Test Report

No.: SHHL241207651201 Date: JAN. 17, 2025 Page: 1 of 18

WENZHOU DREAM GARDEN AMUSEMENT EQUIPMENT
ROOM 803-1, BUILDING 1, CANGHE JINYUAN, YONGQIANG ROAD, YONGZHONG STREET,
LONGWAN DISTRICT, WENZHOU CITY, ZHEJIANG, P.R. CHINA

Sample Description : CLIMBING FACILITIES
****

Sample Receiving Date : DEC. 24, 2024
Testing Period : DEC. 24, 2024 TO DEC. 27, 2024

Test Requested	Result
EN 12572-1:2017 Artificial climbing structures - Part 1: Safety requirements and test methods for ACS with protection points	Pass
EN 12572-3:2017 Artificial climbing structures - Part 3: Safety requirements and test methods for climbing holds	Pass

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Terry Jin

Terry Jin
Authorized Signatory

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Test Conducted:
EN 12572-1:2017 Artificial climbing structures - Part 1: Safety requirements and test methods for ACS with protection points

Scope:

1. This European Standard specifies the safety requirements and test methods for artificial climbing structures with protection points (hereafter referred to as ACS).
2. This European Standard is not applicable to ice climbing, dry tooling and playground equipment.

Clause	Test Method & Test Requirement	Rating
2	Normative references	
3	Terms and definitions	
4	**Safety requirements and test methods**	
4.1	**Layout and placement of individual protection points** If there are individual protection points, the height of the first point shall not exceed 3,10 m. The distance *x* between the placement of the individual protection points (see Figure 1) from height *h* shall be determined as follows: — 1 m if $h \leq 4$ m; — 1,10 m for $h > 4$ m; — 1,20 m for $h > 5$ m; — 1,30 m for $h > 6$ m; — 1,40 m for $h > 7$ m; — 1,50 m for $h > 8$ m; — 2,00 m for $h > 10$ m. The distance *x* may have a tolerance of 10 %. *h* is the distance between the point and the ground measured vertically, in metres, beneath the point in all cases. For protection points, the maximum distance shall be measured from the lowest internal point of the attachment point. If permanent quick draws are installed, the maximum distance shall be measured from lower quick draw end to lower quick draw end. A permanent quick draw (e.g. chain secure element, Maillon Rapide) shall be disassembled from the climbing wall by means of tools (see Figure 2). Protection points attached with bolts shall be secured, so they cannot come undone, e.g. with lock nuts.	N/A No such design

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Clause	Test Method & Test Requirement	Rating

