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HARWiN

Test Report Summary

HT02702

Environmental Testing of Coin Cell Holders
S8401-46, S8411-45R, S8421-45R
and S8211-46R

1. Introduction

1.1. Description and Purpose

The purpose of this test program is to confirm the vibration, shock and bump performance of Harwin Coin Cell Holders S8401-46, S8411-45R, S8421-45R and S8211-46R.

1.2. Conclusion

The following test data has been taken from Harwin test report ET3858.

Test	Duration	Axis	S8401-46	S8411-45R	S8421-45R	S8211-46R
Vibration (best test result shown)	See results	Z Axis	Passed 20g, 120 minutes	Passed 20g, 120 minutes	Passed 20g, 120 minutes	Discontinuity Detected 10g
		Y Axis	Passed 10g, 30 minutes	Passed 20g, 120 minutes	Passed 20g, 120 minutes	Passed 5g, 120 minutes
		X Axis	Passed 20g, 120 minutes	Passed 20g, 120 minutes	Passed 20g, 120 minutes	Passed 5g, 120 minutes
Shock – 100g	1ms	Z Axis	Passed	Passed	Passed	Not Tested
Shock – 50g		Y Axis	Passed	Passed	Passed	Not Tested
Shock – 50g		X Axis	Passed	Passed	Passed	Not Tested
Bump – 40g	10ms	Z Axis	Passed	Passed	Passed	Not Tested
		Y Axis	Passed	Passed	Passed	Not Tested
		X Axis	Passed	Passed	Passed	Not Tested

All discontinuity measurements were taken at 10 microsecond (100kHz) intervals.

2. Test Method, Requirements and Results

2.1. Specification Parameters.

The testing performed included:

- Swept Sine (Vibration): generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc.
- Shock: generally in accordance with BS 9525 and BS EN 60068-2-27 test Ea.
- Bump: generally in accordance with BS 9525 and BS EN 60068-2-27 test Ea.

Each test was carried out In the Z-axis first, followed by Y-axis, then X-axis.

2.2. List of Test Samples

- S8401-46 – Vertical PC Tail coin cell holder for Ø20mm battery
- S8411-45R – Horizontal SMT coin cell holder for Ø20mm battery
- S8421-46R – Horizontal SMT coin cell holder for Ø12mm battery
- S8211-46R – Horizontal SMT one-piece coin cell holder for Ø20mm battery

2.3. Test Method and Results

2.3.1. Vibration – 10g and 5g

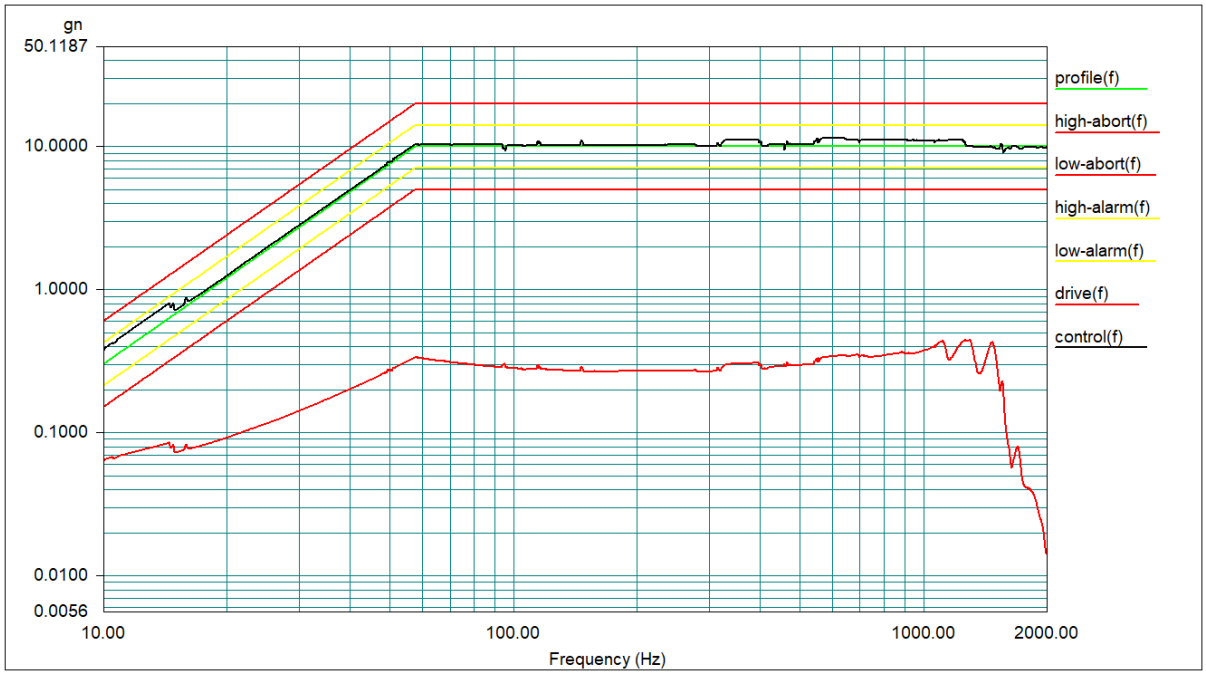
Methodology: The sample was subjected to a Swept Sine Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc, under the following conditions:

- 10-57.55Hz @ 1.5mm peak-peak, 57.55-2,000Hz @ 10g
- Sweep rate 1 octave/minute for 30 minutes in each axis
- Intermittencies on each connector to be recorded

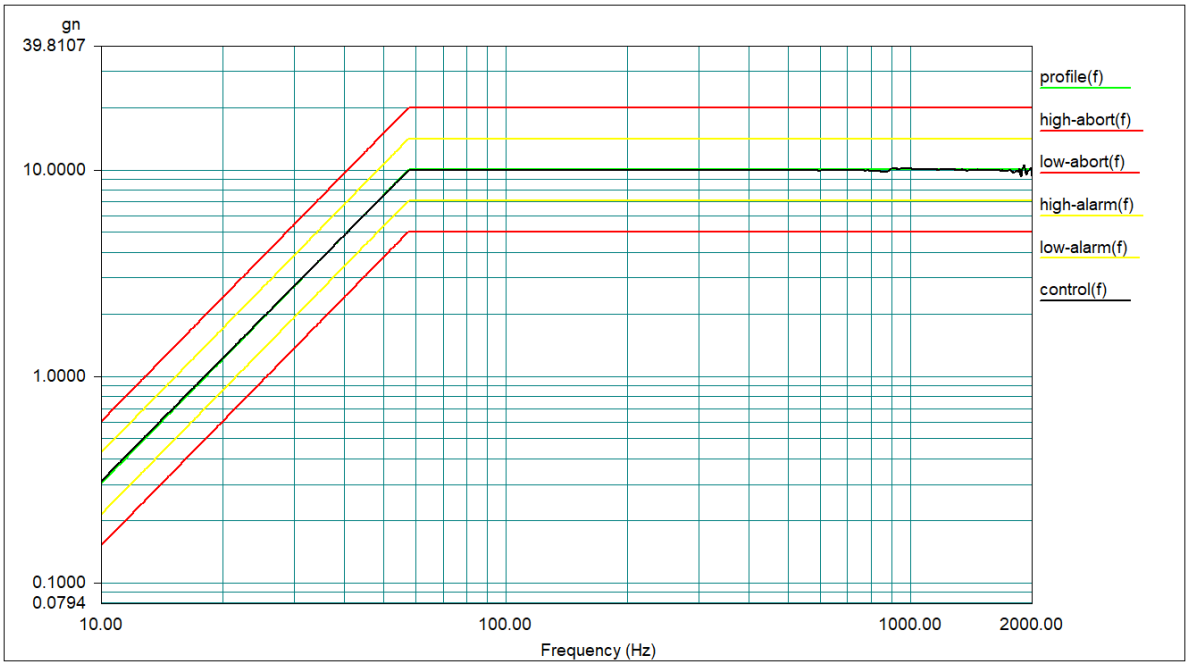
Results: During the Z-axis continuity test (completed first), coin cells held in S8211-46R had vibrated loose during the vibration sweep at around 1,149Hz and discontinuity occurred. The coin cells were placed back into the holders before further testing was carried out at a reduced specification:

