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TEST REPORT

Report Ref: LEI24010113A	
Date Received: 03/01/2024	Date Issued: 24/01/2024

Company Name & Address:	Smart Rider LTD Mishmar Hanegev 1 Mishmar Hanegev 853500 Israel
Contact Name:	Yoram

Order No.:	None given
Description:	Equestrian body protector
Ref / Style number:	#316
No. of Samples:	7
Size Range:	CXXS-AL 9 sizes
Foam description:	Multi layers NBR total 22mm
Specification:	BS EN 13158:2018 - Protective jackets, body and shoulder protectors for equestrian use, for horse riders and those working with horses, and for horse drivers.

Tests Conducted	Method	Pass/Fail
Protective material dimensions in protective jackets and body protectors	BS EN 13158:2018 clause 4.2.2	Pass
Exceptions to the requirements in clause 4.2.2	BS EN 13158:2018 clause 4.2.3	Pass
Adaptability and adjustability	BS EN 13158:2018 clause 4.2.5	Pass
Movement of protective material blocks and gaps between them	BS EN 13158:2018 clause 4.3	Pass
Restraint	BS EN 13158:2018 clause 4.4	Pass
Ergonomic requirements	BS EN 13158:2018 clause 4.5	Pass
Impact performance requirements	BS EN 13158:2018 clause 4.6	Pass

COMMENT: Where the results of a test fall close to the requirement, compliance with the specification may be affected by the uncertainty of measurement of the test.
In those circumstances, the client is advised to contact the laboratory for further information.

Unmarked tests included in this report are included on UKAS Scope 1516.

Simon Bretherton
Technical/Quality Coordinator

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Photograph of body protector

Manufacturers' cleaning instructions

Sample identification	Is protective material removed?	Type of cleaning of protective material	Maximum number of cycles
Model #316	No	Remove foam before handwashing outer	N/A
Is cleaning up to 5 times required before examination?			No

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DESIGN AND MEASUREMENT FOR HORSE RIDERS
BS EN 13158:2018
Clause 4.2.2

RESULTS

					Required Value, cm 'more than', or 'less than' according to sign								Measured Value (cm)	
			Size		#316 Child XXS		#316 Child XS		#316 Child S		#316 Child M		#316 Adult XS	
					Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
	A		**Manufacturer's Size Chart**		64	68	68	72	72	77	77	81	83	87
	B				60	66	64	70	69	74	74	77	79	82
	C				63	68	67	72	72	77	78	84	83	90
	D-D^1 E-E^1		¼ A_{max}		17.0		18		19.3		20.25		21.75	
	M		½ C_{max}		34		36		38.5		42		45	
	Measurements				R	M	R	M	R	M	R	M	R	M
Clause 4.2.2 Table 1	A^1_{min}		<107% A_{min}**D**		68.5	67.0	72.8	70.0	77.0	78.0	82.4	77.0	88.8	83.0
	A^1_{min}		<107% A_{min}**A**		68.5	0.0	72.8	0.0	77.0	74.0	82.4	0.0	88.8	0.0
	A^1_{max}		>103% A_{max}		70.0	73.0	74.2	76.0	79.3	85.0	83.4	86.0	89.6	90.0
	B^1_{min}		<110% B_{min}**D**		66.0	64.0	70.4	68.0	75.9	73.0	81.4	73.0	86.9	79.0
	B^1_{min}		<110% B_{min}**A**		66.0	0.0	70.4	0.0	75.9	70.0	81.4	0.0	86.9	0.0
	B^1_{max}		>102% B_{max}		67.3	69.0	71.4	74.0	75.5	81.0	78.5	81.0	83.6	87.0
	D	Chest	>43% C_{max}		29.2	36.3	31.0	36.7	33.1	38.3	36.1	41.7	38.7	45.0
	E	Back	>57% C_{max}		38.8	42.1	41.0	47.4	43.9	47.5	47.9	52.1	51.3	58.8
	F	C/Back	>52% C_{max}		35.4	37.2	37.4	41.3	40.0	41.6	43.7	46.4	46.8	48.8
	G	Size	>15% C_{max}		10.2	14.6	10.8	17.2	11.6	15.8	12.6	18.1	13.5	19.6
	H	C/Front	>28% C_{max}		19.0	22.3	20.2	23.7	21.6	24.5	23.5	26.0	25.2	27.3
	I	Back W	>27% A_{max}		18.4	21.3	19.4	20.8	20.8	21.9	21.9	24.7	23.5	24.0
	J	Chest W	>20% A_{max}		13.6	21.1	14.4	22.5	15.4	22.2	16.2	22.5	17.4	22.2
	K	W Back	>20% A_{max}		13.6	58.3	14.4	61.6	15.4	53.7	16.2	38.5	17.4	29.3
	L	Arm-H	<80% A_{max}		54.4	46.0	57.6	48.0	61.6	51.0	64.8	55.0	69.6	59.0
	N	Sh Strap	>4% A_{max}		2.7	3.2	2.9	3.2	3.1	3.5	3.2	3.4	3.5	3.8
Clause 4.2.2 Table 1	(c)	**Waist total**	Left	Outer ½ <	+	6.8	2.1	7.2	2.5	7.7	2.9	8.1	0.0	8.7	2.3
		½ Th =		Inner ½ <			2.2		2.6		3.5		4.0		4.3
		<0.1 A_{max}		OL>			2.5	3.5	2.5	3.5	2.5	2.9	2.5	4.1	2.5	4.0
			Right	Outer ½ <	+	6.8	3.0	7.2	3.2	7.7	1.5	8.1	0.0	8.7	2.2
		OL =		Inner ½ <			2.6		1.9		3.0		4.1		4.6
		>25 mm		OL>			2.5	3.2	2.5	3.5	2.5	4.1	2.5	4.7	2.5	4.2
		Overall Exceptions^					13.6	9.9	14.4	10.2	15.4	10.9	16.2	8.1	17.4	13.4
	(a)	**Shoulder**	Left	L_2 Front <			3.2	1.4	3.3	1.1	3.5	1.7	3.6	0.3	3.8	1.4
		½ Th		L_2 Back <			3.2	0.4	3.3	1.0	3.5	1.3	3.6	0.8	3.8	1.3
		L_2 =		L_3 OL >			2.5	3.0	2.5	2.7	2.5	2.5	2.5	4.3	2.5	2.9
		<0.035A_{max} + 8 mm		L_1 Front <			6.2	2.3	6.3	1.5	6.4	1.9	6.4	2.4	6.6	1.9
		L_3 OL =		L_1 Back <			6.2	2.4	6.3	3.4	6.4	3.5	6.4	3.3	6.6	3.6
		>25mm	Rig	L_2 Front <			3.2	1.2	3.3	1.4	3.5	1.0	3.6	0.4	3.8	1.1

