TEST REPORT
EN ISO 20957-1 Stationary training equipment — Part 1: General safety requirements and test methods

Report Number.....	STUESO019011102054HS
Tested by (name + signature).....	Frank Lin
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Date of issue	2019-01-31
Total number of pages	18
Testing Laboratory	V-Trust Inspection Service Co., Ltd. 1107-1109, West tower, Poly World Trade Centre, 1000 Xingang Rd E., Guangzhou, China 510335.
Applicant's name	Align-Pilates Equipment Ltd
Address	430, Enterprise Way, Vale Park, Evesham, Worcestershire, WR11 1AD, UK
Test specification:	
Standard.....	EN ISO 20957-1:2013
Test procedure	Test report
Non-standard test method.....	Not applicable
Test item description	Align-Pilates Combo Chair II
Trade Mark	Align-Pilates
Manufacturer	Align-Pilates Equipment Ltd 430, Enterprise Way, Vale Park, Evesham, Worcestershire, WR11 1AD, UK
Model/Type reference	PAPCHAIR2
Ratings	Usage classes S

List of Attachments:

ANNEX I: Photos

Summary of testing:

Test according to the following standards were carried out:

EN ISO 20957-1:2013

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Product: Align-Pilates Combo Chair II
Model: PAPCHAIR2
Usage Classes: S
Max. user weight: 150kg
Production date: MMYYYY
Manufacturer: Align-Pilates Equipment Ltd
Address: 430, Enterprise Way, Vale Park, Evesham, Worcestershire, WR11 1AD, UK

Remark:

For EU market: As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

The batch or series number or other element allowing its identification will be marked on the product.

Test item particulars ..... :	Align-Pilates Combo Chair II
Classification of installation and use ..... :	Stationary appliance for professional or commercial use
Supply Connection ..... :	---
..... :	
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N (Not applicable)
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing ..... :	
Date of receipt of test item ..... :	2019-01-14
Date (s) of performance of tests ..... :	2019-01-14 to 2019-01-25
General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a ☒ comma / ☐ point is used as the decimal separator.	
General product information: The Align-Pilates Combo Chair II is for professional or commercial use.	

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
4	**Classification**		P
4.1	**General**		P
	Equipment shall be classified in accordance with accuracy and usage class as described in 4.2 to 4.3		P
	If the intended use of an equipment is for more classes it shall fulfill the requirements of each intended class		N
4.2	**Accuracy classes**		N
4.2.1	Accuracy classes only apply to equipment which display training data		N
4.2.2	Class A: high accuracy		N
4.2.3	Class B: medium accuracy		N
4.3.4	Class C: minimum accuracy		N
4.3	**Usage classes**		P
4.4.1	Class S (Studio): professional and/or commercial use		P
4.4.2	Class H (Home): domestic use		N
4.4.3	Class I: professional and/or commercial use provided for inclusive use for people with special needs		N
	Such equipment shall also be in compliance with class S requirements.		N
5	**Safety requirements**		P
5.1	General		P
	If any of the following safety requirements are applicable, the equipment shall meet the requirements using the test methods described in Clause 6.		P
5.2	**Stability of equipment**		P
	The stationary training equipment shall be stable in any direction, in training, folding and storage positions.		P
	The test shall be in accordance with 6.2.		P
5.3	**External construction**		P
5.3.1	**Edges and corners**		P
	All edges and corners of surfaces supporting bodies shall have a radius r ≥ 2,5 mm.		P