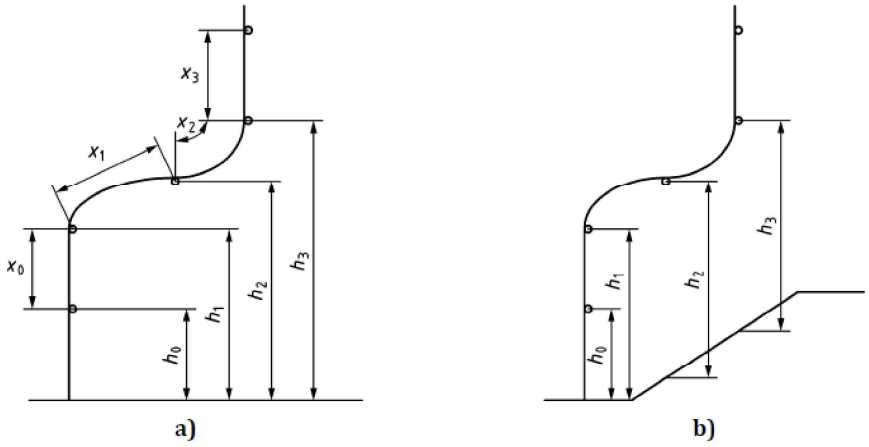

Figure 1 — Layout of protection points

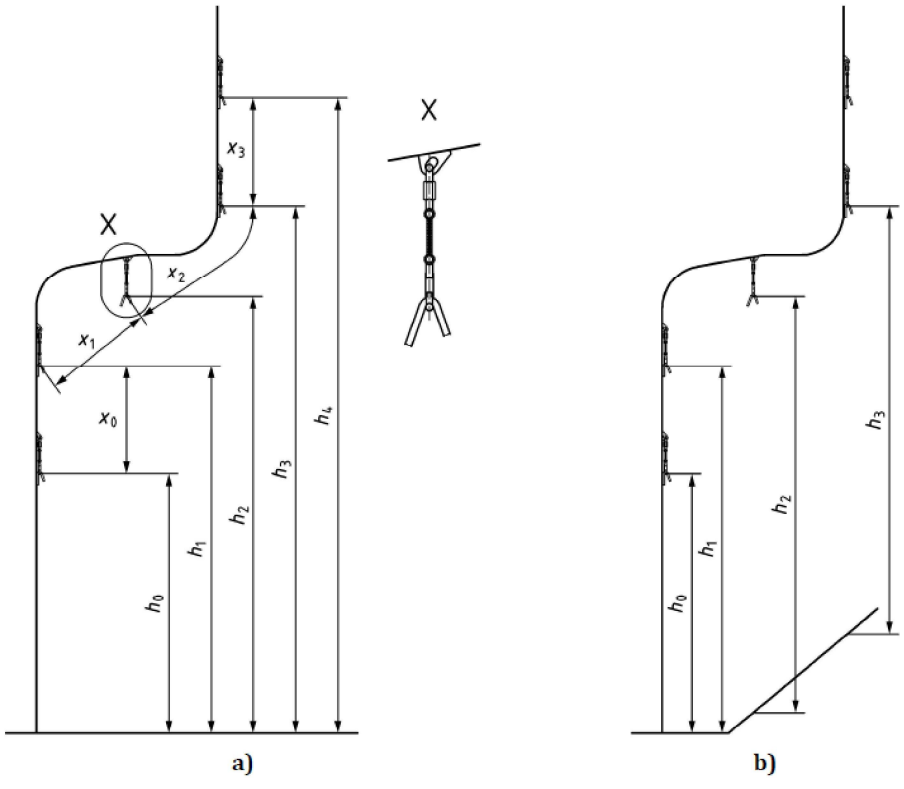

Figure 2 — Design and placement of permanent quick draws

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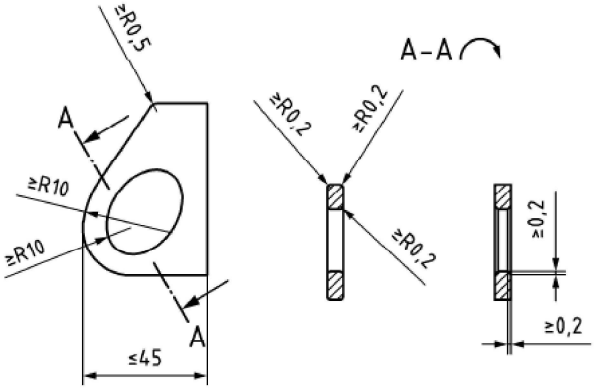
Clause	Test Method & Test Requirement	Rating
4.2	**Design of individual top protection points**	
4.2.1	**General** The rope shall not be able to escape from the top protection points at an untimely moment, e.g. single-snap-gate karabiner is not sufficient. Individual top protection points shall be attached to the structure by two or more points of fixation. Each fixation point shall be calculated as a protection point. Each link between the fixing points shall have a resistance greater than or equal to each of the points which it joins together; this resistance shall be verified by either calculation (see Annex A), or a document of compliance, or tests as defined in Annex C.	Pass
4.2.2	**Dimensions** The minimum dimensions of all protection points and stance points with the exception of individual and collective top protection systems shall be in accordance with Figure 3. Other designs meeting the requirements of Figure 3 are also permissible. The bar or device over or through which the rope passes in either a collective top protection system or an individual top protection point shall be rounded in accordance with Figure 4. Dimensions in millimetres  **Figure 3 — Design of individual protection points**	Pass

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	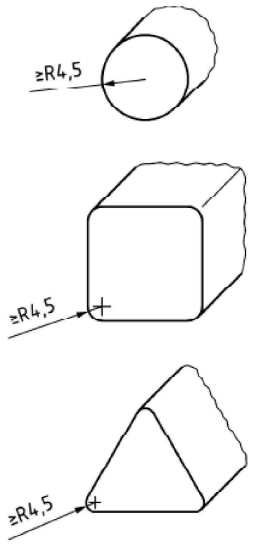 Figure 4 — Rounding of parts	
4.3	**Structural integrity**	
4.3.1	**Structural integrity of an ACS** The structural integrity and stability of an ACS shall be justified by calculation using the characteristic loads given in Table A.1, in accordance with Annexes A, B and Figure 5. Ensure that the structure (e.g. building, concrete platform and ground) can safely accommodate the loads imposed by the ACS. Permanent protection points shall be calculated in accordance with Annexes A and B (e.g. glued protection points in concrete walls). Non-permanent protection points shall have a breaking strength in the main load direction of a minimum of 20 kN.	Pass