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		L_1 =		L_2 Back <	3.2	0.3	3.3	0.9	3.5	1.1	3.6	0.8	3.8	1.0
		Value in		L_3 OL >	2.5	2.7	2.5	2.8	2.5	2.8	2.5	4.5	2.5	3.0
		Table 2 in		L_1 Front <	6.2	2.3	6.3	2.0	6.4	1.4	6.4	2.5	6.6	2.0
		EN 13158		L_1 Back <	6.2	2.0	6.3	3.3	6.4	4.0	6.4	3.2	6.6	3.1
	(b)	**UA ½ Th =**		L≤										
		$\leq 25^{-4}A^2$		R≤										
Clause 4.2.5		**Ad** (girth)		>5% A_{max}	3.4	6.0	3.6	6.0	3.9	7.0	4.1	9.0	4.4	7.0
		Ad $A_{max-min}$		>80% $_{max-min}$A	3.2	6.0	3.2	6.0	4.0	7.0	3.2	9.0	3.2	7.0
		'Over riding value'				73.0		76.0		11.0		86.0		90.0
		Width of coloured markers > 10 mm		Shoulder	1.0	5.0	1.0	5.0	1.0	5.0	1.0	5.0	1.0	5.0
				Waist	1.0	6.0	1.0	8.0	1.0	6.0	1.0	6.0	1.0	6.0

