm)} = \frac{W \times L}{E \times A}$$

where W = Applied Load (KN) L = Wire Length (mm)
E = Strand modulus (KN/mm²)

$$A = \text{Cross sectional wire area} = \frac{D^2 \times \pi}{4}$$

where D = Nominal Diameter (mm)

Typical values for E are:

Conventional 1 x 19 Wire	107.5 KN/mm ²	15.59 x 10 ⁶ psi
Dyform 1 x 19 Wire	133.7 KN/mm ²	19.39 x 10 ⁶ psi
Nitronic 50 Rod Rigging	193.0 KN/mm ²	28.00 x 10 ⁶ psi
Pultruded Kevlar Rod	124.0 KN/mm ²	18.00 x 10 ⁶ psi

