# TOPTESTER OY

# TEST REPORT

# EN 13964 BALL GUN TEST

| | |
|---|---|
| Customer: | Ewona Finland Oy |
| Device name: | Ewona Acustica® suspended ceiling plates Basic Madaline 50mm |

TOPTESTER
Your partner in reliability testing

TOPTESTER OY

# 1. TEST INFORMATION

| | |
|---|---|
| CUSTOMER: | Ewona Finland Oy |
| TEST NAME: | EN 13964 Ball gun test |
| TEST DATE: | 14. – 23. September 2026 |
| TEST SITE: | Toptester laboratory, Rovaniemi |

## EQUIPMENT UNDER TEST

| | |
|---|---|
| DEVICE NAME: | Suspended ceiling plates Ewona Acustica® |
| VERSION: | Basic Madaline 50mm (3 pcs) |

| | |
|---|---|
| Test ID: | BALL_Ewona_ceiling_plates_260910 |
| Report version: | 1.0 |
| Class: | Cust |

## Persons in charge of the test

| | |
|---|---|
| Customer: | Markku Taskila |
| Toptester: | Ossi Hiltunen |

# 2. TEST REPORT HISTORY

| Version | Date | Change description | Changes made by |
|---|---|---|---|
| 1.0 | 30.9.2026 | First version of the report is 1.0. If no changes are necessary, it will be also the final version. | Ossi Hiltunen |

# 3. CONTENTS

1. TEST INFORMATION ..... 1
2. TEST REPORT HISTORY ..... 2
3. CONTENTS ..... 2
4. TEST SUMMARY ..... 3
5. INTRODUCTION ..... 4
5.1. Background ..... 4
5.2. Equipment under test ..... 4
5.3. Goals of the test ..... 4
6. TEST METHOD AND MEASUREMENT DESCRIPTION ..... 5
6.1. Test Method ..... 5
6.2. Acceptance Criteria ..... 5
6.3. Analyses ..... 5
6.4. Test Equipment, Reliability Control and Measurement ..... 5
7. TEST PROCESS ..... 7
8. RESULTS AND CONCLUSIONS ..... 11
9. QUALITY CONTROL ..... 12

# 4. TEST SUMMARY

### Used standard or test method summary

This test was done according to annex D: Impact resistance from EN 13964:2014 standard, Class 1A: (16,5 ± 0,8) m/s.

### Description of equipment under test

Suspended ceiling plates Ewona Acustica® Basic Madaline 50mm (3 pcs).

### Test result summary

All units withstood the impacts without compromising the functionality and only visual defects detected were dark ball marks and some wrinkles caused by impact. Test result is **pass** for all three samples.

### Signatures

Test performed and reported by: Ossi Hiltunen

Date: 30.9.2026 Ossi Hiltunen

# 5. INTRODUCTION

## 5.1. Background

This test was a part of Equipment Under Test (EUT) product reliability testing.

## 5.2. Equipment under test

3 pcs of suspended ceiling plates, samples were numbered from 10 to 12 (Figure 1):

