

CIVL Competition Class Goals

The definition of CIVL Competition Class (CCC) paragliders was created with the purpose of World and Continental Championships in mind: safe, fair and satisfying contest flying. This led to the following goals for the class definition:

1. Safety – wings complying with this definition should be safe to fly by adequately trained competition pilots in competition conditions

2. Fairness –
 - a. ensure that wings are available for a wide range of pilot weights
 - b. prevent pilots from gaining an undue advantage over others through temporary or permanent modification of their glider

3. Satisfaction – wings complying with this definition provide a satisfactory flying experience to the world's best competition pilots

To be able to confirm that a glider conforms to the CCC certified type.

The CCC rule is therefore based on a small number of clearly defined simple parameters that can be easily measured to check conformation to the defined limits of the certified type, within defined tolerances.

CIVL Competition Class: Summary

The CIVL Competition Class definition can be summarized as follows:

1. Use full EN certification (EN 926-1 and EN 926-2) as the basis
2. **Additionally** restrict top speed at 65 km/h
3. **Additionally** restrict aspect ratio to the maximum flat aspect ratio exhibited by EN certified gliders by December 31st, 2013 (7.9)
4. **Additionally** require riser sets which prevent pilots from exceeding the certified top speed
5. **Additionally** require models to be available in multiple sizes, covering a wide range of pilot weight, in time before Category 1 events
6. Require shock and sustained loading tests to be performed once for each model (up to manufacturer, as per EN 926-1)
7. Permit line breaking strength tests to be performed for each model size
8. Forego flight tests that are irrelevant to this class of gliders
9. Set the waiting time until pilot input for collapse tests to two seconds
10. **Additionally** require flight tests to be conducted at the top of a wing's weight range, using a competition harness where relevant
11. Require the manual to contain additional information on the paraglider's operation and maintenance

CIVL Competition Class documentation

5.5.1 Additional measurements and documentation

§5.19 The canopy dimensions are measured and recorded.

§5.20 The line dimensions are measured and recorded.

§5.21 The riser dimensions, including accelerator travel, are measured and recorded.

§5.22 The riser set's layout, including accelerator travel, is documented photographically.

5.5.2 User's manual

§5.23 The user's manual fulfils the requirements defined in EN 926-2:2013, section 7, with the following additions:

- a. Flight characteristics, in comparison with a glider that is certified as EN D
- b. Information on maximum symmetric rear riser travel at maximum weight in flight
- c. Recommendations and special considerations regarding SIV
- d. Instructions for line measurements and re-trimming

CIVL Competition Class glider verification

A paraglider passes verification if

1. a comparison with the model size's stored schematics as well as the model size's stored reference glider shows identical internal and external construction elements
2. all dimensional measurements of profile shape dimensions, line attachment point placements and internal structure element lengths yield results that differ by a maximum of the greater of +/- 1% or 3 mm from the corresponding lengths given in the model size's stored schematics as well as those measured on the model size's stored reference glider
3. all its line diameters are identical to the ones listed in the model size's stored schematics, as well as the ones present on the stored reference glider

CIVL Competition Class sail limits

5.3 Physical requirements

5.3.1 Canopy shape

§5.5 The flat aspect ratio of the test specimen's canopy does not exceed 7.90.

§5.6 On the centre half (the middle 50% of its span) of the test specimen's canopy, neither the leading edge nor the trailing edge have any concave sections.

