

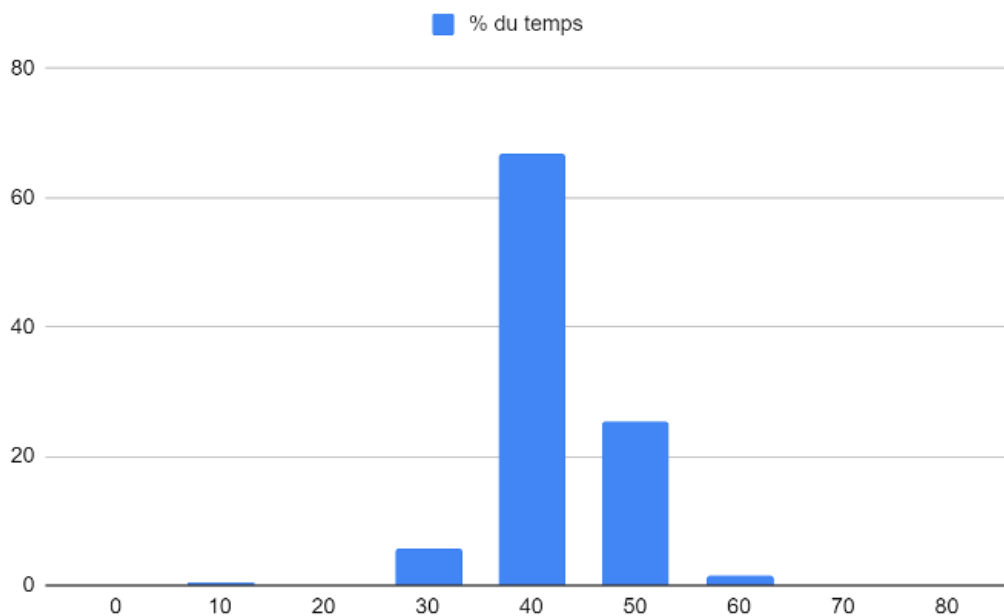
## TEST REPORT GRIVEL PLUM CARABINERS

### 1 - PROTOCOL

We have tested the Grivel Plume carabiners (01248, lot 2021-01) internally at SUPAIR according to a specific protocol adapted to paragliding.

It is a succession of pulls at different values, corresponding to different phases of flight such as takeoff, thermal flight, 360 °, wing-overs, and landing ...

Example of distribution in tension on a carabiner with a total take-off weight of 80 kg:



The carabiners thus underwent up to **500 hours of fatigue** by alternating periods of varying lengths at different tensile intensities.

At the end of this cycle, we tested the carabiners at 2000 daN to check their resistance and deformation.

We then destroyed them in traction. The 3 carabiners broke at close values, between 2205 daN and 2286 daN.

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### 2 - CONCLUSION

We tested 3 carabiners :

- a new one,
- one who has undergone 250 hours of the fatigue test
- one who has undergone 500 hours of the fatigue test

None of the 3 showed any weakness.



We can therefore conclude that the use of Grivel Plume carabiners in paragliding over a period of 500 hours (i.e. the equivalent of 5 years at a rate of 100 hours of flight / year) does not seem to have any influence on their resistance or their functionality.

However, it is advisable to change them every 5 years or 500 hours of flight time, depending on which of these criteria comes first.