- 10-40.69Hz @ 1.5mm peak-peak, 57.55-2,000Hz @ 5g
- Sweep rate 1 octave/minute)
- Tested for both 30 minutes and 120 minutes on X and Y axes

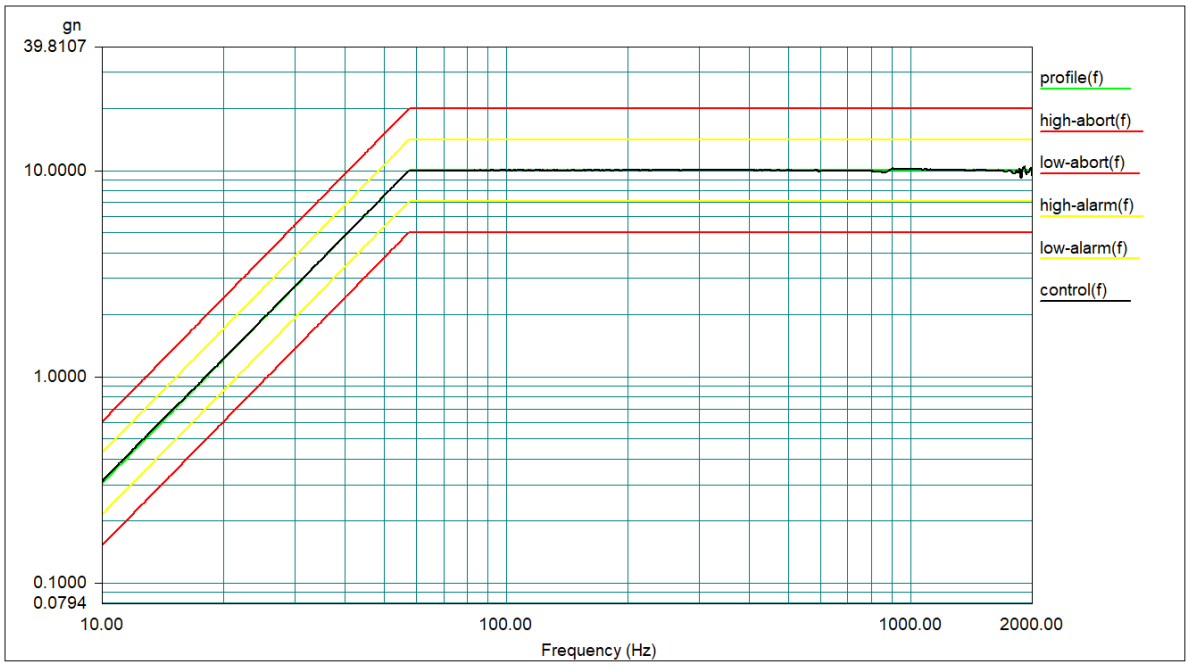
In each plot, the black line is the Control Accelerometer response. The red line in the Z axis plot is the Shaker Drive response.



