

Test Report

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

All the tests were carried out by:

Air Turquoise - Para-test, official test laboratory of Switzerland



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")

Harne		lotai	C
TICHTIC	533 U	letai	0

Manufacturer:	SUP'AIR
Harness model:	Walibi 2
Size:	Medium
Harness Weight:	3.3 kg
Maximum certified pilot	100 kg
Impact protection type:	Air bag
Harness type:	ABS
Test responsible:	Alain Zoller Villeneuve
Test place:	August 18, 2014
Test date:	20° C; 38 %rel
Test room temperature &	PH 111.2014
Certification number EN:	GZ 111.2014
Certification number LTF:	

The management system governing the provision of this test service is ISO 9001 certified:



page 1 of 4



Test summary

A. STRUCTURAL STRENGHT 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.

		Standa	ard Ref.	٩	Anch	oring	For	ces	Min.	
Test ID	TESTED ?	EN	LTF	TEST setup	Attach - ment points	Dummy	Req. Load in g	Min. force [N]	Test durati on [sec]	Result
1	~	5.3.2.1	4.2.1.a	Default flying position	2 main attachment points	Hip fixated	6g 9g	6000 9000	10	ок
2	✓	5.3.2.2		position	points		15g	15000	5	ΟΚ
3	✓		4.2.1.b	Default, landing	2 main att.	Hip fixated,	6g	6000	10	ок
4	✓	5.3.2.7		position	points	landing conf.	15g	15000	5	ОК
5	✓		4.2.1.a rescue	Rescue		Hip fixated	9g	9000	10	ок
6	\checkmark	5.3.2.4			2 rescue att. Pnts.		15g	15000	5	ΟΚ
7	~		4.2.1.b rescue	Rescue , landing	PHIS.	Hip fixated, landing conf.	6g	6000	10	ОК
8	✓	5.3.2.3		One riser	ONE main att.	1 central hip fixation	6g	6000	10	ОК
9		5.3.2.5	4.2.1.d	Towing	2 main att. + 2 tow att.	None	3g 5g	3000 5000	10	n∕t
10	✓	5.3.2.6		Default, Negatif	One main att.	Head fix.	4.5g	4500	10	ОК
11	✓		4.2.1.c	Upside down	2 main att. downw.		6g	6000	10	ок
12	✓		4.2.1.c rescue	Upside down rescue	2 rescue att. downw.	Head fix.	6g	6000	10	ок

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.

page 2 of 4



				Ancl	horing		Impac	t		
Test ID		Standa rd Ref.: 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:	Result
PRO TECT 1	~	5.1.1	Default flying position	the harness	v is attached to s like a pilot in ight.	+50g	24.4 g	-	18 msec	ОК

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	rested ?	Standa rd Ref. LTF		Anc Attach- ment points	horing Au	Force for sir Min. force [N]	ngle han wax. force [N]	nd deployment Resistance measured [daN]	Result
Resc	~	6.1.5	Default flying	to the harne	sble is attached ss like a pilot in ight.		70 N	4.3 daN	ОК
depl			position	(no dumr	ny required)				

D. RESCUE DEPLOYMENT STRAP STRENGHT 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 ?	Standa LTF	ard Ref. EN 12491	TEST setup	Minimum force [N]	Min. Test durati on [s]	Breaking resistance measured	Result
Resc strap	~	6.1.8	5.3.2	Connection strap in tensile testing machine	700N	10	107 daN	ОК

