



MARTIAL ARTS HONG KONG HARNESS

An adjunct to ANSI E1.43-2016 Entertainment Technology- Performer Flying Systems

FORWARD

These safety requirements and test methods have been prepared by Trade Holdings Inc. DBA Climbing Sutra, a manufacturer of performer flying harnesses for over 25 years.

In addition to the requirements specified in **ANSI E1.43-2016 Entertainment Technology- Performer Flying Systems**, these are the testing procedures that Climbing Sutra uses for certification of Climbing Sutra **Martial Arts Hong Kong** Performer Flying Harnesses. We hope it is a helpful resource to others for the evaluation of Martial Arts Hong Kong Performer Flying Harnesses. Please note, Fall safety harnesses and Mountaineering harnesses are not designed for performer flying and lie outside the scope of these requirements. Performer Flying Harnesses are built for use in performer flying systems and shall not be used for fall safety. For the ANSI standard governing performer flying systems see **ANSI E1.43-2016 Entertainment Technology- Performer Flying Systems**.

1 SCOPE

This standard specifies safety requirements and tensile test methods for Climbing Sutra Martial Arts Hong Kong performer flying harnesses. Other types of Climbing Sutra performer flying harnesses include Stunt Vests, Corsets, Flying shorts, Two point waist harnesses, Swivel harnesses, Full body strap harnesses, Positioning belts, Twisting rings, Shoulder harnesses,

Ankle harnesses, and Climbing Style Single Point harnesses. The test methods for these types of Climbing Sutra performer flying harnesses are addressed in separate standards.

2 PRINCIPLE

A **Martial Arts Hong Kong** performer flying harness is placed on a rigid test dummy and subjected to the specified static loads applied in sequence to 2 separate load bearing points.

During the test the specified load bearing points must support the working load of 405 lbs. and meet the minimum breaking strengths of 4050 lbs. (18 kN) as specified. The test is designed to target two waist picks at opposite sides of the harness waistband.

3 TERMS AND DEFINITIONS

3.1 PERFORMER FLYING SYSTEM:

A system of components specifically designed to suspend an aerial performer or transport a performer through the air. The performer flying system includes the attachment to the facility/structural support down to and including the attachment/harness to the performer.

3.2 PERFORMER FLYING HARNESS:

A component that is worn by the performer to support their weight or secure the performer to a prop or performer flying system.

3.3 PICK:

Load bearing attachment point on a harness for supporting the performer's weight. Created by sewing pockets or loops in webbing attached to the harness. A soft pick is a pick made of webbing and stitching only. For purposes of this test, all picks referred to are SOFT PICKS.

3.4 BUCKLE:

A load bearing connector that is an integral part of the harness used to connect and adjust two pieces of webbing.

3.5 MARTIAL ARTS HONG KONG HARNESS:

Also called a multi-pick waist harness.

A Martial Arts Hong Kong Harness is a type of performer flying harnesses used for stunts and flying effects. A Martial Arts / Hong Kong Harness is a webbing harness with a strap that passes around the waist and straps that pass around each individual leg (there are NO shoulder components). It has three or more load bearing attachment points called “picks” sewn around the waist band. The Martial Arts harness is distinguished from other types of waist harnesses by the need for any **individual** pick to support the performers weight throughout a performance. It will have picks covering the waist of the harness and sometimes the legs. Picks range in number from 3 to 12 or more. It is made with webbing, buckles, and thread. Martial Arts Harnesses used for film typically have soft picks made from webbing only. Some Martial Arts Harnesses may have steel “O” ring hardware or quick releases integrated as load bearing attachment points.

3.6 Photo Martial Arts Hong Kong Harness:



3.7 WORKING LOAD LIMIT

The Working Load Limit is defined as the maximum allowable working load a performer's body shall place on the harness pick during normal performance. For a standard Climbing Sutra Martial Arts Hong Kong Harness the Working Load Limit is 405 lbs. for one pick using a safety factor of 10 to 1 with a Minimum Breaking Strength of 4050 lbs. (18 kN).

3.8 MINIMUM BREAKING STRENGTH (MBS)

Minimum Breaking Strength (MBS) aka Minimum Breaking Load is 4050 lbs. (18 kN) for each pick on a Climbing Sutra Martial Arts Harness. MBS is the minimum force required to completely break a Martial Arts Harness pick as defined by test procedures in this standard.

