

SUBJECT:

Batch testing of full body harness incorporated with energy absorber restraining line sampled by Singapore Test Lab officer at Rectitude Pte Ltd premises on 23 June 2021.

TESTED FOR:

Rectitude Pte Ltd
35 Tampines Industrial Ave 5,
T5 @ Tampines,
Singapore 528627

DATE OF TEST:

28 June 2021 to 02 July 2021

METHOD OF TEST:

SS 528: Part 1: 2006 Specification for Personal fall-arrest systems
Part 1 – Full-body harnesses

SS 528: Part 2: 2006 Specification for Personal fall-arrest systems
Part 2 – Lanyards and energy absorbers

SS 528: Part 5: 2006 Specification for Personal fall-arrest systems
Part 5 – Connectors with self-closing and self-locking gates

SS 528: Part 6: 2006 Specification for Personal fall-arrest systems
Part 6 – System performance tests

Configuration of Personal Fall Arrest System (PFAS)

- A + EAL +FBH

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TEST REPORT 2121125-AGK

Date 05 JULY 2021

Singapore Test Lab Pte Ltd, 10B Enterprise Road, Singapore 629828, Tel: +65 6353 6393, Fax: +65 6353 6395

SAMPLE DESCRIPTION:

Full body harness

10 pieces of full body harness with dorsal anchorage point with 3 points buckle were randomly sampled from a consignment of 1000 pieces.

Brand / model: SkyHawk / SK08
 Classification: Class A (for fall arrest purposes)
 Primary strap: 44 mm width

Energy absorbing lanyard (double)

10 pieces of energy-absorbing lanyard (1.5m nominal length) were randomly sampled from a consignment of 800 pieces

Energy absorbing lanyard (13 mm diameter rope-based lanyard)

Brand / model: SkyHawk / SK02KA (1.5m)
 Type: 2 (used in PFAS where the potential freefall distance limited to a maximum of 4 m)
 Number of lanyards: Two

Energy absorber: SkyHawk / SK02KA (1.5m)

Rope lanyard: SkyHawk / SK09
 Steel snap hook: SkyHawk / SK05A (55 mm Gate opening)
 Steel karabiner: SkyHawk / SK06 (20 mm Gate opening)

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TEST RESULTS:

Table 1: SS528: Part 1: 2006 (Full-body harnesses)

Clause	Results	SS 528: Part 1: 2006 Requirements
<p><u>5.7.1 Feet first test</u> The full body harness fitted to the 100 kg torso test mass is allowed to fall freely over a distance of 1.0 m.</p>	Complied	<p><u>4.7 Dynamic performance</u> The full body harness shall retain the torso test mass clear of the ground and in an upright position when tested at each fall-arrest attachment element.</p> <p>In addition, there shall be:</p> <ul style="list-style-type: none"> a) No tearing of webbing material b) No tearing of any primary strap sewn joint c) No partial or complete fracture of any buckle d) No inadvertent opening of any fastening buckle <p>At the conclusion of the test the angle formed between the back of the torso test mass and the test lanyard shall not exceed 45°.</p> <p>The full body harness shall be capable of retaining the torso test mass in post-dynamic test suspension for a period of at least 10 min.</p>

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TEST RESULTS (CON'T):

Table 2: SS528: Part 1: 2006 (Full-body harnesses)

Clause	Results	SS 528: Part 1: 2006 Requirements
<p>5.7.2 Head first test The full body harness fitted to the 100 kg torso test mass is allowed to fall freely over a distance of 1.0 m.</p>	<p>Complied</p>	<p><u>4.7 Dynamic performance</u> The full body harness shall retain the torso test mass clear of the ground and in an upright position when tested at each fall-arrest attachment element.</p> <p>In addition, there shall be:</p> <ul style="list-style-type: none"> a) No tearing of webbing material b) No tearing of any primary strap sewn joint c) No partial or complete fracture of any buckle d) No inadvertent opening of any fastening buckle <p>At the conclusion of the test the angle formed between the back of the torso test mass and the test lanyard shall not exceed 45°.</p> <p>The full body harness shall be capable of retaining the torso test mass in post-dynamic test suspension for a period of at least 10 min.</p>

