

SAFETY COVER COMPLIANCE

OVERVIEW

The below demonstrates how the safety cover supplied with an Alpine Spa Pool complies with the New Zealand Building code under the Acceptable Solutions F9/AS2.

REQUIREMENTS

Bullet points numbered below as per page 17 of F9/AS2.

1.0 - Any spa pool supplied by Alpine Spas has a surface area of less than 5 m².

2.1.1 - Each wall at all points on an Alpine Spa Pool has a height of 760mm or more and is vertical.

2.1.2 - No external objects are installed on the wall that could assist climbing.

2.2.1 - Strength of cover complies in accordance with ASTM F1346-91(2010) report supplied below page #3.

2.3.1 - Top surface construction complies in accordance with ASTM F1346-91(2010) report supplied below page #3.

2.4.1 - Supplied and attached with cover are 'Lockable snap fasteners' with a body width greater than 33mm.

2.4.3 - Fasteners are cable of maintaining cover in place, preventing 100mm sphere from passing through when 100 N (10kg) force is applied, see ASTM F1346-91(2010) report supplied below page #3.

2.5.1 - Signs comply with paragraphs 2.2 and 3.2.2 of F8/AS1 containing the appropriate safety text (labels as per page #2).

SAFETY LABELS

WARNING

AVOID DROWNING RISK

Remove cover(s) completely before entry of bathers – entrapment possible.

Non-secured or improperly secured covers are a hazard.

Keep spa cover locked and in place when spa pool is un-occupied.

Failure to follow instructions may result in injury or drowning.

Manual spa safety cover in accordance with ASTM F1346-91



WARNING: This spa pool cover must be kept locked except when under adult supervision.



Testing. Advising. Assuring.

Exova
2395 Speakman Dr.
Mississauga
Ontario
Canada
L5K 1B3

T: +1 (905) 822-4111
F: +1 (905) 823-1446
E: sales@exova.com
W: www.exova.com

**EVALUATION OF 90" x 90" SPA COVER (2-SECTION)
For: CANADIAN SPA COMPANY
IN ACCORDANCE WITH PERFORMANCE SPECIFICATIONS OF:
ASTM F1346-91(2010), SECTIONS 7 & 9**

Report to:

Alpine Spas Limited / Canadian Spa
Company

Attention:

Telephone:

New Report No.:
Original Report No.:

16-06-M0191-1
16-06-M0191
5 Pages, 1 Appendix

Proposal No.:

16-006-439718 RV1

Date:

July 29, 2016

1.0 INTRODUCTION

At the request of Canadian Spa Company, Exova was retained to conduct physical performance testing of a one-piece 90" x 90" (2286 mm x 2286 mm) spa cover in accordance with ASTM F1346-91(2010), Sections 7 and 9 as outlined in Exova Proposal Number 16-006-439718 RV1

At the request of Canadian Spa Company the original report no.: 16-06-M0191, for Exova sample no.: 16-06-M0191, has been reissued to NANTONG BESTVIEW SPA CO., LTD.

The following drawings and documents in appendix A were as provided by the client and verified by Exova:

- Section assembly configuration
- Bill of materials
- Other qualified spa covers sizes
- Installation manual.

2.0 TEST METHOD & PROCEDURE

The Building Performance Centre at Exova evaluated a 90" x 90" (2286 mm x 2286 mm) spa cover in accordance with the procedures outlined below:

ASTM F1346-91 (2010): *"Standard Performance Specification for Safely Covers and Labeling Requirements for All Covers for Swimming Pools, Spas & Hot Tubs"*

Sections: 7.1 & 9.1 - Static Load

A 90" x 90" (2286 mm x 2286 mm) mock-up pool to be constructed and filled to a waterline 1-½" (38.1 mm) below the upper overflow surface. The test specimen (*spa cover*) shall be placed over the mock-up pool and fitted in accordance with the manufacturer's instructions. As per ASTM F1346-91(2010), section 9.1.1, one 275 lb (125 kg), applied over 1ft² (0.093 m²) areas, to be placed at the following locations:

- Centre point of the cover
- Between attachment points and at distance of at least 4' (107 mm) but not exceeding 6' (152 mm) from the side of the pool

As per section 9.9.1 the test loads shall be stable during the application of applying the load. There shall be no development of openings which would allow any of the test objects to pass through the cover. Upon removal of the load the spa cover shall be inspected for any damage.