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	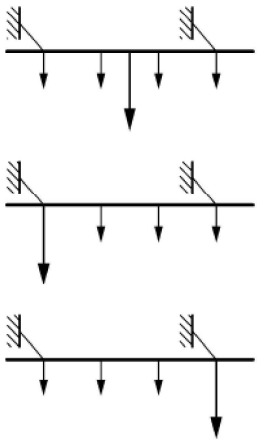 NOTE The larger arrow indicates 6,6 kN. The smaller arrow indicates 1,6 kN. **Figure 5 — Placement of the loads on collective protection systems**	
4.3.2	**Structural integrity of a protection point connection** All elements of an ACS shall be justified by calculation, however in exceptional cases for protection point connections only (the assembly that attaches the actual protection point to the sub frame), a load test as described in Annex C is acceptable as a method of evaluation. After applying the design load to the protection point connection there shall be no permanent deformation. After applying the breaking load to the protection point connection there shall be no breakage.	Pass
4.4	**Impact resistance and deflection of surface elements** When tested in accordance with Annex D, there shall be no breaking or splitting of any surface element. The deflection of the panels shall be calculated by using the load 0,8 kN (see Annex A) or be tested in accordance with Annex D, D.5. When fixed according to the manufacturer's specification, the maximum deflection of the surface element shall not exceed *l*/100: where *l* is the maximum length between the fixations of the surface.	Pass
4.5	**Panel insert resistance** To evaluate the panel insert concerning the resistance to breakage while mounting the climbing holds onto the wall or during climbing use, the panel inserts shall be tested in accordance with Annex E. After test step c) any resulting deformation shall not exceed 0,5 mm at 1,2 kN. After procedure e) there shall be no pull out of the panel insert. Five samples (panel-insert combination) shall be tested.	Pass
4.6	**Proof testing**	Pass

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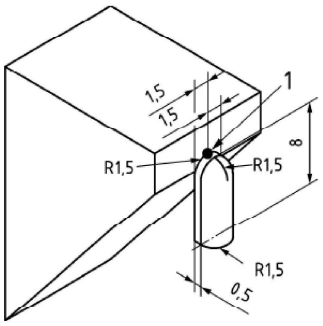
Clause	Test Method & Test Requirement	Rating
	When tested in accordance with Annex F, after settling under load there shall be no breaking, tearing or destruction of the elements after testing.	
4.7	**Falling space** Within the falling space there shall not be any exposed obstacles or edges which could lead to a serious hazard to the user. This does not apply to climbing structures and other obstacle-free surfaces or walls capable of withstanding accidental impacts. The horizontal falling space shall be 2 m behind, 1,5 m either side and 8 m below the protection points in accordance with Figure 6. Dimensions in metres  Key 1 protection point Figure 6 — Falling space	Pass
4.8	**Free space** The free space shall allow the climber to land safely and other users to move without being obstructed by obstacles.	Pass
4.9	**Climbing surfaces** All reachable parts of the climbing surface shall be free of sharp edges and burrs. Edges where the rope passes shall be designed in order to avoid damage to the rope. There shall be no gaps between 8 mm and 25 mm and with a depth greater than 15 mm which can lead to entrapment, unless it is a feature specifically designed for climbing. Insert holes in climbing surface of the ACS for attaching holds are excluded.	Pass
5	**Marking**	N/C
6	**Instruction manual**	N/C
7	**Technical documentation of ACS**	Pass Documentation was provided Test Lab: TUV SUD

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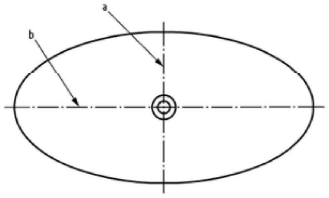
EN 12572-3:2017 Artificial climbing structures - Part 3: Safety requirements and test methods for climbing holds

Scope:

3. This European Standard specifies the safety requirements and test methods for climbing holds. This European Standard is applicable to climbing holds, which are used for the natural progression of the climber, i.e. without the use of artificial means (e.g. ice axes, crampons, hooks, nuts) on artificial climbing structures (ACS) and bouldering walls. Climbing holds are designed to be mounted on the ACS with bolts, screws, etc. Climbing holds include large volumes or features that are designed for use without additional climbing holds being attached to them. The main fixation points for climbing holds forms part of the existing layout of the ACS and are considered in EN 12572-1 and EN 12572-2.
4. This European Standard is not applicable to ice climbing, dry tooling and playground equipment.

