

# CHALLENGER OF RECORD & DEFENDER

## AMERICA'S CUP 36

### Interpretation 029

of

### AC75 Class Rule Version 1.7 issued 4<sup>th</sup> November 2019

#### Rules References:

- 13.1 Each **foil** must comprise:
- (a) a **foil arm** and a **foil wing**, which must form a single **linear component**;
  - (b) two **foil flaps**, each of which must be a **linear component**; and
- 16.1 A **rudder** must be a single **linear component**, constructed only from:
- (a) one **rudder upper** that must penetrate the **hull IGES**; attached to
  - (b) one **rudder lower** that must not penetrate the **hull IGES**.
- 17.1 The combination of the **bowsprit** and the **hull** shall form a single **linear component**.
- 17.5 The **bowsprit** shall not be bonded to the **hull** and must be removable for easy replacement.
- 35.64 **Linear component**
- A component of the **yacht**:
- (a) that has no moving parts or mechanisms;
  - (b) for which any two points on or within it must either always be in contact, or never be in contact;
  - (c) whose overall deformation at any point, in response to normal sailing loads, is approximately linear; and
  - (d) that always returns to the same state in the absence of applied load.
- Such components may be constructed from multiple parts and fastened together **mechanically**, but such fastening must be such that the final component satisfies the above conditions.

#### Background:

We are concerned that a strict literal interpretation of Rule 35.64 (b) would create a near impossible situation for designers to achieve and for measurers to verify for almost any physical or mechanical joint or fastening in a practical sense.

If the “two points” of Rule 35.64 (b) are small enough (i.e. microscopic); any mechanical fastening of two components would breach Rule 35.64 (b).

Furthermore, any small crack or fissure in a **linear component** (such as a crack in the paint of a **rudder upper** or in a connection of two components) would breach Rule 35. 64 (b).

Besides, the word “point” is not defined in the **AC75 Class Rule** and must be interpreted by the **Rules Committee**.

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In the **AC Class Rule**, there are occasion as illustrated in Rules 16.1, 17.1 and 17.5 where we have distinctly different components which must be attached to create **linear components**. Designing connections which will stand up to the scrutiny of Rule 35.64 (b) in a strict literal, microscopic point of view, we believe is impossible and can create an unpractical and potentially contentious situation(s).

Thus, we request an interpretation to attempt to bring clarity and practical application to Rule 35.64 (b) taking into account the interpretation principles of Rule 32.5 (b) – *reasonable and natural interpretation of the written words* – (c) – *precedence of the more detail over the more general*– (such as the last sentence of Rule 35.64 or the obligations included in Rule 17.5) and (d) – *permissive default*–.

### Request for Interpretation:

- (0) For the purposes of Rule 35.64 (b):
  - a. What is the definition of “point”?
  - b. Is there a specified size of “point”?
  - c. Do the “two points” refer to in the microscopic or diminutive level?

Taken as a premise that a single component, or two components that are connected to create a **linear component**, otherwise fulfil the **AC 75 Class Rule** including letters a) c) d) of Rule 35.64, please answer the following questions:

### Questions:

- 1) When two components are connected which must create a **linear component**, may they satisfy Rule 35.64 (b) if the **Competitor** provides the drawings of the connection to the **Measurement Committee** from which the **Measurement Committee** deems that the joint is designed to behave approximately linearly?
- 2) When two components are connected to create a **linear component**, may they satisfy Rule 35.64 (b) if the **Competitor** illustrates to the **Measurement Committee** through a physical test that the joined components behave approximately linearly by means of force-deflection data from this physical test, for which the **Measurement Committee** reserve the right to be present for?
- 3) If the answers to both 1) and 2) is NO; how will the **Measurement Committee** evaluate the small scale, micro not macro, compliance to Rule 35.64 (b) in a pinned or bolted joint?
- 4) If the answers to both 1) and 2) is NO; how will the **Measurement Committee** evaluate the small scale, micro not macro, compliance to Rule 35.64 (b) when components are joined via a male-female socketed joint?
- 5) If the answers to both 1) and 2) is NO; how will the **Measurement Committee** evaluate the small scale, micro not macro, compliance to Rule 35.64 (b) when a component (or a connection between two components) has a diminutive fracture or small fissure such as a crack in the paint or a tension crack in a carbon component that has been produced due to sailing loads?

### Interpretation:

Amongst the other listed, this interpretation refers to Rule 35.65, the definition of **linear Component** in the current version of the **AC75 Class Rule**. In the above request, in previous versions of the **AC 75 Class Rule** and previous interpretations, the same definition was given in different numbering, i.e. Rule 35.64.

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This interpretation refers to Interpretation 001, which already dealt with the issue of a microscopic versus a macroscopic interpretation of **linear component**:

1. Interpretation b) of Interpretation 001 states:

*“A strict interpretation of Rule 35.64 (b), so that any two points must remain in an unchanged contact status, is practically impossible to ensure in a material containing voids, on a microscopic level, when an **AC75 Yacht** is subjected to structural loading.”*

2. The last paragraph of answer 1 of Interpretation 001 states:

*“Rule 35.64 (b) is satisfied provided that, at the macroscopic level (e.g. interfaces between materials), two points are always in contact or never in contact, providing that materials are not engineered to provide globally non-linear characteristics through a contact/non-contact mechanism within that material.”*

Interpretation 001 requires that a component that must be a linear component must not be engineered to provide non-linear characteristics. This covers the examples in this request, namely mechanical fastenings, cracks or fissures.

3. Interpretation d) of Interpretation 001 states:

*“This interpretation is limited to the materials addressed in the request for interpretation.”*

The validity of interpretation b) of Interpretation 001 and the last paragraph of answer 1 of Interpretation 001 is herewith extended to the examples given in this interpretation request.

Thus, it is not deemed necessary to define a general definition of “point” for the purpose of Rule 35.65 (b).

### Answers.

1. Yes.
2. Yes.
3. Not applicable.
4. Not applicable.
5. Not applicable.

END.