page 3 of 4





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

SUP'AIR Walibi 2 Medium

complies 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 18, 2014

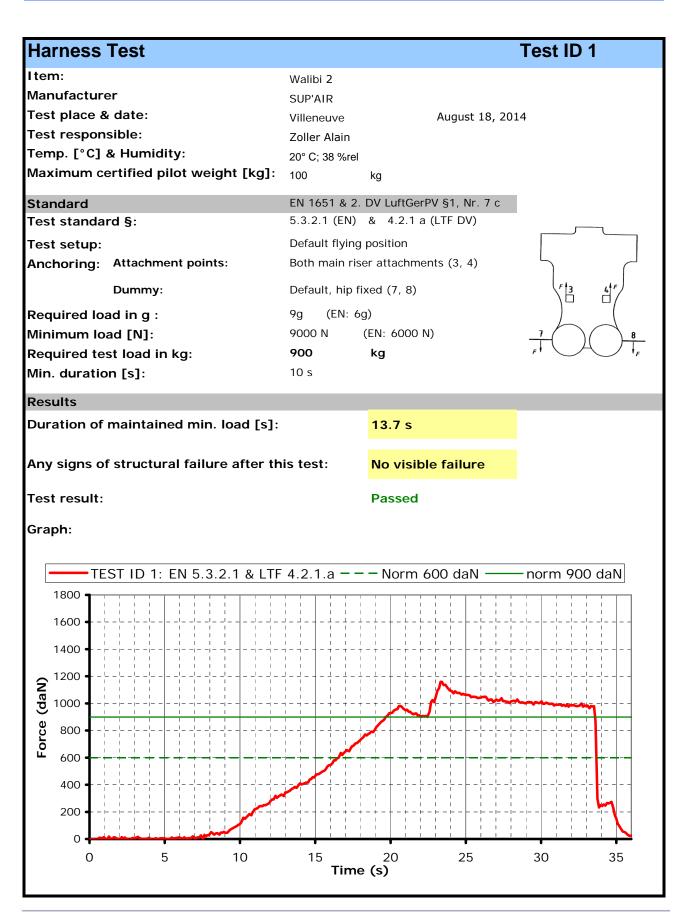
Place, Date

ting cente Test responsible.Dara-tes

page 4 of 4



Annex: detailed test reports





Harness Test	Test ID 2
Item: Manufacturer Test place & date: Test responsible: Temp. [°C] & Humidity:	Walibi 2 SUP'AIR Villeneuve August 18, 2014 Zoller Alain 20° C; 38 %rel
Maximum certified pilot weight [kg]:	100 kg
Standard	EN 1651
Test standard §:	5.3.2.2
Test setup:	Default flying position
Anchoring: Attachment points:	Both main riser attachments (3, 4)
Dummy:	Default, hip fixed (7, 8)
Required load in g:	15 g
Min load [N]:	$\frac{15\ 000\ N}{f}$
Required test load in kg: Min. duration [s]:	1500 kg F' V V _F
Results	17.0
Duration of maintained min. load [s]:	15.0 s
Any signs of structural failure after this	is test: No visible failure
Test result:	Passed
Graph:	
TEST ID 2: E	N 5.3.2.2 — Norm 1500 daN
$ \begin{array}{c} 1800 \\ 1600 \\ 1400 \\ 1400 \\ 1200 \\ 0 \\ 0 \\ 0 \\ 0 \\ 36 \\ 41 \\ 46 \\ 1800 \\ 1600 $	51 56 61 66
30 41 46	51 56 61 66 Time (s)

