# Re: The strength of a rope is more than the sum of the strengths of its separate

***Source:*** http://sci.tech−archive.net/Archive/sci.physics/2008−09/msg02855.html


- *From*: John Polasek <jpolasek@xxxxxxxxxx>

- *Date*: Mon, 22 Sep 2008 17:01:02 −0400

On Mon, 22 Sep 2008 08:00:00 −0700 (PDT), ed wolf <eduartwolf@xxxxxxx>
wrote:

> On 22 Sep., 02:21, John Polasek <jpola...@xxxxxxxxxx> wrote:
>
> > On Sun, 21 Sep 2008 19:49:16 +0200, "minimus"
> >
> > <spammergetthisem...@xxxxxxxxxx> wrote:
> >
> > > The strength of a rope is more than the sum of the strengths
> > > of its separate
> > > strands.
> >
> > > Why?
> >
> > What's your authority on that?
> > Look closely what you are dealing with, say 100 fibers. Are they 100
> > identical fibers? Not likely. They will have various breaking
> > strengths and each has a specific weak point.
> > When you bundle them as in good tight rope, every fiber's weak spots
> > will be supported by 99 or so strong ones, so it won't even be
> > stressed enough to fail.
> > You would probably find that the rope is as strong as 80 or 90 of the
> > strongest fiber.
> > John Polasek
>
> Hi,
> fibers say 12m long are twisted to a rope say 8 m long.
> It will be 1.5 times thicker than the bundle of fibers you started
> with.
> Could it be 1.2 or even 1.5 times stronger?
> Sounds quite reasonable,doesn´t it?
> ed, slightly puzzled

I dont want to get too involved here, but...
Since you have shortened by 8/12 the area is 12/8 = 1.5 times, by simple proportion. The 'screw' of the rope is at 42 deg m/l. (That rope would want to unwind). sin 42 = 2/3; sec 42 = 1.33.
So for X pounds vertical, a slanted fiber has to take 1.33X pounds to provide X vertical and some Y compression force of tan 42 or .9X.
Therefore the strength would be increased by only 1.5/1.33 = 9/8 .
John Polasek
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