Sections 7.2 & 9.2 - Perimeter Deflection

A 50 lb (22.7 Kg) weight to be placed at a distance of at least 4' (101 mm) but not exceeding 6' (152 mm) from the side of the pool, as per ASTM F1346-91(2010), Section 9.2.3.

Simultaneously, a 36.6-lb force shall be distributed by an ellipsoidal shaped test object with the dimensions of: 3.7" x 5.7" x 12" (94 mm x 145 mm x 305 mm) as shown in Figure 2 of ASTM F1346-91(2010).

As per section 9.2.3 during the application of the test load the spa cover shall not deflect enough to allow:

- The ellipsoidal shape test object to pass through the cover and gain access to the water. or
- The ellipsoidal shape test object shall not be trapped between the cover and the side of the pool.

Sections 7.3 & 9.3 - Surface Drainage

Prior to testing, *Timmy*, (a CPR mannequin simulating a 3 years old 36.6 lb (16.6 kg) boy) to be placed at approximately 3' (914mm) of and parallel to the edge of the spa cover in a supine position as prescribed in ASTM F1346-91(2010) Section 9.3.1. The pool cover shall be evenly sprayed with water at 10 gal/min per 1000 ft² for 30 minutes while observing if the waterline was maintained throughout the test.

As per sections 9.3.1 and 9.3.2 three minutes into test there shall be no unsafe amount of water build-up to completely cover the torso of the test object (*Timmy*). 30-minutes after the conclusion of the test there shall be no standing water on the test cover.

Sections 7.4 & 9.4 - Openings Tests

The cover shall be installed in accordance with the manufacturer's instructions. A solid faced sphere test object with a maximum breadth of 4.5" (114 mm) shall be placed at or into any opening. Simultaneously a 40 lb (18.4 kg) force shall be applied to all existing openings of the spa cover as prescribed in ASTM F1346-91(2010), Section 9.4.3.

As per section 9.4.3 during the application of test load the test object shall not pass through the following openings:

- Between the edge of the cover and the deck surface, and or
- Between the cover and coping wall, and or
- At the top surface of the spa cover.

Test Equipment:

Test The following calibrated equipment was used during testing:

- Spray Rack: MII B00136
- Scale: II B04639
- Measuring Tape: MII B14472
- Force Gauge: MII B04085
- Timer: MII B06860

3.0 RESULTS

Table 1 - ASTM F1346-91 (2010) Standard Performance Specification for All Covers for Swimming Pools, Spas & Hot Tubs (Exova Specimen 16-06-M0919)			
Test	Requirement		Result
Static Load Section 7.1 & 9.1	Test objects shall not cause any damage which would allow the test objects to pass through the cover.		Meets Requirement
	Test Load, lb (kg): for covers < 8ft	275 (125)	
Perimeter Deflection Section 7.2 & 9.2	Deflection of the cover shall not allow the test object to pass between the cover and the side of the pool, or to gain access to the water.		Meets Requirement
	Test Load, lb (kg):	50 (22.7)	
	Test Object, in (mm):	Ellipsoidal shape 3.7 x 5.7 x 12 (94 x 145 x 305)	
Surface Drainage Section 7.3 & 9.3	3 min into the test there shall be no unsafe amount of water. Standing water to be drained 30 min after the conclusion of the test.		Meets Requirement
	Test Load lb (kg):	Timmy 36.6 (16.6)	
Openings Test Section 7.4 & 9.4	Test object shall not pass through any openings.		Meets Requirement
	Test Load, lb (kg):	40 (18.4)	
	Test object, in (mm):	Sphere 4.5 (114) dia	

4.0 CONCLUSION

The 90" x 90" (2286 mm x 2286 mm) one-piece spa cover submitted by the Canadian Spa Company was tested in accordance with ASTM F1346-91(2010), Sections 7 and 9. The tested spa cover has met the following performance requirements:

- Static Load Test (Sections 7.1 and 9.1)
- Perimeter Deflection Test (Section 7.2 and 9.2)
- Surface Drainage Test (Section 7.3 and 9.3)
- Openings Test (Section 7.4 and 9.4)

