



Submission Form 2023 General Assembly Meeting

Submission Form to be completed and emailed to office@420sailing.org

Your Name (first name, surname)	James George (The British International 420 Class Association Class Chairman)
Your Nation	Great Britain
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I propose the following submission, to be discussed at the General Assembly meeting (in case of several submissions, please, use one form for each submission):	
Subject Header: Change of Class Rules to allow material for trapeze lines to become optional - the current rules specify wire	
Context: If referencing existing 420 Class Rules, Constitution or other documentation please reference the documentation.	
<u>Proposal Summary</u> The British International 420 Class Association would like the General Assembly to consider allowing trapeze 'wires' to be made of optional materials for the full length by an alteration to the Class Rules. Allowing 'optional' materials would enable sailors to use materials such as Dyneema® for the full length or keep the current specification which is steel wire with an option for 500mm of rope at the bottom connected to the handle. This would bring the 420 Class in line with the 470 Class and many other International Classes e.g. 49er, Fireball, 505, etc. who have made this alteration.	
<u>Reason for the change</u> The GBR fleet regularly suffer from trapeze wires breaking, typically just below the swage end fitting at the top, often with no visible signs of wear prior to the break happening. We believe that moving to a 100% rope system for the trapeze, using a material such as Dyneema® has many benefits, and we have detailed the arguments for and against this change below. In these arguments we have used Dyneema® as the comparison material verses wire.	
<u>Arguments for allowing Optional materials:</u> <ul style="list-style-type: none">• From reviewing their use in other classes, we believe that a Dyneema® trapeze is less likely to break unexpectedly compared to a steel wire, which makes it safer for the sailor and will reduce some pressure on safety boats.• Trapeze wires almost always break at the top, next to the T-terminal fitting and inspection for <i>failing but not yet broken</i> wire strands at this point can be difficult. Inspection of a Dyneema® line for wear is easier.• Dyneema® trapeze lines can be easily made using normal rope splicing methods which	



would allow people to make their own trapezes without the need to have them made by specialists. They can be made in the dinghy park quite easily if need.

- Lower cost to buy initially - A new single trapeze wire costs £25 (€28.58) in the UK. In comparison, the length of Dyneema® needed plus the Rope Eye T-Terminal required to connect it to the mast costs £23 (€26.45) to purchase for a single trapeze.
- Lower cost to replace - If you wish to then replace your Dyneema® later, this will only cost about £12.50 (€14.38) as you can reuse your existing Rope Eye T-Terminal fitting, compared to a new wire at £25 (€28.58).
- Dyneema® rope does wear eventually, normally at the ends, but when it does you can reuse the rest of it for another purpose, which makes this more sustainable. Generally, once a wire breaks this is not reused for another purpose and placed in general waste.
- Importantly, Dyneema® can be cut with a knife in an entanglement situation, wire cannot.

Arguments against allowing Optional materials:

- Dyneema® is a more flexible material than wire and is more buoyant in water than wire. Therefore, there is a slightly higher risk of a sailor becoming entangled in Dyneema® opposed to wire in a capsized situation.
- Dyneema® is marginally lighter than wire and therefore will potentially be seen to provide a slight competitive advantage. If allowed, it's anticipated that all competitive sailors will spend the additional £46 (€52.90) needed to convert to 2x all-Dyneema® trapeze lines.

Both steel wire and Dyneema® are both ultimately recyclable materials, so they both have this in their favour and the Class should promote this. The sad reality is that failed wire will often be placed in general waste but there is a chance that a good length of Dyneema® will be used again for a less important task e.g. boat transportation.

In summary, we believe the above arguments for the change to 'optional' material outweigh any against, with the largest against argument being somewhat neutralised by the fact that Dyneema® and similar materials can be cut with a knife.