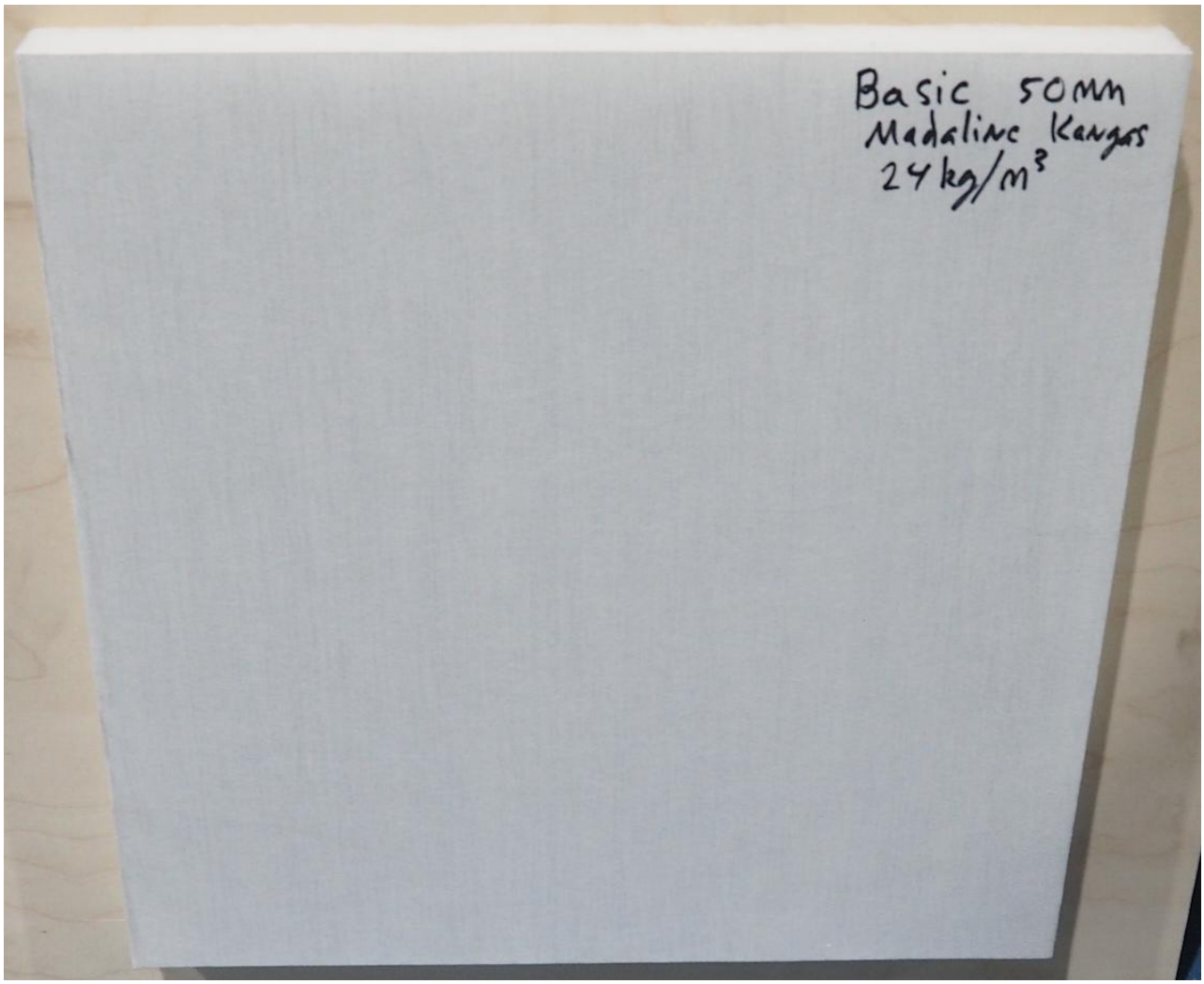



**Figure 1. Suspended ceiling plates were attached to plywood before the test.**

## 5.3. Goals of the test

The goal of the test was to check EUT's resistance against handball impacts.

# 6. TEST METHOD AND MEASUREMENT DESCRIPTION

## 6.1. Test Method

This test was performed according to annex D: Impact resistance from EN 13964:2014 standard. EUT was fastened to a rack from the plywood with screws and then lifted up to desired height to reach minimum distance from the ball gun barrel. A size 3 handball pressurized to 1,2 bars was shot 36 times total to the EUT distributed like so:

- 12 shots directly from below
- 12 shots with 60° angle
- 12 shots with 60° angle from opposite side

The ball gun was moved between the shots to distribute the impacts as evenly as possible. If a weak spot was found during the test that could affect function or safety, two additional shots were done at this spot. The ball velocity was Class 1A (16,5 ± 0,8) m/s.

## 6.2. Acceptance Criteria

Acceptance criteria were according to the standard:

*"After the impact test, the strength, function and safety of the suspended ceiling shall not have been adversely affected and its appearance shall not have changed to any great degree. Visual examination is adequate to assess this."*

## 6.3. Analyses

Visual checks were carried out continuously between the shots to see possible changes.

## 6.4. Test Equipment, Reliability Control and Measurement

Ball gun used in the test is presented in Figure 2. The speed of the handball was measured before the test using Speed measurement system - Photo cell and a software created by Toptester. Laboratory conditions were measured with Ruuvi Tag 4in1 sensor.

**Table 1. Used equipment**

| Equipment | Purpose | Serial number | Last calibration | Calibration valid until |
|---|---|---|---|---|
| Speed measurement system - Photo cell | Ball speed measurement | TT00001 | 3.6.2026 | 3.12.2026 |
| Ruuvi Tag 4in1 | Lab conditions measurement | ED5C | 11.8.2025 | 11.2.2027 |



**Figure 2. Ball gun used in the test.**

# 7. TEST PROCESS

Laboratory conditions during the test:

Temperature: 18.9 °C
Relative humidity: 59.1 %

Before the test each sample was visually inspected for possible damage. None was found. After the initial inspection, the EUT was attached with screws to the rack. The rack was then lifted to the desired height. In this case, that distance from barrel to the EUT surface was a minimum of 150 cm. (Figure 3).



