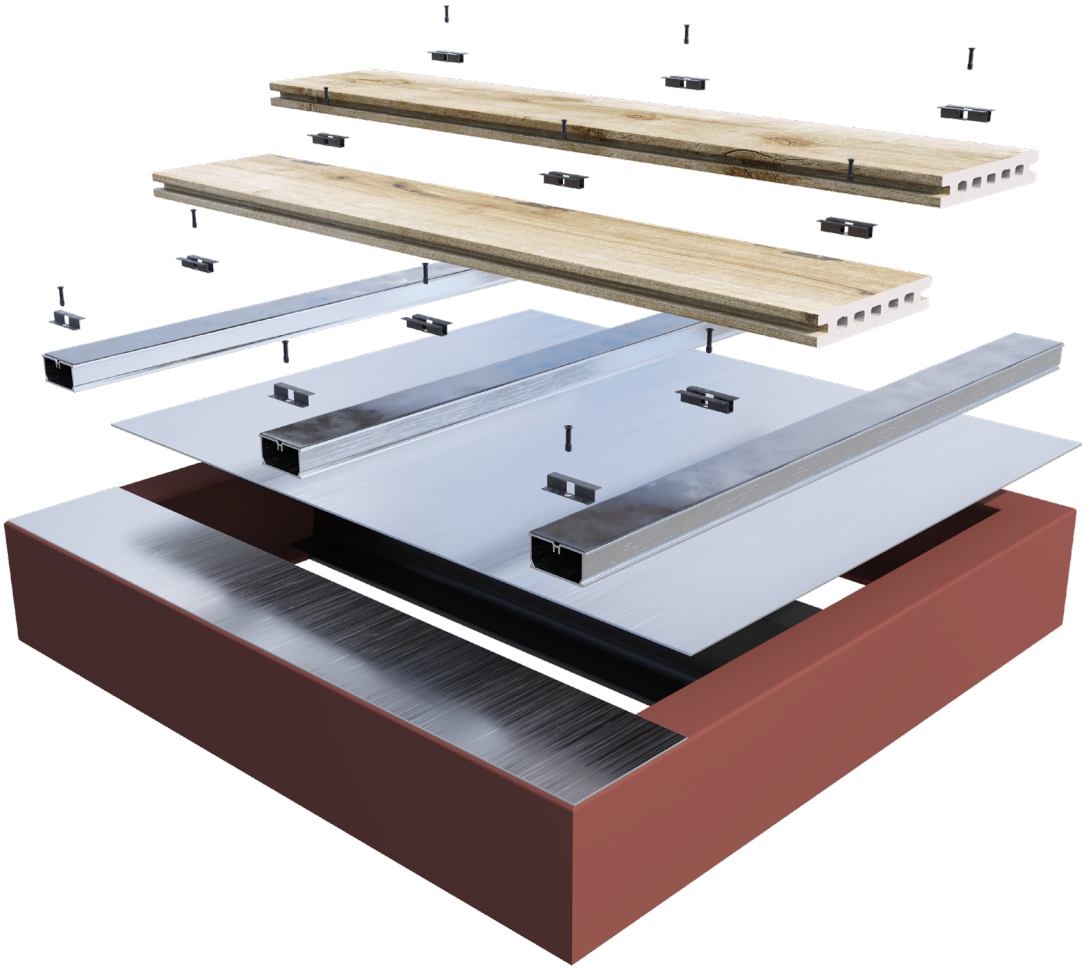
BALCASMART VITRIFIED COMPOSITE DECKING SYSTEM

CONCENTRATED AND IMPACT LOAD TESTING



“This document is the property of Ryno Ltd. and may not be used for any purpose unless authorized in writing by Ryno and which, upon demand, shall be returned to Ryno. The document contains Ryno confidential, proprietary information and shall not be copied, reproduced, used, transferred to other documents or disclosed to others for any purpose unless specifically authorized in writing by Ryno."

RECORD OF REVISIONS

REV	REASON FOR RELEASE	DATE	BY	CHECK	APPROVAL
01	Issued for Release	27/6/24	Garry Alexander	Amos Whiteside	Dale Alexander

TABLE OF CONTENTS

GENERAL **4**
OBJECTIVE 4
SAFETY STATEMENT **4**
SYMBOLS **4**
TECHNICAL DESCRIPTION **5**
TEST LOAD WEIGHTS 5
TEST LOAD HEIGHT 5
TEST AREA 5
CHECK LIST **7**
REQUIRED EQUIPMENT 7
LOAD TESTS **8**
SYSTEM ACCEPTANCE **10**
LOAD TEST ACCEPTANCE **10**
APPENDIX **11**

GENERAL

OBJECTIVE

The test procedure replicates the event of Vitrified Composite decking shattering and allowing the subject to fall onto the substructure below.

