

BRE Test Report

Tests to PAS 59:2014 on Forest Safety Products Double Stack of 600mm Lorry Fall Arrest Bags

Prepared for: Julie Boon, Managing Director, Forest Safety Products Limited
Date: 10th April 2015
Report Number: PR0138-1000 Issue: 2

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Summary of test results

PAS 59:2014 Drop Test

Result of tests carried out according to PAS 59:2014

| | |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Bag Tested: Double Stacked 600mm Forest Safety Products Lorry Fall Arrest Bags | |
| Dimensions: 1800mm x 2400mm x 600mm (each bag) | |
| Configuration: Two 600mm Lorry bags stacked on top of each other. Bags not connected together. Overall depth 1200mm. | |
| Client: Forest Safety Products Ltd | |
| Date of test: 7 th April 2015 | Report Number: PR1038-1000 |
| Report Prepared by: Dr P Blackmore – Associate Director, Building Technology Group | |
| Signed:  | Date: 10 th April 2015 |
| Approved on behalf of BRE by: Dr J Bregulla – Director, Building Technology Group | |
| Signed:  | Date: 10 th April 2015 |
| Results | |
| Drop test 1 - Drop height 3.0m: Maximum deceleration – 9.09g | |
| Drop test 2 - Drop height 3.0m: Maximum deceleration – 10.73g | |
| Drop test 3 - Drop height 3.0m: Maximum deceleration – 10.76g | |
| Overall Result: PASS at drop height of 3.0m | |



1 Introduction

This report describes testing of a double stack of Forest Safety Products 600mm Lorry fall arrest bags to the requirements of PAS 59:2014 incorporating corrigendum No 1, here after referred to as PAS 59:2014 [1]. This work is based on BRE proposal number 137-383 dated 24th February 2015, which was accepted by Ms Jo Summers of Forest Safety Products Ltd, Stardens Works, Tewkesbury Road, Newent, GL18 1LG.

The tests were carried out under the BRE Standard Terms and Conditions of Business for testing as BRE project number PR1038.



2 Description of Test Specimens

The bags tested were supplied by Forest Safety Products Ltd. These bags comprise of an outer woven polypropylene fabric, sealed with a continuous stitched seam and filled with filler type REPS (Recycled Expanded Polystyrene) encapsulated in polythene bags.

The bags were Forest Safety Products 600mm Lorry Fall Arrest Bags with nominal dimensions of 1800mm x 2400mm x 600mm deep. The bags were laid on a concrete floor in a double layer for these tests as shown in Figure 1.

The bags were not connected together.



Figure 1 View of the double stack of 600mm Lorry bags

3 Details of the Tests Carried Out

The tests were carried out according to PAS 59:2014 Annex A which specifies the requirements for filled collective fall arrest systems used to absorb kinetic energy of a falling person from a height. The deceleration was measured using a calibrated tri-axial accelerometer. The resultant vector sum vertical axis deceleration results were used and are presented in this report. The sample rate for the deceleration measurements was 1024Hz. The raw deceleration signal was filtered at 60Hz using a Fast Fourier Transform Digital Filter.

The bags were positioned on a rigid concrete floor as shown in Figure 1. A mass was allowed to free fall from a height of 3.0m (measured above the highest point of the bags) onto the bags.

The mass used for these tests was a rigid steel cylindrical block of diameter 200mm conforming to the specifications of BS EN 364:1993. An accelerometer was rigidly attached to the top face to measure maximum deceleration force. A disc of plywood simulating the floor area of an EU male boot size 42/43 (280 ± 5) mm diameter and (20 ± 5) mm thick was secured to the underside of the steel mass, as required by BS EN 364.

The deceleration generated during the impact was measured by the accelerometer attached to the top of the mass. A time/acceleration curve was recorded for each impact from which the maximum deceleration was identified. Figure 2 shows the drop positions used in this test



Figure 2 Impact positions used in this test



4 Results

The maximum deceleration measured for each drop is given in Table 1. Annex A shows the time-deceleration curves measured during the testing.

Table 1 Summary of test results for double stack of 600mm Lorry bags

| Test No. | Drop Height (m) | Test Mass (kg) | Temperature (°C) | Humidity (%RH) | Peak Deceleration (g) |
|----------|-----------------|----------------|------------------|----------------|-----------------------|
| 1 | 3.0 | 101Kg | 20.2 | 51.4 | 9.09 |
| 2 | 3.0 | 101Kg | 20.2 | 51.4 | 10.73 |
| 3 | 3.0 | 101Kg | 20.2 | 51.4 | 10.76 |

