

TOPTESTER LTD

TEST REPORT

CUSTOMER: HANDSHAKE FINLAND OY

TEST NAME: MIL-STD-810H, METHOD 503.7, TEMPERATURE SHOCK

EQUIPMENT UNDER TEST

DEVICE NAME: COMPASS R
VERSION NR: COMPASS R (V.6)
DEVICE ID: 6078

TEST DATE: 27.10.2020

Test id: Env_ Hanshake_201028_01

Report version: 1.0

Persons in charge of the test

Customer: Niko Peltoniemi

Toptester: Pasi Tiuraniemi

Test ordered by: Niko Peltoniemi

Test order date: September 2020

TEST REPORT HISTORY

Version	Date	Change description	Changes made by
1.0	10.11.2020	First version of the report is 1.0. If no changes are necessary, it will be also the final version.	Pasi Tiuraniemi

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1 TEST SUMMARY

Used standard or test method summary

The test was based on MIL-STD-810H, Method 503.7, Temperature shock, Procedure I-C (Multi -cycle shocks from constant extreme temperature).

Description of equipment under test

Equipment Under Test (EUT):

- Compass R Multifunctional High Power Headlamp, 3 pcs
 - Version: Compass R (v.6)
 - Device ID: SKU: 6078

Test result summary

No external damages caused by the temperature shock test were found. EUT was functional during and after the test. Test result is **Pass**.

2 Introduction

2.1 Background

Test was ordered by Handshake Finland as a part of product testing program.

2.2 Equipment under test

Equipment Under Test (EUT):

- Compass R Multifunctional High Power Headlamp, 3 pcs
 - Version: Compass R (v.6)
 - Device ID: SKU: 6078



Picture 1. Compass R headlamps on test tray

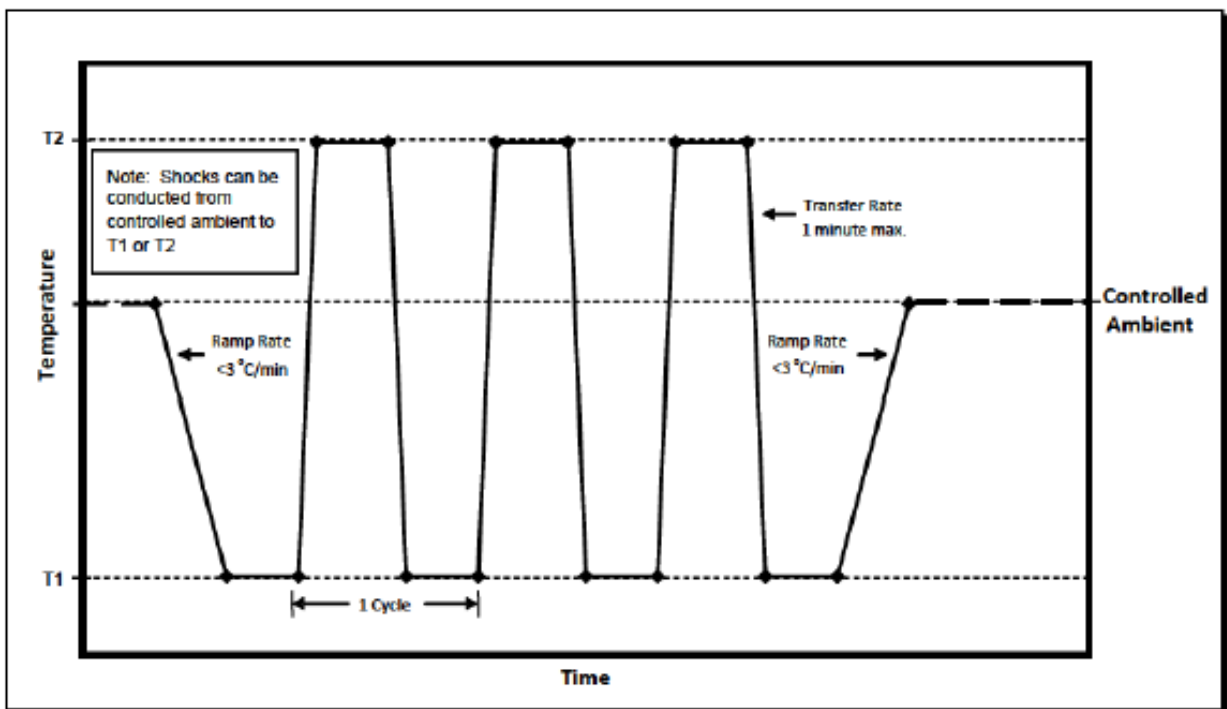
2.3 Goals of the test

The goal of the test was to see if the EUT's pass or fail the acceptance criteria named in the test standard and test plan.

3 Test method and measurement description

3.1 Test Method

The test performed was MIL-STD-810H, Method 503.7, temperature shock, Procedure I-C (Multi -cycle shocks from constant extreme temperature). Test dwell temperatures were -30°C and +40°C. One cycle contained 30 min dwell in each temperature and less than one minute transfer time between temperatures (chambers). Three cycles were performed.