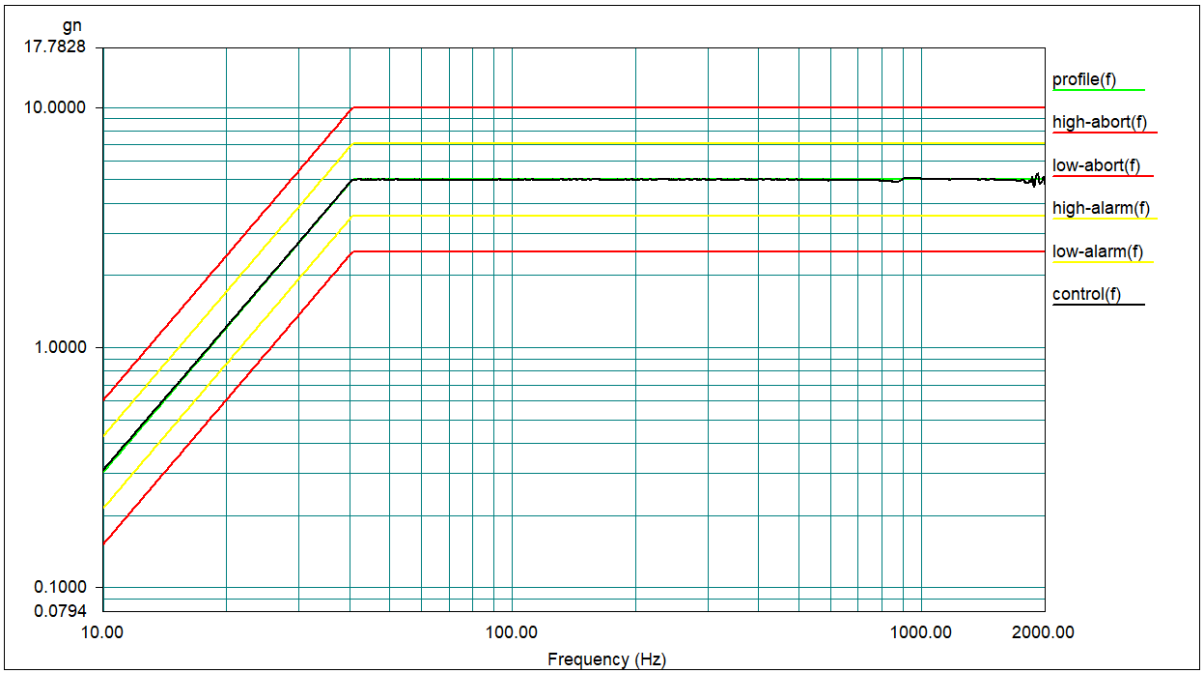
Z axis - 10g Sine Vibration Plot



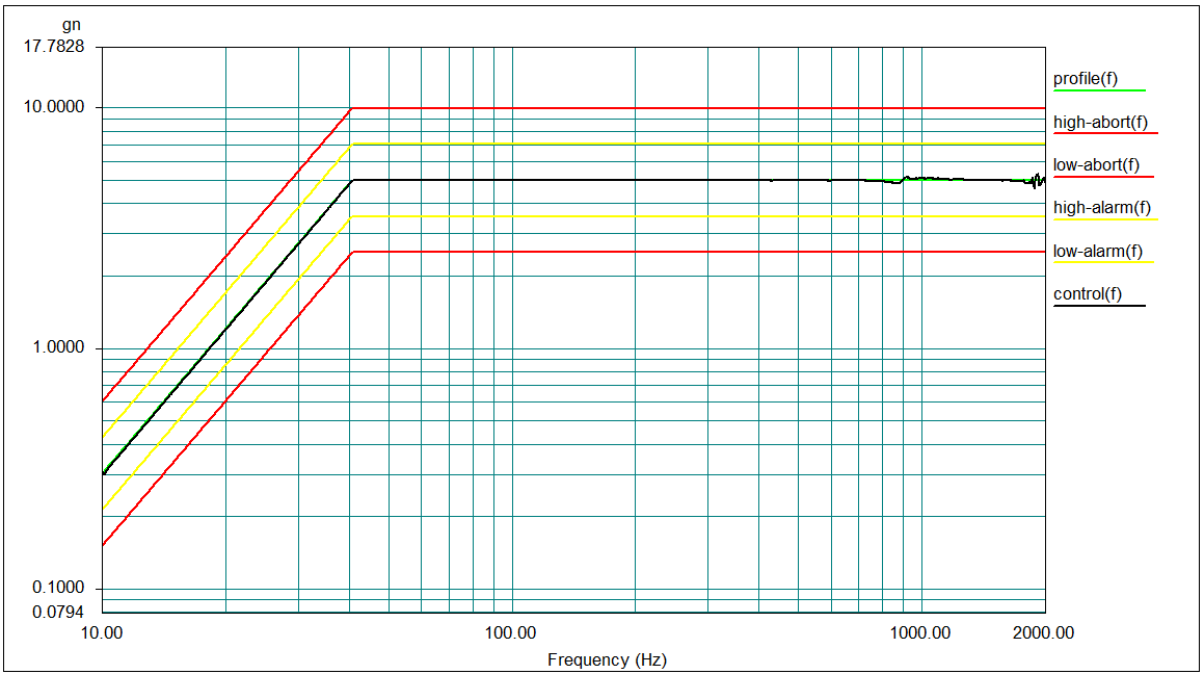
Y axis - 10g Sine Vibration Plot



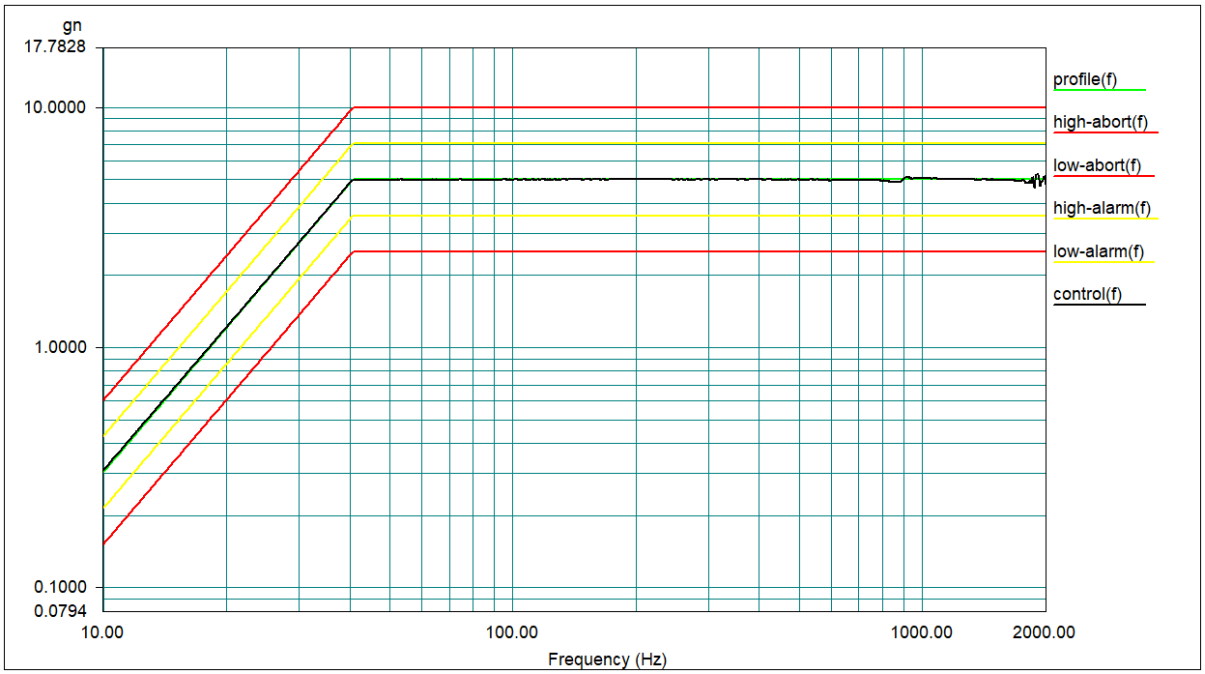
X axis - 10g Sine Vibration Plot



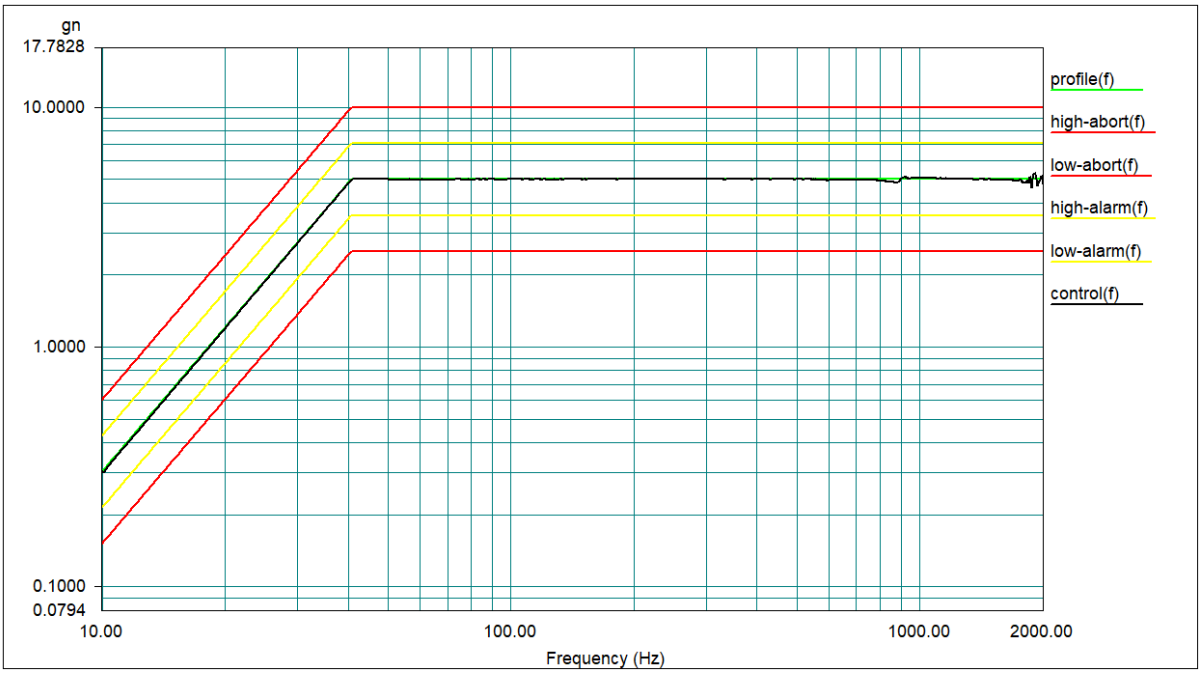
Y axis - 5g Sine Vibration Plot for 30 minutes



