


Test Report



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Client	Rojak Design Limited The Danesmead Business Centre 33 Fulford Cross York North Yorkshire YO10 4PB	
Authority & date	Quotation acceptance reference No 127604 dated 8 March 2008	
Items tested	Ladder Accessories	
Specification	Client's specification Direct commission testing	
Results	See Report Text	
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Issue Date	7 April 2008	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of <i>PS082</i> 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI Product Services, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	

TESTING OF LADDER ACCESSORIES SUBMITTED AS A DIRECT COMMISSION TEST SAMPLES

INTRODUCTION

At the request of Rojak Design Limited the ladder accessories detailed below, were tested against the Client's specifications, as indicated on the following pages of this Report. This request was made on Quotation Acceptance form reference 127604 dated 8 March 2008.

The results detailed in this Report apply only to the particular sample tested and to the specific tests carried out. The results obtained do not necessarily relate to samples from the production line and no way imply the performance or quality of the continuing production.

Date sample received: 8 March 2008

Date of Test: 8 – 9 March 2008

TEST ITEMS

- | | |
|---|---|
| 1 off 'Ladder Stopper': | 24" ladder accessory, rectangular shaped rubber base plate with a T shaped aluminium extrusion, the base being enclosed in vulcanised rubber. |
| 1 off 'Multi Stopper Ladder System': | Ladder accessory consisting of adjustable height cylindrical aluminium and rubber feet attached to a 'Multi Stopper' base by means of the feet slotting into a channel. |
| 1 off 'Spyder Top Stabiliser / Work Station': | Aluminium ladder stand-off. |

EXAMINATION AND TEST**TEST 1****TEST PROCEDURE FOR TOP SIDEWAYS SLIP**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 6th rung.
2. The ladder's feet were placed onto a horizontal substrate of ultra high molecular weight polyethylene and set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) against a vertical substrate of P.T.F.E.
3. A vertical load of 100.0kg was applied centrally to the third rung down from the top of the ladder.
4. A load was applied to the topmost rung perpendicular to the stiles via a steel cable running through a pulley in order for the load to be applied in the same axis as the topmost rung. The load was gradually increased until movement (slip) occurred and the load recorded.

TEST RESULTS WITH NAKED LADDER

Test No	Load at which ladder initially slipped (kg)	Load to produce continuous (slow) movement (kg)
1	6.74	10.32
2	5.43	6.93
3	4.96	6.72
4	4.45	5.72
5	5.02	6.46

EXAMINATION AND TEST (CONTINUED)**TEST 2****TEST PROCEDURE FOR TOP SIDEWAYS SLIP (CONTINUED)**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 6th rung.
2. The ladder's feet were placed onto a horizontal substrate of ultra high molecular weight polyethylene and set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) and against a vertical substrate of P.T.F.E.
3. For Test No 1 a vertical load ¹⁾ of 100.0kg was applied centrally to the third rung down from the top of the ladder, whilst for Test No 2 the vertical load ¹⁾ was applied at the far end of the same rung , as close to the stile as possible.
4. A vertical load ²⁾ was applied to the end of a cylindrical steel bar extending 650mm from the outside face and perpendicular to the stile at the position of the topmost rung. The load was gradually increased until movement occurred and the load recorded.

TEST RESULTS WITH NAKED LADDER

Test No	Vertical load ¹⁾ on third rung down from ladder top, (kg)	Vertical load ²⁾ applied to cause continuous (slow) movement (kg)
1	100.0	4.48
2	100.0	- +

- + Test discontinued due to ladder being unable to withstand vertical load without collapse ²⁾

EXAMINATION AND TEST (CONTINUED)**TEST 3****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 7th rung.
2. The 'Spyder' and 'Multi Stopper' ladder accessories were both fitted to the ladder by the manufacturer and the system was placed onto a horizontal substrate of ultra high molecular weight polyethylene set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) and against a vertical substrate of P.T.F.E.
3. A vertical load of 128kg was applied at a distance of 0.39m down from the centreline of the 'Spyder' feet and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable running through a pulley in order for the load to be applied in the same axis as the rungs.
5. The horizontal load required to produce movement of the ladder system was recorded, and then increased in order to observe the ladder behaviour.

TEST RESULTS

Test No	Horizontal load applied to cause initial and continuous (slow) movement (kg)	Maximum horizontal load applied (kg)	Comments
1	~11	18	System withstood the vertical load without movement. No evidence of flip observed
2	~11	24	System withstood the vertical load without movement. No evidence of flip observed
3	~11	23.3	System withstood the vertical load without movement. No evidence of flip observed

Testing discontinued at manufacturers request.