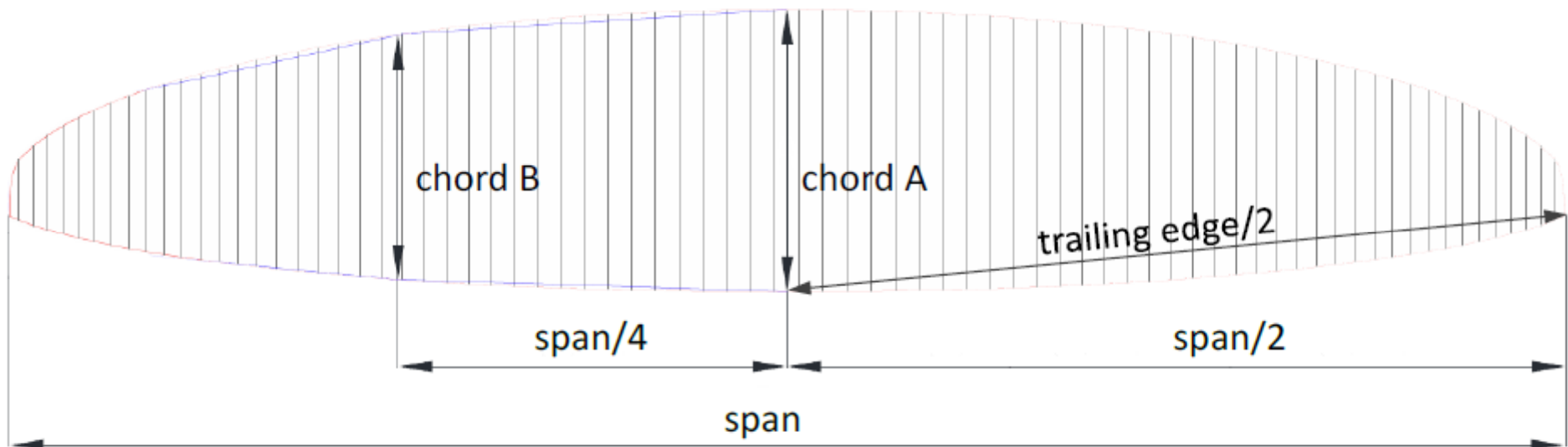


Figure 1: Canopy dimension measurements

$$AR_{flat} = \frac{4 * span}{chord(A) + 2.5 * chord(B)}$$

CIVL Competition Class sail measurements and tolerances

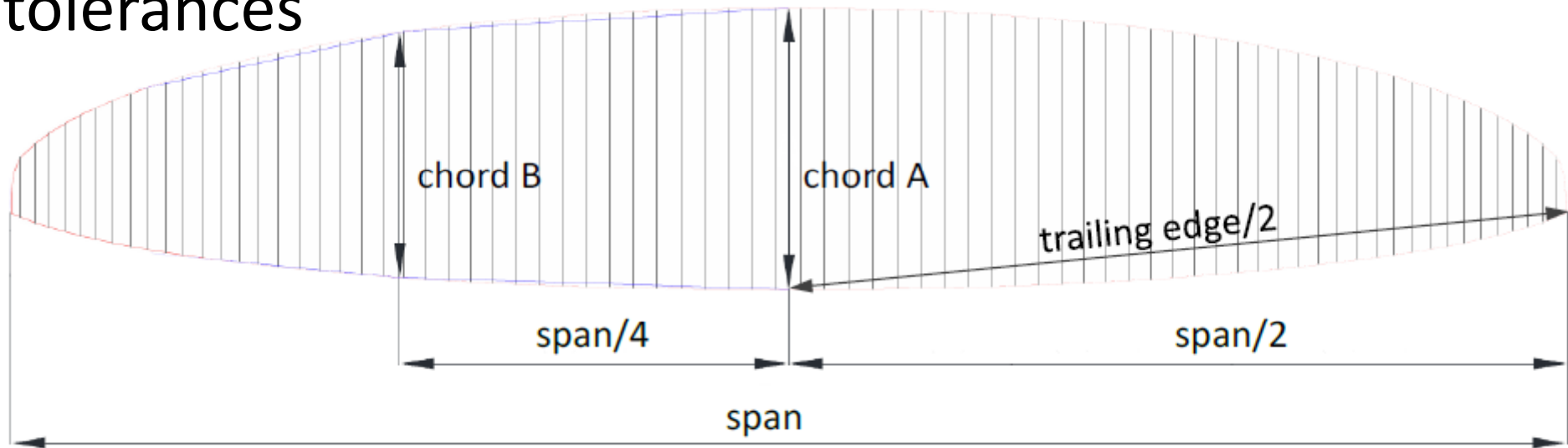


Figure 1: Canopy dimension measurements

7.1.1 Canopy dimension measurements

Results: Measurements of Span, Chord A, Chord B, Trailing Edge length (see Figure 1)

Unit: Centimetre Accuracy: One decimal digit

Tension:

- Span and Trailing Edge measurements are conducted under tension of 50 N in the measurement direction
- Chord measurements are conducted under tension of 10 N in the measurement direction

A paraglider passes verification if span, trailing edge and both chord measurements according to section 7.1.1 yield results that correspond with those documented for that paraglider's CIVL Competition Class model size, within a tolerance of +/- 1%.

Structural strength, sail and lines

5.3.2 Structural strength

§5.7 The test specimen's model size is covered by a passed shock loading and sustained loading tests as specified by EN 926-1.

§5.8 Any existing EN certification for the test specimen, implicitly satisfies the structural strength requirement (§5.7) for the test specimen.