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TEST RESULTS (CON'T):

Table 3: SS528: Part 2: 2006 (Lanyards and energy absorbers)

Clause	Results	SS 528: Part 2: 2006 Requirements
<p><u>5.3.4 Dynamic test of energy absorbing lanyard</u> The 100 kg test mass of steel is allowed to fall freely over a distance of 4 m.</p>	Complied	<p><u>4.3.5 Energy absorber (Type 2)– Dynamic performance</u> An energy absorber shall limit the arrest force to a maximum of 6 kN. Permanent extension of the energy absorber shall not exceed 1.75 m.</p>

Table 4: SS528: Part 5: 2006 (Connectors with self-closing and self-locking gates)

Clause	Results	SS 528: Part 5: 2006 Requirements
<p><u>Clause 5.2 Static strength test</u> Applied a minimum force of 20 kN and maintained it for 60 sec.</p>	Complied	<p><u>4.3 Static strength test</u> The connector shall withstand a minimum force of 20 kN for 60 sec. There shall be no partial fractures or inadvertent opening of the gate.</p>

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TEST RESULTS (CON'T):

Table 5: SS528: Part 6: 2006 (System performance tests)

Clause	Results	SS 528: Part 6: 2006 Requirements
<p><u>6.2 Performance test for A + EAL + FBH type PFAS</u></p> <p>a. 100 kg torso test mass</p> <p>b. 1.8 m free fall distance</p>	<p>Complied</p>	<p><u>5.2 System performance</u></p> <p>The arrest force shall not exceed 6kN.</p> <p>The angle formed between the back of the torso test mass and the vertical plane shall not exceed 45°.</p> <p>With the 100 kg torso test mass remaining in post-drop suspension, there shall be none of the following results on a full body harness:</p> <p>a. Tearing of webbing material</p> <p>b. Tearing of any primary strap sewn joint</p> <p>c. Partial or complete fracture of any fastening or adjusting buckle</p> <p>d. Inadvertent opening of any fastening buckle</p> <p>e. Straps applying pressure to the neck of the torso test mass.</p> <p>With the torso test mass remaining in post-drop suspension, there shall be neither of the following results on other parts of the PFAS:</p> <p>a. Tearing or rupture of any component (except where such tearing was deliberately designed to contribute to energy dissipation)</p> <p>b. Partial fractures or inadvertent opening of connector gates.</p>

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TEST RESULTS (CON'T):

Table 6: SS528: Part 1 & Part 5: 2006 (Corrosion resistance)

Clause	Sample Reference	Results	SS 528: Part 1 & Part 5: 2006 Requirements
5.2 Corrosion test (SS528: Part 1) Salt spray test the connector in accordance with ISO 9227, with an initial exposure of 24 h, followed by 1 h of drying, followed by a second exposure of 24 h.	D-ring	Complied	Clause 4.4 Corrosion resistance All metallic fittings shall be free of red rust, as visible to the unaided eye, or other evidence of corrosion of the base metal.
	Buckle	Complied	
5.3 Corrosion test (SS528: Part 5) Salt spray test the connector in accordance with ISO 9227, with an initial exposure of 24 h, followed by 1 h of drying, followed by a second exposure of 24 h.	Snap hook (55 mm Gate opening)	Complied	Clause 4.4 Corrosion resistance When tested, the connector gate shall continue to function. There shall be no evidence of corrosion of the base metal.
	Karabiner (20 mm Gate opening)	Complied	

REMARKS:

- Based on the test results, in accordance with the requirements of the following Singapore Standards, the samples taken from the consignment passed the established rejection-acceptance criteria:
 - SS 528: Part 1: 2006
 - SS 528: Part 2: 2006
 - SS 528: Part 5: 2006
 - SS 528: Part 6: 2006
- A total of 1880 nos. of SINGAPORE TEST LAB Batch tested labels, comprising BTF-000985 to BTF-002764 were issued to the above consignment of full body harness incorporated with energy-absorbing lanyard.