Y axis - 5g Sine Vibration Plot for 120 minutes



X axis - 5g Sine Vibration Plot for 30 minutes



X axis - 5g Sine Vibration Plot for 120 minutes

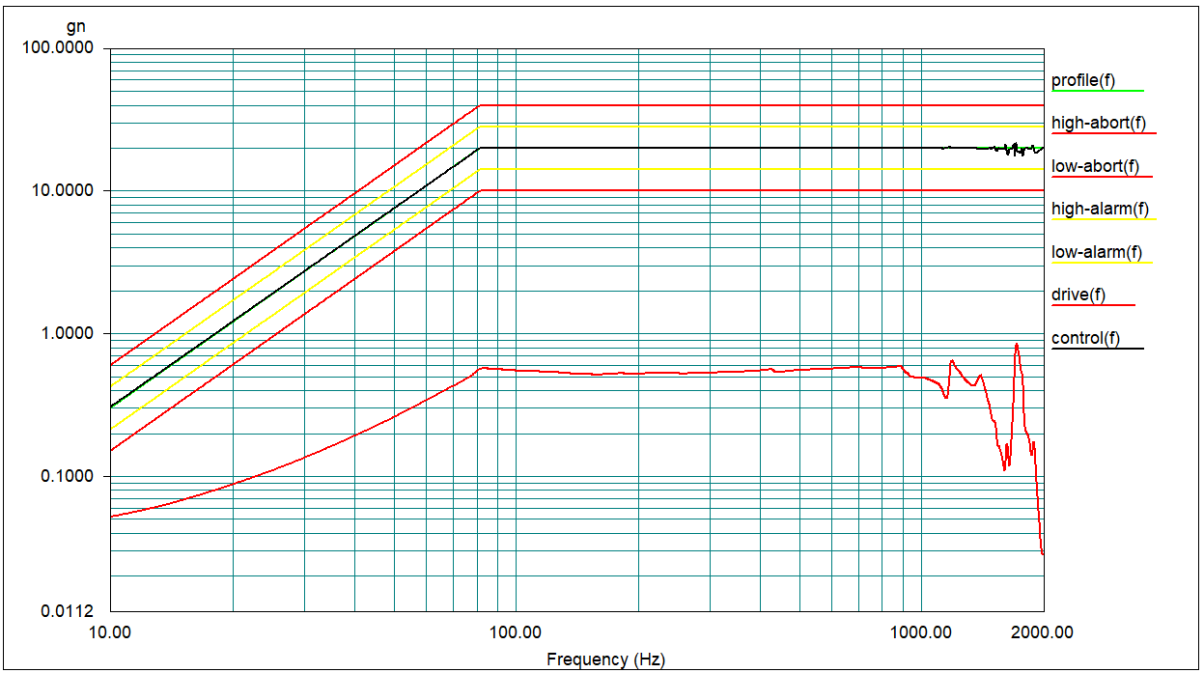
2.3.2. Vibration – 20g

Methodology: The sample was subjected to a Swept Sine Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc, under the following conditions:

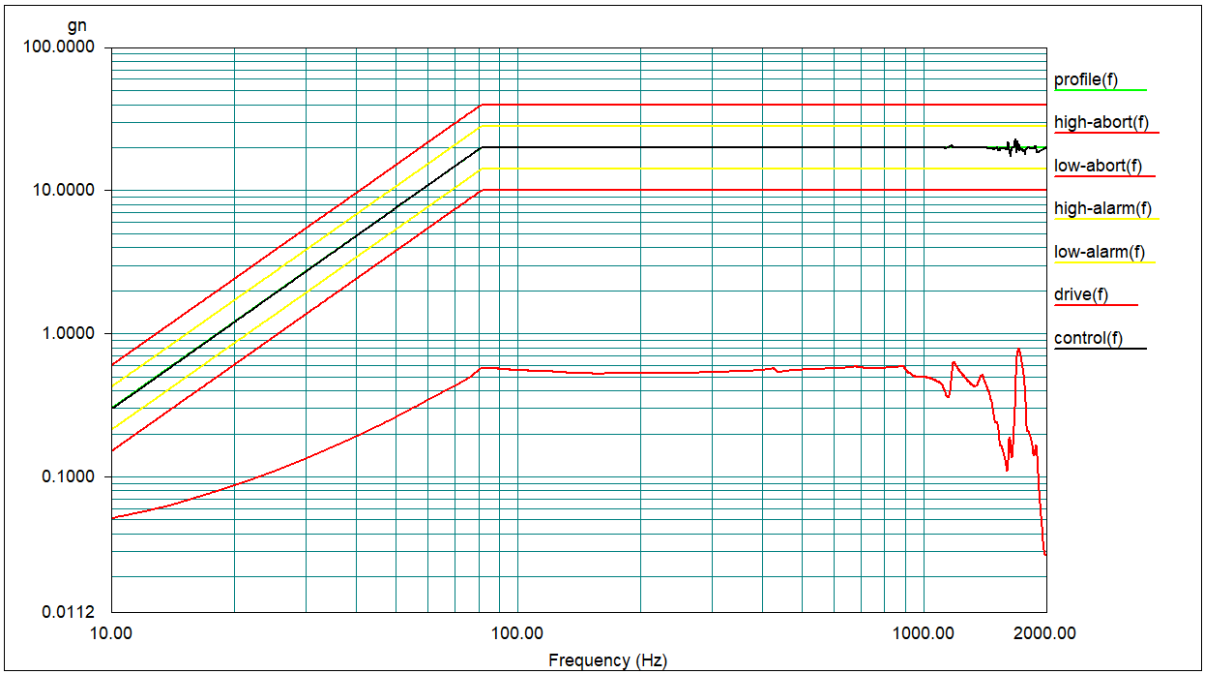
- 10-81.73Hz @ 1.5mm peak-peak, 57.55-2,000Hz @ 20g
- Sweep rate 1 octave/minute for 30 minutes, followed by 2 hours in each axis if no intermittencies are recorded during the 30 minute duration
- Intermittencies on each connector to be recorded

Results: During the second 30 minute vibration sweep (Y-axis), the coin cells held in S8401-46 vibrated at the higher frequencies and discontinuity occurred.

