PACKAGING PERFORMANCE UN/IMDG CERTIFICATE

CONTAINER TESTING LABORATORY ID #+AQ

Certification Report #2555
CTL P. #41847

REQUESTING PARTY: Mr. Jay Calnen
Stephen-Gould Corporation
1491 Route 52
Fishkill, NY 12524

1. Product tested: combination packaging, comprising one (1) 2.5 kg gross weight rectangular battery pack inner packagings inserted into a static shielded bag, then placed within side corrugated inserts inside the inner corrugated box. The corrugated box (battery box) is then installed into a double-wall regular slotted fibreboard container (International Box Code 0201) with top corrugated pads and accessory box. The use of other packaging methods or components may render this report invalid.

2. Designated packaging code type: 4G
Packaging nomenclature: Combination Package

3. Tests performed:

TEST	SPEC	INTENSITY	RESULTS
Cobb	Para 6.1.4.12.1	127.5 g/m^2	Pass
Drop	Para 6.1.5.3	1.2 meter	Pass
Stacking	Para 6.1.5.6	91 kg	Pass
Vibration	49 CFR 178.608	1 hour	Pass

4. Authentification: USA/+AQ2555

5. I certify that the samples of the packaging prepared as for transport, described herein and re-tested in May 2005 in the manner summarized in paragraph (3) above, successfully passed the tests according to the criteria described in paragraphs 6.1.4.12.1, 6.1.5.3 and 6.1.5.6 as set forth in the UN Recommendations of the Committee of Experts on the Transportation of Dangerous Goods, Chapter 6, and US 49CFR Section 178.608, and that the packages may bear the marking:

4G / Y 6.1 / S / **
USA / +AQ2555

* year of manufacture

By: _____Date: May 16 2005
CONTAINER TESTING LABORATORY, INC.
CERTIFICATION OFFICER

May 27, 2005

Stephen-Gould Corporation
1491 Route 52
Fishkill, NY 12524

Attn: Mr. Jay Calnen

RE: Summary of Packaging Performance for UN/IMDG Certification for the
Transport of Dangerous Goods
Double-Wall Fibreboard Box Containing One (1) 2.5 Kg Gross Weight Lithium Battery Pack
(LeCroy Battery Pack)
CTL P. #41847; Cert. #+AQ2555

Tests performed to certify compliance with the UN Recommendations of the Committee of Experts on the Transport of Dangerous Goods, Chapter 6, 12th Revised Edition and US 49CFR Section 178.608, as follows:

TEST	SPEC	INTENSITY	RESULTS
Cobb	Para 6.1.4.12.1	127.5 g/m^2	Pass
Drop	Para 6.1.5.3	1.2 meter	Pass
Stacking	Para 6.1.5.6	91 kg	Pass
Vibration	49 CFR 178.608	1 hour	Pass

The packages submitted satisfy the requirements for a fibreboard box (4GV) tested to Packaging Group II specifications for a Type Y certificate.
The use of other packaging methods or components may render this report invalid.

Respectfully submitted,

CONTAINER TESTING LABORATORY, INC.

Anton Cotaj
Project Engineer

AC/ac
Enc.

CONTAINER DESCRIPTION

One (1) 2.5 kg gross weight rectangular battery pack inner packagings inserted into a static shielded bag, then placed within side corrugated inserts inside the inner corrugated box. The corrugated box (battery box) is then installed into a double-wall regular slotted fibreboard container (International Box Code 0201) with top corrugated pads and accessory box, as detailed in Appendices A and B, respectively.

Ser #	Weight Filled (kg)	Ser#	Weight Filled (kg)
1.	6.16	5.	6.16
2.	6.16	6.	6.16
3.	6.16	7.	6.16
4.	6.16	8.	6.16

TEST METHODS & RESULTS

1. Drop Test - Packing Group II, Type Y – UN Paragraph 6.1.5.3

The packages are received filled with battery cells or solid product simulant to reach the actual testing weight and they are conditioned to 23^{0} C and 50% R.H. for 24 hours prior to testing. Then, five (5) filled packages, closed as for shipment, are subjected to a free fall drop test from a height of 1.2 meters onto a solid concrete floor as follows:

Containers	Point of Impact	Result
#1	Flat onto the bottom panel	No rupture/leakage
#2	Flat onto the top panel	No rupture/leakage
#3	Flat onto the long side panel	No rupture/leakage
#4	Flat onto the short side panel	No rupture/leakage
#5	Onto the mfr's joint/most fragile corner	No rupture/leakage

2. Stacking Test – UN Paragraph 6.1.5.6

Three (3) filled containers are closed as for shipment and subjected to a static compression load of 61 kg, equivalent to a 3 meter high stack of identical test packages, continuously for 24 hours.

Containers	Actual Load	Result
#6, #7 & #8	91 kg	No rupture/leakage

3. Cobb Test – UN Paragraph 6.1.4.12.1

The outer fibreboard box is tested for water resistance following ISO International Standard 535-1976 (E). The increase in mass as determined over a thirty (30) minute period by the Cobb method is determined to be less than 155 g/m^2 as follows:

Container Outer Surface	Water Absorption	Result
	127.5 g/m^2	Pass

4. <u>Vibration Standard – US DOT 49CFR Section 178.608</u>

Three (3) filled samples, closed as for shipment, are placed on a vibration platform having 25.4 mm peak-to-peak displacement and vibrated in normal shipping orientation for one (1) hour at 235 CPM such that a 1.6 mm thickness could be passed between the bottom of the samples and the platform. Immediately thereafter, the packages are removed from the platform and examined.