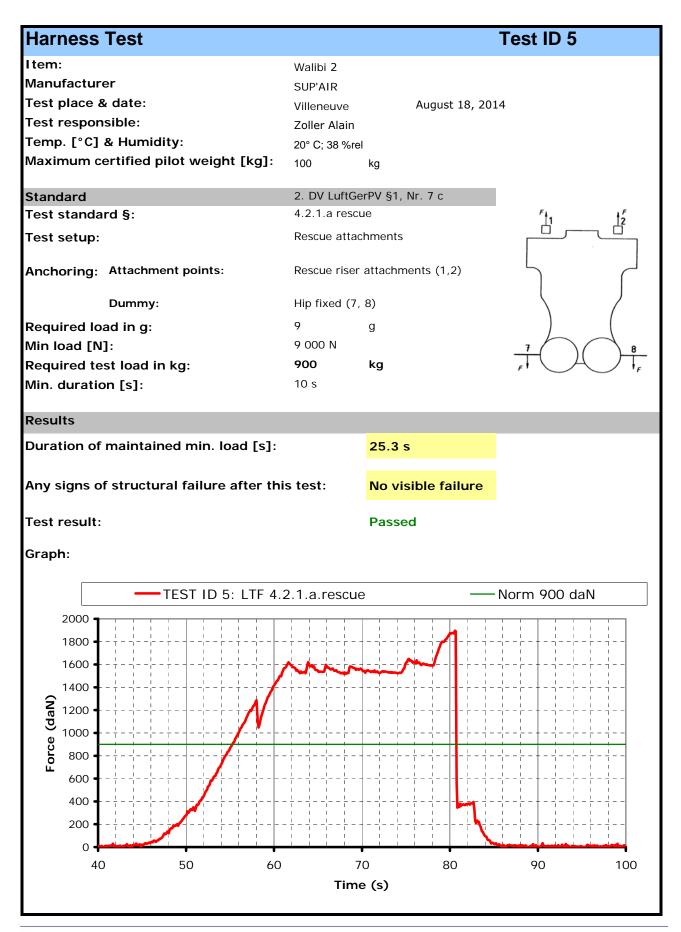


Harness Test			Test ID 3
Item: Manufacturer Test place & date: Test responsible: Temp. [°C] & Humidity: Maximum certified pilot weight [kg]:	Walibi 2 SUP'AIR Villeneuve Zoller Alain 20° C; 38 %rel 100	August 18, 2()14
Standard	2. DV LuftGerPV	′§1, Nr. 7 c	
Test standard §:	4.2.1.b		-
Test setup: Anchoring: Attachment points: Dummy:	board (11) in lar straps (10) close	n riser attachments 4);	3/4
Required load in g:	6	g	7/8
Min load [N]:	6000 N		Tr Ar
Required test load in kg:	600	kg	
Min. duration [s]:	10 s		
Results			
Duration of maintained min. load [s]:		21.3 s	
Any signs of structural failure after th	is test:	No visible failure	
Test result:		Passed	
Graph:			
TEST ID 3: LTI	F 4.2.1.b	Norm	600 daN
2000			
1800		++-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-	
1600	·		
1400 •			
1200 1000 1000 1000 1000 1000		+ - + - + - - + - + - + - -	
U 1000 •	+ +	+ + +	
5 800 -		, , , , , , , , , , , , , , , , , , ,	· · · · · · · · · · · · · · · · · · ·
600		I I I I I I I I I I I I I I I	
400		· · · · · · · · · · · · · · · · · · ·	
200 +			
0 5 10	15 20	25 30) 35 40
	Time		



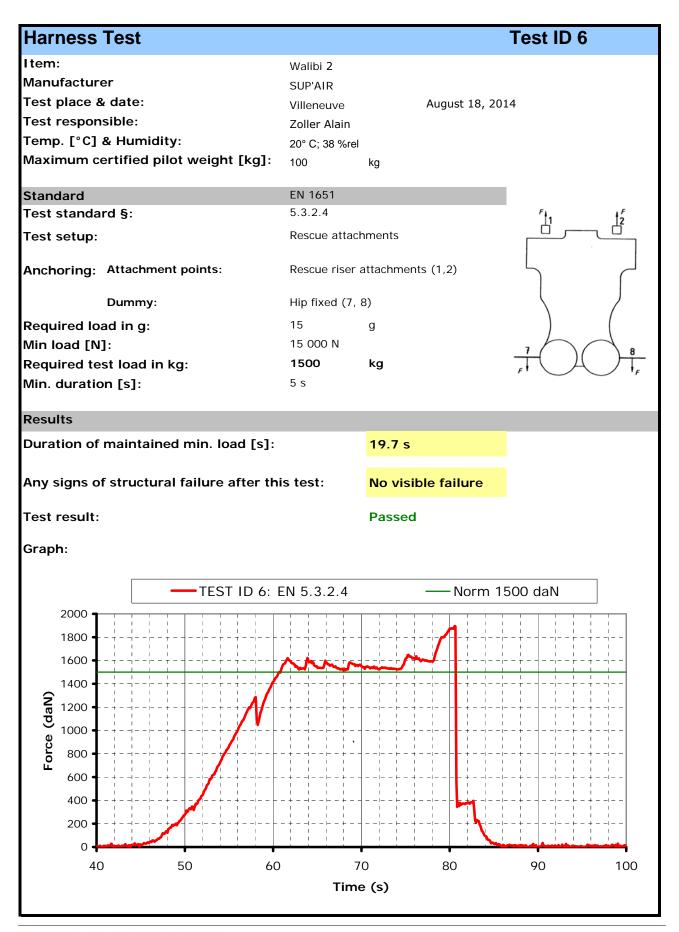
Harness Test	Test ID 4	
Item: Manufacturer Test place & date:	Walibi 2 SUP'AIR Villeneuve August 18, 2014	
Test responsible: Temp. [°C] & Humidity: Maximum certified pilot weight [kg]:	Zoller Alain 20° C; 38 %rel 100 kg	
Standard	EN 1651	
Test standard §:	EN 5.3.2.7	
Test setup:	Flying position before landing: seat board (11) in landing position, leg straps (10) closed.	Ð
Anchoring: Attachment points: Dummy:	attached (3 and 4); Default, hip fixed (7, 8)	
Required load in g:	15 g	10
Min load [N]:	15 000 N	<i>I</i> -11
Required test load in kg:	1500 kg	
Min. duration [s]:	5 s	
Results		
Duration of maintained min. load [s]:	11.6 s	
Any signs of structural failure after this	test: No visible failure	
Test result:	Passed	
Graph:		
TEST ID 4: EN 5	5.3.2.7 — Norm 1500 daN	
2000 •		
1600 •		
1200 1200 1000 1000 800 1000		
1000 •		
200 •		
0 4	20 25 30 35	40
	Time (s)	