6.0 REPORT REVISION SUMMARY

<u>Report No:</u>	<u>Date:</u>	<u>Description of Revisions:</u>
16-06-M0191	2016-July-29	Original report issued to Canadian Spa Company
16-06-M0191-1	2016-August-05	Report No.:16-06-M0191 was re-issued to NANTONG BESTVIEW SPA CO., LTD

Reported by:

Reported & Reviewed by:



Haya Soghrati, B.Arch. Sc, (Building Science), Ext. 11227
Building Systems Fenestration Services Project Manager,
Products Testing Division



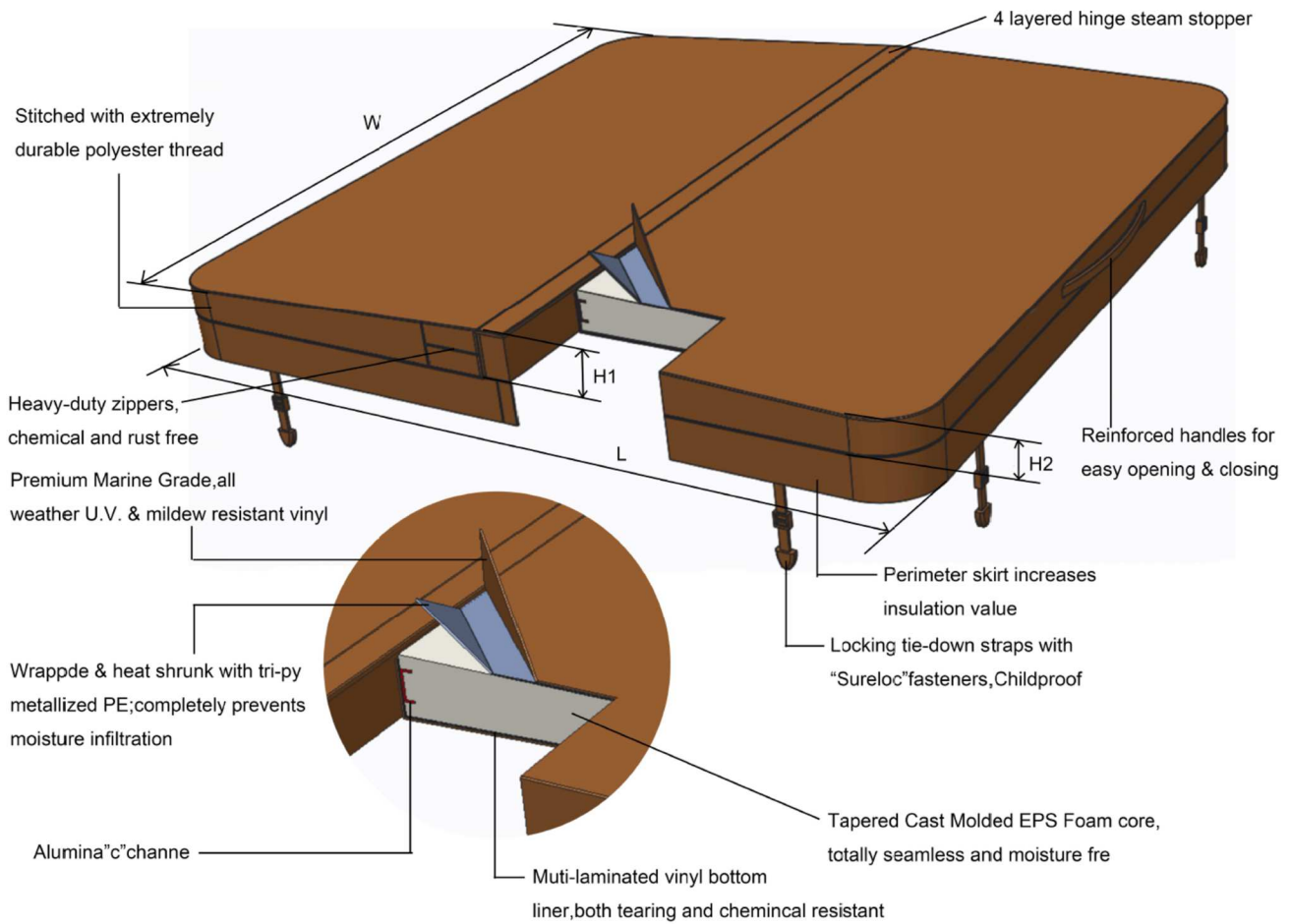
Sunny Ling, C.E.T., Ext. 11412
Supervisor, Building Systems
Products Testing Division