**Figure 3. Test setup (impacts aimed at EUT from 60° angle on the left and directly from below).**

The EUT were inspected between each shot and after the test. The after-test pictures are shown in Figure 4, Figure 5 and Figure 6.

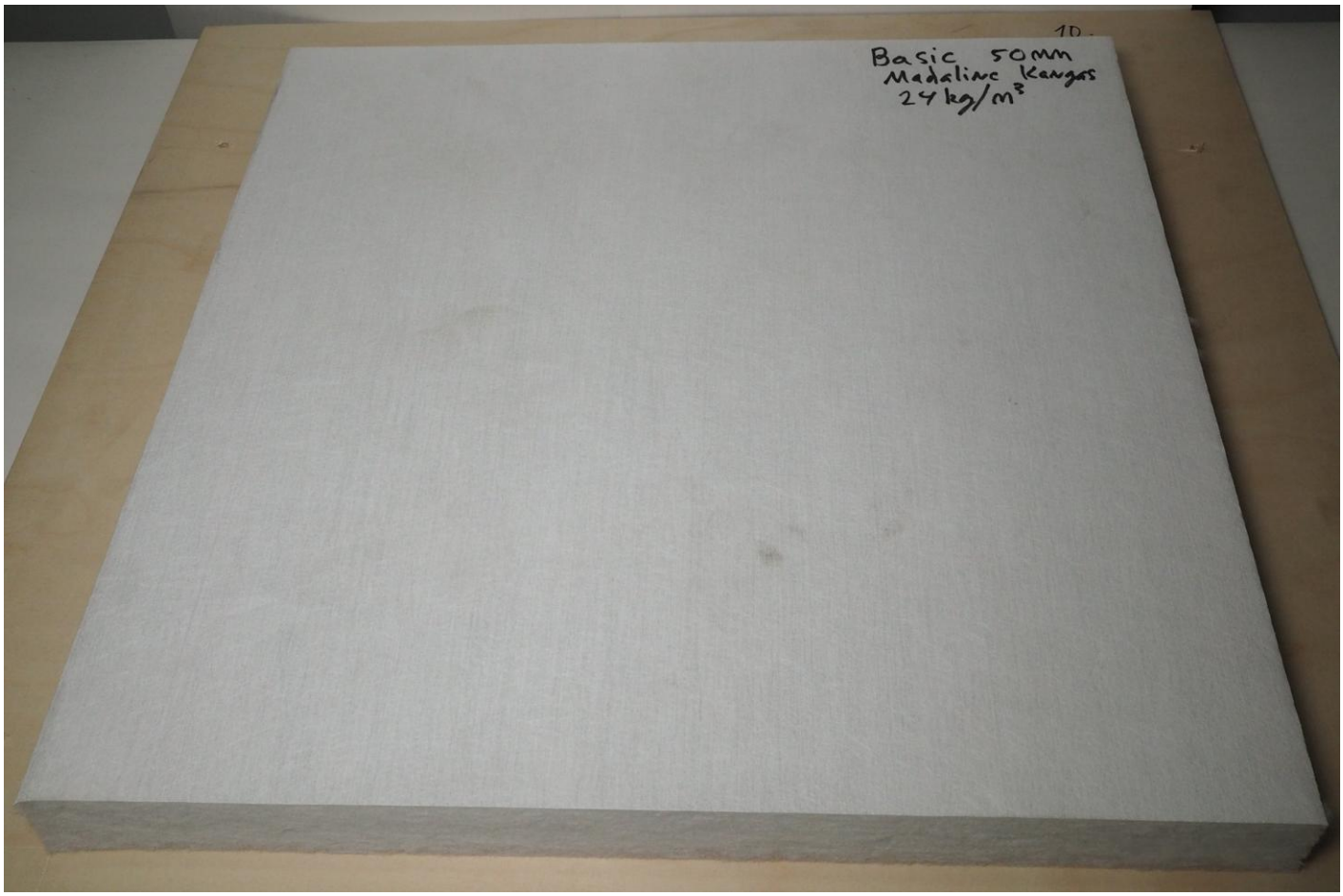



**Figure 4. Sample 10 after the test. There were no mechanical defects detected and only visual changes detected were dark ball marks and some wrinkles caused by impact.**