The objectives of the following Load Test are described below:

- To load test the BalcaSmart Vitrified Composite decking system and ensure the results pass a structural and visual inspection test.
- To demonstrate that if a subject is to fall onto the Vitrified Composite decking and shatter the planks, the subject will not fall through the balcony frame causing injury or death.

SAFETY STATEMENT

- All witnesses must wear steel-toed footwear at all times
- All witnesses must wear eye protection at all times
- Hard hats must be worn during any lifting operations
- All witnesses must stand in a safe area during any testing

SYMBOLS

The following words and symbols found throughout this manual, highlight special messages to alert the operator of specific information concerning of the PERSONNEL, the EQUIPMENT, the PROCESS or the ENVIRONMENTAL IMPACT.

SYMBOL	DESCRIPTION
	WARNING: Failure to follow these directions can result in bodily harm and hazard, resulting in harm or loss of life and/or extensive damage to equipment.
	CAUTION: Failure to follow these directions can result in damage to equipment.
	CAUTION: Failure to follow these directions can result in environmental hazard.
	NOTE: Information or specific instructions.

TECHNICAL DESCRIPTION

This procedure provides details on how the BalcaSmart Vitrified Composite decking system was tested for safe use on projecting balconies. 2 tests were conducted – Concentrated (Dead) Load, and Impact (Live) Load.

To replicate the most common design use, one system was tested:

• DS25 25mm deep Aluminium Decking Joist were fixed directly to the balcony sub frame.

• Joists were installed at 300mm centres as per the Vitrified Composite support requirements.

• The aluminium sheet membrane will be used to provide fall restraint and falling debris safety when used in this configuration.

To replicate a person's full body weight on to the system the following parameters have been calculated.

TEST LOAD WEIGHTS

Concentrated (dead) load weight

Allowable Load (Concentrated) on Balconies – 2kN – 204kg (load weight)

Impact (live) load weight

62kg (average adult male weight) x 2.5 (margin of safety) = 155kg (load weight)

TEST LOAD HEIGHT

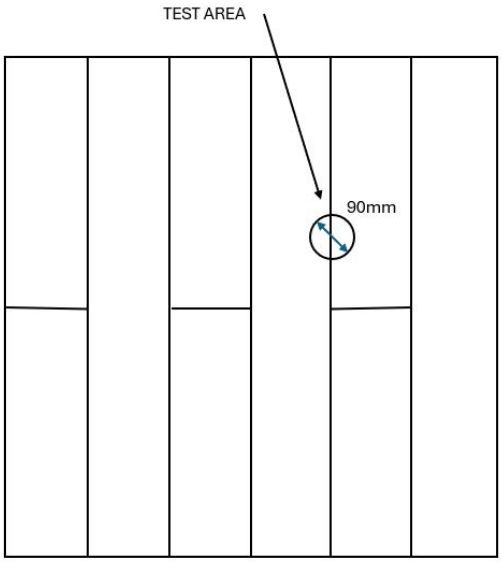
Impact load height

Maximum full weight fall height = 500mm - 0.5m

TEST AREA

Concentrated (Dead) Load test area

The purpose of this test is to ensure the system can withstand a concentrated dead load of at least 2KN (204kg) allowable on balconies. To ensure conclusive test data, a weight of 208kg was placed on a surface area of 90mm diameter in the position shown below: this is deemed the 'worst-case-scenario' as the system will have the least support from the balcony subframe at this point.

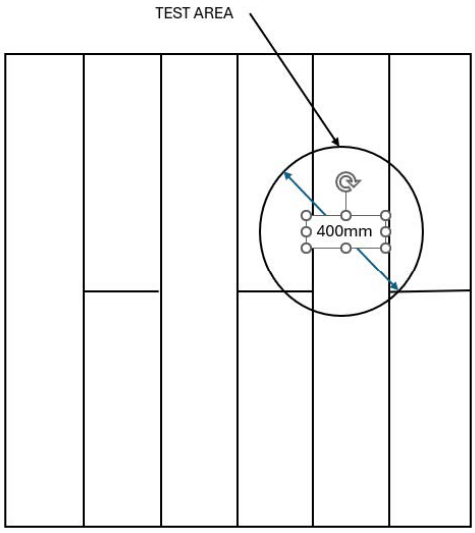


Plan View – Concentrated Load Test Area

Impact (Live) Load test area

The purpose of this test is to replicate a subject falling on to BalcaSmart Vitrified Composite decking system.

