



Test Report

This test report describes the test results of the below mentioned paragliding harness.

All the tests were carried out by:

Air Turquoise SA, official test laboratory of Switzerland.

para-test.com



paragliding by air turquoise

Standards

Tests were carried out in conformity with the following standards:

- 2. DV LuftGerPV §1, Nr. 7 c (*note: in what follows this will be abbreviated by "LTF")
- European Standard EN1651 September 1999 (*note in what follows this will be abbreviated by "EN")
- European Standard EN12491 September 2001 (*note in what follows this will be abbreviated by "EN12491")

Harness details

Manufacturer:	Flugsau GmbH
Harness model:	Front container
Size:	S - M - L
Harness Weight:	na
Maximum certified pilot	na kg
Impact protection type:	na
Harness type:	na

Test responsible:	Alain Zoller
Test place:	Villeneuve
Test date:	August 27, 2013
Test room temp & humidity:	22,4° C; 49 %rel
Certification number EN:	PH 069.2013
Certification number LTF:	GZ 000.0000

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Air Turquoise SA certified by



Air Turquoise S.A. - Certification of paraglider equipment
 Tested in accordance with EN 1651:1999 and 2.DV LuftGerPV§1, Nr.7c

Prepared by RE
 Rev.0, 25.01.2011
 No. 71.9.3



Test summary

A. STRUCTURAL STRENGTH TESTS

A test plan was set up in order to execute the different tests in an efficient order. The table below summarizes this test plan together with the applicable standards and results.

Test ID	TESTED ?	Standard Ref.		TEST setup	Anchoring		Forces		Min. Test duration [sec]	Result
		EN	LTF		Attach - ment points	Dummy	Req. Load in g	Min. force [N]		
1		5.3.2.1		Default flying position	2 main attachment points	Hip fixated	6g	6000	10	n/a
2			4.2.1.a				9g	9000		
3		5.3.2.2		Default, landing position	2 main att. points	Hip fixated, landing conf.	6g	6000	10	n/a
4			4.2.1.b				15g	15000		
5			4.2.1.a rescue	Rescue	2 rescue att. Pnts.	Hip fixated	9g	9000	10	n/a
6		5.3.2.4					15g	15000		
7			4.2.1.b rescue	Rescue, landing		Hip fixated, landing conf.	6g	6000	10	n/a
8		5.3.2.3		One riser	ONE main att.	1 central hip fixation	6g	6000	10	n/a
9			4.2.1.d	Towing	2 main att. + 2 tow att.	None	3g	3000	10	n/a
		5.3.2.5					5g	5000		
10		5.3.2.6		Default, Negatif	One main att.	Head fix.	4.5g	4500	10	n/a
11			4.2.1.c	Upside down	2 main att. downw.	Head fix.	6g	6000	10	n/a
12			4.2.1.c rescue	Upside down rescue	2 rescue att. downw.		6g	6000	10	n/a

B. HARNESS PROTECTION SHOCK TEST

Most paraglider harnesses are equipped with a protection device that damps the shock on the pilot's spine during a hard landing.

Shock impact tests have to be executed on these harnesses in order to prove the damping characteristics of it.



Test ID	TESTED ?	Standar d Ref.:	TEST setup	Anchoring		Impact			Result	
		LTF		Attach- ment points	Dummy	Max. tolerated peak impact in g	Max Peak impact measured	Impact duration of + 38 g (if any) recorded:		Impact duration of + 20 g (if any) recorded:
PRO TECT 1		5.1.1	Default flying position	Test dummy is attached to the harness like a pilot in flight.		+50g	0	0	0	n/a

C. RESCUE DEPLOYMENT RESISTANCE TEST

The deployment of the rescue system has to be ensured in all circumstances of flight. This test is to verify whether the force needed to deploy is in between reasonable limits.

Test ID	TESTED ?	Standar d Ref.	TEST setup	Anchoring		Force for single hand deployment			Result
		LTF		Attach- ment points	Dummy	Min. force [N]	max. force [N]	Resistance measured [daN]	
Resc depl	✓	6.1.5	Default flying position	Test responsible is attached to the harness like a pilot in flight. (no dummy required)		20 N	70 N	n/t	OK

D. RESCUE DEPLOYMENT STRAP STRENGTH TEST

The connection between handgrip and inner container has to have sufficient load capacity/structural strength in any situation that may arise during normal use. During this test is verified, whether this connection fulfill the requirements.

