

SANDBERG

65275/M - B

**LABORATORY TESTING OF BUTTON- FIX
SYSTEM - TYPE 1 - METAL**

BUTTONFIX LIMITED

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LABORATORY TESTING OF BUTTON-FIX SYSTEM

BUTTON-FIX LIMITED

- TYPE 1 - METAL

Buttonfix Limited
Unit A, 1 Britton Street
London
EC1M 5NW

This report comprises:
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For the attention of: Mr Tony Wills

16 July 2019

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Materials, samples and test specimens are retained for a period of 2 months from the issue of the final report. Your attention is drawn to the enclosed sample retention form and we would be grateful if you could complete the form and return it within one month from the date of the report.

Tests reported on sheets not bearing the UKAS mark in this report/certificate are not included in the UKAS accreditation schedule for this laboratory.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Summary of Test Results:

Type 1 - Metal

Test	Vertical Shear (kg) MZ 564	Horizontal Shear (kg) MZ 565	Pull Apart (kg) MZ 566
A	299.8	375.2	217.2
B	347.2	355.4	214.6
C	351.8	311.5	233.5
Average	333	347	222
Standard Deviation	24	27	8

Type 1 - Metal - 4 Buttons

Test	Vertical Shear (kg) MZ 618	Horizontal Shear (kg) MZ 619	Pull Apart (kg) MZ 620
A	1280	1363	818.3
B	1311	1352	873.4
C	1304	1251	894.3
Average	1298	1322	862
Standard Deviation	13	50	32

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TEST CERTIFICATE

Certificate:	65275/M - B/1	Order Ref:	PO - 19/190
Samples Received:	03 June 2019	Tested By:	NAF/AT
Test Date:	07 June 2019	Test Procedure:	In House
Client Details:	Buttonfix Limited, Unit A, 1 Britton Street, London, EC1M 5NW		

STRENGTH TESTING OF BUTTON-FIX SYSTEM

Test Details:	Type 1 - Metal
Button-Fix Type:	Diecast ZL2 Zinc Alloy Button-Fix with Stainless Steel Spring
Fixing Screw Details:	Spax 5 x 20 mm Pan Head for the fixes and 5 x 20 mm countersunk for the buttons
Substrate Material:	18 mm Birch Faced Plywood
Test equipment:	Hounsfield Tensometer ref.: C/002

TEST RESULTS

Sample Reference	Load Direction	Maximum Failure Load (kN)	Comments
MZ 564-A	X - Vertical Shear Surface Mounted	2.940 (299.8 kg)	Fractured in zinc & pulled out screw
MZ 564-B	X - Vertical Shear Surface Mounted	3.405 (347.2 kg)	Fractured in zinc & pulled out screw
MZ 564-C	X - Vertical Shear Surface Mounted	3.450 (351.8 kg)	Fractured in zinc & pulled out screw Fix plate fractured
MZ 565-A	Y - Horizontal Side Shear Surface Mounted	3.680 (375.2 kg)	Fractured in zinc & pulled out screw
MZ 565-B	Y - Horizontal Side Shear Surface Mounted	3.485 (355.4 kg)	Fractured in zinc & pulled out screw
MZ 565-C	Y - Horizontal Side Shear Surface Mounted	3.055 (311.5 kg)	Fractured in zinc & pulled out screw
MZ 566-A	Z - Pull Out from Panel Surface Mounted	2.130 (217.2 kg)	Fractured in zinc
MZ 566-B	Z - Pull Out from Panel Surface Mounted	2.105 (214.6 kg)	Fractured in zinc
MZ 566-C	Z - Pull Out from Panel Surface Mounted	2.290 (233.5 kg)	Fractured in zinc

For Sandberg LLP



Date: 16 July 2019

Neale Fetter - Assistant Manager Metallurgy Department

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TEST CERTIFICATE

Certificate:	65275/M - B/2	Order Ref:	PO - 19/190
Samples Received:	21 June 2019	Tested By:	NAF/AT
Test Date:	28 June 2019	Test Procedure:	In House
Client Details:	Buttonfix Limited, Unit A, 1 Britton Street, London, EC1M 5NW		

STRENGTH TESTING OF BUTTON-FIX SYSTEM

Test Details:	Four number Type 1 - Metal
Button-Fix Type:	Diecast ZL2 Zinc Alloy Button-Fix with Stainless Steel Spring
Fixing Screw Details:	Spax 5 x 20 mm Pan Head for the fixes and 5 x 20 mm countersunk for the buttons
Substrate Material:	18 mm Birch Faced Plywood
Test equipment:	Universal Testing Machine ref.: C/238