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





Harness Test				Test ID 7
I tem: Manufacturer Test place & date: Test responsible: Temp. [°C] & Humidity: Maximum certified pilot weight [kg]:	Walibi 2 SUP'AIR Villeneuve Zoller Alain 20° C; 38 %rel 100	kg	August 18, 201	14
Standard	2. DV LuftGerF	N/ 81 Nr	7 c	
Test standard §:	4.2.1.b rescue		, ,	1
Test setup: Anchoring: Attachment points:	Flying position board (11) in l straps (10) clo Both of the res attached (1 an	anding po sed. scue riser a	sition, leg	1/2 5
Dummy:	Default, hip fix			
Required load in g: Min load [N]: Required test load in kg: Min. duration [s]:	6 000 N	g kg		
Results				
Duration of maintained min. load [s]: Any signs of structural failure after th		27.6 s No visib	le failure	
Test result:		Passed		
Graph:				
TEST ID 7: LTI	F 4.2.1.b.res	cue	No	rm 600 daN
2000 1800 1600 1400 1200 1200 1000 1000 400 50 600 400 600 600 600 600 600 60				90 100
	Time	(s)		



Test responsible: Zolle Temp. [°C] & Humidity: 20°C Maximum certified pilot weight [kg]: 100 Standard EN 1 Test standard §: 5.3.2 Test standard §: 5.3.2 Test setup: Only Anchoring: Attachment points: One Dummy: Hip f Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph:	AIR heuve August 18, 2014 rr Alain c; 38 %rel kg 651 2.3 one riser attached main riser attached main riser attachments (3) ixed (7, 8 -> 12) g 0 N kg 11.4 s
Test standard §: 5.3.2 Test setup: Only Anchoring: Attachment points: One Dummy: Hip f Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: 800 TEST ID 8: EN 5.3.2.3	2.3 one riser attached main riser attachments (3) ixed (7, 8 -> 12) g 0 N kg 11.4 s st: No visible failure
Test standard §: 5.3.2 Test setup: Only Anchoring: Attachment points: One Dummy: Hip f Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: 800 TEST ID 8: EN 5.3.2.3	one riser attached main riser attachments (3) ixed (7, 8 -> 12) g 0 N kg 11.4 s st: No visible failure
Anchoring: Attachment points: One Dummy: Hip f Required load in g: 6 Min load [N]: 6000 Required test load in kg: 6000 Min. duration [s]: 10 s Results Duration of maintained min. load [s]: Any signs of structural failure after this test Test result: Graph: 0 0 0 0 0 0 0 0 0 0 0 0 0	main riser attachments (3) ixed (7, 8 -> 12) g 0 N kg 11.4 s st: No visible failure
Dummy: Hip f Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: Any signs of structural failure after this test Test result: Graph: TEST ID 8: EN 5.3.2.3	ixed (7, 8 -> 12) g N kg 11.4 s st: No visible failure
Dummy: Hip f Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: Any signs of structural failure after this test Test result: Graph: TEST ID 8: EN 5.3.2.3	ixed (7, 8 -> 12) g N kg 11.4 s st: No visible failure
Required load in g: 6 Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: TEST ID 8: EN 5.3.2.3	g kg 11.4 s st: No visible failure
Min load [N]: 6 000 Required test load in kg: 600 Min. duration [s]: 10 s Results Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: 00 00 00 00 00 00 00 00 00 0	kg 11.4 s st: No visible failure
Required test load in kg: 600 Min. duration [s]: 10 s Results 10 s Duration of maintained min. load [s]: 10 s Any signs of structural failure after this test 10 s Test result: 10 s Graph: 10 s 10 s 10 s	kg 11.4 s st: No visible failure
Min. duration [s]: 10 s Results Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: 800 TEST ID 8: EN 5.3.2.3	11.4 s st: No visible failure
Results Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: 	st: No visible failure
Duration of maintained min. load [s]: Any signs of structural failure after this tes Test result: Graph: TEST ID 8: EN 5.3.2.3	st: No visible failure
Any signs of structural failure after this tes Test result: Graph: TEST ID 8: EN 5.3.2.3	st: No visible failure
Test result: Graph: 	
Test result: Graph: 	
Graph: TEST ID 8: EN 5.3.2.3	Passad
	rasseu
800	
800	Norm 600 daN
700	
	Net many in the second
600 -	
€ 500	
g 400 •	
<u>Б</u> 300 •	╶┽╌┾╴┿╴┥╴┥╴┊╴┊ <mark>╻</mark> ╶╌╴┽╴┼╴┾╴╶┿╴┥╴
200	
100	
o have an interest of the second	I I I I Manalande I I I
0 10 20	U
	30 40 50