The British International 420 Class Association arranged a vote by its members to understand their view on this subject. We used the term Dyneema® in our poll rather than 'optional material'. The results were as follows:

94.7% in favour of allowing BOTH Wire and Dyneema®

2.6% in favour of Dyneema® only

2.6% in favour of staying with Wire only

Rule Changes

Should the 420 Class wish to adopt the above proposal to allow 'optional' materials for the trapeze, then the following Class Rules will need amending:

- D.4.2.2
- F.2.4.7
- F.2.7
- F.5.1.2

In the *Further Discussion* section below, we have provided potential wording for these rules, to



allow optional materials. **This has been done purely to help voting members understand our proposal more fully, however World Sailing and the International 420 Technical Committee would provide final wording should this change be approved.**

END OF PROPOSAL

Further Discussion

Dyneema® rope would be the logical choice of material in today's sailing world for trapeze lines as demonstrated by its adoption by other classes. However, to provide some futureproofing, as we suspect that improved rope materials will be developed in the future, we're proposing that the trapeze material choice is left optional, as per the current 470 Class Rules.

470 Class rules extract:

MANDATORY (1) 1 trapeze on each side of the boat. **The material of the trapeze is optional, if wire rope is used it shall have a diameter not less than 2.3 mm.** Each trapeze system may be provided with handholds, rings and adjustment. Self-tacking trapeze systems are not permitted.

The 470 Class Rules do not specify a minimum diameter if rope is used for the trapeze; they only specify a minimum diameter if wire is used. As the 420 is a Youth Class we feel that the minimum diameter currently in the 420 Class Rules for wire (2mm) should be kept for all materials. A key reason of this rule change request is based in safety and allowing our youth sailors to use less than 2mm is potentially counterintuitive.

This then raises a potential issue around measurement. Measuring the diameter of wire is relatively easy as it's a hard material, but rope diameter can be subjective. However, the precedence for having a defined minimum diameter for rope is already in the Class Rules, for example, the towing rope in **C.5.2.b.1**

From experience in other classes, we believe that 2.5mm will be the thickness of Dyneema® adopted by most 420 sailors.

The other thing The British International 420 Class Association considered was the impact that allowing trapeze lines of optional material had on all up mast weight (Class Rule **F.2.6**) and the centre of gravity of the mast (Class Rules **F.2.7**). Our findings found that moving to Dyneema® trapeze lines still meant that a 420 mast still complied with both rules. Testing was undertaken with a Selden Zeta sectioned mast, but for completeness a test on the lightest mast currently used in 420 fleets, the lighter Selden Kappa could be undertaken by the International 420 Technical Committee prior to any formal rule change.

A Rope Eye T-Terminal. £10.50 (€12.07) to purchase for a single trapeze. Note the use of a Lark's Head knot to reduce wear on the Dyneema®.



Potential 420 Class Rule changes to allow the use of optional materials are as follows:

Red are deleted words, **Green** are additional words

D.4.2.2 MANDATORY, WITH POSITION OR DIMENSION OPTIONAL

(i) A maximum of six fairleads (also mentioned in F.5.1.2) for the elastic cord of the two trapeze **wires** **lines**.

F.2.4.7 The positions of **rigging points** of the **shrouds**, **forestay** and trapeze **wires** **lines** shall be at the distances mentioned in F.2.7 (see **shrouds**, **forestay** and trapeze heights).

F.2.7 The centre of gravity of the **mast**, including fittings and **rigging** listed in F.2.6 with the shrouds, forestay, trapeze **wires** **lines** and halyards secured along the **mast**, shall be at 2400 mm minimum from the **mast datum point**. For the measurement, the halyards shall be hoisted and the halyard tails outside the **mast** shall be kept in hand by the measurer.

F.5.1.2 One **steel** **trapeze** **wire** **line**, with a minimum diameter of 2 mm, on each side for the use of one person only. **The material of the trapeze is optional.** Each **trapeze** adjustment system shall be provided with a maximum of one handhold, two sheaves, a ring or hook, an elastic cord, one rope, and one cleat. **If wire rope is used** for the trapezes **wires** they may be substituted with rope for a maximum length of 500mm from the handhold top. The two **trapezes** shall be connected to the **hull** by elastic cord with a maximum of six fairleads as stated in D.4.2.2.(i). Elastic is permitted to keep each **trapeze** **wire** **line** clear of the **spreaders** and **shrouds**. Self-tacking **trapeze** systems are not permitted.