<table>
<tr><th>Clause</th><th>Test Method & Test Requirement</th><th>Rating</th></tr>
<tr><td>2</td><td>Normative references</td><td></td></tr>
<tr><td>3</td><td>Terms and definitions</td><td></td></tr>
<tr><td>4</td><td>Size classification

Table 1 allows a hold to be categorized in terms of its average hold diameter. The average hold diameter (as a projection) is taken as the sum of the major, a, and minor, b, axis (see Figure 1) divided by two.

Table 1 — Hold size and corresponding average diameter range
<table><tr><th>Hold Size</th><th>Diameter range
mm</th></tr><tr><td>XS</td><td>0 to ≤ 50</td></tr><tr><td>S</td><td>> 50 to ≤ 80</td></tr><tr><td>M</td><td>> 80 to ≤ 130</td></tr><tr><td>L</td><td>> 130 to ≤ 210</td></tr><tr><td>XL</td><td>> 210 to ≤ 340</td></tr><tr><td>XXL</td><td>> 340 to ≤ 550</td></tr><tr><td>Macro</td><td>> 550</td></tr></table>

Key
a major axis
b minor axis
Figure 1 — Footprint of a climbing hold</td><td>N/A
No such design</td></tr>
<tr><td>5</td><td>Safety requirements</td><td></td></tr>
<tr><td>5.1</td><td>General</td><td>N/A</td></tr>
</table>

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Clause	Test Method & Test Requirement	Rating
	No hold, when tested in accordance with 6.2 and 6.3, shall break when applying the force given in Table 2. Only holds greater than 100 g shall be tested.	No such design
5.2	**Material** Dangerous substances shall not be used in the manufacture of climbing holds in such a way that they can cause adverse health effects to the user of the equipment. NOTE Attention is drawn to the provisions of the Dangerous Substances Directive 1907/2006 and its successive modifications. Prohibited materials include but are not limited to, asbestos, lead, formaldehyde, coal tar oils, carbolineums and polychlorinated biphenyls (PCBs).	N/C
5.3	**Ergonomic requirements** a) The climbing surface of a hold shall be free from accessible sharp edges with a radius less than 0,5 mm and burrs; b) There shall be no pointed climbing holds with a diameter less than 15 mm, which protrude more than 40 mm from the wall; c) There shall be no gaps between 8 mm and 25 mm and with a depth greater than 15 mm which can lead to entrapment, unless specifically designed for climbing.	Pass
5.4	**Resistance to fixation force** Climbing holds shall be tested in accordance with 6.2 and they shall not fracture.	N/A No such design
5.5	**Resistance to breakage in use** Climbing holds shall be tested in accordance with 6.3 and they shall not fracture.	N/A No such design
5.6	**Dimension ratio** This requirement is to protect the surface of the ACS and the panel insert. The hold shall be designed in such a way that: $d2 \leq 3d1$ and $d3 \leq 3d1$ according to Figure 2.	N/A No such design

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	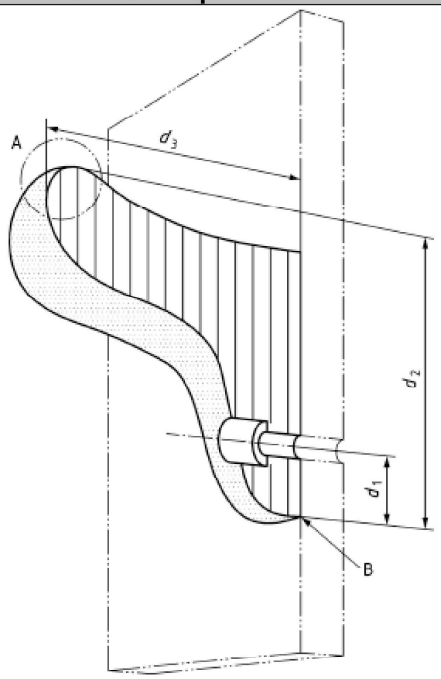 **Key** A is the holding point where the climber can exert the greatest force B opposite edge to point A d_1 is the distance between the fixation hole axis and the opposite edge B to point A d_2 is the parallel to the surface distance between point A and opposite edge B d_3 is the perpendicular to the surface distance between point A and opposite edge B **Figure 2 — Dimension Ratios of the hold**	
5.7	**Volumes** Volumes shall be fixed to the ACS ensuring the maximum load transfers efficiently to the ACS in accordance with the manufacturer's instructions. The volume surface, body and panel inserts shall fulfil the requirements for climbing surfaces according EN 12572-1 and EN 12572-2. Volumes shall not have protection points. Volumes shall be fixed using multiple fixation points.	N/A No such design
6	**Test methods**	
6.1	**Sample preparation** Hold samples shall be subjected to five temperature cycles each for a period of 1 h at –30 °C followed by a period of 1 h at +70 °C. Before performing the test cycles the climbing holds shall be wetted by submerging in tap water for 10 min. There shall be	