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	All other edges of components which are accessible to the user or to third parties shall be free of burrs, rounded or protected.		P
	Test in accordance with 6.3.1.		P
5.3.2	**Tube ends**		P
	When tested in accordance with 6.3.2, accessible tube ends shall be closed off, e.g. by parts of the equipment or by plugs.		P
	If plugs are used, they shall remain in position at the end of the endurance load test, as described in the relevant parts of the applicable specific standards. If no endurance test is described in a specific standard the pullout force of the plug shall be ≥ 20 N.		P
5.3.3	**Squeeze and shear points within the accessible hand and foot area**		P
	Squeeze and shear points between moving parts, between moving parts and fixed parts, or between a moving part and the floor shall be guarded or shall have a minimum clearance of at least 60 mm, except as follows:		P
	a) if only the fingers are at risk, the dimension shall be at least 25 mm;		P
	b) if third party access is prevented by the user's body position, and where the user is able to immediately stop the movement, the distance shall be at least 25 mm;		P
	c) if the angle between two adjacent moving parts or between a rigid part and an adjacent moving part is always 50 degrees or greater, it is not considered a shear point;		P
	d) open and obvious stops are excluded; however, if the stop is the part which is moving, then it shall pass no closer than 25 mm from any fixed frame member throughout its range of movement.		P
	All products shall fulfil the above requirements during use.		P
	For foldable products during folding or unfolding, the above requirements are waived if the following three requirements are simultaneously met:		N
	- inadvertent movement is not possible during folding, unfolding, transportation and/or storage;		N
	- access to squeeze and shear points remain at all times in the user's field of vision;		N
	- the user can stop the motion at any time.		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.3.4	**Squeeze and shear points as well as rotating and reciprocating points in the accessible hand and foot area**		N
	The distance between movable parts or between a movable and a fixed part shall be at least 60 mm except as follows:		N
	a) if only fingers are at risk, the dimension shall not be less than 25 mm;		N
	b) if the distance between the moving part and fixed part, or between two moving parts, does not change during use or setup, the distance shall be greater than 25 mm or less than 9,5 mm;		N
	c) open and obvious stops are excluded. However, if the stop is the part which is moving, then it shall pass no closer than 25 mm to any fixed frame member throughout its range of movement.		N
	Test in accordance with 6.3.3.		N
5.3.5	**Weights and resistant means**		P
	The range of motion of all weights attached to the stationary training equipment shall be limited to that required to perform the exercise. Test in accordance with 6.3.4.		P
	Weights and resistant means with stored energies (e.g. bungee cords, elastic tubes, mechanical springs) shall move freely and return to the starting point.		P
	Weights shall be securely retained during use.		N
5.4	**Entrapment of the user**		N
	The possibility of users not being able to exit the equipment when using it according to the user's manual shall be avoided (e.g. providing assisted means of escape).		N
	Test in accordance with 6.4		N
5.5	**Adjustment components and locking mechanisms**		P
	Adjustment components and locking mechanisms on the stationary training equipment shall function securely, be conspicuous, self-evident and safely accessible to the user. The possibility of unintended change shall be eliminated.		P