To ensure conclusive test data the impact load was dropped on the position in the area shown below: this is deemed the 'worst-case-scenario' as the system will have the least support from the balcony subframe at this point.



Plan View – Impact Load Test Area

CHECK LIST

REQUIRED EQUIPMENT

The following equipment will be required to complete the load test:

- Fabricated and assembled balcony test frame
- 3x Aluminium fall restraint sheets
- 5x DS25 Aluminium Joists
- Vitrified Composite Decking Boards
- All associated Fasteners

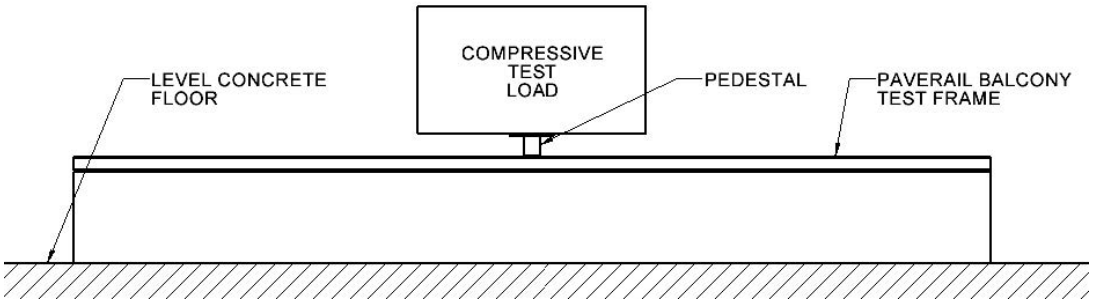


DS Joist Balcony Test Frame with DS25 Joists @ 300mm Centres (Vitrified Composite not shown)

LOAD TESTS

CONCENTRATED (DEAD) LOAD TEST

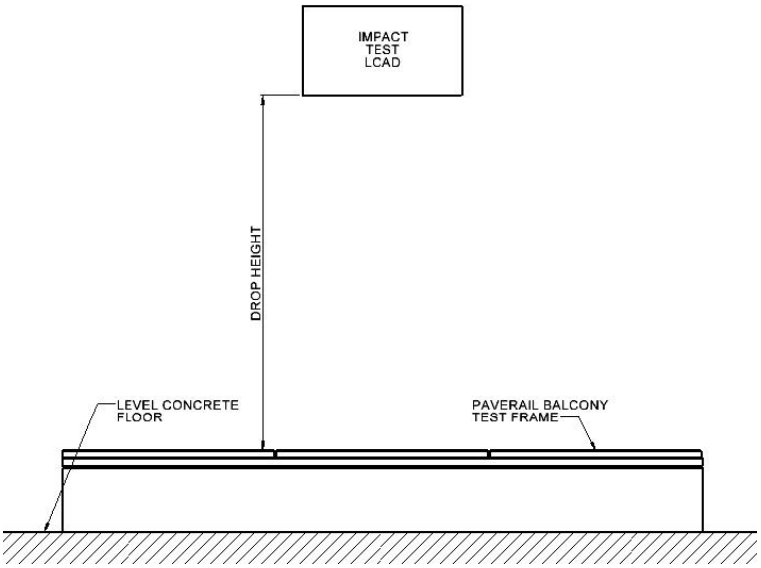
With BalcaSmart Vitrified Composite decking system



ITEM	DESCRIPTION	OK	N/A
	The load test should be performed in a cordoned off test area.	✓	
1	Position pedestal. Locate 204kg test load on top of the VC boards using a pedestal as seen above. (See Appendix Figure 1.1 and 1.2)	✓	
	Ensure test load is positioned correctly to gain accurate test. Refer to Technical Description for test area.	✓	
2	Once load has been applied to the frame leave for a period of 5 minutes	✓	
3	Remove test load and pedestals for inspection. (See Appendix Figure 2.3)	✓	
4	Mark PASS or FAIL below. If visual examination shows evidence of exceeding the ultimate strength of the material (showing fatal damage or evidence of failure) the system has failed. None of the above, the system has passed.	✓	
SIGN:		**DATE:** 21/06/24	
PASS ✓		**FAIL**	