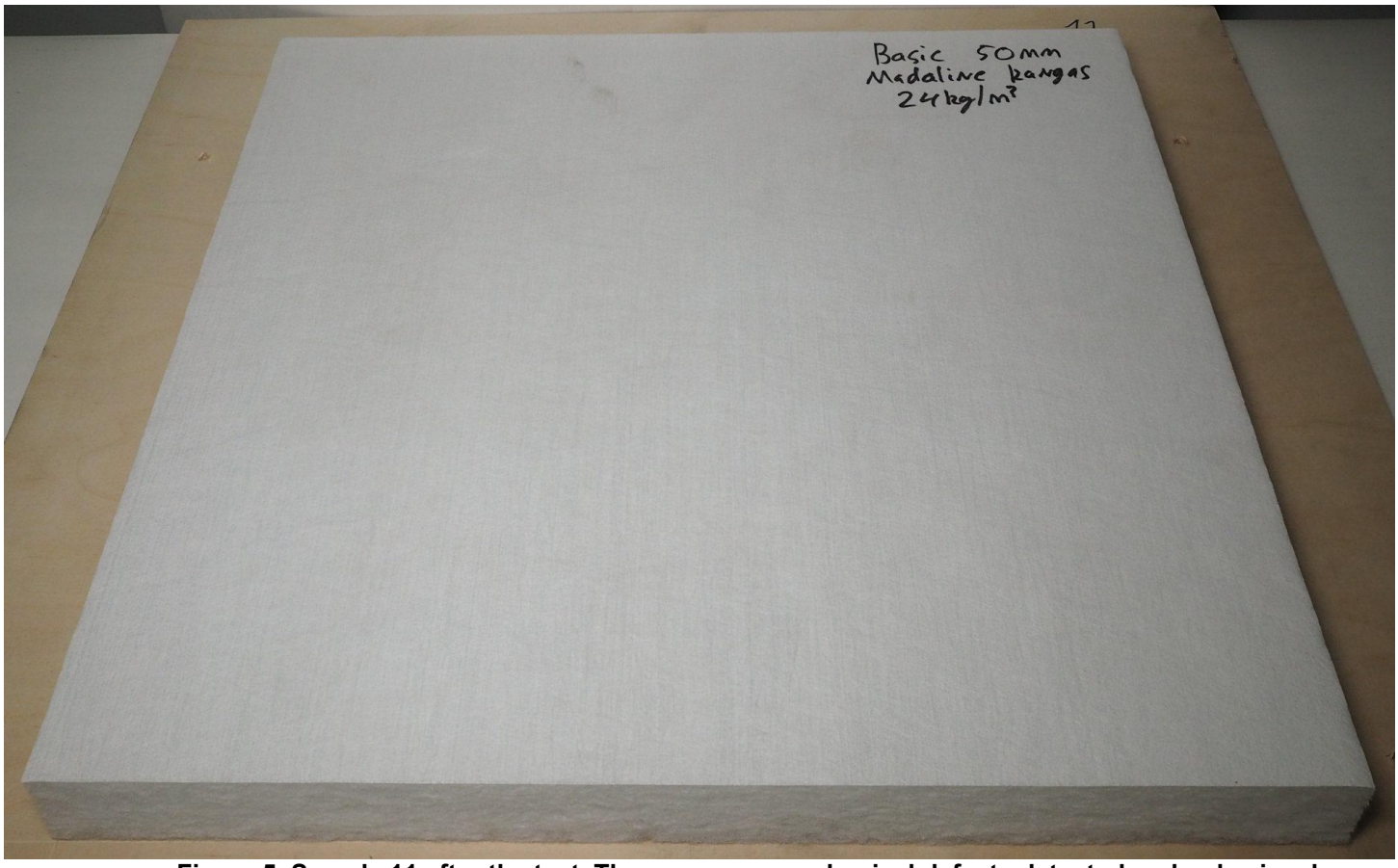



**Figure 5. Sample 11 after the test. There were no mechanical defects detected and only visual changes detected were dark ball marks and some wrinkles caused by impact.**