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Adjustment components and locking mechanisms e.g. knobs and levers shall not interfere with the user's range of movement.		P
	Weight selection pins shall be fitted with a retention device to prevent unintended change or movement during the exercise.		N
	Test in accordance with 6.5.		P
5.6	**Ropes, belts, chains and attachment components**		N
5.6.1	General		N
	Ropes, belts, chains and their attachment components (e.g. snap links, shackles, carabineers, clamps or similar) shall have a safety factor against breakage of 6 times the maximum possible tension that can be developed. The design of the pulleys and the bending radius shall be in accordance with the applicable requirements of the rope, belt or chain manufacturers.		N
	Ropes, belts, chains and their attachment components shall not break and function as described in the user's manual		N
	Test in accordance with 6.6.		N
5.6.2	Ropes and belts		N
	Rope and belt ends shall be, as a minimum, flush with the end of the termination means and shall be visible for inspection.		N
	Pressed connections shall not be subjected to bending.		N
	Rope and belt ends and grips shall have no sharp edges or frayed ends.		N
	Test in accordance with 6.6.		N
5.6.3	Rope and belt guides		N
	A means shall be provided to prevent a rope or a belt becoming unintentionally disengaged during use or set-up.		P
	Test in accordance with 6.7.		N
5.7	**Pull in points**		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Pull-in points of rope or belt drives up to 1 800 mm height shall be protected except if the surface pressure is ≤ 90 N/cm^2 or when access to the pull-in point is prevented by the user's body during exercising.		N
	This may be achieved by ensuring that the angle between the rope and the guard is not less than 50° in all positions. The guard shall not rotate together with the pulley		N
	Test in accordance with 6.3.5.		N
	Pull-in points for chains, gears and sprockets shall be protected in accordance with ISO 12100.		N
	For flywheels the test finger (see Figure 1) shall not become trapped when tested in accordance with 6.8.		N
5.8	**Hand grips**		P
5.8.1	Integral handgrips		N
	Gripping positions shall be easily identifiable and designed to reduce slipping (e.g. textured, coated, knurled). Test in accordance with 6.9.		N
5.8.2	Applied handgrips		P
	When tested in accordance with 6.10, applied handgrips shall not be removed. Applied handgrips shall be equipped with a surface that reduces hand slip.		P
5.8.3	Rotating handgrips		N
	Rotating handgrips shall be secured during use and shall be designed to reduce slipping (e.g. textured).		N
	Test in accordance with 6.11		N
5.9	**Endurance test**		P
	The stationary training equipment shall function as specified in the manufacturer's instructions after the test has been carried out. Test in accordance with 6.12.		P
5.10	**Isometric test requirements**		N
	If the stationary training equipment is designed to perform an isometric test, then the load or force on the user's body shall be displayed with an accuracy of ± 10 % in the range of measurement given in the user's manual and the read outs shall be SI units.		N
	Test in accordance with 6.13.		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.11	**Heart rate measurement system**		N
	The function of the heart rate measurement system shall be indicated on the display when the equipment is receiving a usable signal from the user, e.g. a blinking heart.		N
	Test in accordance with 6.14.		N
5.12	**Heart rate control mode**		N
	The function of the heart rate measurement system shall be permanently indicated on the display when the equipment is receiving a usable signal from the user, e.g. a blinking heart.		N
	The loss of heart rate signal shall result in effort intensity remaining at the same intensity for maximum 60 s and then decrease until the minimum intensity is reached. The rate of decrease shall be at least 10 % in each 20 s time period.		N
	Test in accordance with 6.15.		N
5.13	**Electrical safety**		N
	Concerning electrical and electronic aspects of stationary training equipment EN 60335-1 shall be applied. For medical devices EN 60601-1 shall be applied.		N
5.14	**Loading**		P
5.14.1	Intrinsic loading		P
	Each piece of equipment loaded with the user's bodymass shall withstand a force Fof 2,5 times the bodymass.		P
	After the test the equipment shall not be broken and shall still function as intended by the manufacturer.		P
	Test in accordance with 6.16.		P
5.14.2	Extrinsic loading		P
	When tested according to 6.3.4 and loaded with the user's bodymass and/or reaction forces or moments of the user as well as other forces or moments caused by any other source (e.g. additional weights supported by a stand), each piece of equipment shall withstand a load F according to Formula (1): $F = [Gk + 1{,}5\ G] \cdot 2{,}5 \cdot 9{,}81\mathrm{m/s^2}$		P

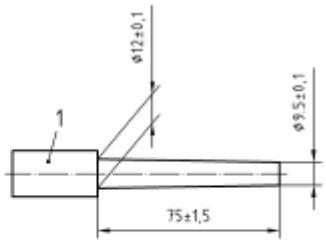
EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	After the test the equipment shall not be broken and shall still function as intended by the manufacturer.		P
	Test in accordance with 6.17		P
5.15	**Care and maintenance**		P
	Care and, if applicable, maintenance advice shall be provided with each piece of equipment. The advice shall include at least:		P
	a) a warning notice to the effect that the safety level of the equipment can be maintained only if it is examined regularly for damage and wear, e.g. ropes, pulleys, connection points;		P
	b) an advice to replace defective components immediately and/or keep the equipment out of use until repair;		P
	c) special attention to components most susceptible to wear.		P
	Test in accordance with 6.18.		P
5.16	**Assembly instructions**		P
	If the stationary training equipment requires assembly, then a manual shall be supplied (in the national language), giving clear and accurate assembly instructions relating to the stationary training equipment and with an emphasis on safe assembly.		P
	If the stationary training equipment requires assembly, then a list of tools needed shall be provided.		P
	If the stationary training equipment requires assembly, then a comprehensive parts list shall be supplied, including identifying part numbers.		P
	The manufacturer shall indicate the total mass and the total surface area (e.g. foot print) of equipment.		P
	When stationary training equipment is attached/anchored, e.g. to a wall or the floor, assembly instructions including the attaching/anchoring operations shall be provided.		N
	The manufacturer shall provide the minimum value (force) each attachment shall support.		P
	Test in accordance with 6.18.		P
5.17	**General instructions for use**		P