TEST RESULTS

Sample Reference	Load Direction	Maximum Failure Load - 4 Fixings (kN)	Comments
MZ 618-A	X - Vertical Shear Surface Mounted	12.556 (1280 kg)	Fractured in zinc & pulled out screws
MZ 618-B	X - Vertical Shear Surface Mounted	12.854 (1311 kg)	Fractured in zinc & pulled out screws
MZ 618-C	X - Vertical Shear Surface Mounted	12.785 (1304 kg)	Fractured in zinc & pulled out screws
MZ 619-A	Y - Horizontal Side Shear Surface Mounted	13.366 (1363 kg)	Fractured in zinc & pulled out screws
MZ 619-B	Y - Horizontal Side Shear Surface Mounted	13.260 (1352 kg)	Fractured in zinc & pulled out screws
MZ 619-C	Y - Horizontal Side Shear Surface Mounted	12.273 (1251 kg)	Fractured in zinc & pulled out screws
MZ 620-A	Z - Pull Out from Panel Surface Mounted	8.025 (818.3 kg)	Fractured in zinc & pulled out screws
MZ 620-B	Z - Pull Out from Panel Surface Mounted	8.565 (873.4 kg)	Fractured in zinc & pulled out screws
MZ 620-C	Z - Pull Out from Panel Surface Mounted	8.770 (894.3 kg)	Fractured in zinc & pulled out screws

For Sandberg LLP

Date: 16 July 2019

Neale Fetter - Assistant Manager Metallurgy Department

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APPENDIX A

Photographs 1 to 9



Photograph 1 A view showing the general condition of the button after a vertical shear test on a type 1 - metal fixing.



Photograph 2 A view showing the general condition of the fixing after a vertical shear test on a type 1 - metal fixing.



Photograph 3 A view showing the general condition of the fixing after a horizontal shear test on a type 1 - metal fixing.



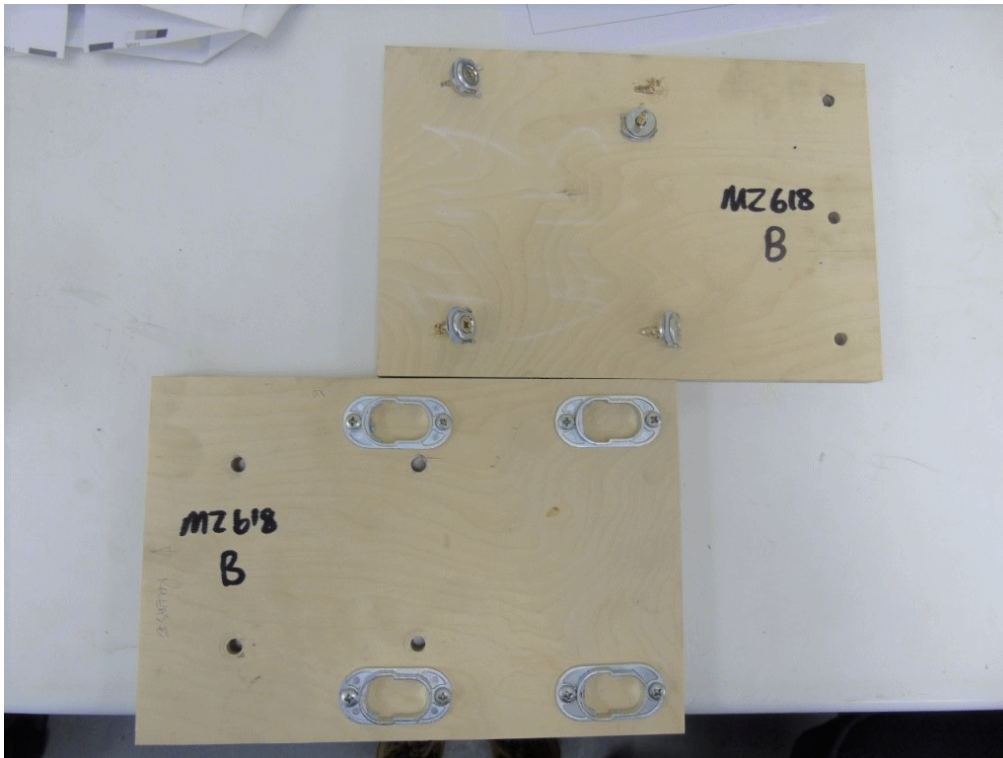
Photograph 4 A view showing the general condition of the button after a horizontal shear test on a type 1 - metal fixing.