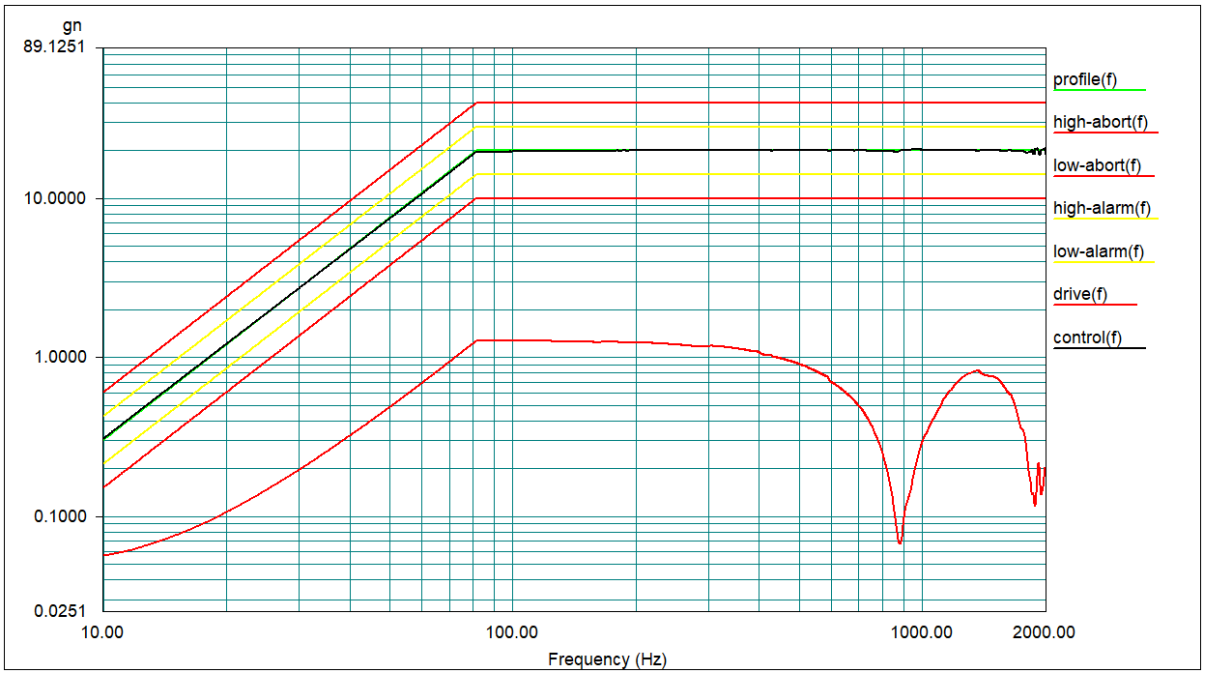
In each plot, the black line is the Control Accelerometer response, and the red line is the Shaker Drive response.



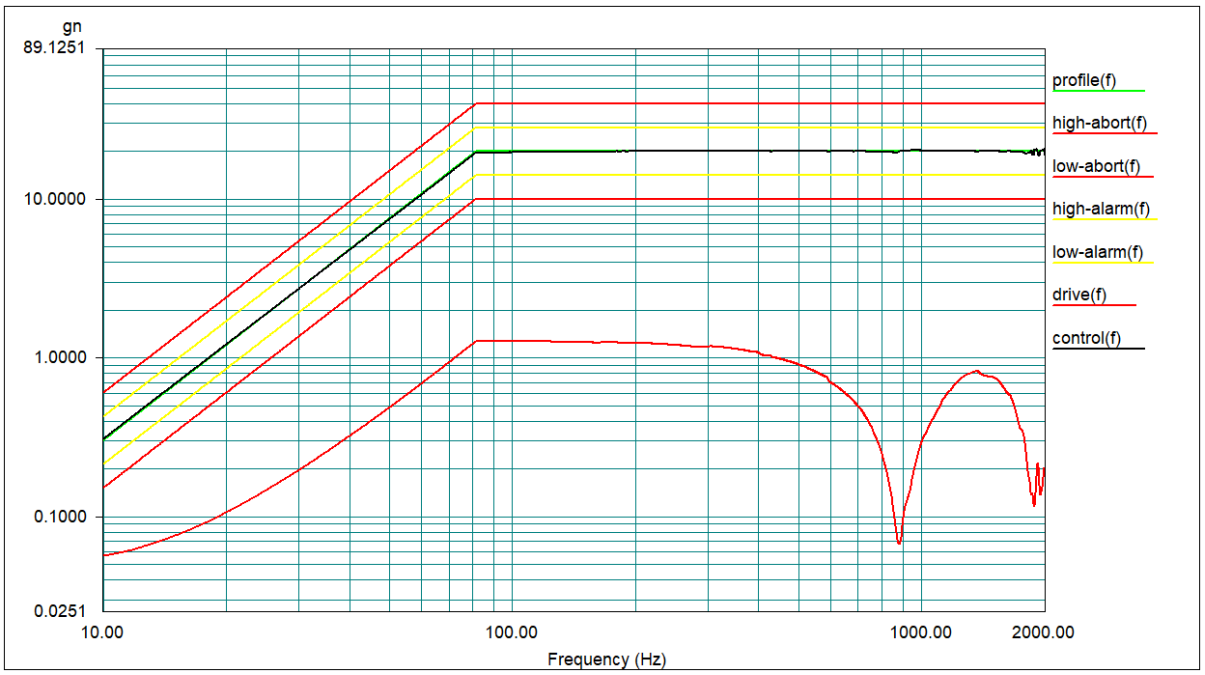
Z axis - 20g Sine Vibration Plot for 30 minutes



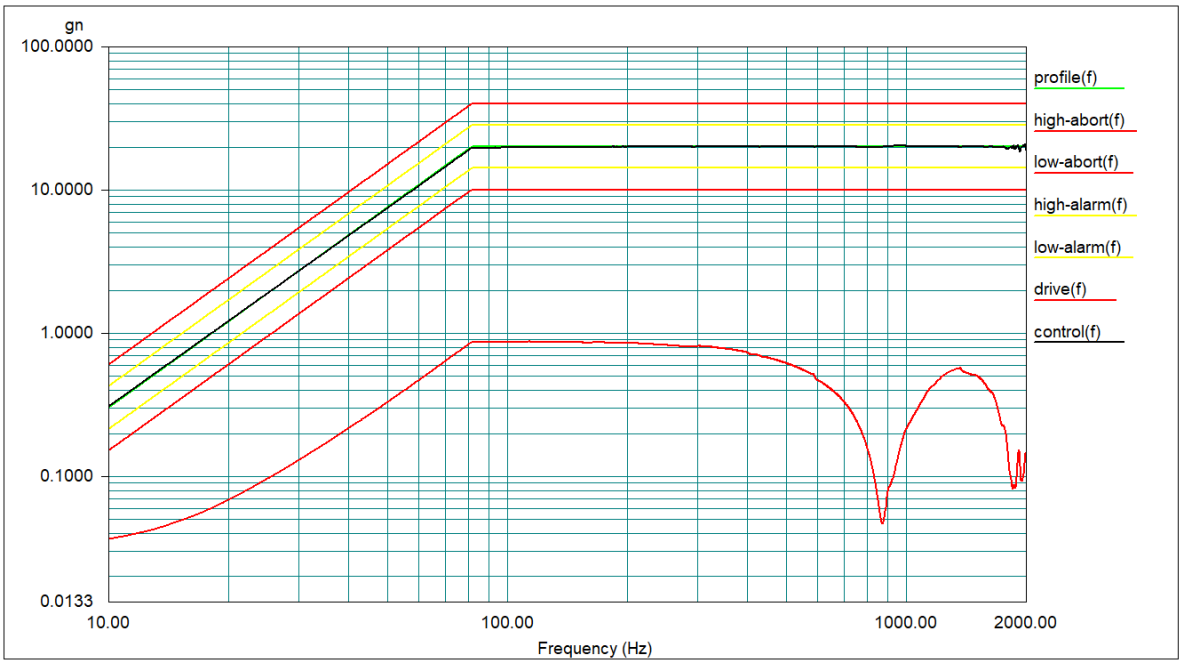
Z axis - 20g Sine Vibration Plot for 120 minutes