IMPACT (LIVE) LOAD TEST

With BalcaSmart Vitrified Composite decking system



ITEM	DESCRIPTION	OK	N/A
	The load test should be performed in a cordoned off test area.	✓	
1	Position the 155kg test load 0.5m above test frame top surface. (See Appendix Figure 2.1 and 2.2)	✓	
	Ensure test load is positioned correctly to gain accurate test. Refer to Technical Description for test area.	✓	
2	Release test load	✓	
3	Once load has been applied to the frame leave for a period of 5 minutes	✓	
4	Remove test load for inspection. (See Appendix Figure 2.3)	✓	
5	Mark PASS or FAIL below. If visual examination shows evidence of exceeding the ultimate strength of the material (showing fatal damage or evidence of failure) the system has failed. None of the above, the system has passed.	✓	

SIGN:	**DATE:** 21/06/24
PASS ✓	**FAIL**

SYSTEM ACCEPTANCE

Visual examination may reveal deformation of metal sheet but must not exceed the ultimate strength of the material (showing fatal damage or evidence of full system failure).

All fasteners shall show no sign of flaw or deformation which may result in structural failure.

To be signed by company representative confirming completion of the test. Further comments to be added below.

TEST	COMPANY REPRESENTATIVE	DATE
VC SYSTEM BALCONY TEST FRAME -COMPRESSION LOAD TEST	**NAME** G Alexander	27/6/24
	SIGNATURE	
VC SYSTEM BALCONY TEST FRAME - IMPACT LOAD TEST	**NAME** G Alexander	
	SIGNATURE	27/6/24

LOAD TEST ACCEPTANCE

From the testing procedures carried out in accordance with this document it has been established that the system conforms with and meets the objects outlined previously.

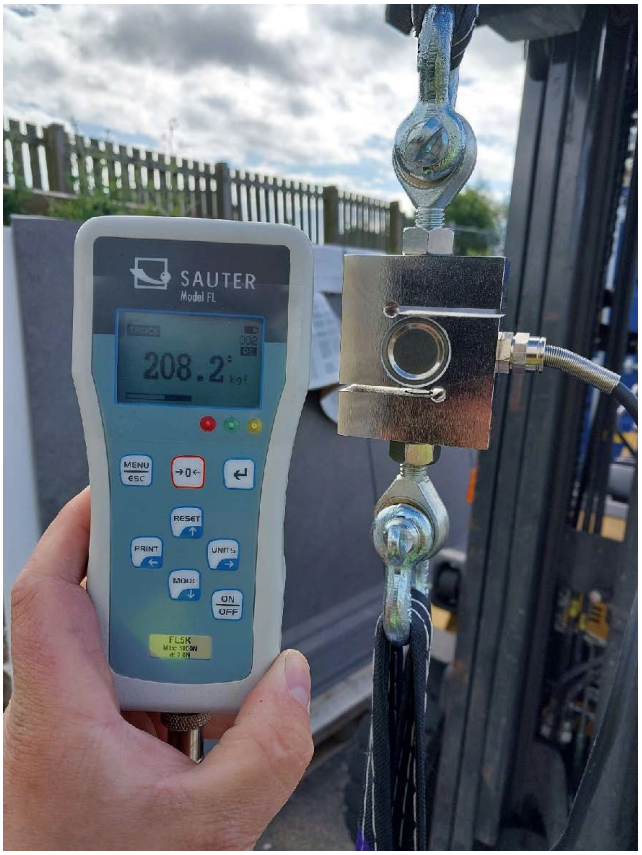
Signature from all participants of the load test.