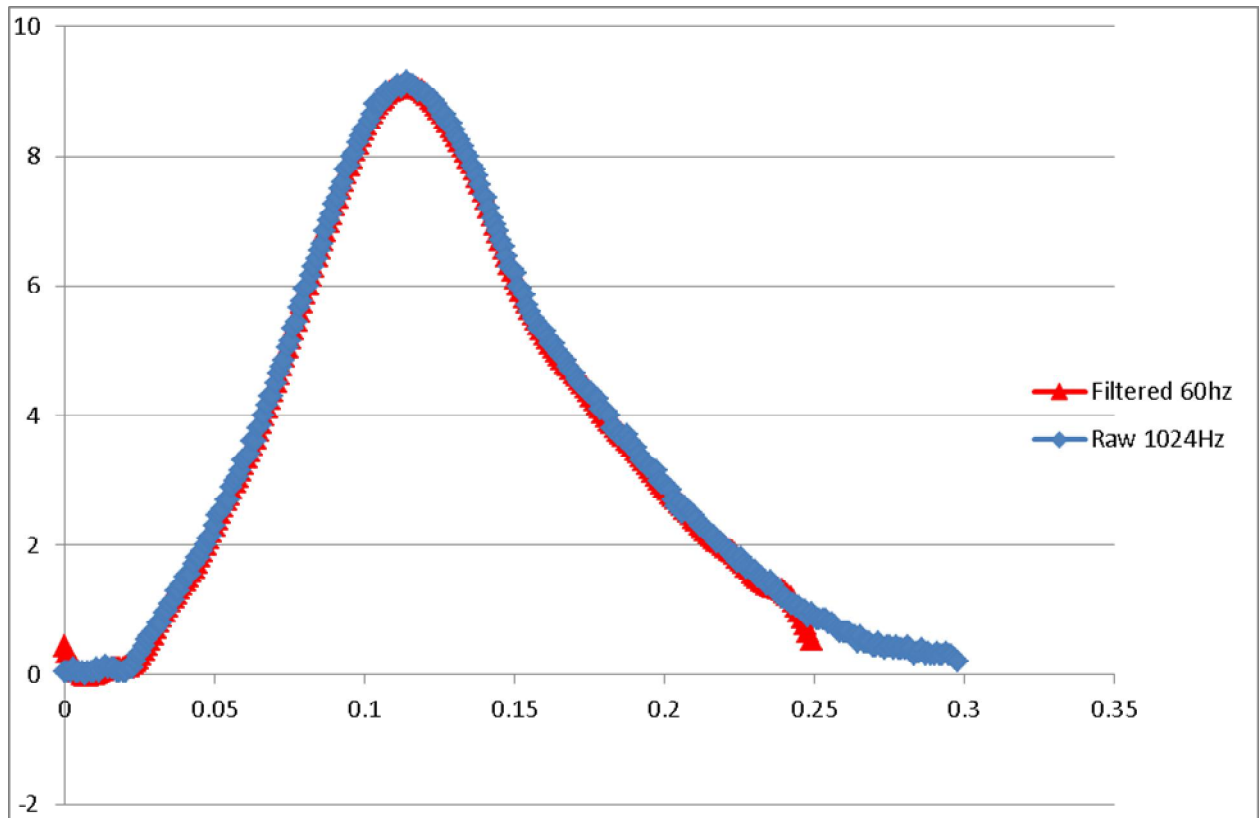


5 References

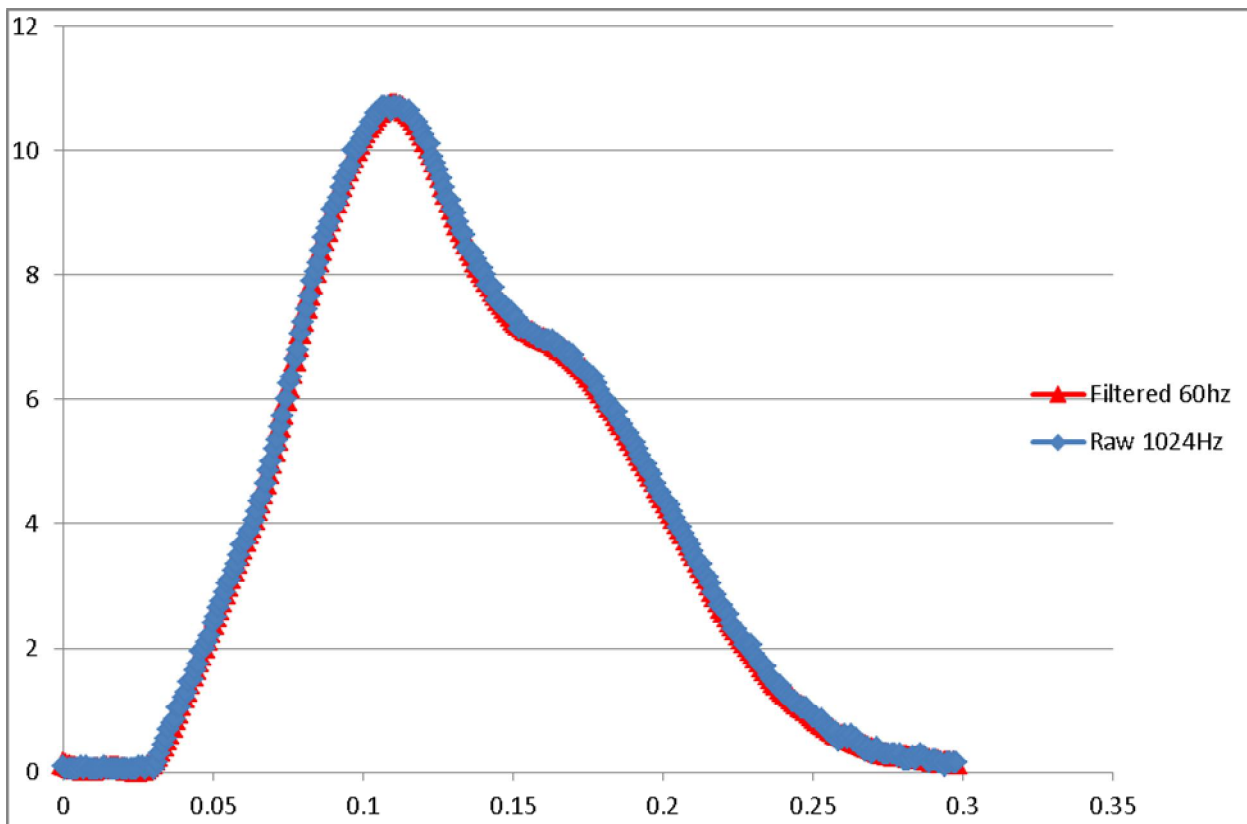
- 1) PAS 59:2014 incorporating corrigendum No 1 (January 2015), Specification for collective fall arrest soft landing systems, BSI.