Test ID	TESTED ?	Standard Ref.		TEST setup	Minimum force [N]	Min. Test durati on [s]	Breaking resistance measured	Result
		LTF	EN 12491					
Resc strap	✓	6.1.8	5.3.2	Connection strap in tensile testing machine	700N	10	n/t	OK

After careful examination as explained in above mentioned test reports (from page 2 to page 18), the undersigned persons declare that the harness:

**Flugsau GmbH
Front container
S - M - L**

Complied with:

- **European Standard EN 1651 September 1999**

And / or (if tested)

- **European Standard EN 12491 March 2001**

And / or (if tested)

- **2. DV LuftGerPV §1, Nr. 7 c**

Villeneuve, August 27, 2013

Place, Date



EN & LTF Testing center
Alain Zoller 
www.para-test.com

Test responsible

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Rescue deployment resistance test		Test ID resc
Item:	Front container	
Manufacturer	Flugsau GmbH	
Test place & date:	Villeneuve	August 27, 2013
Test responsible:	Alain Zoller	
Temp. [°C] & Humidity:	22,4° C; 49 %rel	
Maximum certified pilot weight [kg]:	na	kg
Standard	2. DV LuftGerPV §1, Nr. 7 c	
Test standard §:	6.1.5	
Test setup:	<p>The deployment of the rescue system has to be ensured in all circumstances, especially with a damaged glider.</p> <p>The pilot has to be able to deploy the rescue chute with a single pull out of the outer container, single handed and in an anatomical favorable direction.</p> <p>In order to simulate this, the test responsible deploys the rescue seated in the harness. In a similar way as in real flight. The deployment resistance is approximately measured by the load cell, which is placed between the hand of the test responsible and the rescue hand grip.</p> <p>On the other hand inadvertent deployment has to be fairly remote. Therefore a shear link has to withstand a minimum load.</p>	
Requirements:	<p>Max force for single hand deployment:</p> <p>Min force to prevent unwanted opening:</p>	<p>approx. 70 N</p> <p>approx. 20 N</p>
Results		
Measured peak to peak required force for deployment [daN]:	3.7 daN	
Comment:	Passed	
Graph:		

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Annex TEST ID resc depl
 Prepared by RE
 Rev.0, 25.01.2011
 No. 71.9.3



Rescue deployment strap strength test

Test ID resc strap

Item: Front container
 Manufacturer: Flugsau GmbH
 Test place & date: Villeneuve August 27, 2013
 Test responsible: Alain Zoller
 Temp. [°C] & Humidity: 22,4° C; 49 %rel
 Maximum certified pilot weight [kg]: na kg

Standard: EN 12491 & 2. DV LuftGerPV §1, Nr. 7 c

Test standard §: 5.3.2 (EN 12491) & 6.1.8 (LTF)

Test setup: The handgrip of the outer container has to be connected to the inner container with a removable loop in a way that it is possible to use the inner container with different types of outer containers.
 The connection between handgrip and inner container has to have sufficient load capacity/structural strength in any situation that may arise during normal operation.
 In order to verify this, the connection is tested on its tensile strength by a default tensile testing setup.
 In addition to this the breaking resistance will also be measured.

Requirements: Min. tensile strenght for 10 s: 700 N (= 70daN)

