test report

test report

number/*Number* 8123007288-70 v1

***date of issue*/ *Date of issue* December 19, 2024**

client *Customer*	Fisacon GmbH Augsburger Str. 2-6 33378 Rheda-Wiedenbrück Germany / *Germany*	Proceedings *Method*	**explosion test** with a propane-air mixture according to the test principle for awarding the certificate **"TÜV NORD type tested"**
clerk *case worker*	Feldmann	sample receipt *Specimen receipt*	May 14, 2024
test date *Date of test*	May 15, 2024	Valid until *Valid until*	unlimited *unlimited*

Product name*/*Product designation**
RACLAN SQUARE

Results/*Results*
room closure *Integrity*
fulfilled/*fulfilled*

Dortmund, December 19, 2024

Niederberghaus

Digital unterschrieben von Nadine Niederberghaus

Release/*approval*

Prüflaboratorium für Brandschutz DMT

Feldmann

Digital unterschrieben von Sebastian Feldmann

Responsible/*responsible*

This report includes 7 Pages and more 6 Page attachments.
This test report consists of 7 pages and further 6 pages appendices.

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1 test basis/specification

The explosion test with a propane-air mixture was carried out in accordance with the test principle “M 02- 2022 Storage media for lithium-ion batteries”, version 1.0, as of May 12, 2022.

The client provided the tested container.

2 documentation of the test setup

2.1 Framework conditions of the examination

place of the exam		:	Tremoniastrasse 13, 44137 Dortmund
air temperature	[°C]	:	18.8
air pressure	[hPa]	:	- /-
relative humidity	[% RH]	:	51.9

2.2 Sample description

feature	Unit	Value
manufacturer and place of manufacture		see client
brand name / type designation		RACLAN SQUARE
specimen structure		RACLAN SQUARE - Box with a flap at the front, consisting of loading/ storage space and functional space - Equipped with a pressure-free extinguishing system within the functional room Corpus: - Housing made of synthetic resin pressed wood (Panzerholz®, (material thickness 8 mm, according to DIN 7707) - framed in aluminum groove profiles (profile 8 30 x 30 type B and profile 23-229 (groove 8) - Profiles connected with 3D cube connectors (cube connectors 8 30 x 30 3D) - In addition, a vermiculite plate was used in the floor area (material thickness 9.6 mm) - Mat to prevent the fire load/battery from slipping (material: NR/SBR 70°; fine grooves on the underside with a fabric pattern; material thickness: 3.0 mm) - There are handles on the sides in the upper area, the openings of the exhaust management system are also located on the sides - There are adjustable feet on the floor

feature	Unit	Value
		flap/door: - Plate of the flap made of synthetic resin pressed wood (Panzerholz®, (material thickness 8 mm, reinforced to 15 mm, according to DIN - 7707) Flap equipped with opening handle - for closing two spring-loaded locking units, each consisting of a compression rotary latch (7-086 flush compression rotary latch made of stainless steel) and a spring unit (pressure spring VD-288Z-08) two hinges (7-202 hinge Pr01 - 270 ° made of stainless steel) are attached to the bottom of the flap - silicone seal 4.5 x 6.5 mm (50°±5° Shore A, translucent, tolerance according to DIN ISO 3302-1 E2) applied all around the inside of the flap[1] exhaust gas management system: - Exhaust pipe with ventilation openings through the interior (loading/storage space), ventilation slots (long hole) on the rear - Gill plates on the outside to divert the exhaust gas flow - Filter sections consisting of stainless steel wool, stainless steel flame retardant screen 500 micron 2 layers and Sorbacal® SP extrudate are inserted inside the exhaust pipe extinguishing system: - Components in the functional space: ■ Extinguishing agent bag filled with approx. 10 liters of extinguishing agent TRIDENT ■ pump ■ solenoid valve ■ Thermal switch with a trigger temperature of approx. 90 °C (sensor in the storage room) - Components in the loading/storage area: ■ extinguishing agent nozzles (full cone nozzles R1/8 S120 3.2) External electrical components: - key switch - Two indicator lights - Voltage display for the internal power supply Button for - the voltage display - buzzer - Connection to external power supply No external - electrical components were installed for the explosion test.
Color		brown / silver
number of specimens		1

[1]This type of seal was not installed for the explosion test. After consultation with the certification body, the replacement of the seal is considerednot Considered relevant to the result.

feature	Unit	Value	
		nominally	determined
specimen size (L x W x H)	[mm]	580 x 580 x 380	- /-
Weight	[kg]	~ 42	42.21
free storage volume	[l]	60	- /-

All information is provided by the client unless otherwise indicated. Overview and detailed photographs of the test specimen can be found in Appendix A 1.