				Required Value, cm 'more than', or 'less than' according to sign			**M**easured Value (cm)
		Size		#316 Adult S		#316 Adult L	
				Min	**Max**	**Min**	**Max**
	A	**Manufacturer's Size Chart**		88	93	98	104
	B			83	90	96	102
	C			86	93	92	97
	D-D^1 E-E^1	¼ A_{max}		23.3		26	
	M	½ C_{max}		46.5		48.5	
	Measurements			R	M	R	M
Clause 4.2.2 Table 1	A^1_{min}	<107% A_{min}**D**		94.2	85.0	104.9	101.0
	A^1_{min}	<107% A_{min}**A**		94.2	0.0	104.9	0.0
	A^1_{max}	>103% A_{max}		95.8	98.0	107.1	110.0
	B^1_{min}	<110% B_{min}**D**		91.3	82.0	105.6	95.0
	B^1_{min}	<110% B_{min}**A**		91.3	0.0	105.6	0.0
	B^1_{max}	>102% B_{max}		91.8	95.0	104.0	107.0
	D Chest	>43% C_{max}		40.0	47.2	41.7	49.9
	E Back	>57% C_{max}		53.0	57.0	55.3	61.2
	F C/Back	>52% C_{max}		48.4	49.5	50.4	53.7
	G Size	>15% C_{max}		14.0	16.5	14.6	18.0
	H C/Front	>28% C_{max}		26.0	29.5	27.2	31.6
	I Back W	>27% A_{max}		25.1	26.2	28.1	29.8
	J Chest W	>20% A_{max}		18.6	22.6	20.8	24.4
	K W Back	>20% A_{max}		18.6	26.6	20.8	37.5
	L Arm-H	<80% A_{max}		74.4	69.0	83.2	76.0
	N Sh Strap	>4% A_{max}		3.7	3.8	4.2	4.5
Clause 4.2.2 Table 1	**Waist total**	Left	Outer ½ <	+	9.3	2.2	10.4	1.4
(c)	**½ Th =**		Inner ½ <			6.8		4.1
	<0.1 A_{max}		OL>		2.5	2.6	2.5	3.7
		Right	Outer ½ <	+	9.3	2.5	10.4	2.7
	OL =		Inner ½ <			6.1		3.5
	>25 mm		OL>		2.5	2.6	2.5	3.7
	Overall Exceptions^				18.6	17.6	20.8	11.7

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	(a)	**Shoulder**	Left	L_2 Front <	4.1	1.7	4.4	2.3
		½ Th		L_2 Back <	4.1	1.4	4.4	2.1
		L_2 =		L_3 OL >	2.5	2.5	2.5	2.6
		<0.035A_{max} + 8 mm		L_1 Front <	6.7	2.0	6.9	3.1
		L_3 OL =		L_1 Back <	6.7	3.5	6.9	3.9
		>25mm	Right	L_2 Front <	4.1	1.8	4.4	2.0
		L_1 =		L_2 Back <	4.1	1.7	4.4	1.2
		Value in		L_3 OL >	2.5	2.7	2.5	3.0
		Table 2 in		L_1 Front <	6.7	2.6	6.9	3.2
		EN 13158		L_1 Back <	6.7	3.4	6.9	2.8
	(b)	**UA ½ Th =**		L≤				
		≤$25^{-4}A^2$		R≤				
Clause 4.2.5		**Ad** (girth)		>5% A_{max}	4.7	13.0	5.2	9.0
		Ad $A_{max-min}$		>80% $_{max-min}$A	4.0	13.0	4.8	9.0
		'Over riding value'				98.0		110.0
		Width of coloured markers > 10 mm		Shoulder	1.0	5.0	1.0	5.0
				Waist	1.0	6.0	1.0	6.0

^ Note: Should one side of the waist half thickness gaps on the garment fail. This could indicate unevenness in the distribution of the foam. However, providing the overall exceptions pass, the garment passes this area but attention is required.

UoM: ±4.14%

Key to dimensions (see previous page)	
A_{max}	is the chest girth or bust girth given by the manufacturer for the largest user.
A_{min}	is the chest girth or bust girth given by the manufacturer for the smallest user
B_{max}	is the waist girth given by the manufacturer for the largest size
B_{min}	is the waist girth given by the manufacturer for the smallest size
C_{max}	is the over-the-shoulder length given by the manufacturer for the largest size
C_{min}	is the over-the-shoulder length given by the manufacturer for the smallest size
A^1_{max}	is the maximum internal girth of the garment below the armholes
A^1_{min}	is the minimum internal girth of the garment below the armholes
A^1_{min} 'D'	'Designed' The minimum girth of the garment below the armholes with the closures closed with half thickness foam butting together
A^1_{min} 'A'	'Absolute' The minimum girth of the garment below the armholes with the closure tightened as far as it will go, half thickness foam riding over full thickness foam.
B^1_{max}	is the maximum internal girth of the garment at the lower edge of the protective material
B^1_{min}	is the minimum internal girth of the garment at the lower edge of the protective material.
B^1_{min} 'D'	'Designed' The minimum girth of the garment at the lower edge of the protective material with the closure closed with half thickness foam butting together.
B^1_{min} 'A'	'Absolute' The minimum girth at the lower edge of the protective material with the closure tightened as far as it will go, half thickness foam riding over full thickness foam
D and D^1	are vertical lines on the chest separated by a distance of 25% of A
E and E^1	are vertical lines on the back separated by a distance of 25% of A
F	is the centre back line.
G	is the height of the side below the armhole
H	is the centre front length
I	is the width across the back between the armholes measured at a level half-way down the armhole opening

