

CI-1505: Static Bend Test Method

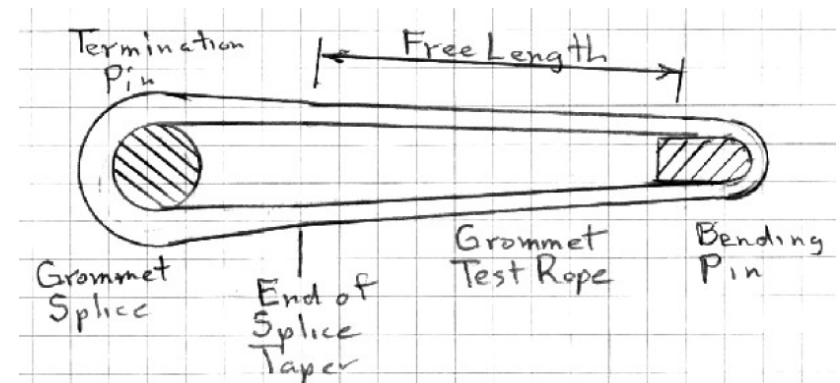
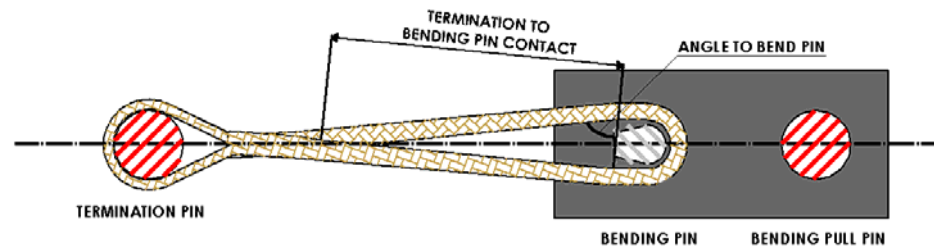


CIRTS
Committee for International
Rope Testing Standards



Test specimen configuration

Are both an **eye-and-eye sling in a basket configuration** and an **endless grommet** viable configurations for testing
*and is the angle critical to the test / results?



Discussion/Decision:

Testing Speed

- Intended to align with CI-1500B
- Loading rate such that specimen reaches 20% of the break strength in:
 - 2 – 200 seconds
 - 20 – 200 seconds
- Speed for the control sample = static bend sample
- Proposal to update CI-1500B to match

- *Discussion / Decisions:*

What happens if the break occurs at the “termination pin”?

The current draft document has conflicting information

- “...the *test is invalid* if it breaks at the termination”
- “...it is an indication that the strength in the bend is *equivalent to 2x* the straight rope strength.”
- Can it be assumed that the bend had no effect and the SBE is 100% efficiency (or 2x the rope strength)?
- OR is the maximum bend efficiency of the tested product is “as tested” – not simply “2x rope strength”
 - NOTE: the actual tested strength of the bend may be <2x the rope strength even for very large D/d’s
- Should the test be repeated to confirm the results? And if it is verified with a second test, then which of the above is true?

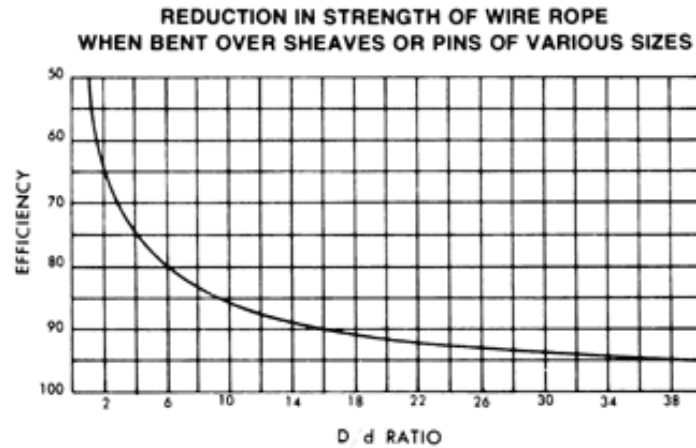
Proposed wording:

In the case of large D/d ratios (> D/d of 20/1), the effect of the bend may be negligible and the break may occur at the termination instead. However it should not be assumed that a break at the termination indicates the bend configuration is equivalent to 2x the straight rope strength without verification/confirmation of the termination strength.

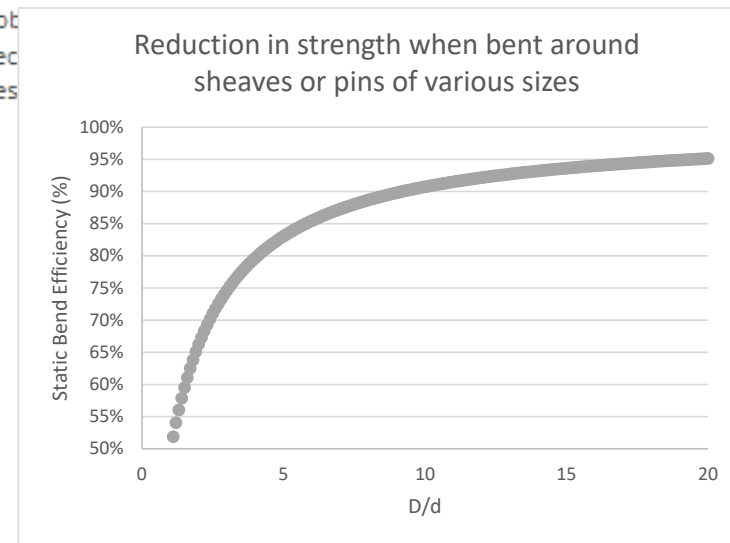
- *Discussion / Decisions:*

Representation of “Static Bend Efficiency”

f



When a wire rope is bent around any sheave or other object, the strength due to this bending action. As the D/d ratio becomes smaller, the loss of strength becomes greater and the rope becomes



- *Discussion / Decisions:*

SBE: What is the denominator in the equation?

The static bend efficiency can be calculated by the following formula:

$$E_b = \frac{BF_b}{BF * 2}$$

E_b = Static Bend Efficiency (%)

BF_b = Breaking force of a rope around a curved surface

BF = Breaking force of a **spliced**, straight line rope per CI 1500B (*section 8; Determination of Cycled Strength*)

- BF should be:
 - Spliced rope strength
 - **Actual** strength of a tested sample OR
 - Manufacturer's stated **AVERAGE** strength (not MBS)
- There are several references to "MBS" or "MBL" in the document → change to actual and/or average strength of the straight-line rope.
- *Discussion / Decisions:*

Appendix

- Interpolation vs Extrapolation:
 - “Data should only be interpolated within the range of diameters tested.”
- Guidance for determining the equation of the SBE should not be prescriptive (use the graphical illustration only)
 - Add NOTE: upper limit should not exceed 100% (or 2x the rope strength)??
- *Discussion / Decisions:*