



Speed of opening, stability, descent rate

Inspection certificate number: **EP_225.2018**

Test Report

Manufacturer data

Manufacturer name: **Findsterwalder GmbH**
 Representative: **Thomas Finsterwalder**
 Street: **Pagodenburgstrasse 8**
 Post code / Place: **81247 München**
 Country: **B.R. Deutschland**

Sample data

Name: **Diamond Cross ST Tandem** Size: **160**
 Steerable **Yes** Maximum weight in flight ⁽¹⁾ [kg]: **160**
 Weight ⁽²⁾ [kg] **1.778** volume packed [cm³]: **5300**
 Serial number: **DC160-002**

Test data ⁽³⁾

	Test no. 1	Test no. 2
Place of test	Villeneuve	Villeneuve
Date of test	14.12.2017	07.02.2017
Inspector:	Alain Zoller	Alain Zoller

Atmosphere AGL

	Test no. 1	Test no. 2
[°C]	3	5
RH [%]	78	78
[hPa]	973	972.9
Wind [m/s]	0.1	0.2

Summary of both results ⁽⁴⁾

	EN	LTF
Time of opening test [s]:	4.83	4.83
Calculated descent rate test [m/s]:	5.20	5.20
Stability test:	POSITIVE	POSITIVE
Behaviour during descent test:	Stable	Stable



Inspection certificate number: **EP_225.2018**

Formula using to calculate corrected mass

$$m_{corr} := m_{dec} \cdot \frac{p \cdot T_0}{p_0 \cdot T}$$

Sink rate test no. 1 ⁽⁵⁾

Ground level atmospheric pressure at test location: (p)	973 [hPa]
ICAO standard atmospheric pressure at MSL: (p ₀)	1013.25 [hPa]
Ground level temperature at the test location: (T)	3 [°C]
	276.15 [°K]
ICAO standard temperature at MSL: (T ₀)	15 [°C]
	288.15 [°K]
Declared maximum payload: (m _{dec})	160 [kg]
Corrected mass: (m _{corr})	160.32 [kg]
Corrected mass with uncertainty: (m _{corr})	161.22 [kg]
Time when pilot release rescue	8.08 [s]
Time when weak link broken	12.76 [s]
Calculated speed opening [s]:	4.83 [s]
Time ball touch the water:	25.2 [s]
Time pilot touch the water:	31.12 [s]
Time between ball and pilot touching water (30m)	5.77 [s]
Calculated sink rate [m/s]:	5.20 [m/s]

Sink rate test no. 2 ⁽⁵⁾

Ground level atmospheric pressure at test location: (p)	972.9 [hPa]
ICAO standard atmospheric pressure at MSL: (p ₀)	1013.25 [hPa]
Ground level temperature at the test location: (T)	5 [°C]
	278.15 [°K]
ICAO standard temperature at MSL: (T ₀)	15 [°C]
	288.15 [°K]
Declared maximum payload: (m _{dec})	160 [kg]
Corrected mass: (m _{corr})	159.15 [kg]
Corrected mass with uncertainty: (m _{corr})	160.05 [kg]
Time when pilot release rescue	11.12 [s]
Time when weak link broken	14.16 [s]
Calculated speed opening [s]:	3.19 [s]
Time ball touch the water:	12.12 [s]
Time pilot touch the water:	18.28 [s]
Time between ball and pilot touching water (30m)	6.01 [s]
Calculated sink rate [m/s]:	5.00 [m/s]

Inspection certificate number: **EP_225.2018**

Weak link test no. 1



Weak link test no. 2



Instrument & type no.	Validity	Manufacturer	S/N
Weak link	2020	Tost	N/A
Line 30 meter	2020	Air Turquoise SA	N/A
Geos n° 11 Skywatch	08.05.2017	JDC elec.	22

The validation of this test report is given by the signature of the test manager on inspection certificate 71.5.1

Air Turquoise SA has thoroughly tested the sample of emergency parachute mentioned above and certifies its conformity with the standards: **EN 12491:2001 chapter 5.3.3 / 5.3.4 - LTF NFL II 9/09 chapter 6**

⁽¹⁾ Total weight in flight exclude weight of paraglider, also called payload - ⁽²⁾ Weight of the emergency parachute

⁽³⁾ The rescue system is dropped from a paraglider in straight flight at 8 [m/s] +-1 [m/s] and a vertical airspeed of less than 1,5 [m/s]. The paraglider is released as the rescue system begins to open. Wink link 200 [N] is used to measure the speed opening. After a minimum of 100 m of descent, the average rate of descent is measured over 30 m of descent. The test is carried out twice.

⁽⁴⁾ The calculated value include the value minus the uncertainty / The uncertainty stated is the expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor k = 2. The value of the measurand lies within the assigned range of values with a probability of 95%. The tests do not include any compatibility tests with alternative inner containers. Required time from the instant of free drop until a load of 200 [N] is sustained for **EN 5 [s]** and for **LTF 5 [s]**. The required maximum sink rate is for **EN 5.5 [m/s]** and for **LTF 6.80 [m/s]**. The final result is the worst case of both tests.