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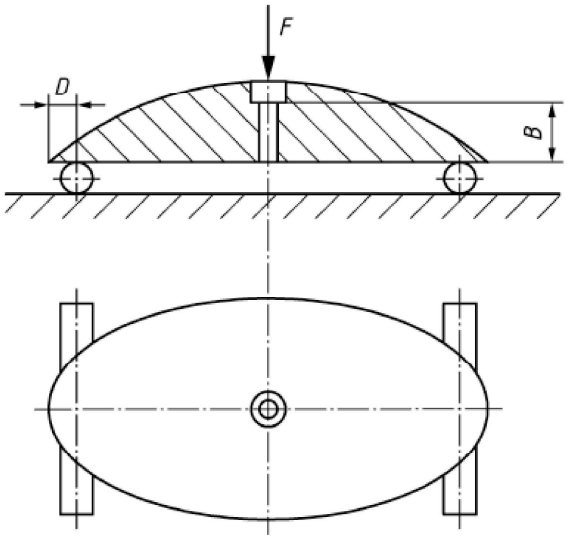
	no visible signs of damage to the climbing holds after conditioning. Undamaged climbing holds shall then be tested according to 6.2 and 6.3.	
6.2	**Resistance to fixation force** Testing shall be carried out with the climbing hold in a three-point bend scenario (see Figure 3) as follows: a) Find the maximum width of a hold passing through the fixing hole. b) Define two perpendicular lines on the base at a distance *D* (see Figure 3 and Table 2) from the edge of the hold. c) Put iron rod bearings with a minimum radius of 10 mm under the hold on a flat and solid (e.g. steel plate) surface were the lines are located. d) The hold shall be loaded with the force *F* (see Table 2) in the bolt hole using a tool with the same form as the manufacturer's recommended fixing (e.g. cap-head or countersunk) for 1 min at ambient temperature with relative humidity (50 ± 5) %.  **Key** B bolt-hole depth *D* distance *F* force **Figure 3 — Resistance to fixation force test**	N/A No such design

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	Table 2 — Test distances and maximum forces according to the hold size Climbing hold size / Distance D mm / Force F kN S and smaller / 5 to 10 / 2 M / 10 to 15 / 5 L and bigger / 15 to 20 / 8 Holds to be tested shall be selected as follows: a) divide each set of holds into size according to Table 1; b) chose for each size the hold with the biggest major axis to bolt-hole depth ratio; c) at least 5 % of the total number of different holds available from the manufacturer.	
6.3	**Structural integrity**	
6.3.1	**Holds** Fix the hold to a rigid surface with a torque on the fixation screw using the manufacturer's recommended maximum tightening torque. Load the hold with a device which pushes or pulls in the most unfavourable usable position and direction against breakage in use with a force of 2,4 kN for 1 min (see Figure 3). An example test setup is given in Annex A. Holds to be tested shall be selected as follows: a) divide each set of holds into size according to Table 1; b) chose for each size the hold with the largest dimension ratio. NOTE The value of 2,4 kN results from the maximum pushing force from the foot of a climber: 0,8 kN resulting from the weight of the climber, × 2 resulting from the dynamic movement, × 1,5 (safety factor).	Pass Not standard product