Picture 2. Multi-cycle shocks

3.2 Analyses

Before, during, and after the test following analyses were performed

- Visual check
- Inspection to verify the electrical functionality of the device

3.3 Acceptance criteria

After the test, EUT was inspected. Test result was a pass if EUT was determined to function normally.

3.4 Test Reliability Control and Measurement

Weiss environmental chamber was controlled and recorded by SIMPATI chamber control software, version 1.30. Espec environmental chamber was manually programmed.

4 Test and measurement time and resources

Test date 27.1.2020

Test personnel Pasi Tiuraniemi

Test sites Toptester, Rovaniemi
Ambient temperature: 20,7 °C
Ambient relative humidity: 52,6 %

Test and measurement equipment:

- Weiss WK340/40/5 temperature & humidity chamber (serial number 58226070000010), Calibration valid until 17.2.2022
- Espec SH-641 temperature & humidity chamber (serial number 92006522), Calibration valid until 17.2.2022
- VAISALA HMT337 temperature & humidity transmitter (S/N: N2050042, calibration valid until 18.2.2022)
- Digital camera

5 Test results

EUTs were inspected and installed on metal tray. EUTs power level was adjusted to medium. Metal tray was placed inside of Weiss environmental chamber and chamber control program was started. Espec environmental chamber was heated to elevated test temperature. After 30 min soak on time at -30°C temperature, EUTs were transferred to elevated temperature chamber (40°C) for 30 min soak on time. This procedure was repeated three (3) times.



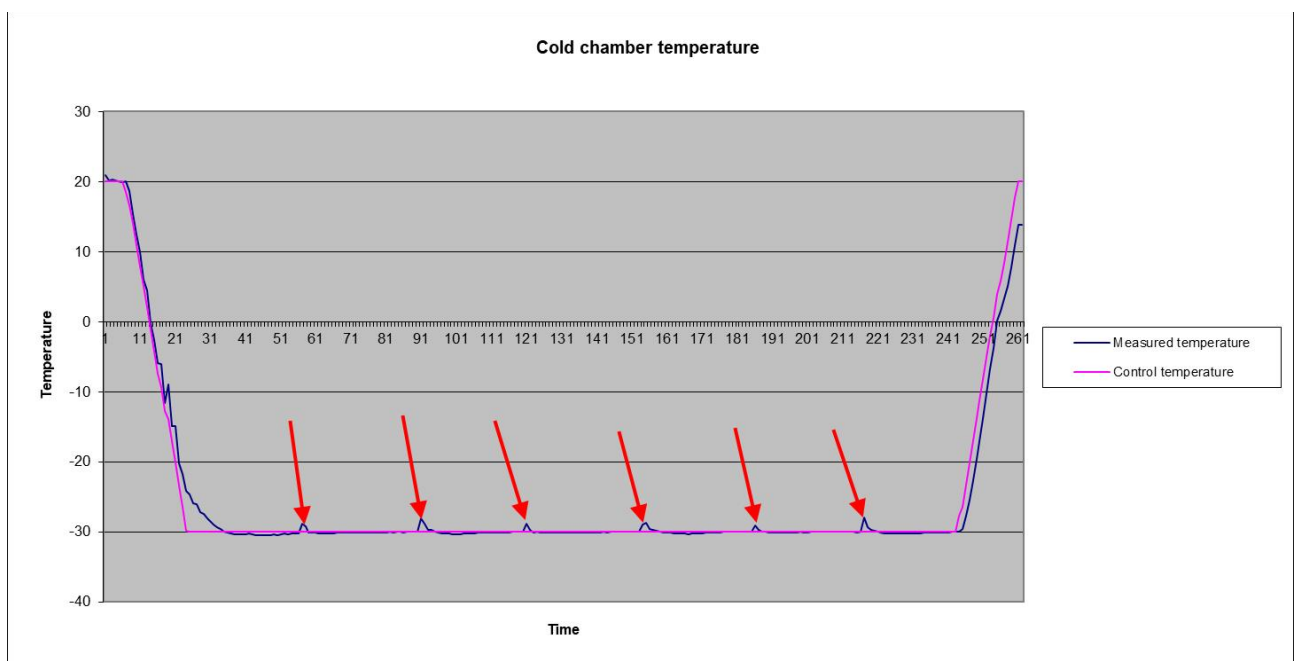
Picture 3. EUTs on cold temperature chamber and elevated temperature chamber



Picture 4. EUTs moved to elevated temperature chamber and frosting was seen on EUT's external surfaces

After the last transfer and 30 min soak in cold chamber, the chamber temperature was gradually heated to controlled ambient temperature.

All EUTs were operational during and after the test.



Picture 5. Cold temperature chamber curve with transfer timings (red arrows)

6 Conclusions and recommendations

No external damage caused by the temperature shock test was found. EUT was functional during and after the test. Thus, the test result is **Pass**.

7 Quality



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