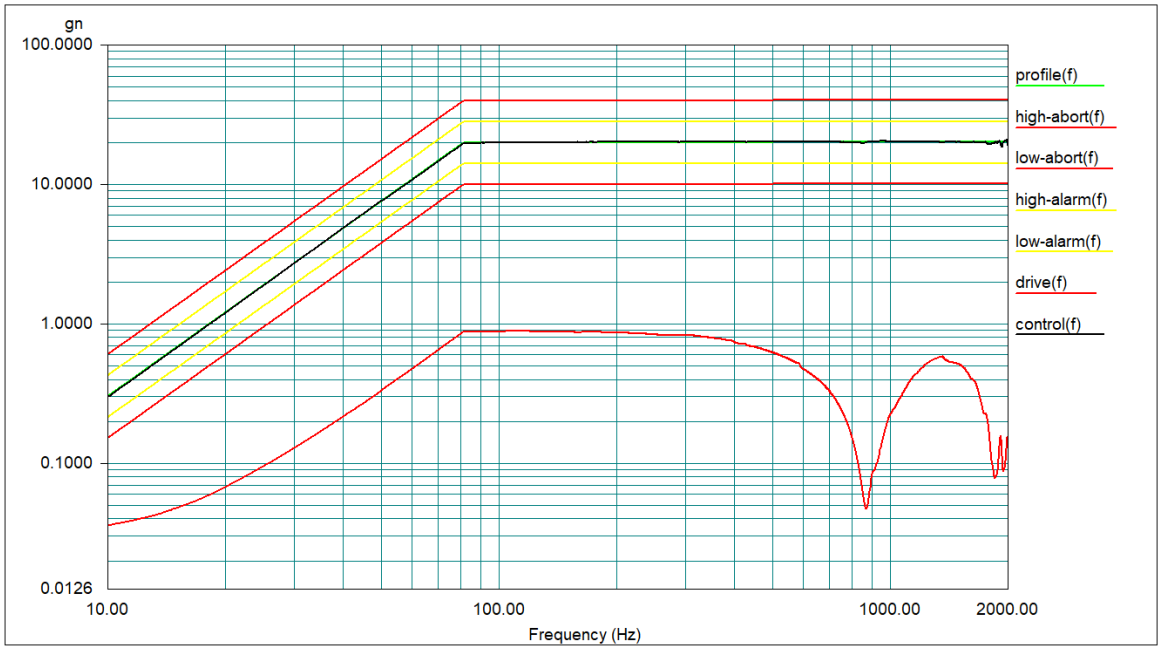
Y axis - 20g Sine Vibration Plot for 30 minutes



Y axis - 20g Sine Vibration Plot for 120 minutes



X axis - 20g Sine Vibration Plot for 30 minutes



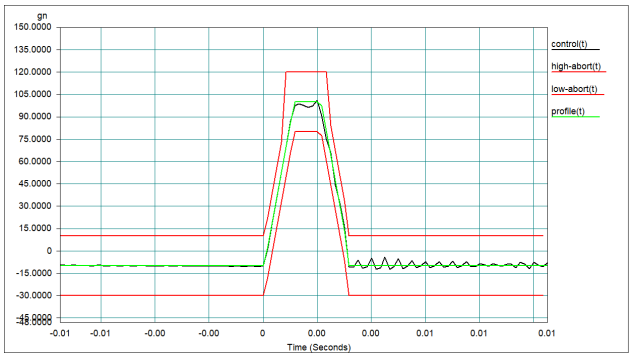
X axis - 20g Sine Vibration Plot for 120 minutes

2.3.3. Shock

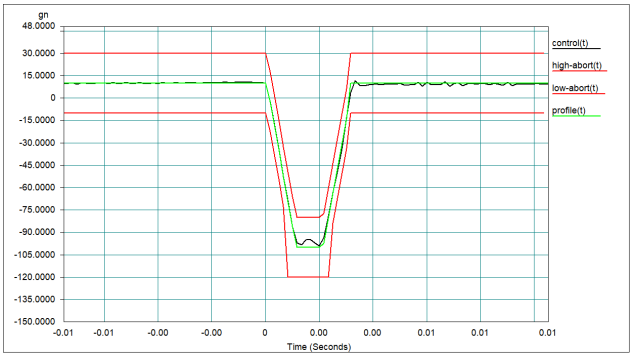
Methodology: The sample was subjected to a Shock Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Ea, under the following conditions:

- Severity = 100g for Z axis, 50g for X/Y axes (due to shaker table limitations)
- Duration = 1ms
- Shape = trapezoidal
- Number of shocks = 1 per direction; 2 per axis; 6 in total

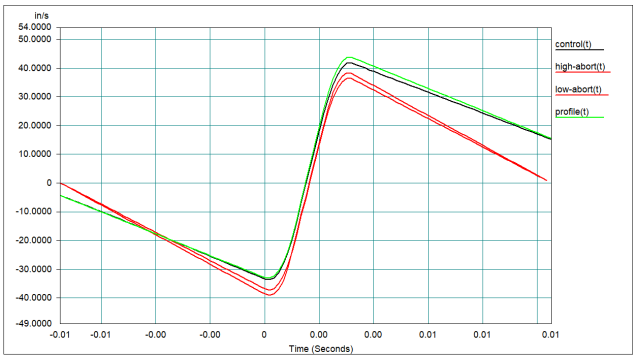
Results: In each plot, the black line is the Control.