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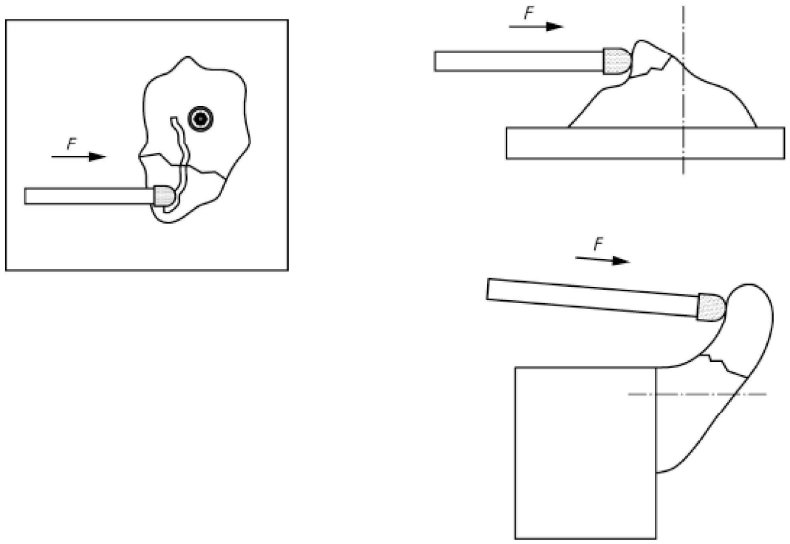
	Annex A (informative) **Setup for testing the structural integrity** Test rig is a system that is capable of delivering a pushing force by means of a rounded, rubber coated tip measuring between 10 mm and 15 mm DIA, this is attached to load cell giving a resulting force. This apparatus should be able to be positioned in a number of angles in all 3-axis to test all shapes and variety of holds.  **Key** *F* force **Figure A.1 — Setup (3 examples) for testing the structural integrity**	
6.3.2	**Structural integrity of volumes** Fix the volume to a panel with all recommended fixation screws. Fix an exe bolt at the most unfavourable volume insert an pull with a force of 2,4 kN for 1 min in the most unfavourable direction(s).	Pass Not standard product
7	**Information to be provided by the manufacturer/supplier**	N/C
8	**Marking**	N/C

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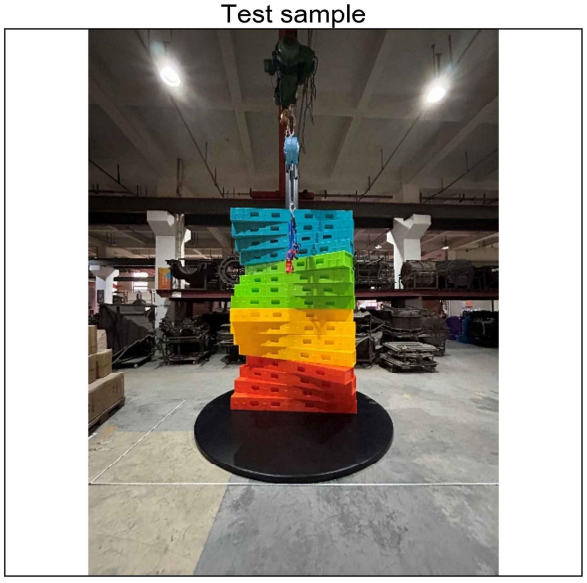

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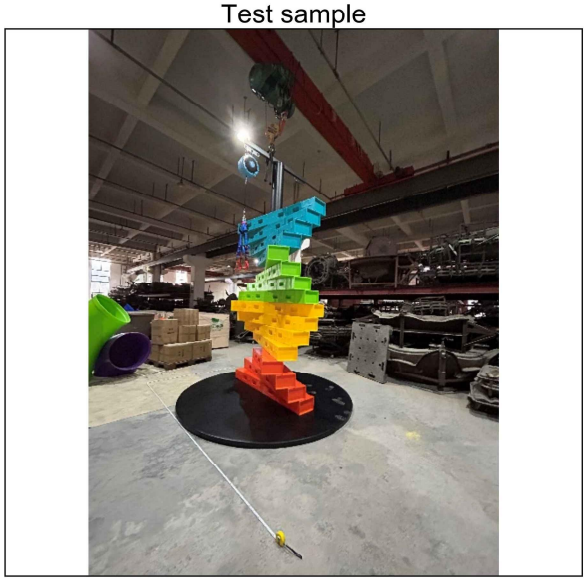

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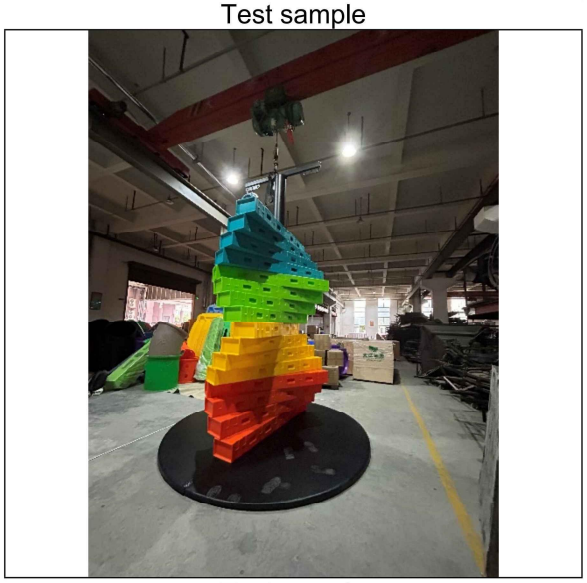