5.3.3 Line breaking strength

§5.9 The test specimen passed the theoretical line breaking strength test specified by EN 926-1 for its top weight, with the following modifications:

- a. A separate test is permitted for each size.
- b. The minimum line breaking strength for all individual line segments, including brake line segments, is 20 daN after bending conditioning according to EN 926-1, section 4.6.2.
- c. The manufacturer defines the load distribution over the span-wise main line planes

§5.10 The breaking strength of each line segment used in the test specimen's construction is equal to or higher than the breaking strength of the equivalent line segment subjected to the structural strength tests (§5.7) which cover the test specimen's size. See §5.7.

§5.11 For a test specimen with existing EN certification, to fulfil the line breaking strength requirements (§5.9 and §5.10), individual lines may be replaced with lines of higher breaking strength without repeating the structural strength tests according to §5.7 nor the flight tests according to §5.15.

7.1.6 Structural strength tests

Structural strength tests are done according to EN 926-1, without any modifications.

7.1.7 Line breaking strength tests

Calculated total line breaking strength tests are performed according to EN 926-1, with modifications regarding the test specimen (EN 926-1, section 4.2), minimum strength of individual line segments, and the distribution of loads between line planes (EN 926-1, section 3.3).

7.1.7.1 Test specimen

Every size of a model can be separately tested, at the maximum allowed total take-off weight of that size. The test does not have to be repeated for a size if that size uses the identically constructed lines (according to EN 926-1, section 2.3) as a bigger size that has already passed the test.

7.1.7.2 Minimum line breaking strength

Minimum line breaking strength of each individual line segment used in the construction of the tested paraglider, including brake line segments, must be according to EN 926-1. If the revision of EN 926-1 (currently 20daN after bending).

7.1.7.3 Load distribution and total force

Load distribution between A, B, C, D and any further line planes is defined by the manufacturer. The sum of the individual calculated breaking forces for all line planes must exceed the total of the forces given by EN 926-1, section 3.3: $14 \times g \times [\text{max weight in flight}]$ with $g=9.81 \text{ m/s}^2$.

CIVL Competition Class Riser definitions and speed limit

5.3.4 Riser set layout

§5.12 The test specimen's accelerator system, when fully engaged, shortens the front-most riser by 17 cm or less, compared to when the accelerator system is not engaged at all.

§5.13 The test specimen's riser sets are designed in a way that prevents a change of relative riser lengths beyond the one achieved by maximum acceleration system travel. In particular, it prevents pilots from achieving higher maximum speeds through application of excessive force on the acceleration system, or through temporary modifications of the riser sets.

§5.14 The only technical means to increase airspeed beyond trim speed in flight is the test specimen's acceleration system.

CIVL Competition Class flight test requirements

5.4.1 Flight test

§5.15 The test specimen passed the flight tests as specified by EN 926-2:2013, with the following modifications:

- a. The test is conducted once, at the size's top weight
- b. No test results are required for
 - i. Roll stability and damping
 - ii. Low-speed spin tendency
 - iii. Recovery from a developed spin
 - iv. B-line stall
 - v. Big ears at trim speed and in accelerated flight
- c. In collapse tests, pilot reaction occurs after 2 seconds
- d. Collapse, deep stall, full stall and high angle of attack recovery tests are performed with a competition harness

§5.16 Any existing EN certification for the test specimen implicitly satisfies the flight test requirement (§5.15) for the test specimen.

CIVL Competition Class Flight Tests

Test name	Description in EN 926-2:2013	Modified test criteria	Test pilot
Inflation/take-off	5.5.18.1		Testing laboratory
Landing	5.5.18.2		Testing laboratory
Speeds in straight flight	5.5.18.3		Testing laboratory
Control movement	5.5.18.4	7.1.8.2.1	Testing laboratory
Pitch stability exiting accelerated flight	5.5.18.5		Testing laboratory
Pitch stability operating controls during accelerated flight	5.5.18.6		Testing laboratory
Behaviour exiting a fully developed spiral dive	5.5.18.9	7.1.8.2.2	Testing laboratory
Symmetric front collapse	5.5.18.10.1-3	7.1.8.2.3	Manufacturer
Exiting deep stall (parachutal stall)	5.5.18.11		Manufacturer
High angle of attack recovery	5.5.18.12		Manufacturer
Recovery from a developed full stall	5.5.18.13		Manufacturer
Asymmetric collapse	5.5.18.14.1-3	7.1.8.2.4	Manufacturer
Directional control with a maintained asymmetric collapse	5.5.18.15		Manufacturer
Trim speed spin tendency	5.5.18.16		Testing laboratory
Quick descent option in straight flight according to user's manual	5.5.18.23	7.1.8.2.5	Testing laboratory
Alternative means of directional control	5.5.18.22		Testing laboratory
Any other flight procedure and/or configuration described in the user's manual	5.5.18.23		Testing laboratory