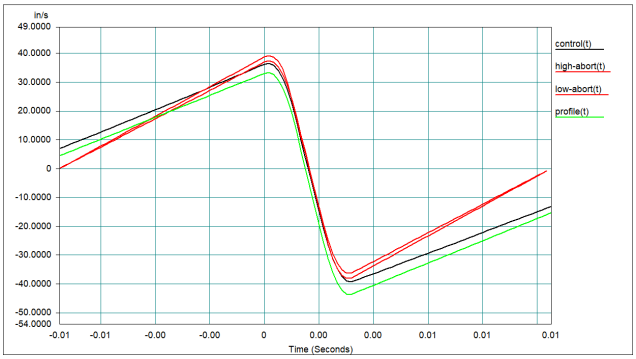
Z axis - Positive shock pulse



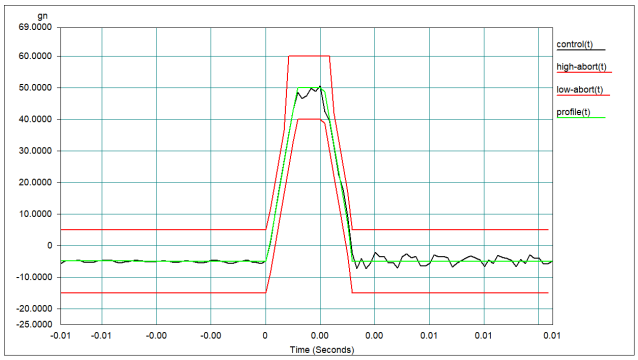
Z axis - Negative shock pulse



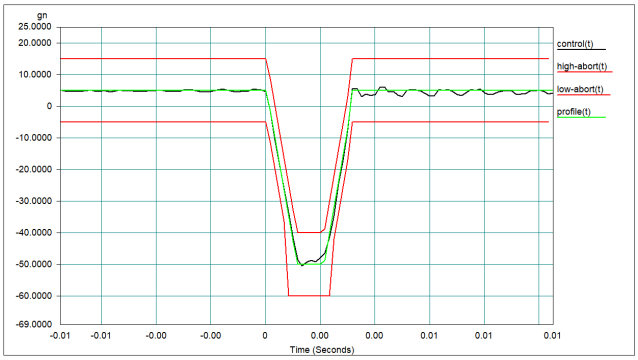
Z axis - Positive velocity pulse



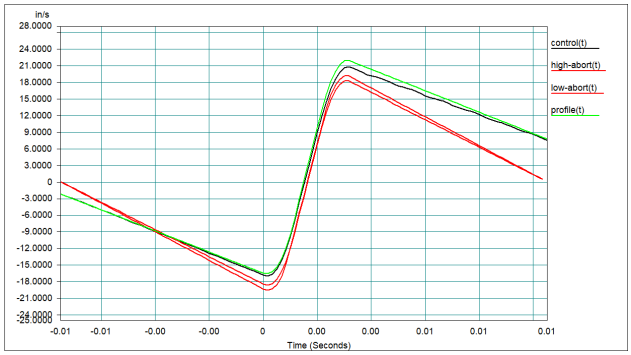
Z axis - Negative velocity pulse



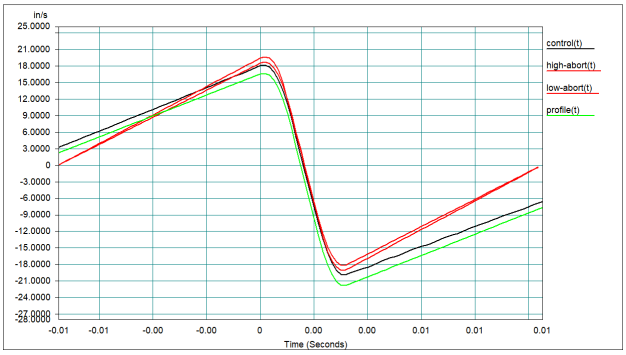
Y axis - Positive shock pulse



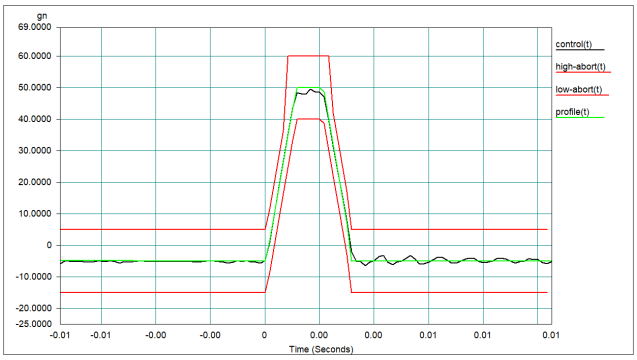
Y axis - Negative shock pulse



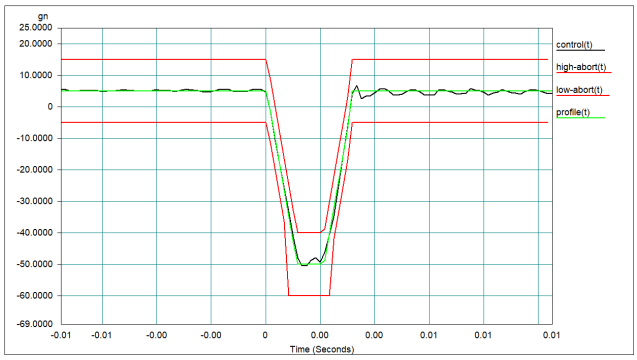
Y axis - Positive velocity pulse



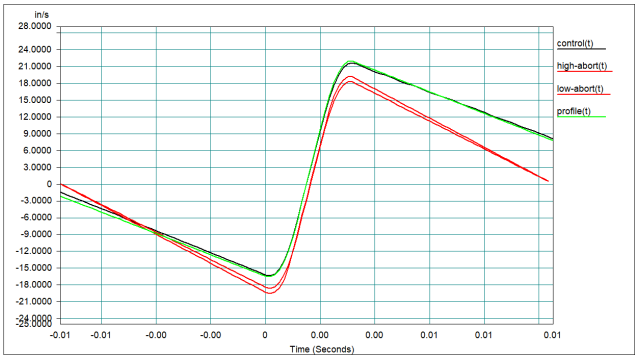
Y axis - Negative velocity pulse



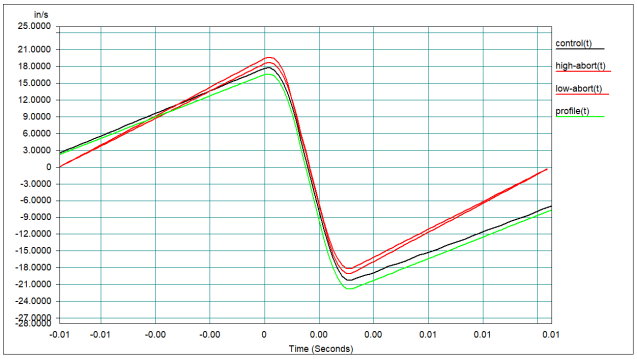
X axis - Positive shock pulse



X axis - Negative shock pulse



X axis - Positive velocity pulse



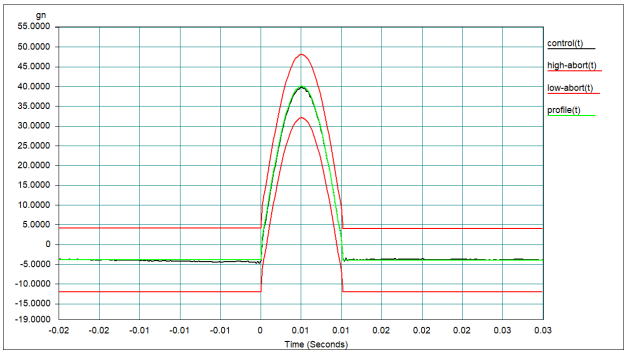
X axis - Negative velocity pulse

2.3.4. Bump

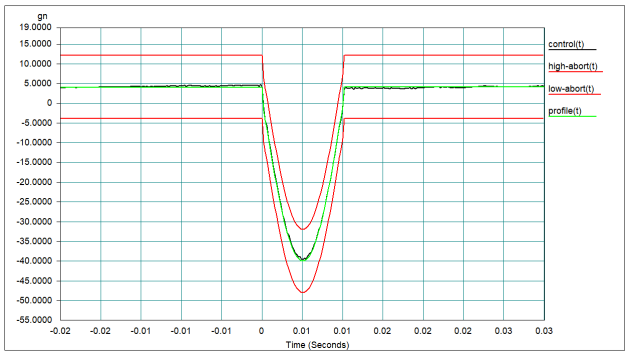
Methodology: The sample was subjected to a Bump Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Ea, under the following conditions:

- Severity = 40g
- Duration = 10ms
- Shape = half-sine
- Number of bumps = 666 per direction; 1,333 per axis; 4,000 in total

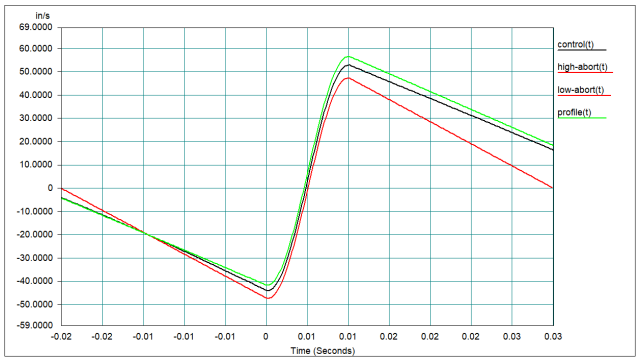
Results: In each plot, the black line is the Control.