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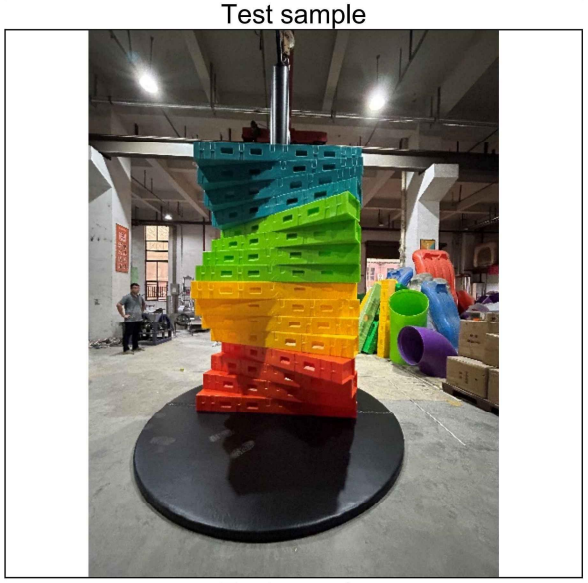

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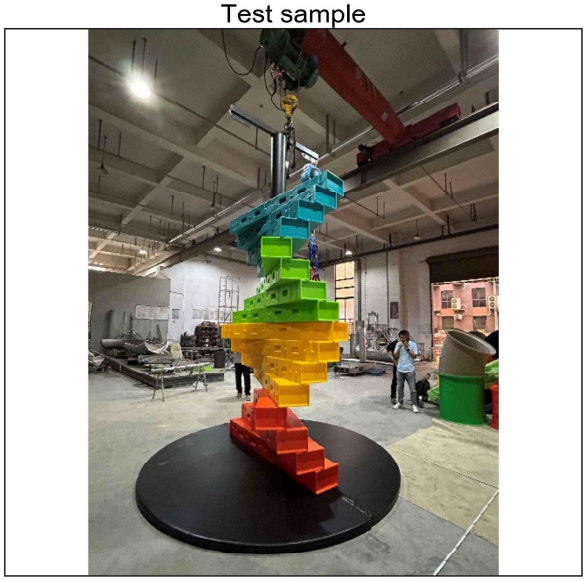

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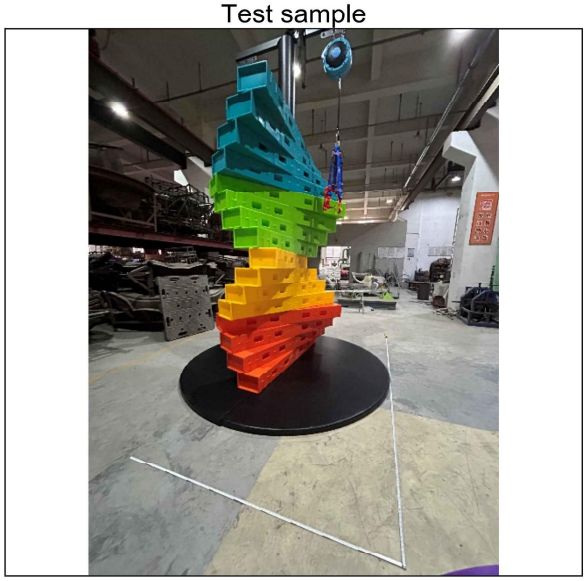

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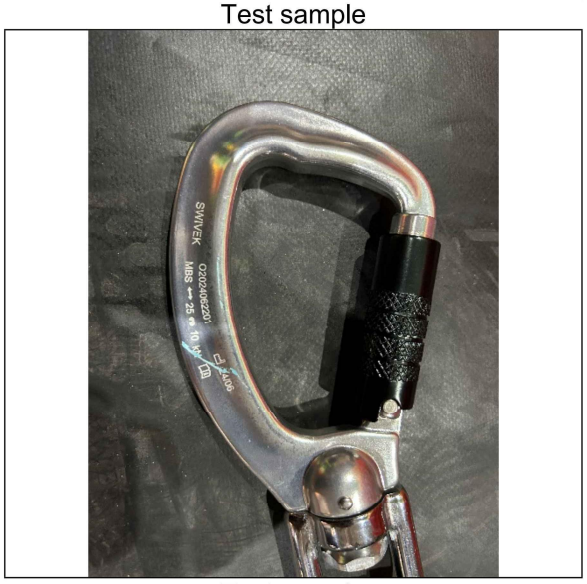