PARTICIPANTS	DATE
Lukasz Mocek	27-06-2024
Garry Alexander	27-06-2024

APPENDIX

FIGURE 1.1

COMPRESSION LOAD TEST



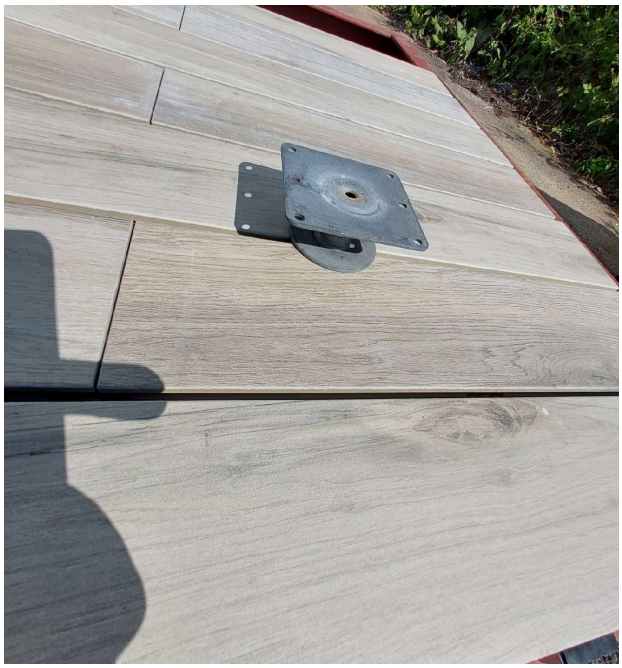
COMPRESSION LOAD TEST

FIGURE 1.2



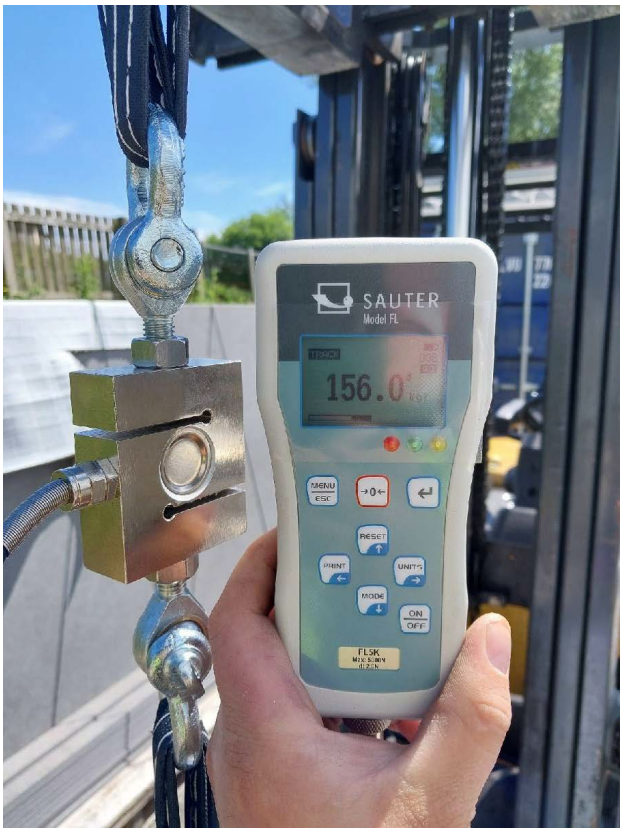
COMPRESSION LOAD TEST

FIGURE 1.3



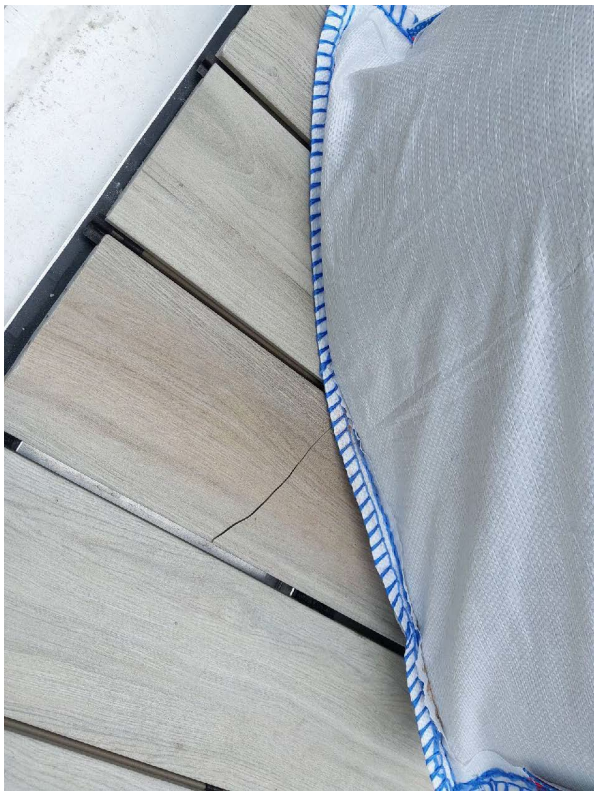
IMPACT LOAD TEST

FIGURE 2.1



IMPACT LOAD TEST

FIGURE 2.2



IMPACT LOAD TEST

FIGURE 2.3



LET'S TALK
sales@rynosystems.com
+44 203 967 3500
rynosystems.com

HEAD OFFICE
CastlePoint
Castle Way,
Ellon
AB41 9RG

STUDIO
2 Sutton Lane
London
EC1M 5PU