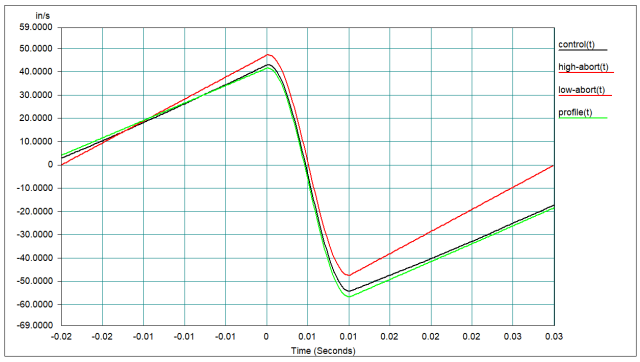
Z axis - Positive bump pulse



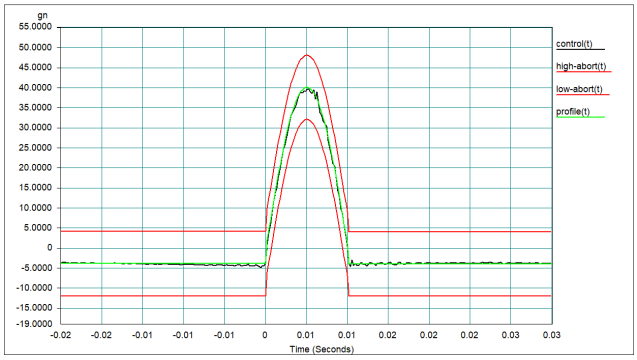
Z axis - Negative bump pulse



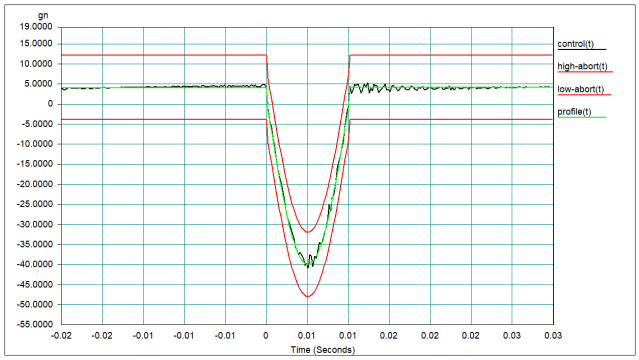
Z axis - Positive velocity pulse



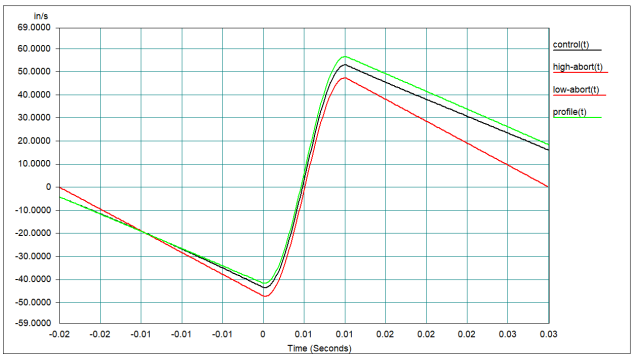
Z axis - Negative velocity pulse



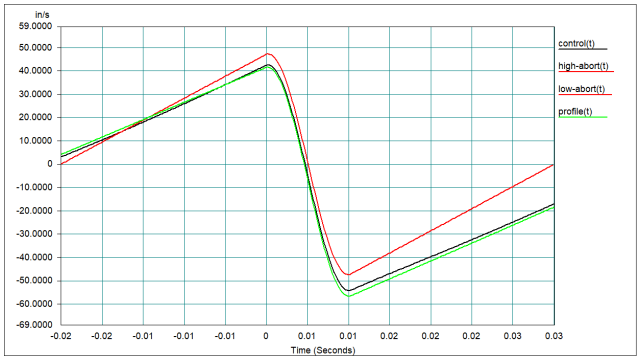
Y axis - Positive bump pulse



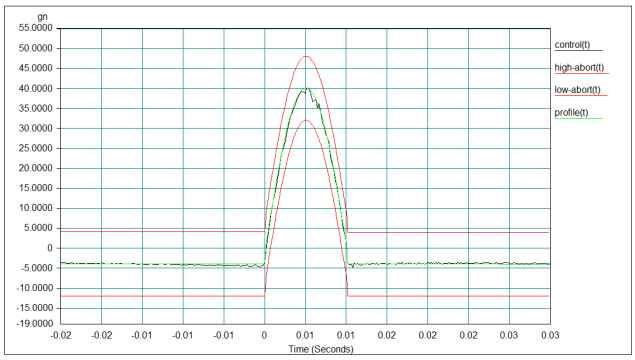
Y axis - Negative bump pulse



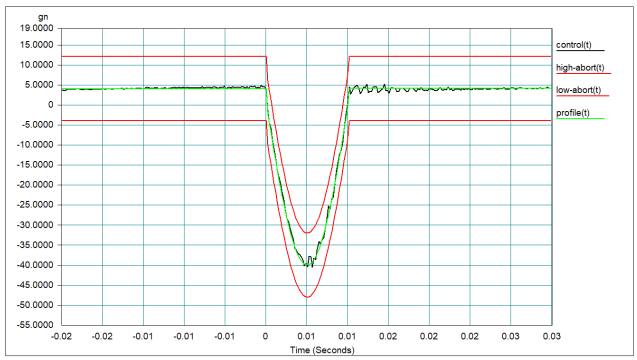
Y axis - Positive velocity pulse



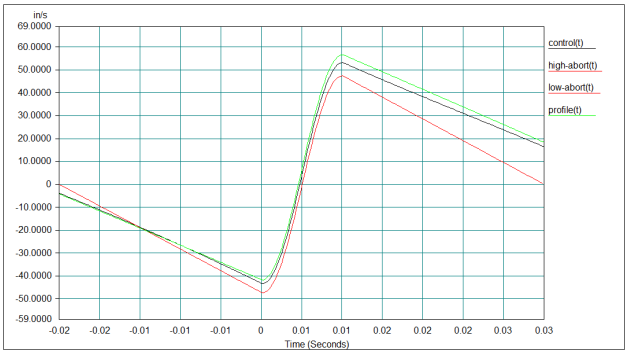
Y axis - Negative velocity pulse



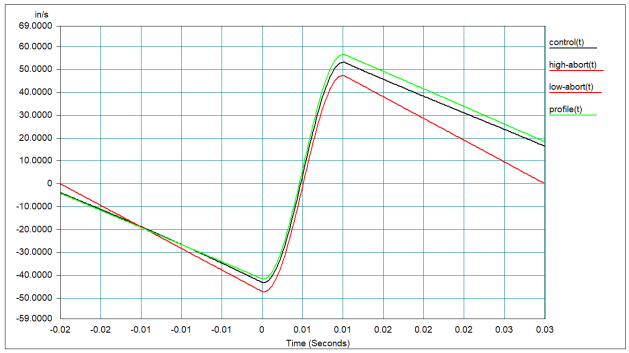
X axis - Positive bump pulse



X axis - Negative bump pulse



X axis - Positive velocity pulse



X axis - Negative velocity pulse