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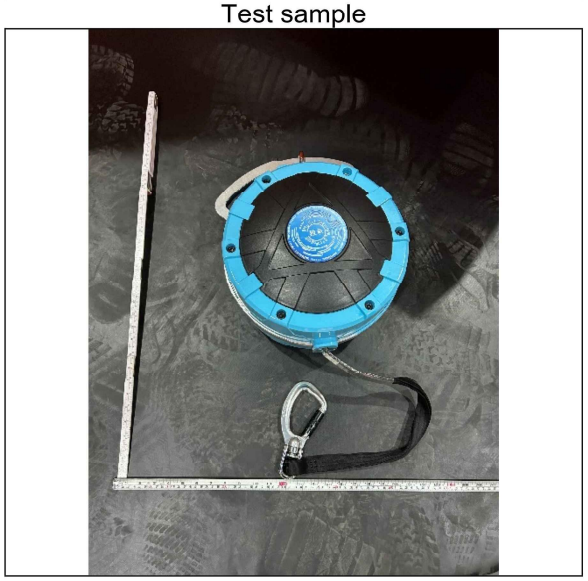

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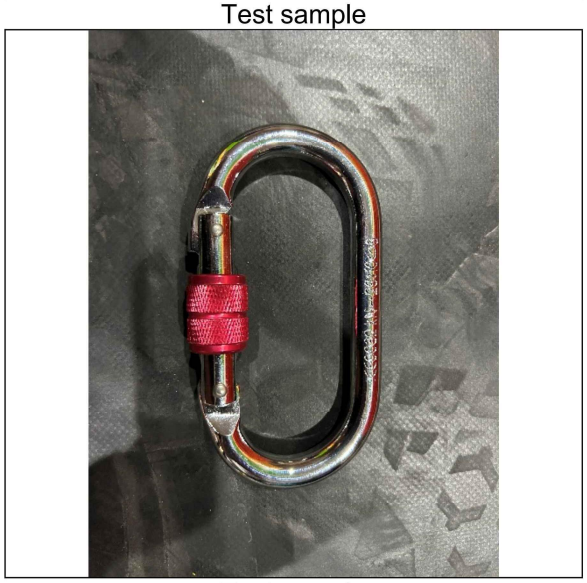

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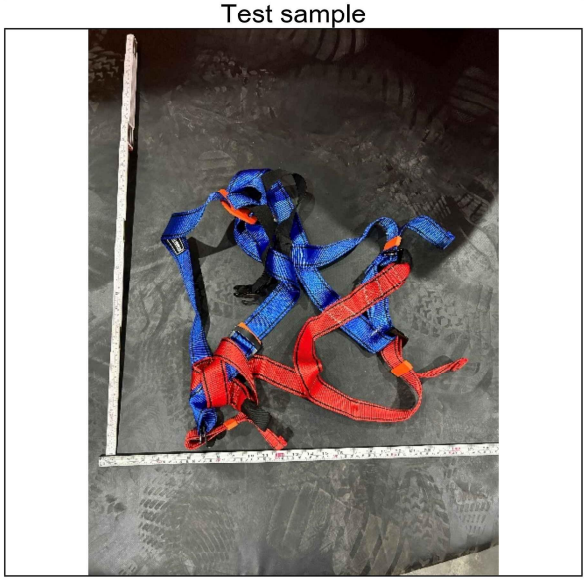

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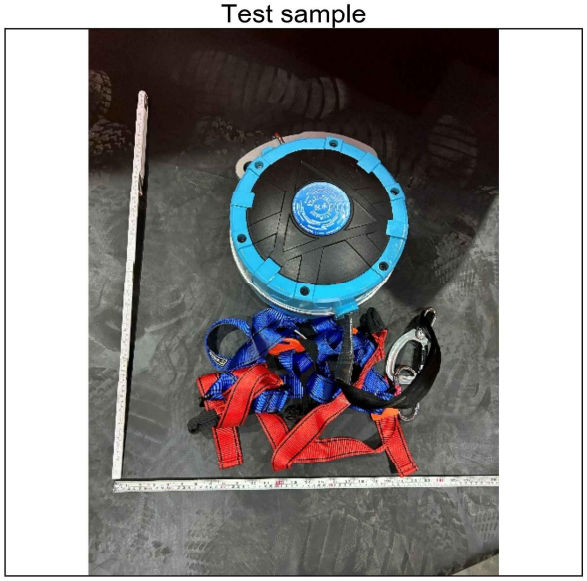

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