2.3 Measurement technology

2.3.1 camera technology

The test was recorded with two cameras at 100 fps and 1920x1080 px.

2.3.2 Measurement of deformations and spatial closure

To measure the deformation and gap formation, 6 mm and 25 mm gap gauges according to DIN EN 1363-1, section 4.5.5.2 and a calibrated caliper were kept ready.

2.3.3 overall structure

Compressed air and propane gas were introduced into the test specimen via two separate openings (fuel gas quick couplings) and mixed inside the test specimen by the turbulent outflow and an electric fan (air flow from bottom to top). Ignition was initiated by an ignition electrode inside the test specimen, which was connected to an ignition transformer (2 x 5 kV, 20 mA) outside the test specimen.

3 test procedures

3.1 Sampling

The test specimen was selected and provided by the client without the involvement of the testing laboratory. The necessary modifications were made by the client.

3.2 Sample preparation

The client provided the test specimen with two fuel gas quick couplings in the right-hand side (seen from the front). The power supply for the fan and the connection cable for the ignition electrode were also routed through this side wall.

3.3 Test procedures

According to the underlying test specification, the test specimen was flooded with a total volume that corresponds to 5 times the storage volume of the test specimen. Gas flowing out through the exhaust openings was removed by a high-performance fan. For the test specimen in question, this corresponded to a

discharge of 109.2 $L_{standard}$/min ambient air and 4.6 $L_{standard}$/min propane gas over a period of 180 s. Ignition was initiated within 1 s after the gas supply was interrupted.

After ignition, the voltage supply of the ignition transformer was interrupted and the condition of the test specimen was documented.

3.4 Observations

The flap of the test specimen opens briefly to relieve pressure and then returns to its original position. It was not necessary to use gap gauges; no gaps or cracks appeared on the test specimen.

The photographic documentation can be found in Appendix A 2.

3.5 Deviations from the test specification

The test was carried out without deviations from the test specification.

4 Results

Table 1: Test results

criterion	observation	assessment
doors/hatches closed	Flap closed at the end of the test and continue to open and close	fulfilled
No cracks/gaps that could indicate failure of the room closure are to be evaluated	Gaps along the lower edge of the specimen and in the inner wall, no Penetration with gap gauges possible	fulfilled

5 notes

The results only reflect the behavior of the tested specimens under the specific test conditions. They do not represent the only criteria that can cause possible fire hazards. In case of doubt, the German version of this report is valid. This test report may only be distributed in its entirety and unchanged. Extracts or abbreviations require the written permission of DMT GmbH & Co. KG.

If a statement of conformity has been made in this test report, the following decision rule has been applied: "The measurement uncertainty is not taken into account in the statement of conformity".

This document does not constitute type approval or certification of the product.

Information marked with an asterisk (*) is data provided by the customer. Information provided by the customer may affect the validity of the results.

The test specimens are used up.

Appendix

A 1 Photo documentation – before the test

Figure 1: External view with gas and compressed air connection and cable feedthrough for the fan