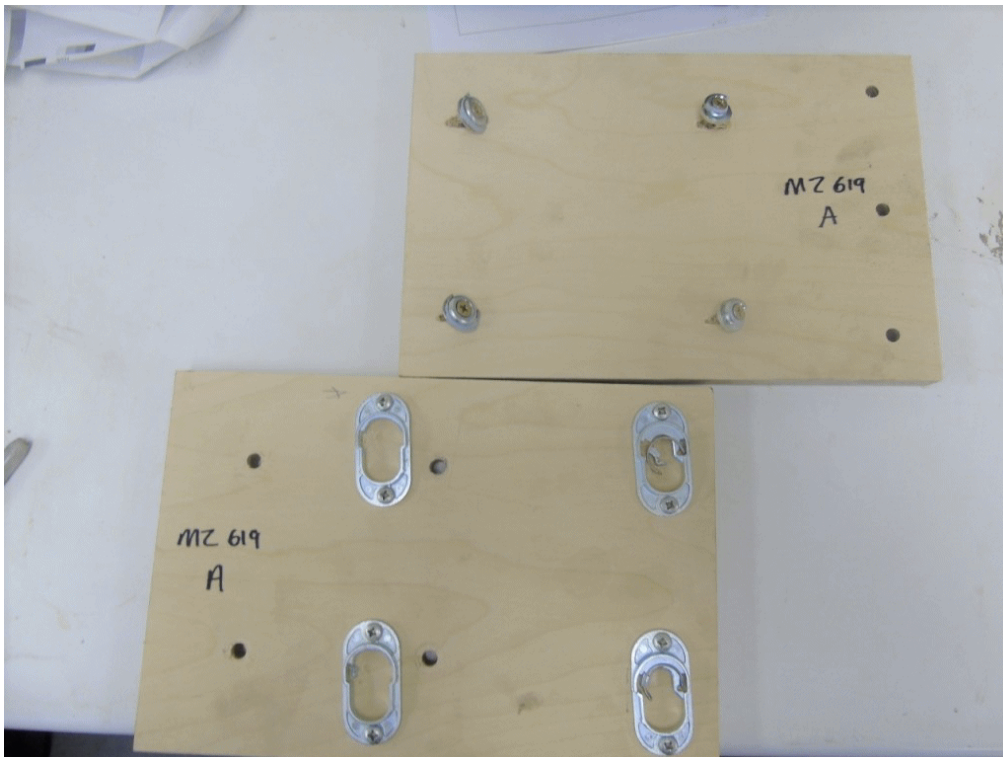
Photograph 5 A view showing the general condition of the fixing after a pull apart test on a type 1 - metal fixing.



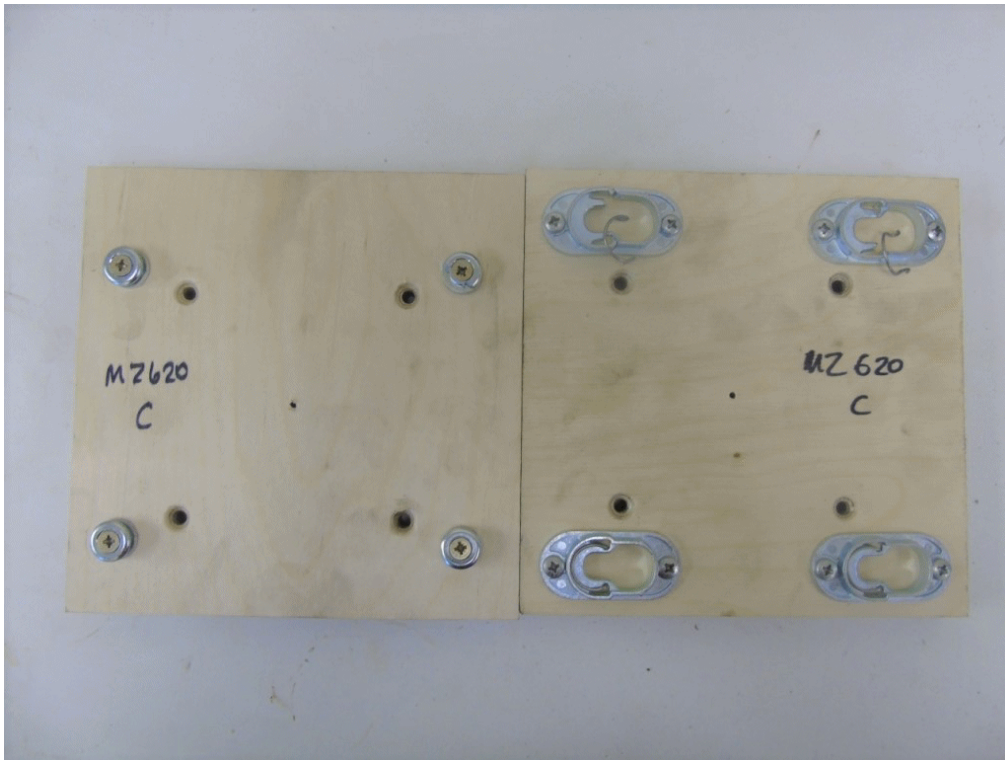
Photograph 6 A view showing the general condition of the button after a pull apart test on a type 1 - metal fixing.



Photograph 7 A view showing the general condition of the buttonfix system after a vertical shear test on a type 1 - metal with four fixings.



Photograph 8 A view showing the general condition of the buttonfix system after a horizontal shear test on a type 1 - metal with four fixings.



Photograph 9 A view showing the general condition of the buttonfix system after a pull apart test on a type 1 - metal with four fixings.

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Where our involvement consists exclusively of testing samples, the results and our conclusions relate only to the samples tested.

