

## Certification

December 2, 2009

Plasticase is proud to announce that NANUK has been awarded certification by the independent accredited laboratory Cascade Technical Sciences based on the standards below. A copy of the certification document is attached. The full test report is available from Plasticase upon request.

### Standards

**ATA Specification 300 Category 1 Impact**  
**ASTM D-4169 DC-18 Drop**  
**ASTM D-4169 DC-18 Vibration**  
**ASTM D-4169 DC-18 Rainfall**  
**MIL-STD-810F Immersion**  
**IP 67 Ingress protection**

### Description of tests and procedures

#### ATA Specification 300 Category 1

Airline transport container suitable for a minimum of 100 airline trips

Impact Resistance Test; samples were exposed to impact using a bar weighing 13.2lbs with a hemispherical end of 3.2cm. Bar was dropped with its longitudinal axis vertical on to each sample's weakest point from a height of 0.5m. Samples were conditioned to a temperature of -20°C before impact exposure.

#### ASTM D-4169 DC-18

Level 1 Schedule A Handling (Manual)

Drop tests - a series of drops on each edge, corner and face of the case from a height of no less than 48cm(19") and with loads of 6.8-31.8kg(15-70lbs) determined by case size.

Samples were conditioned at lab ambient conditions and then temperatures of -28°C and +60°C for a minimum of 3 hours at each condition.

#### ASTM D-4169 DC-18

Level 1, Schedule F loose load vibration

Vibration - The cases are tested using test method D-999 to determine the ability to withstand the repetitive shocks occurred during transportation of loose loads.

#### ASTM D-4169 DC-18

Level 1, Schedule H Environmental Hazard Rainfall

Simulated rainfall for 2hrs at a rate of 10cm/hr (4"). Samples were conditioned to -20 degrees C and +52 degrees C.

#### MIL-STD-810F

Method 512.4

Immersion - The case is submerged in a basin of water to a depth of 1 meter (3.28 ft) to the top most part of the case for 30 minutes. The case is heated to 10 degrees F higher than the temperature of the water.

#### IP 67 ingress protection

6- Total protection from dust

7- Protected against the effects of immersion between 15cm(5.9") and 1m(39.37")

Samples exposed to 8hr dust exposure with a concentration of 2 kg/m<sup>3</sup> using talcum powder as dust

Samples exposed to immersion in 1 meter of water for a period of 30 minutes.

December 1, 2009

Certification No: CTC 9730

Attention: Benjamin Coley  
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Reference: a. ATA 300  
b. ASTM D4169  
c. Mil-Std-810F  
d. CEI/IEC 60529:2001  
e. PO# 761505  
f. Quote CTQ 7933  
g. Cascade TEK Job No. 9730



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TESTING CERT #2582.01

### **CERTIFICATION**

Cascade Technical Sciences hereby certifies that Fourteen (14) Nanuk Protective Cases, (With Custom Foam) P/N 905-0006 S/N 2, P/N 915-0006 S/N 2A, P/N 920-0006 S/N 2B & 2C, P/N 930-0006 S/N 2D, P/N 940-0006 S/N 2E and P/N 945-0006 S/N 2F and (With Foam) P/N 905-0006 S/N 1, P/N 915-0006 S/N 1A, P/N 920-0006 S/N 1B & 1C, P/N 925-0006 S/N 1D, P/N 940-0006 S/N 1E and P/N 945-0006 S/N 1F were subjected to the following tests:

1. Impact Resistance Test per Reference (a) and (f) Item 1, samples were exposed to impact using a bar weighing 13.2lbs with a hemispherical end of 3.2cm. Bar was dropped with its longitudinal axis vertical onto each sample's weakest point from a height of 0.5m. Samples were conditioned to a temperature of -20°C before impact exposure. (Custom Foam).
2. Schedule A Handling Test per Reference (b) Paragraph 10.2.3 and (f) Item 2, samples were exposed to drops from heights depending on each sample weight per specification. Samples were conditioned at lab ambient conditions and then temperature of -28°C and +60°C for a minimum of 3 hours at each condition. (Custom Foam).
3. Schedule F Loose Load Vibration Test per Reference (b) Paragraph 13.1 and (f) Item 3, samples were exposed to repetitive shock for 30 minutes along the normal shipping axis and the remaining 30 minutes distributed among all other shipping orientations. (Custom Foam).
4. Schedule H Environmental Hazard Rainfall Test per Reference (b) Paragraph 15.2 and (f) Item 4, samples were exposed to temperature cycling and water spray test per method D951 and test level per assurance level 1. (Custom Foam).
5. Immersion Test per Reference (c) Method 512.4, Procedure I and (f) Item 5, samples were conditioned 10°C above water temperature and then immersed in 3ft. of water for a period of 30 minutes. (Foam) \*

6. Dust Test per Reference (d) Paragraph 13.4, (IP-6X)m Category 2 and (f) Item 6, samples were exposed to 8 hours of dust exposure with a concentration of 2 kg/m<sup>3</sup> using talcum powder as dust. (Foam)
7. Temporary Immersion Test per Reference (d) Paragraph 14.2.7, (IP-X7) and (f) Item 7, samples were immersed in 1 meter of water for a period of 30 minutes. (Foam)

Testing was done in accordance with the above references as evidenced and reported in the accompanying data. The test samples were returned to the customer's facility for evaluation.

The original of this report is on file at Cascade Technical Sciences, Inc. under the above referenced certification number for review by authorized personnel. The results of the testing reported herein relate only to the actual item tested.

Respectfully submitted,

  
David Bowles  
Quality Manager  
Cascade Technical Sciences, Inc.

This test certification shall not be reproduced, except in full, without written authorization from Cascade Technical Sciences.  
Total number of pages in this document is 124.

The objective of this test program was to subject customer provided test hardware to environmental simulation in compliance with customer stated specification, including any authorized modification, deviations or concessions to the original requirements. The hardware consisted of items identified in the appropriate sections of this report. In addition to test hardware identification, each section contains information that describes the associated test setup and performance and the resulting data. CascadeTEK, Inc measuring instruments used in testing were calibrated according to the requirements of ANSI/NC SL Z540-1-1944, ISO/IEC 17025-2005 and are NIST traceable. Calibration records are on file and available for inspection by request. Because the test methods are well established and are qualitative or semi-quantitative in nature, CascadeTEK, Inc does not apply measurement uncertainty unless obligated by contract. Measured value related to the corresponding tolerance requirement is used to decide whether a test meets the requirements of the specification. Any test hardware operational setups and resulting evaluations or inspections performed by the customer are not included in this report, unless they were explicitly requested. While observations and/or specification compliance statements may be reported, no interpretations or opinions regarding customer product performance are intended. Unless otherwise indicated in the appropriate report section, all contract obligations were met and the test objective achieved.