EXAMINATION AND TEST (CONTINUED)**TEST 4****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 7th rung.
2. The 'Spyder' and 'Multi Stopper' ladder accessories were both fitted to the ladder by the manufacturer and the system was placed onto a horizontal substrate of ultra high molecular weight polyethylene set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) and against a vertical substrate of P.T.F.E.
3. A vertical load of 60kg was applied at a distance of 0.39m down from the centreline of the 'Spyder' feet and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable running through a pulley in order for the load to be applied perpendicular to the stiles.
5. The horizontal load required to produce movement of the ladder system was recorded.

TEST RESULTS

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous movement (kg)	Comments
1	11.3	Not recorded, test discontinued at initial movement	System withstood the vertical load without movement. No evidence of flip observed
2	10.6	Not recorded, test discontinued at initial movement	System withstood the vertical load without movement. No evidence of flip observed

EXAMINATION AND TEST (CONTINUED)**Measured and calculated parameters for tests 3 and 4**

Parameter	Measurement
Overall Length of the ladder, (m)	4.616
Half the width of the ladder at the upper end of the effective stiles (m)	0.477
Half the width of the ladder at the base of the effective stiles (m)	0.309
Horizontal distance between the vertical surface on which the upper active ladder rests and the point on the horizontal surface on which the active ladder base rests (m)	1.565
As above but for the accessible ladder (m)	1.565
Half the accessible rung width at a distance of 390mm from stile to ladder top (m)	0.141
The included angle between the horizontal substrate and the accessible ladder stiles (°)	74°58'
The included angle between the horizontal substrate and the active ladder stiles (°)	70°14'
The total mass of the ladder and device (kg)	25.076
The distance along the ladder stile from the foot to the location of the point of ladder and device's centre of gravity (m)	2.539
Maximum reliable friction limit at the bottom	1.3
Maximum reliable friction limit at the top	0.839

EXAMINATION AND TEST (CONTINUED)**TESTS 5 AND 6****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 6th rung.
2. The ladder's feet were placed onto a horizontal substrate of ultra high molecular weight polyethylene and set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) and against a vertical substrate of P.T.F.E.
3. A vertical load of 60kg was applied at a distance of 0.39m down from the top of the stiles and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable running through a pulley in order for the load to be applied in the same axis as the rungs. The horizontal load required to produce movement of the ladder system was recorded.
5. The test was repeated with the 'Ladder Stopper' attached to the bottom of the ladder.

TEST RESULTS WITH NAKED LADDER

Test No	Horizontal load applied to cause movement (kg)	Horizontal load applied to cause continuous movement (kg)	Comments
1	0.86	-	+
2	1.58	-	+
3	1.26	-	+
4	2.04	-	+

- + The ladder exhibited the initial signs of flip where the torsional force induced in to the ladder caused the stile opposite to the load application to lift from the vertical substrate at the stated horizontal load.

TEST RESULTS WITH 'LADDER STOPPER'

Test No	Horizontal load applied to cause movement (kg)	Horizontal load applied to cause continuous (slow) movement (kg)	Comments
1	1.7	5.28	++
2	2.22	4.02	++

- ++ The ladder system did not exhibit any signs of flip up to the stated horizontal load.

EXAMINATION AND TEST (CONTINUED)**TESTS 7 AND 8****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 6th rung.
2. The ladder's feet were placed onto a horizontal substrate of ultra high molecular weight polyethylene and set at an angle of $75^{\circ}\pm 5'$ (1 in 4 slope approximately) and against a vertical substrate of P.T.F.E.
3. A vertical load of 128kg was applied at a distance of 0.39m down from the top of the stiles and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable running through a pulley in order for the load to be applied in the same axis as the rungs. The horizontal load required to produce movement of the ladder system was recorded.
5. The test was repeated with the 'Ladder Stopper' attached to the bottom of the ladder.

TEST RESULTS WITH NAKED LADDER

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous movement (kg)	Comments
1	0.0	-	+
2	0.0	-	+
3	0.0	-	+

+ Once the full 128kg load was applied the ladder exhibited unrecoverable flip failure without any horizontal load being applied.

TEST RESULTS WITH 'LADDER STOPPER'

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous (slow) movement (kg)	Comments
1	1.6	3.72	++
2	1.9	2.82	++
3	1.8	3.1	++

++ The ladder system did not exhibit any signs of flip up to the stated horizontal load.