CIVL Competition Class Flight tests modified from EN D

Measurement and Ranges (according to Table 8)	Classification
Approximately constant (any control travel)	F

Table 2: Addition to EN 926-2:2013, Section 4.4.4 Control movement, Table 9

Measurement and Ranges (according to Table 18)	Classification
More than 4.5 g measured, and “turn remains constant”, and “with pilot action”	F

Table 3: Addition to EN 926-2:2013, Section 4.4.9 Behaviour exiting a fully developed spiral dive, Table 19

Measurement and Ranges (according to Table 20)	Classification
Recovery through pilot action after 2 s in less than a further 5 s	D
Recovery through pilot action after 2 s in more than a further 5 s	F

Table 5: Addition to EN 926-2:2013, Section 4.4.10 Symmetric front collapse, Table 21

Symmetric collapse: 2 s rather than 5 s delay before pilot action: If the paraglider has not recovered spontaneously after 2 s or after 180° of turn (which ever happens first), the pilot acts on the controls to recover normal flight (without inducing a deliberate stall).

Asymmetric collapse: 2 s rather than 5 s delay before pilot action: The pilot shall take no further action and remains passive until the glider either recovers, or changes course by more than 360°, or 2 s elapses.

The user's manual must list at least one quick descent option for straight flight. This option is tested according to EN 926-2:2013, section 5.5.18.23

CIVL Competition Class Test Flight Procedure

7.1.8.3 Modified procedures

In EN 926-2:2013, section 5.5.1 General, disregard the first sentence (*“Two different test pilots of the testing laboratory each carry out one complete programme of the test manoeuvres laid down in 5.5.18, one at the minimum weight in flight declared by the manufacturer, the other one at the maximum weight in flight declared by the manufacturer.”*). Instead, the following applies:

1. The flight tests are carried out once, for the maximum weight in flight declared by the manufacturer.
2. The test specimen for the flight tests must be a production-grade paraglider, without loops or knots in the lines, and equipped with the final, non-prototype riser sets
3. The flight tests in Table 1 marked with “Testing laboratory” in the “Test pilot” column must be performed by a testing laboratory test pilot.
4. The flight tests in Table 1 marked with “Manufacturer” in the “Test pilot” column must be performed by a manufacturer test pilot, with the following additional requirements:
 - a. The tests are performed under direct observation of a test pilot from the testing laboratory.
 - b. In addition to the usual video recording equipment defined by EN 926-2:2013 (section 5.5.4 Video documentation), the manufacturer test pilot is equipped with one or more on-board video cameras to record control movements and accelerator use.
 - c. The correct execution of the tests is verified by the testing laboratory’s test pilot through direct observation as well as inspection of all recorded video evidence.
 - d. The flight tests in Table 1 marked with “Manufacturer” in the “Test pilot” column shall be flown with a competition harness with leg fairing which is compliant with the dimension requirements defined in EN 926-2:2013, section 5.5.6, if doing so does not compromise the test pilot’s safety

CIVL Competition Class certification

5.6 Certification

§5.24 The testing laboratory, after verifying compliance with all requirements, issues a certification of compliance (for a template, see Appendix A) to the manufacturer, and submits a copy of this certification in electronic form to the CIVL competition coordinator at civl_comps@fai.org.

§5.25 The testing laboratory provides CIVL with access to the complete test files in electronic form.

§5.26 The certification becomes official with the publication on CIVL's Web site.

5.7 Marking

§5.27 The conformity of a paraglider to the requirements of this section shall be stated on a stamp or label permanently fixed to the canopy, which shall include the information defined in EN 926-2:2013, section 9, with the following modifications:

- a. Replace d) with "CIVL Competition Class"
- b. Replace f) with the edition of this document, i.e. "2015", and its issue date

CIVL Competition Class: Timing

January 2, 2014: Publication of the final 2015 edition proposal

February 21/22, 2014: CIVL Plenary, decision on acceptance of proposal

January 1, 2015: If accepted by the 2014 Plenary, the definition becomes effective, and will be revised every two years from then on

Late 2015: Publication of the 2017 edition draft

Early 2016: CIVL Plenary, decision on acceptance of the 2017 edition proposal

January 1, 2017: If accepted by the 2016 Plenary, the revised definition becomes effective