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Each item of stationary training equipment shall be accompanied by a user's manual, in the national language including at least the following information.		P
	a) Customer service address.		P
	b) Full address of the manufacturer or importer.		P
	c) Indication of field of application (e.g. indoor use, explanation of the usage class).		P
	d) Indication that the free area shall be not less than 0,6 m greater than the training area in the directions from which the equipment is accessed. The free area must also include the area for emergency dismount. Where equipment is positioned adjacent to each other the value of the free area may be shared. The free area and training area shall be illustrated with a dedicated figure.		P
	e) Information on the correct use of the equipment and its features with the emphasis on safe operation, and the importance of keeping unsupervised children away from the equipment.		P
	f) Exercise instructions with advice with regard to correct biomechanical positioning of the user on the stationary training equipment. A warning indicating that injuries to health may result from incorrect or excessive training. Instructions shall be given in respect of every major exercise type for which the equipment is designed.		P
	g) Texts concerning difficult or complicated manoeuvres shall be accompanied by illustrations.		P
	h) Instruction on how to safely use access and escape assist means.		P
	i) Design illustration.		P
	j) Warning that if any of the adjustment devices are left projecting, they could interfere with the user's movement.		P
	k) Warning that free standing equipment shall be installed on a stable and levelled base.		P
	l) Setting of the load and equipment further adjustments (e.g. seat adjustments).		P
	m) Indication of the maximum user body mass.		P
	n) Indication of the maximum training mass, if applicable.		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	o) Explanation of the displayed data, if applicable.		N
	p) If the heart rate is displayed, a warning with the following content shall be given: “WARNING! Heart rate monitoring systems may be inaccurate. Over exercising may result in serious injury or death. If you feel faint stop exercising immediately”.		N
	Test in accordance with 6.18.		P
5.18	**Marking**		P
	Stationary training equipment shall be permanently marked with the following minimum information:		P
	a) name or trademark and full address of the manufacturer, supplier or importer;		P
	b) maximum body mass of user and the maximum training mass for the individual exercise stations (if applicable);		P
	c) usage classes S, H or I and accuracy classes A, B, C, which can be combined (e.g. SA) if both classes are specified in that part of this International Standard;		P
	d) individual code number (which contains information about type and year of manufacture);		P
	e) graphical symbol or written information in the national language(s) instructing the user to read the information supplied by the manufacturer;		P
	f) for class S and I equipment, a conspicuous graphical symbol or written information in the national language(s) shall be applied if the equipment needs attachment/anchoring for safe operation.		N
	Test in accordance with 6.18.		P
6	**Test methods**		P
6.1	**Test conditions**		P
	All testing shall be performed under the following conditions:		P
	a) temperature of 23 °C ± 5 °C; b) relative humidity of 55 % to 75 %	20 °C, RH 64 %	P
6.2	**Stability test**		P
6.2.1	Test in training position		P
	Place the equipment on a $(10^{+2}_{-0})°$ incline surface, in the most onerous position.		P

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Perform exercise(s) that involve(s) the user's mass, with the equipment loaded with a person weighin (100 ± 5)kg, using the minimum as well as the maximum load, over the full range of exercise motion.		P
	In addition, if applicable, perform exercise(s) that does not involve the user's mass, using the minimum as well as the maximum load, over the full range of exercise motion.		P
	The equipment shall not tip over in either test.		P
	The test person shall not lean or try to influence the balance of the machine.		P
6.2.2	Test in folded/storage position		P
	Place equipment, folded according to the user's manual, on a $(10^{+2}_{-0})°$ incline surface		P
	The equipment shall not tip over in either test.		P
6.3	**External construction**		P
6.3.1	Test of edges and corners		P
	Test by measuring the radius and visual and tactile examination		P
6.3.2	Tube ends		P
	This test is a visual inspection of the unit to verify that all tube ends in the accessible hand and foot area are closed off.		P
	The pull-out test shall be performed in a quasi static manner with an appropriate device.		P
6.3.3	Testing of squeeze and shear points and rotating and reciprocating points		N
	Measure the minimum distance between two moving parts or a moving part and a fixed part.		N
6.3.4	Weights and resistant means		P
	A performance test using the maximum and minimum resistance or weights including added resistance or weights (e.g. incremental weights) shall be carried out over the maximum range of movement.		P
6.3.5	Testing of pull-in points		N
	Apparatus: test finger in accordance with Figure 1. Surface hardness ≥ HRC 40 (measured in accordance with ISO 6508-1).		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Approach the pull-in point with the test finger probe to determine whether the test finger can become trapped. For non-protected pull-in points measure the pressure perpendicularly to the moving direction in the most onerous position of the mechanism (e.g. the rim of a pulley or the minimum radius of a cam). The test shall be performed with the maximum load. The pressure shall not exceed 90 N/cm^2 in any part of the mechanism.		N
6.4	**Testing of entrapment**		N
	A visual and performance test shall be carried out to determine whether or not the user can become entrapped.		N
6.5	**Adjustment components and locking mechanisms**		P
	Perform a visual and functional examination before, during and after every test.		P
6.6	**Tensile test for ropes, belts, chains and attachment components**		N
	Measure the tension of the rope, belt or chain as well as the attachment components while statically applying the maximum specified load. Then perform a tensile test, with 6 times the maximum measured tension for the whole functional system.		N
6.7	**Testing of rope and belt guides**		N
	Perform a functional test.		N
6.8	**Testing of flywheels**		N
	Transmission elements and rotating parts		N