EXAMINATION AND TEST (CONTINUED)**Measured and calculated parameters for tests 5 and 7**

Parameter	Measurement
Overall Length of the ladder (m)	4.8
Half the width of the ladder at the upper end of the effective stiles (m)	0.16
Half the width of the ladder at the base of the effective stiles (m)	0.1765
Horizontal distance between the vertical surface on which the upper active ladder rests and the point on the horizontal surface on which the active ladder base rests (m)	1.244
As above but for the accessible ladder (m)	1.244
Half the accessible rung width at a distance of 390mm from stile to ladder top (m)	0.13
The included angle between the horizontal substrate and the accessible ladder stiles (°)	74°59'
The included angle between the horizontal substrate and the active ladder stiles (°)	74°59'
The total mass of the ladder and device (kg)	17.796
The distance along the ladder stile from the foot to the location of the point of ladder and device's centre of gravity (m)	2.375
Maximum reliable friction limit at the bottom	0.556
Maximum reliable friction limit at the top	0.387

EXAMINATION AND TEST (CONTINUED)**Measured and calculated parameters for tests 6 and 8**

Parameter	Measurement
Overall Length of the ladder (m)	4.813
Half the width of the ladder at the upper end of the effective stiles (m)	0.16
Half the width of the ladder at the base of the effective stiles (m)	0.1765
Horizontal distance between the vertical surface on which the upper active ladder rests and the point on the horizontal surface on which the active ladder base rests (m)	1.247
As above but for the accessible ladder (m)	1.247
Half the accessible rung width at a distance of 390mm from stile to ladder top (m)	0.13
The included angle between the horizontal substrate and the accessible ladder stiles (°)	74°59'
The included angle between the horizontal substrate and the active ladder stiles (°)	74°59'
The total mass of the ladder and device (kg)	21.196
The distance along the ladder stile from the foot to the location of the point of ladder and device's centre of gravity (m)	1.99
Maximum reliable friction limit at the bottom	1.3
Maximum reliable friction limit at the top	0.556

EXAMINATION AND TEST (CONTINUED)**TESTS 11 AND 12****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 7th rung.
2. The 'Spyder' and 'Ladder Stopper' ladder accessories were both fitted to the ladder by the manufacturer and the system was placed onto a horizontal substrate of granite impregnated concrete at an angle of 75°±5'. The 'Spyder' was placed onto a roofing felt covered angled platform at an elevated height of 3.1m above ground level.
3. A vertical load of 60kg was applied at a distance of 0.39m down from the top of the stiles and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable, with the load applied in the same axis as the rungs. The horizontal load required to produce movement of the ladder system was recorded.
5. The test was repeated with a vertical load of 128kg.

TEST RESULTS WITH 'SPYDER' AND 'LADDER STOPPER' AT 60kg

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous slow movement (kg)	Comments
1	17.16	17.16	System withstood the vertical load without movement. No evidence of flip observed
2	14.66	14.66	System withstood the vertical load without movement. No evidence of flip observed

TEST RESULTS WITH 'SPYDER' AND 'LADDER STOPPER' AT 128kg

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous (slow) movement (kg)	Comments
1	31.68	31.68	System withstood the vertical load without movement. No evidence of flip observed

EXAMINATION AND TEST (CONTINUED)**TESTS 9 AND 10****TEST PROCEDURE FOR CLIENTS STABILITY TEST**

1. The ladder used for this test complied with BS EN 131: Parts 1 and 2: 1993 and was extended to the 7th rung.
2. The 'Spyder' and 'Ladder Stopper' ladder accessories were both fitted to the ladder by the manufacturer and the system was placed onto a horizontal substrate of granite impregnated concrete at an angle of 60°24'. The 'Spyder' was placed onto a roofing felt covered horizontal platform at an elevated height of 3.1m above ground level.
3. A vertical load of 60kg was applied at a distance of 0.39m down from the top of the stiles and 0.14m out from, and perpendicular to, the inside face of the stile.
4. A progressively increasing horizontal load was applied at the same position as per item 3) via a steel cable, with the load applied in the same axis as the rungs. The horizontal load required to produce movement of the ladder system was recorded.
5. The test was repeated with a vertical load of 128kg.

TEST RESULTS WITH 'SPYDER' AND 'LADDER STOPPER' AT 60kg

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous slow movement (kg)	Comments
1	17.4	24.4	System withstood the vertical load without movement. No evidence of flip observed

TEST RESULTS WITH 'SPYDER' AND 'LADDER STOPPER' AT 128kg

Test No	Horizontal load applied to cause initial movement (kg)	Horizontal load applied to cause continuous (slow) movement (kg)	Comments
1	34.4	34.4	System withstood the vertical load without movement. No evidence of flip observed

Testing discontinued due to the roofing felt becoming detached from the horizontal platform as a result of the forces applied.