Containers	Vibration	Result
#6, #7 & #8	1 hr at 235 CPM	No leakage/rupture

CONCLUSIONS

The packages were tested according to Paragraphs 6.1.4.12.1, 6.1.5.3 and 6.1.5.6 of the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods, Chapter 6, 12th Revision and 49CFR Section 178.608 to Group II products.

The packages met the test requirements and it is recommended that a UN certificate be issued with the mark Y, to wit:

4G / Y 6.1 / S / **
USA / +AQ2555

where: 4G is the packaging type code
Y is the packing group
6.1 is the gross mass in kg
S is for combination packaging
** year of manufacture
USA is the country of testing
+AQ2555 is lab & test number of certifying agency

Note: According to 49CFR Section 178.601 (e) Periodic Retesting. The packaging manufacturer shall achieve successful test results for the periodic retesting at intervals established by the manufacturer of sufficient frequency to ensure that each packaging produced by manufacturer is capable of passing the design qualification test. Changes in retest frequency are subject to the approval of the Associate Administrator for Hazardous Materials Safety. <u>For combination packagings, the periodic retest must be conducted at least once every 24 months.</u>

APPENDIX A

The pack being tested is a combination packaging comprising one (1) 2.5 kg gross weight rectangular battery pack inner packagings.

Product Information: Packing Group II Solid Product

INNER PACKAGING:

Manufacturer	Iwatsu Test Instruments Corporation, Japan
Style	Rectangular Lithium-Ion Battery
Size (OD, mm)	288 x 260 x 68
Material	Blue plastic case
Closure Type	Molded plastic
Removal Torque	N/A
Gross weight	2.53 kg each, as tested
Count	One (1) per package
Label	LeCroy Battery Pack; WS Battery

INNER PACKAGING DETAILS:

Static Shielded Bag – 1 required
Material – LDPE; 0.05 mm thickness
Size (mm, OD) – 405 x 460
Weight – 23.2 grams

The static shielded bag contains the battery pack

APPENDIX B

The pack being tested is a combination packaging comprising a regular slotted container (4G) outer packaging.

OUTER PACKAGING:

UN code	4G
Manufacturer	Not Indicated
Style	Regular slotted container (International Box Code 0201)
Size (mm, OD)	440 x 325 x 284
Weight	840 grams
Certificate	275#; Tests to 283.5 lbs/in^2 Burst Strength; 114.7 (43.0/27.5/28.2/28.5/43.5) lbs/1000 ft^2 Combined Weight of Facings
Corrugations	Vertical "BC" flute
Facing	Kraft-kraft (visual exam only)
Mfr's joint	Stitched with at least seven (7) staples
Print	None
ID	WS Battery Pack
Closure	Sealed with 76 mm (3") wide reinforced paper tape: One (1) piece with 2" overhang along the flap seam on each top and bottom

OUTER PACKAGING DETAILS:

1. Inner Box (Battery Box) – 1 Required
   Style – Regular Slotted Container (International Box Code 0202) with glued joint
   Corrugation – Kraft/Kraft Vertical "C" flute
   Size (mm, OD) – 425 x 308 x 155
   Tare Weight – 400 grams

   Placed within the outer box, contains all the battery pack installed within the side corrugated inserts. The battery box is sealed with 1PC 2" plastic tape on each top and bottom.

1.1 Battery Insert - 2 required
   Corrugation – Kraft/Kraft Vertical "C" flute
   Size (mm, OD) – 420 x 62 x 134
   Tare Weight – 150 grams each

   Each insert is composed of three 93) corrugated pieces. The die-cut inserts nest the battery pack within the inner box.

2. Accessory Box - 1 required
   Style – Regular Slotted Container (International Box Code 0202) with glued joint
   Corrugation – Kraft/Kraft Vertical "C" flute
   Size (mm, OD) – 225 x 222 x 95
   Tare Weight – 165.5 grams

   The accessory box is placed on top of the battery boxes and contains the accessories. The box is sealed 1PC 2" plastic tape on each top and bottom.

3. Top Padding – 2 required
   Corrugation – Kraft/Kraft Vertical "C" flute
   Size (mm, OD) – 228 x 306 x 100 & 402 x 305 x 102
   Weight – 113 grams & 240 grams respectively

   Two (2) U-style inserts are placed across the top of the accessory box.

APPENDIX C

The following section details: (A) the method of calculating the gross weight *("GW")* of the packaging as indicated in the UN Mark; and, (B) the compressive load *("SL")* applied in the stacking test.

A. Maximum gross weight of package, based on test level = GW (kg)
Gross weight of package, as tested = TW (kg)

GW = TW

GW = 6.16 kg

GW = 6.1 kg

Mark = Y 6.1

B. Stacking load = SL (kg)
Stacking height = SH = 3 meter = 3000 mm
Outer packaging height = PH (mm)
Maximum gross weight of the package, based on the test weight = GW (kg)

SL = [Integer (SH/PH) – 1] * GW

SL = [Integer (3000 mm/284 mm) – 1] * 6.1 kg

SL = 10 * 6.1

SL = 61 kg