⁽⁵⁾ Condition for the descent rate test. A. At horizontal airspeed 8 m/s and vertical speed 1.5 m/s B. Formula to be used for correcting the test mass ofr differences from ICAO standard atmosphere

Strength test - 40 m/s opening shock

Inspection certificate number: **EP_225.2018**

Test Report

Manufacturer data

Manufacturer name: **Findsterwalder GmbH**
 Representative: **Thomas Finsterwalder**
 Street: **Pagodenburgstrasse 8**
 Post code / Place: **81247 München**
 Country: **B.R. Deutschland**

Sample data

Name: **Diamond Cross ST Tandem** Size: **160**
 Steerable: **Yes** Maximum weight [kg]: **160**
 Weight [kg]: **1.778** volume packed [cm³]: **5300**
 Serial number: **DC160-001**

Test data ⁽¹⁾

	Test no. 1	Test no. 2
Place of test	Illarsaz	Illarsaz
Date of test	08.12.2016	08.12.2016
Corrected mass [kg]	164.85	164.85
Inspector:	Alain Zoller	Alain Zoller

Atmosphere AGL

	Test no. 1	Test no. 2
[°C]	2	2
RH [%]	67	67
[hPa]	991.4	991.4
Wind [m/s]	0.2	0.2

Test results

	Test no. 1	Test no. 2
Speed of opening (maximum 5 s)	POSITIVE	POSITIVE
Strength test (40m/s shock)	POSITIVE	POSITIVE
Aircraft speed uncertainty K=2 [m/s] ⁽²⁾	1.7	1.7

Item / type no.	Validity	Manufacturer	S/N
Weight	2020	Air Turquoise SA	N/A
Geos n° 11	08.05.2017	JDC elec.	22
Weak link	2020	Tost	N/A



Inspection certificate number: **EP_225.2018**

Formula using to calculate corrected mass

$$m_{\text{corr}} := m_{\text{dec}} \cdot \frac{p \cdot T_0}{p_0 \cdot T}$$

Corrected mass for strength test no. 1

Ground level atmospheric pressure at test location: (p)	991.4 [hPa]
ICAO standard atmospheric pressure at MSL: (p ₀)	1013.25 [hPa]
Ground level temperature at the test location: (T)	2 [°C]
	275.15 [°K]
ICAO standard temperature at MSL: (T ₀)	15 [°C]
	288.15 [°K]
Declared maximum payload: (m _{dec})	160 [kg]
Corrected mass: (m _{corr})	163.95 [kg]
Corrected mass with uncertainty: (m _{corr})	164.85 [kg]

Corrected mass for strength test no. 2

Ground level atmospheric pressure at test location: (p)	991.4 [hPa]
ICAO standard atmospheric pressure at MSL: (p ₀)	1013.25 [hPa]
Ground level temperature at the test location: (T)	2 [°C]
	275.15 [°K]
ICAO standard temperature at MSL: (T ₀)	15 [°C]
	288.15 [°K]
Declared maximum payload: (m _{dec})	160 [kg]
Corrected mass: (m _{corr})	163.95 [kg]
Corrected mass with uncertainty: (m _{corr})	164.85 [kg]

The validation of this test report is given by the signature of the test manager on inspection certificate 71.5.1

Air Turquoise SA has thoroughly tested the sample of emergency parachute mentioned above and certifies its conformity with the standards: **EN 12491:2001 chapter 5.3.5.1 - LTF NFL II 9/09 chapter 6**

⁽¹⁾ The emergency parachute (in its standard inner container and packed according to the user's manual instructions) is stowed on the drop test device. The test parachute's riser (or both risers in the case of a two riser parachute) is (are) connected to the single anchor point on the drop test device using the connector(s) specified and supplied by the parachute manufacturer.

The drop test device is accelerated to a straight line velocity of 40 m/s and the parachute deployed using its handle or handle attachment point by a static line attached to a drogue chute or similar low force deployment system.

The test is carried out twice with the same parachute.

Speed of opening must be less than 5 seconds and shock not exceeded 15g.

⁽²⁾ Calculated value include the value minus the uncertainty (on safe side) / The uncertainty stated is the expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor k = 2. The value of the measurand lies within the assigned range of values with a probability of 95%.

Additional test for steerable parachutes

Inspection certificate number: **EP_225.2018****Test Report**

Manufacturer data

Manufacturer name: **Findsterwalder GmbH**
 Representative: **Thomas Finsterwalder**
 Street: **Pagodenburgstrasse 8**
 Post code / Place: **81247 München**
 Country: **B.R. Deutschland**

Sample data

Diamond Cross ST
 Name: **Tandem** Size: **160**
 Steerable: **Yes** Maximum weight in flight ⁽¹⁾ [kg]: **160**
 Weight ⁽²⁾ [kg]: **1.778** volume packed [cm³]: **5300**
 Serial number: **DC160-002**

Test data ⁽³⁾

	Test no. 1	Test no. 2
Place of test	Villeneuve	Villeneuve
Date of test	14.12.2017	07.02.2017
Inspector:	Alain Zoller	Alain Zoller

Atmosphere AGL

[°C]	3	5
RH [%]	78	78
[hPa]	973	972.9
Wind [m/s]	0.1	0.2

Test results

- | | |
|---|-----------------|
| a The emergency parachute is deployed from a paraglider in normal straight flight. | POSITIVE |
| b The pilot shall take no action while the behaviour of the parachute and paraglider are observed 200 metres. | POSITIVE |
| c The pilot take action while the behaviour of the parachute and paraglider are observed 200 metres. | POSITIVE |
| d Any flight procedure and/or configuration described in the user's manual | POSITIVE |

The validation of this test report is given by the signature of the test manager on inspection certificate 71.5.1

Air Turquoise SA has thoroughly tested the sample of emergency parachute mentioned above and certifies its conformity with the standards: **EN 12491:2001 chapter 5.3.6 - LTF NFL II 9/09 chapter 6**

(1) Total weight in flight exclude weight of paraglider, also called payload - (2) Weight of the emergency parachute

⁽³⁾ Check whether every other flight procedure and/or configuration described in the user's manual can be flown safely. This can be done during the opening, stability and descent rate test is done