 Sam Au
 Testing Officer


 Chua Peck Cheong
 Senior Manager

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APPENDIX:

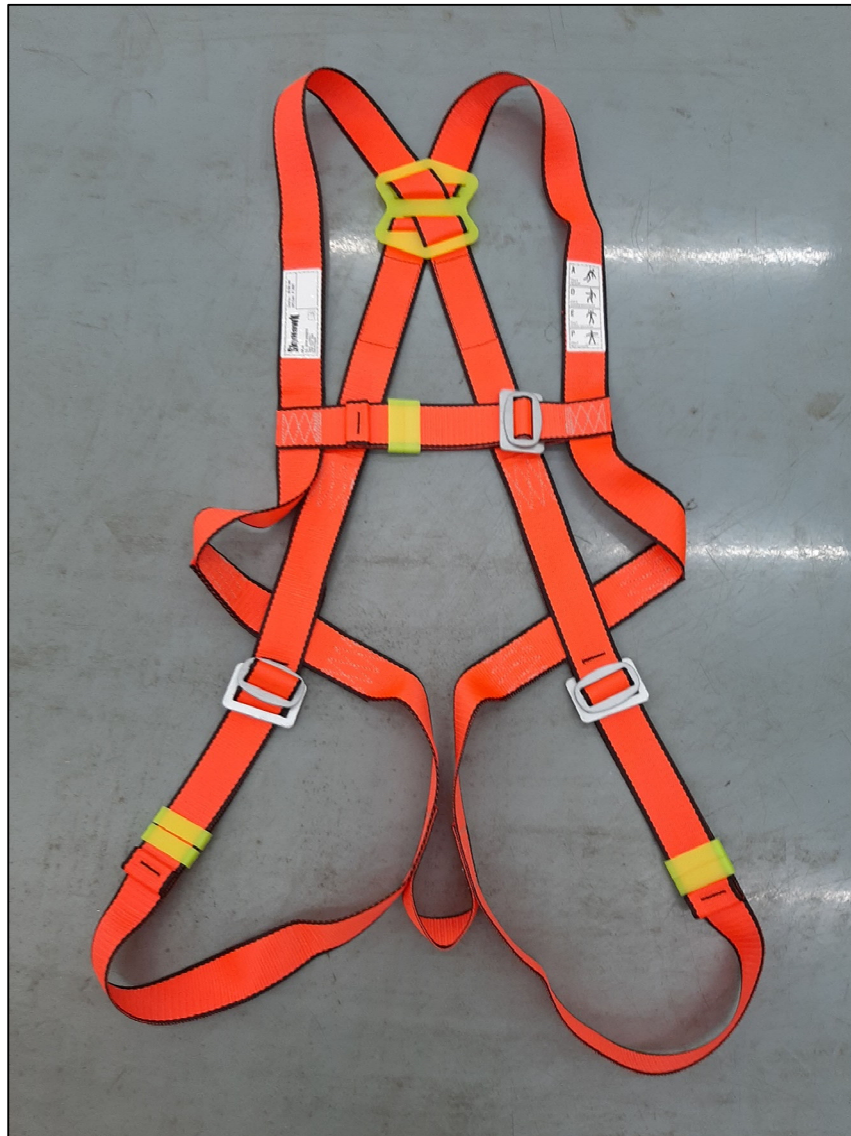


Photo 1: Full body harness, SK08

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APPENDIX (CON'T):



Photo 2: Energy-absorbing lanyard, SK02KA (1.5m)

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