4 APPARATUS

The apparatus shall consist of the following:

4.1 **tensile testing machine** constructed so that a rigid test dummy may be suspended and pull testing be performed without interference. The tensile test equipment shall pull at a uniform rate of not greater than 60 inches (1524 mm) per minute and not less than 30 inches (762 mm) per minute.

4.2 **load cell** with current calibration and recording equipment capable of registering momentary peak loads up to 10,000 lbs. (45 kN) within an accuracy of +/-3% of the specified load. The recording data channel shall have a minimum sampling rate of 1,000 samples per second.

4.3 **Rigid Test Dummy** shall be sized for adults and meet the specifications described in one of the following safety standards: ANSI/ASSE Z359, or CSA Z259, or NFPA1983, or EN12277.

4.4 **Shackle** used to attach to the harness picks shall be polished (smooth finish) stainless or

titanium alloy “bow” style shackle with a cross section (diameter) of 9-13mm. The bow end of the shackle shall connect to the harness pick.

Shackles with rough finish, sharp edges, or raised markings shall NOT contact any pick.

5 TEST SPECIMENS

Test Harnesses shall be new and in unused condition, selected randomly from a given model of harness. Harness model shall be retested after any design or materials change.

Manufacture date, serial number, model name, and a picture of the harness shall be included with the final test report. Harness shall be properly sized and fitted to the test torso as per the manufacturers fitting instructions. In this standard it is accepted that stitching and/or webbing may tear while testing for the Minimum Breaking Strength (MBS), but Not for the Working Load Limit (405 lbs.)

6 CONDITIONING

Test sample shall be dry and conditioned in an atmosphere of 15 to 38 degrees Celsius for a minimum of 24 hours. Then sample shall be tested within 15 minutes.

7 PROCEDURE

7.1 The Martial Arts Harness shall be placed on a standardized rigid test dummy.

7.2 All harness buckles shall be tightened as per the manufacturer’s instructions. Leg straps should be evenly tensioned. There should be space to insert a finger under each tensioned strap.

7.3 The rigid test dummy shall be suspended from the test apparatus by the buttocks ring (inverted).



7.4 The shackle shall be attached to the specified pick on the waist strap with the bow side pulling on the pick. Force is applied in the direction pulling away (down) from the designated suspension ring.

7.5 Working Load Limit (WLL) test. Force shall be applied over a period of 10 to 60 seconds until 405 +80/-0 lbs. (1.8 kN) is reached. The force of 405 +80/-0 lbs. shall be maintained for a period of 2 minutes, +15/-0 seconds, then immediately released. Inspect for any tearing of stitching or webbing. Any tearing of stitching or webbing fails the WLL test.

7.6 Minimum Breaking Strength (MBS) test. Using the same pick as in 7.5, the force shall be increased over a period of 10 to 30 seconds until the Minimum Breaking Strength is reached, then the force shall be immediately released. Tearing of stitching and webbing or breaking of the harness is acceptable in the MBS test providing the Minimum Breaking Strength of 4,050 lbs. (18kN) is reached or exceeded.

Failure of any single pick to reach the MBS of 4,050 lbs. shall cause failure of the entire test.

7.7 Record the results of the tests.

8 TEST SEQUENCE

Follow this sequence for testing the 2 specified Picks on a single Martial Arts Harness.

8.1 Pick 1: Right side (hip) of waist strap, centered between the Right front leg strap anchor and the Right back leg strap anchor. Dummy is suspended from buttocks ring (inverted). MBS 4050 lbs. Follow 7.2 through 7.7

8.2 Pick 2: On the same test sample Pick on the Left side closest to the front. If the closest pick to the front is the left hip pick then test the left hip pick. Dummy is suspended from buttocks ring (inverted). MBS 4050 lbs. Follow 7.2 through 7.7

End of tensile testing.

9 TEST REPORT / CERTIFICATE OF CONFORMANCE

9.1 Testing shall be performed and a test report created by a company that is NOT the manufacturer or distributor; or a competing manufacturer or distributor of the harness being tested.

9.2 Test report shall include the testing company name with logo, address, website, contact information, contact person(s), and the supervisor of the test.

9.3 Test report shall include the manufacturer of the sample harness, the model number, serial number, manufacture date, and photograph of each sample tested.

9.4 Result of the test shall include a list of the peak loads captured for **each** of the individual tested picks for each harness. Any single peak load that does not meet or exceed the required WLL or MBS for that pick equals failure of the **entire** harness. Result shall be shown as PASS or FAIL at conclusion of report along with the date of the test and name of supervisor.

End of Climbing Sutra test for Performer Flying Harness Martial Arts / Hong Kong Harness