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J	is the width across the chest between the armholes measured at a level half-way down the armhole opening
K	is the width at the back at a distance equal to 50% of dimension C_{max} from the neck inlet
L	is the circumference of the armhole.
M	is the distance below the centre of the back of the neck of the garment at which dimension K is measured. ($M = 0.5\ C_{max}$)
N	is the smallest with of the shoulder strap

PROTECTIVE MATERIAL DIMENSIONS IN PROTECTIVE JACKETS AND BODY PROTECTORS & EXCEPTIONS TO THE REQUIREMENTS
BS EN 13158:2018
Clauses 4.2.2 & 4.2.3

RESULTS

Clause	Question	Answer	Result
4.2.2	Were any removable parts of torso protection found?	No	Pass
4.2.2	Did the sample(s) meet the requirements for the dimensions of protective material (clause 4.2.2) with all removable parts taken off?	N/A	Pass
4.2.2	Is the central 200mm of the back (scaled to A_{max} = 1000mm) constructed so that it can only be shortened by a destructive process?	Yes	Pass
4.2.3 (d)	Do shoulder protectors substitute for torso protector material?	No	Pass
4.2.3 (d)	Do such shoulder protectors cover gaps in the torso protection when the arms are raised laterally 60° to the torso and swung forward?	N/A	Pass
4.2.3 (e)	Do perforations in the foam or similar material exceed 15mm diameter?	No	Pass

ADAPTABILITY AND ADJUSTABILITY
BS EN 13158:2018
Clause: 4.2.5

RESULTS

Examination to ensure appropriate construction of adjusters and closures

Question	Observation	Result
Is there an absence of excessive touch & close fastener or other features that would permit the garment to be worn with the adjustment set excessively wide?	Yes	Pass
Are there appropriate coloured markers exceeding 10mm in width? Or Is there an alternative acceptable system?	Yes	Pass
What are the background and contrast colours?	Black/Red	Pass

MOVEMENT OF PROTECTIVE MATERIAL BLOCKS AND GAPS BETWEEN THEM
BS EN 13158:2018
Clause 4.3

RESULTS

Question	Answer	Result
Do the test bars come into contact in any gaps between padding block in the test described in clause 5.5 of EN 13158? And if so list examples	No - A	Pass

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CLOSURE STRENGTH OF ADJUSTERS AND RESTRAINT
BS EN 13158:2018
Clause 4.4

RESULTS

Closure strength

Condition of the test	Position of closure	Did the closure open? Yes / No	Did any gap in the protective padding less than 15mm wide appear? Yes / No	Result
Widest setting of adjusters, 50N pull	Waist Left Side	No	No	Pass
Widest setting of adjusters, 50N pull	Waist Right Side	No	No	Pass
Widest setting of adjusters, 50N pull	Shoulder Left Side	No	No	Pass
Widest setting of adjusters, 50N pull	Shoulder Right Side	No	No	Pass
Widest setting of adjusters, 50N pull	Centre Front	No	No	Pass

Restraint

Maximum movement during 50N pull to be less than A_{max} x 0.1 =			**8.7 cm**
Position of clamp	Direction of pull	Movement in cm	Result
Lower edge – Centre Front	Upwards	2.5	Pass
Lower edge – Left side	Upwards	3.0	Pass
Lower edge – Right side	Upwards	3.0	Pass
Lower edge – Centre Back	Upwards	4.0	Pass
Shoulder area, pull on the edge of the arm hole on the chest	Forwards	2.5	Pass
Shoulder area, pull on the edge of the arm hole at the top	Upwards	2.5	Pass
Shoulder area, pull on the edge of the arm hole on the back	Backwards	3.0	Pass

UoM: ±5.71%

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ERGONOMIC REQUIREMENTS
BS EN 13158:2018
Clause 4.5

RESULTS

Wearing a protective riding helmet and prescribed light clothing, 2 subjects were asked to perform the following movements 5 times:

1. Put on, adjust, and take off the garment.
2. While wearing the adjusted garment swing your arms out sideways and raise them to the level of the top of your head, swing them forward till your hands touch in front of you, then down and back till your hands are below your waist and behind you.
3. Adopt a racing crouch while sitting on a stool or other object, look down and look up.