This report and service are covered under Exova Canada Inc's. Standard Terms and Conditions of Contract which may be found on our company's website www.exova.com, or by calling 1-866-263-9268

APPENDIX A

Specimen Drawings and Technical Data

(4 pages)



BOM FOR SPA COVER

ITEM	MATERIAL	QTY
1	Marine grade vinyl	per spa size
2	Liner	per spa size
3	Polystyrene	per spa size
4	Alumina C channel	per spa size
5	Reinforced Handles	2pcs
6	Heat retaining skirt	per spa size
7	Zipper	3 sets
8	Splice -buckles	4 sets
9	Durable polyester thread	per spa size
10	PE foam steam stopper	per spa size
11	SS screw	12pcs

SPA COVER SIZE LIST

Total Length (mm)	Total Width (mm)	Number of covers	Slope Height (Highest--lowest)(mm)
5940	2280	3	120-80
5000	2280	2	120-80
4210	2280	2	120-80
3900	2280	2	120-80
2290	2290	1	120-80
2270	2270	1	120-80
2250	2250	1	120-80
2230	2140	1	120-80
2220	2110	1	120-80
2210	2200	1	120-80
2190	2190	1	120-80
2150	1600	1	120-80
2150	1000	1	120-80
2130	2140	1	120-80
2130	2120	1	120-80
2010	2000	1	120-80
2010	1910	1	120-80
2010	1500	1	120-80
Round spa cover Diameter \varnothing 2030			
Round spa cover Diameter \varnothing 2290			

INSTALLATION INSTRUCTIONS

Our spa cover has been designed to help reduce energy costs by minimizing heat loss and evaporation from your spa . In addition , the attractive spa cover is an effective means of preventing debris such as leaves and dirt from entering your spas when it is not in use. It is recommended that the spa cover to be in place on the spa whenever the spa is not in use .

The spa cover , which is designed to fit the contour of your spas is made of tapered expanded polystyrene , reinforced with alumina channels . The foam cores are then heat sealed in clear plastic then covered with heavy duty marine grade vinyl. The spa cover folds in the center and has reinforced handles for easy handling . The spa cover flaps or tie downs can be used on these fasteners to discourage unauthorized use of spa .

The zippered covers permit the replacement of one or both of the foam panels if needed .

INSTALLATION

Spa cover assembly includes :

1 spa cover , twist-latch fasteners , pad lock and screws .

Tools required for installation :

7/64" drill bit , power of hand drill , and a screwdriver .

To properly secure the cover install twist latch fasteners . Follow the procedure below :

1. Position the spa cover on the spa , next note the location of the vinyl tie downs with relation to the skirt or spa rim .Mark the center point at each eyelet on the skirt or the spa rim depending on which is applicable .
2. When center points are marked , lift the straps or flap back . Then position twist latch to center of mark and mark center of two screws holes of twist latch .
3. Using a 7/64" drill bit , drill the holes at two markings made in the rim in step 2 .
DO NOT DRILL AT CENTER POINTS .
4. Align the holes on the twist-latch fasteners with the holes in the rim and insert screws into the holes , securing the fasteners in the rim .

USE

1. The cover must be completely off the spa at all times while spa is in use ;
2. Entrapment possible , Children or objects cannot be seen under cover ;
3. Remove cover completely before entry of bathers ;
4. Non-secured or improperly secured covers are a hazard ;
5. Failure to follow all instructions may result in injury or drowning ;

To protect your spa cover from surface damage by chemicals , remove the cover completely when adding chlorine or other chemicals to the water .

NOTE : As a safety precaution , do not allow children do use the spa unattended or to play on the spa cover .

SPA COVER MAINTENANCE

Clean accumulations of dust and dirt off your spa cover with a mild liquid detergent solution , then apply a good grade non silicone vinyl protector with ultra violet inhibitors .

The foam cores can be changed if they should become broken , To remove panels , fold the spa cover at the hinges so the bottom side of the panel is facing up . Open zippers , then slide out the damaged foam panel . Obtain the replacement panels from cover manufacturer or nearest dealer.

CAUTION

While the spa is rigid it is not designed to support weight , as a safety precaution and to preserve the life of your cover , you must not sit , stand or lie on it ; nor should you place objects of any kind on the top of it .