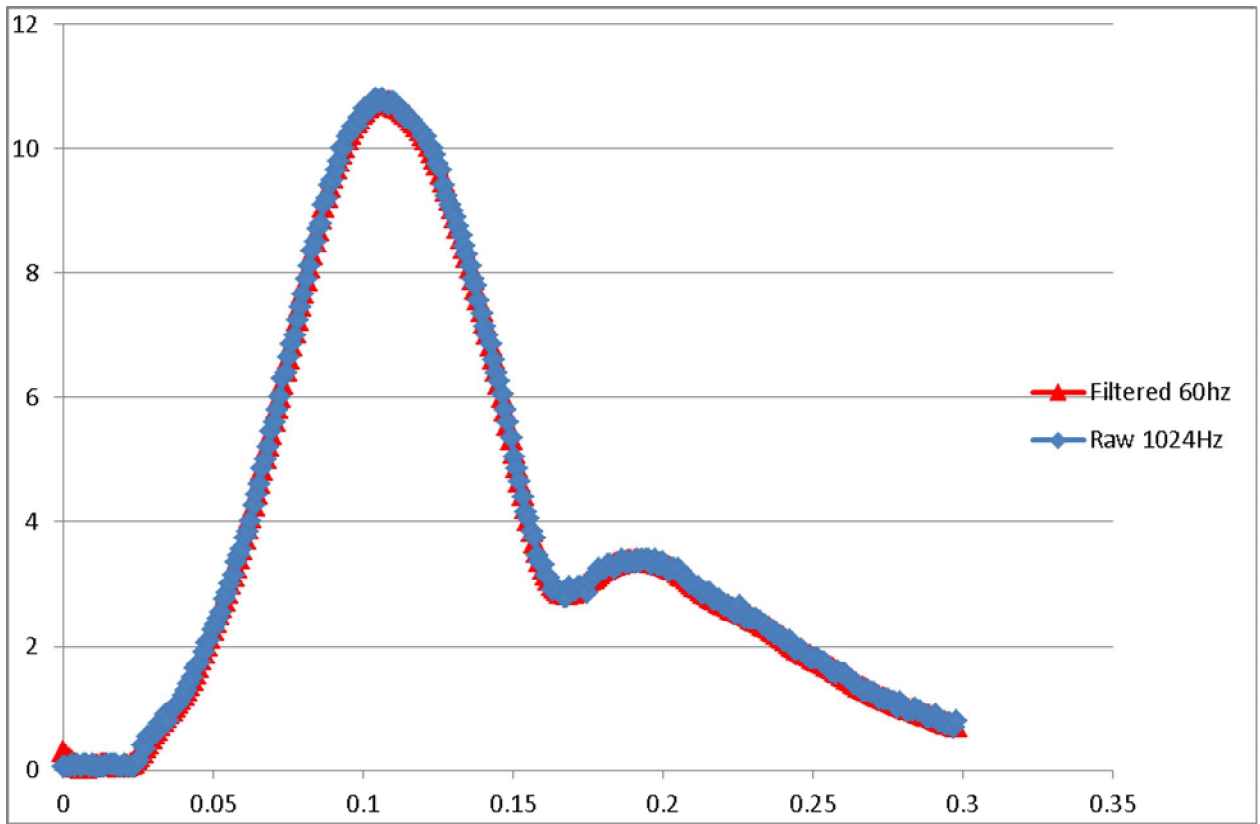
Appendix A Measured time – deceleration plots



Test 1



Test 2



Test 3