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Insert the test finger (see Figure 1) from all sides into any possible entrapment point between the drive and transmission elements, while the equipment is in normal operation.  Key 1 Handle R_a-value ≤ 0,40 µm Surface hardness ≥ HRC 40 (measured in accordance with EN ISO 6508-1) Figure 1 — Test finger		N
	Do not introduce the test finger beyond the edge of the protective covering.		N
	Determine whether the test finger becomes trapped.		N
6.9	**Testing of integral handgrips**		N
	Perform a functional test.		N
6.10	**Determination of the removing force of applied handgrips**		P
	Apply a force of 70 N carefully to the handgrip by means of an appropriate pulling device.		P
6.11	**Testing of rotating handgrips**		N
	Perform a functional test.		N
6.12	**Testing of endurance load**		P
	Carry out the test as close as possible to normal exercise frequency and free of shocks for:		P
	a) class H 12 000 cycles over 80 % of the possible range of movement;		N
	b) class S 100 000 cycles over 80 % of the possible range of movement;		P
	1) with maximum load;		P
	2) in direction of load in accordance with the exercise instructions fixed by a 50 percentile man;		P
	3) with a frequency of movement in accordance with the user's manual.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	If the equipment offers multiple exercise stations the test shall be done with all stations and functions as described in the user's manual.		P
6.13	**Testing of isometric equipment**		N
	Measure the static output force or torque of the body in the position(s) as described in the user's manual and compare this value to the displayed value.		N
	Perform the test using the following three values:		N
	minimum		N
	maximum		N
	a third random value between these two points		N
6.14	**Testing of the heart rate measurement system**		N
	Perform a visual test by using the heart rate measurement system		N
6.15	**Testing of the heart rate control mode**		N
	Set the equipment to the heart rate control mode with a target of 120 bpm. Operate the product according to the manufacturer's specifications, then use a heart rate simulator or a person to activate the control mode. Cut off the signal and then check if the resistance or the load reduces according to the requirements shown in 5.12. If there are more than one heart rate control system, each system shall be tested.		N
	Test the heart rate indicator by visual testing.		N
6.16	**Testing of intrinsic loading**		P
	Carry out the test quasi-statically. Apply the load F in the most onerous position when used according to the instructions in the user's manual on a surface area of 300 mm × 300 mm for 5 min on the stationary training equipment.		P
	Only equipment that requires anchoring for normal use shall be fixed during the test.		N
6.17	**Testing of extrinsic loading**		P
	Carry out the test quasi-statically. Apply the load F in the most onerous position when used according to the instructions in the user's manual for 5 min on the stationary training equipment. Place the determined load on the equipment as in normal practice and in a position which imposes greatest strain on the equipment.		P

EN ISO 20957-1			
Clause	Requirement - Test	Result - Remark	Verdict
	When the load bearing surface is divided, apply the test load to each part in proportion to the total surface area at the same time.		P
	The load should be applied through a load applicator in a way that simulates the situation that occurs when the equipment is used according to the instructions in the user's manual.		P
6.18	**Testing of care and maintenance, assembly instructions, general instructions for use and marking**		P
	Verify the information provided by the manufacturer versus the equipment being tested.		P

ANNEX I: Photos

Figure 1

Figure 2

-- End of the report --