Item: Walibi 2 Manufacturer SUP'AIR Test place & date: Villeneuve August 18, 2014 Test responsible: Zoller Alain Temp. [°C] & Humidity: 20° C; 38 %rel Maximum certified pilot weight [kg]: 100 kg Standard EN 1651 Test standard §: 5.3.2.6 Test standard §: Standard flying position in NEGATIF Anchoring: Attachment points: Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg Min. duration [s]: 10 s
Standard EN 1651 Test standard §: 5.3.2.6 Test setup: Normal flying position in NEGATIF Anchoring: Attachment points: ONE of the main riser attachments attached downwards(3 or 4); Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
Test standard §: 5.3.2.6 Test setup: Normal flying position in NEGATIF Anchoring: Attachment points: ONE of the main riser attachments attached downwards(3 or 4); Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
Test setup: Normal flying position in NEGATIF Anchoring: Attachment points: ONE of the main riser attachments attached downwards(3 or 4); Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
Anchoring: Attachment points: ONE of the main riser attachments attached downwards(3 or 4); Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
Dummy: Dummy anchored at the head position (9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
(9) Required load in g: 4.5 g Min load [N]: 4500 N Required test load in kg: 450 kg
Min load [N]: 4500 N Required test load in kg: 450 kg
Required test load in kg: 450 kg
Results
Duration of maintained min. load [s]: 17.7 s
Any signs of structural failure after this test: No visible failure
Test result: Passed
Graph:
500 •
a b
8 300 - - +
200
100
0 10 20 30 40 50 60
Time (s)



Harness Test	Test ID 11		
Item:	Walibi 2		
Manufacturer	SUP'AIR		
Test place & date:	Villeneuve August 18, 2014		
Test responsible:	Zoller Alain		
Temp. [°C] & Humidity:	20° C; 38 %rel		
Maximum certified pilot weight [kg]:	100 kg		
Standard	2. DV LuftGerPV §1, Nr. 7 c		
Test standard §:	4.2.1.c		
Test setup:	Pilot upside down flying position		
Anchoring: Attachment points:	Both of the main riser attachments attached downwards (3 and 4);		
Dummy:	Dummy anchored at the head position (9)		
Required load in g:	6 g		
Min load [N]:	6 000 N		
Required test load in kg:	600 kg ()()		
Min. duration [s]:	10 s		
Results			
Duration of maintained min. load [s]:	10.8 s		
Any signs of structural failure after this	is test: No visible failure		
Test result:	Passed		
Graph:			
TEST ID 11: LTF	F 4.2.1.c — Norm 600 daN		
900			
800			
700			
600			
a b b b b c c c c c c c c c c			
3 400 •			
H A A A A A A A A A A			
L 300 -			
200			
0 5 10 15 20 25 30 35 40 Time (s)			