Dimensions of Subject 1 (cm)		Dimensions from the garment (cm)		Dimensions of Subject 2 (cm)		Dimensions from the garment (cm)	
Chest girth	86	Chest girth	80-86	Chest girth	87	Chest girth	86-92
Under bust girth	/	Under bust girth	/	Under bust girth	/	Under bust girth	/
Waist girth	78	Waist girth	76-82	Waist girth	82	Waist girth	82-88
Over the shoulder length	81	Over the shoulder length	78-84	Over the shoulder length	85	Over the shoulder length	84-92

Question	**Subject 1 Response**	**Subject 2 Response**	**Result**
Is donning, adjusting (possibly with assistance), and doffing the garment practical?	Yes	Yes	Pass
Is pain caused by firm contact with the armhole, waist, or back of the neck during movements?	No	No	Pass
Is there firm contact of the protective clothing on the front of the neck, or underside of the chin when seated and leaning forward?	No	No	Pass
Are any arm or head movements restricted in a way that might endanger an average rider?	No	No	Pass
Is maximal inspiration (fully breathing in) restricted or does it require excessive effort or result in any pain?	No	No	Pass
Is coverage by the body protector maintained after the movements?			
Around the torso	Yes	Yes	Pass
More than 25mm below the ribs anteriorly	Yes	Yes	Pass
Less than 30mm above iliac crests (top outer edge of hip bone) laterally	Yes	Yes	Pass
E and E_1 intersect with lower edge >50mm below iliac crests	Yes	Yes	Pass
Reaching the seventh cervical vertebra (the prominent bone at the base of the neck)	Yes	Yes	Pass
Less than 25mm from the top of the sternum (breastbone)	Yes	Yes	Pass
Covering more than 50% of the centre of the clavicle (collarbone)	Yes	Yes	Pass

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IMPACT BS EN 13158:2018 Clause: 4.6					
Sample: Model #316					
RESULTS					
Conditions:	20°C / 65% rh				
Date of Testing:	18/01/2024				
Performance Level:	3				
Flat Impactor, Guard Ring at 0 mm, 150 mm Radius Dome Anvil			**Narrow Bar, Guard Ring at 10 mm, 150 mm Radius Dome Anvil**		
Impact Energy (J): 35			Impact Energy (J): 45		
Result 1	2.491	kN (Zip)	Result 1	4.341	kN (Zip)
Result 2	4.044	kN	Result 2	1.533	kN
Result 3	3.107	kN	Result 3	2.000	kN
Result 4	3.738	kN	Result 4	1.003	kN
Result 5	1.932	kN (Zip)	Result 5	1.656	kN
Result 6	3.542	kN	Result 6	4.554	kN (Zip)
Mean	3.142	kN	Mean	2.515	kN
Comment: Pass			Comment: Pass		
REQUIREMENTS					
Mean: ≤ 4 kN No single value shall exceed 6 kN					

UoM: ±2.58%

End of Report

The client acknowledges and agrees that any services provided and/or reports produced by Intertek are done so within the limits of the scope of work agreed pursuant to the client's specific instructions. This report relates specifically to the sample(s) tested that were drawn and delivered by the client or their nominated third party. Intertek does not make any representation or warranty for any bulk samples or certify the bulk samples received from the client. Furthermore, Intertek does not provide a warranty or verification on the sample(s) representing any specific goods, material and/or shipment and only relate to the sample(s) as received and tested. Intertek have aimed to conduct the review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or willful misconduct. In no event, will the contents of any reports or any extracts, excerpts or parts of any reports be distributed or published without the prior written consent of Intertek in each instance. Only the client is authorized to permit copying or distribution of this report (and then only in its entirety). Any such third parties to whom this report may be circulated rely on the content of the report solely at their own risk.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k = 2, providing a level of confidence of approximately 95 %. Unless otherwise specified all compliance and pass/fail statements are binary simple acceptance based on the tolerance interval and, with the exception of graded methods, a test uncertainty ratio greater (TUR) than 4:1. For graded methods the TUR will drop to as low as 0.5:1 when the tolerance limits are within a grade division of the upper scale limit. The Uncertainty budgets are stated for each Test method, these are for reference, and should be considered when results are on or close to Specification Limits / Requirements and in such cases it should be noted that the risk of false acceptance or rejection may be as high as 50%, for further information please refer to ILAC G8.