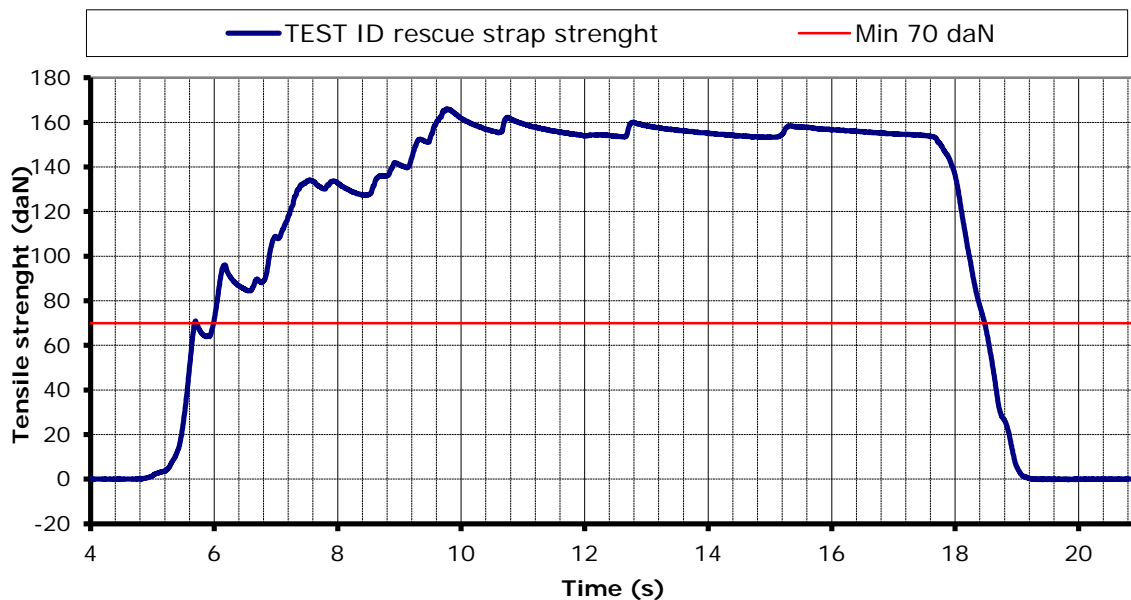
Results

Duration of maintained load [s]: **> 10 sec.**

Breaking resistance [daN]: **501.5 kg**

Comment: **Passed**

Graph:



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 Tested in accordance with EN 1651:1999 and 2.DV LuftGerPV§1, Nr.7c

Annex TEST ID resc strap
 Prepared by RE
 Rev.0, 25.01.2011
 No. 71.9.3

FLUGSAU GmbH
Mr. Andre Bernhard
Alplerhaus
6388 GRAFENORT
Switzerland

Strap Certificate

The hereunder sample of the strap (riser) of rescue has been tested in accordance with following German standards: 2. DV LuftGerPV, §1, Nr. 7 c (6.1.4)

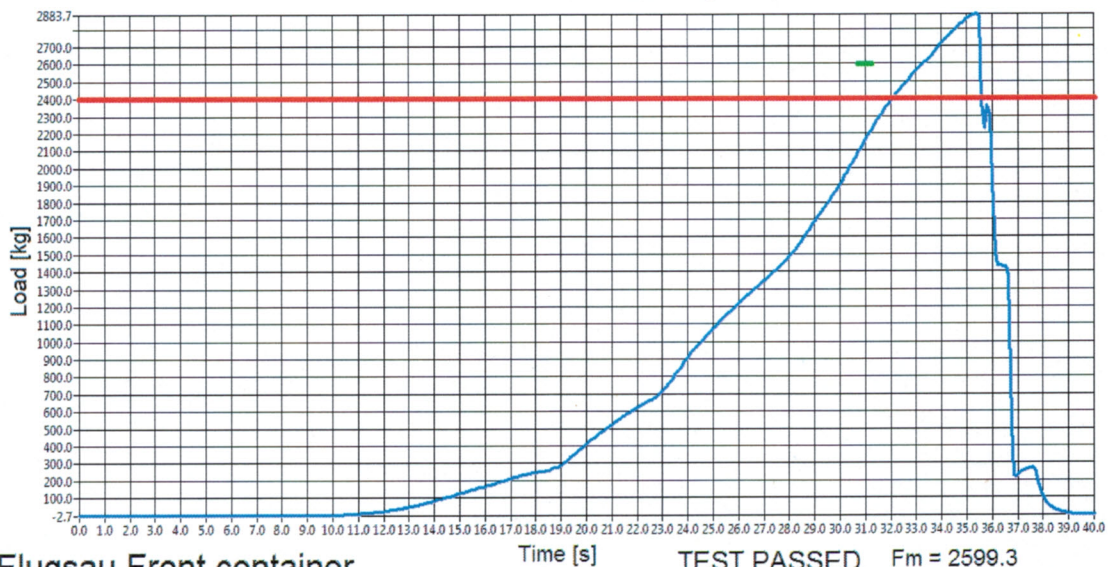
Manufacturer: Flugsau GmbH

Model and size: Front Container

Maximum load of the strap: 2883.7 daN

Air Turquoise Homologations
LOAD DIAGRAM

Alain Zoller
Rue de la Poterlaz 6, CP-10
CH-1844 Villeneuve
079 202 52 30 / info@airturquoise.ch



Flugsau Front container
Test Load [kg] = 2400

TEST PASSED Fm = 2599.3
02/09/2013 - 15:25

measurement with ShockRecord
(c) 2008 Jonas Buchli jonas@buchli.org

Villeneuve, 03.09.2013

Alain Zoller