Harness Test			Test ID 12
Item:	Walibi 2		
Manufacturer	SUP'AIR		
Test place & date:	Villeneuve	August 18, 20	14
Test responsible:	Zoller Alain	August 10, 20	
Temp. [°C] & Humidity:	20° C; 38 %rel		
Maximum certified pilot weight [kg]:	100	kg	
Standard	2. DV LuftGer		
Test standard §:	4.2.1.c rescue		$\frac{1}{1}$ $\frac{1}{9}$ 2
Test setup:	Pilot upside de	own flying position	
Anchoring: Attachment points:	Both of the rescue riser attachments attached downwards (1 and 2);		
Dummy:	Dummy anchored at the head position (9)		
Required load in g:	6	g) (
Min load [N]:	6 000 N		
Required test load in kg:	600	kg	(\mathcal{A})
Min. duration [s]:	10 s		
Results			
Duration of maintained min. load [s]:		13.4 s	
Any signs of structural failure after th	nis test:	No visible failure	
Test result:		Passed	
Graph:			
TEST ID 12: LTF	4.2.1.c.resc	ue — Norm	600 daN
800			
700			
600		w www.	
	· · · // · ·		
Solution B B B B B C C C C C C C C C C			
0 300 -			
H			
200			
100	• +-+- -+-+-+		
- Aman marker			Manne
0			
0 5 10 15 20 25 30 35 40			
Time (s)			



Protector shock test	Test ID Protect		
Item: Manufacturer Test place & date: Test responsible: Temp. [°C] & Humidity: Maximum certified pilot weight [J	Walibi 2 SUP'AIR Villeneuve August 18, 2014 Zoller Alain 20° C; 38 %rel Yollow Kg		
Standard	2. DV LuftGerPV §1, Nr. 7 c		
Test standard §:	5.1.1		
Test setup:	Harness attached to protector test dummy, in a similar way like a real pilot in flight. Impact will be simulated by dropping the dummy from a certain height. To simulate the "in-flight" conditions, the airbag is inflated with		
Requirements: Minimun height:	pressurized air equalling an airspeed of 7m/s. Inflation has to be stopped at least 5 sec before impact. Impact will be measured by an accelerometer mounted on the dummy. (Impact measured in g's) 1.65 m (between lowest point test dummy and impact surface)		
Impact requirements:	+50g as absolute maximum;		
	+38g during less than 7 msec; +20g during less than 25 msec.		
Results			
Impact at a height of 1.5m:	24.4 g		
Impact duration of+ 38 g (if any)	:		
Impact duration of +20 g (if any)	: 18 msec		
Comment:	Passed		
Graph:			
TEST ID PROTECT: LTF 5	.1.1 — Norm +50g — Norm +38g — Norm +20g		
30.0000 25.0000 20.0000 15.0000 5.			
5.500 5.700 5.900 6.100 6.300 6.500 6.700 6.900 7.100 7.300 7.500 Time (s)			





Rescue deplo	oyment resistanc	e test		Test ID resc
I tem: Manufacturer Test place & date Test responsible: Temp. [°C] & Hun Maximum certifie		Walibi 2 SUP'AIR Villeneuve Zoller Alain 20° C; 38 %rel 100	August 18, 2014 kg	
Standard		2. DV LuftGerP	V 81 Nr 7 c	
Test standard §:		6.1.5	V 91, NI. 7 C	
Test setup:		The deploymer circumstances, The pilot has to pull out of the	It of the rescue system h especially with a damage b be able to deploy the r outer container, single h prable direction.	ged glider. escue chute with a single
		seated in the h deployment res	arness. In a similar way sistance is approximately aced between the hand	
			and inadvertent deploym ore a shear link has to v	nent has to be fairly vithstand a minimum load.
Requirements:	Max force for single hand deployment: Min force to prevent unwanted opening:	approx. 70 N approx. 20 N		
Results				
	peak required force daN]:		4.3 daN	
Comment:			Passed	
Graph:				



Rescue deployment strap stre	ngth test	Test ID resc strap		
I tem: Manufacturer Test place & date: Test responsible: Temp. [°C] & Humidity: Maximum certified pilot weight [kg]:	Walibi 2 SUP'AIR Villeneuve Zoller Alain 20° C; 38 %rel 100	August 18, 2014 kg		
Standard	EN 12491 & 2. DV LuftGerPV §1, Nr. 7 c			
Test standard §: Test setup: Requirements: Min. tensile strenght for	 5.3.2 (EN 12491) & 6.1.8 (LTF) 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. 			
10 s:	/00111(= /00			
Results				
Duration of maintained load [s]:	7.3 s			
Breaking resistance [daN]:	107 daN			
Comment: Graph:	Passed	Passed (although a duration of 10 s was not obtained the test responsible considers this test as passed giving the high break resistance)		
TEST ID rescue str 120 100 100 100 100 100 100 100	5 20 Time (s			