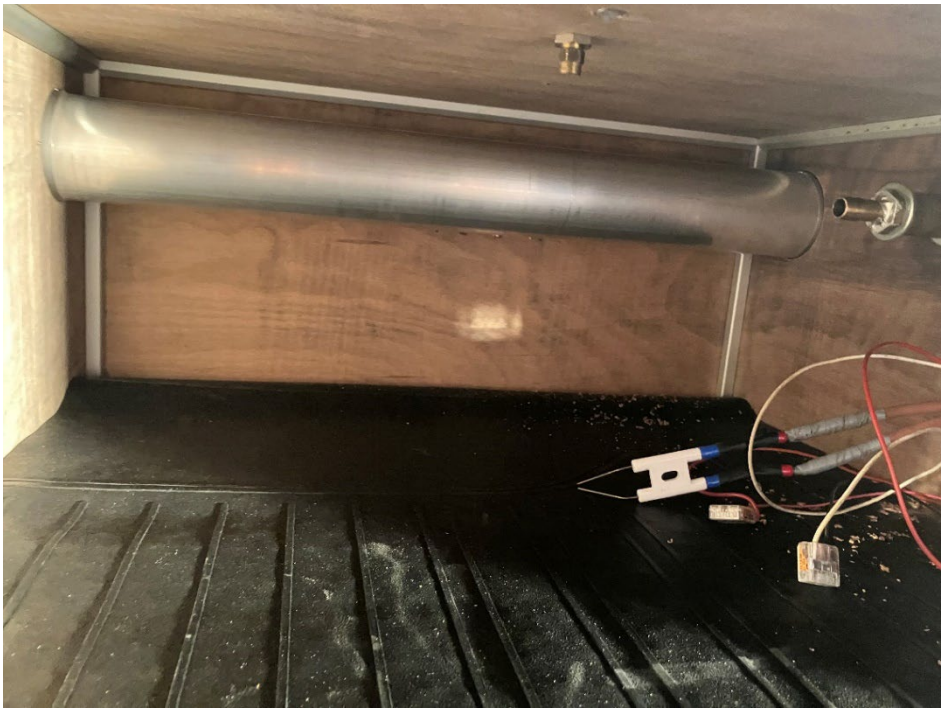

Figure 2: Interior view with ignition electrodes

Figure 3: Front view with flap open

Figure 4: right side surface

Figure 5: Back

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t key

Figure 8: Detail - locking system

Figure 9: Detail – rubberized insert mat

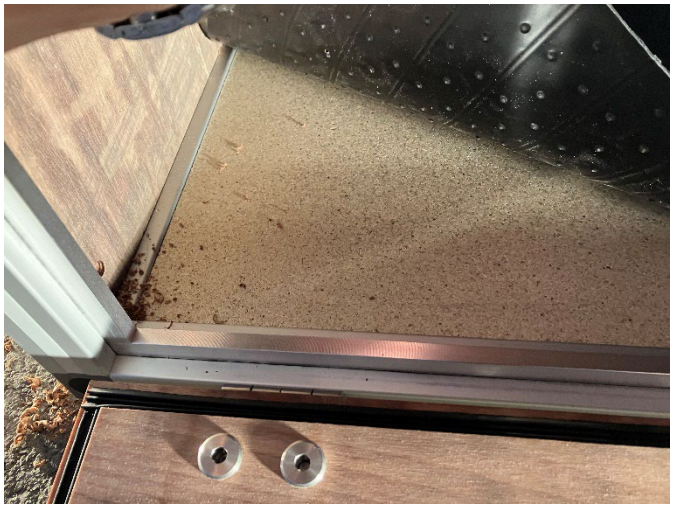

Figure 10: Detail – Hinge fastening

A 2 Photo documentation – after the test

Figure 11: Front view of the specimen

Figure 12: right side surface

Figure 13: Rear wall

Figure 14: left side surface

image

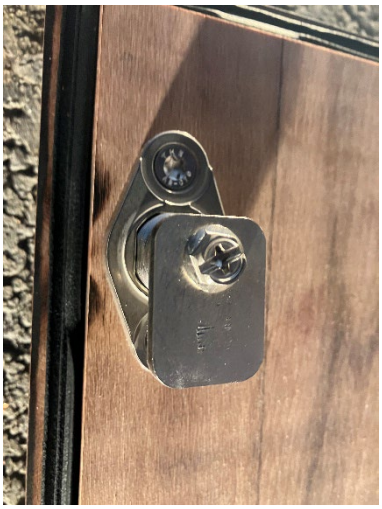

Figure 16: Locking