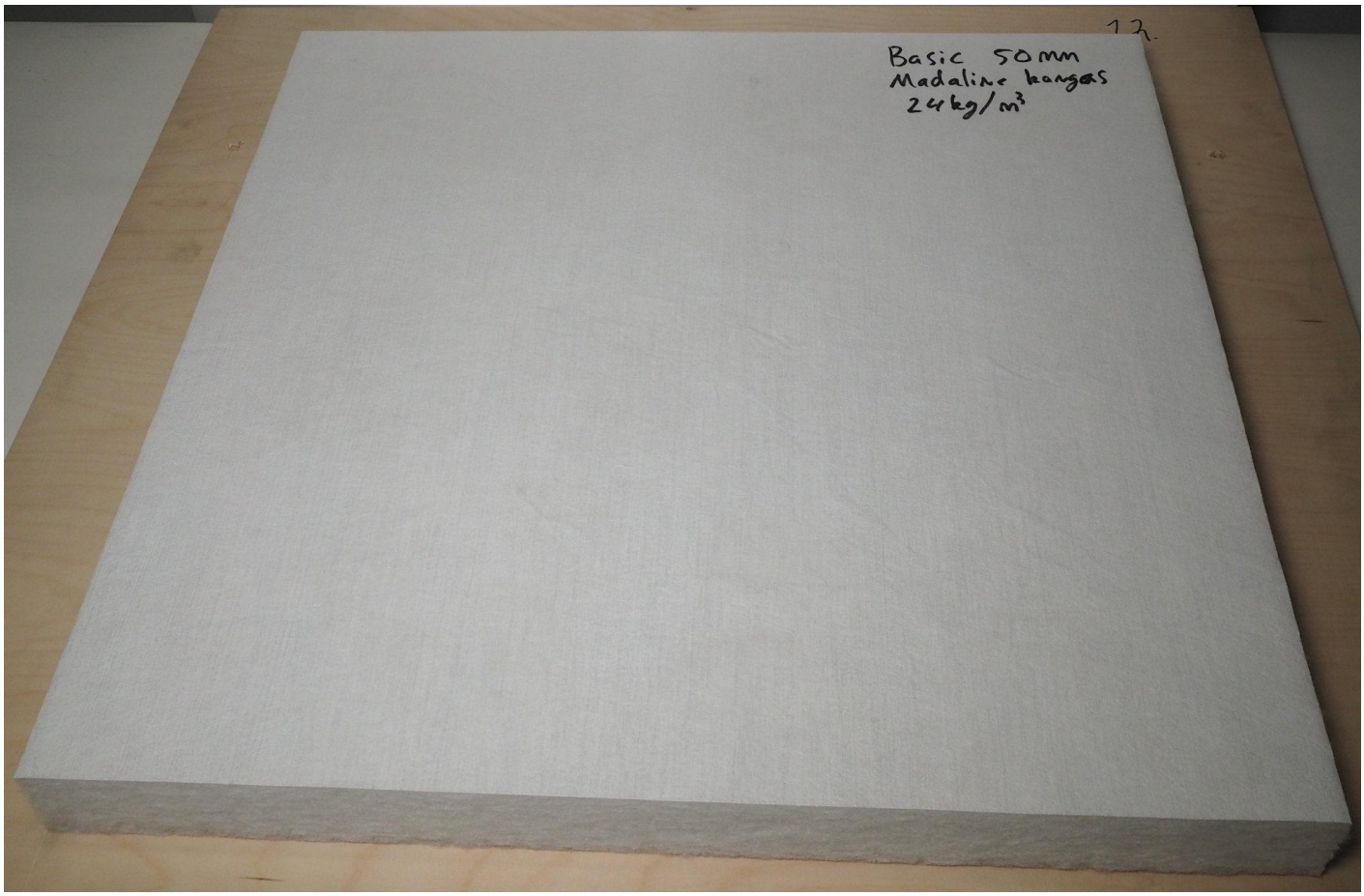



**Figure 6. Sample 12 after the test. There were no mechanical defects detected and only visual changes detected were dark ball marks and some wrinkles caused by impact.**

# 8. RESULTS AND CONCLUSIONS

All units withstood the impacts without compromising the functionality and only visual defects detected were dark ball marks and some wrinkles caused by impact.

Sample 10 functionality was not compromised. Only visual defects detected were dark ball marks and wrinkles caused by impacts.→ Test result is **pass.**

Sample 11 functionality was not compromised. Only visual defects detected were dark ball marks and wrinkles caused by impacts.→ Test result is **pass.**

Sample 12 functionality was not compromised. Only visual defects detected were dark ball marks and wrinkles caused by impacts.→ Test result is **pass.**

# 9. QUALITY CONTROL

