The Gasket

Thermo Donut © System

Feb 2020

The Gasket story:

Imagine, 20 cm beside this

is this.

Good night!

The Gasket

No thermal bridges = more energy efficient:

If minimizing thermal bridging of a building, you improve enormously the energy efficiency! A building with lots of thermal bridges is leaking a lot of heating energy (or cooling energy) ! Every year! Lost and wasted!

Airtight:

When the attachments of a façade are not sealed, the building is not airtight. The result is that together with the "escaping" air the building loses heating energy (or cooling energy). Therefore it is not energy efficient!

Mold & mildew:

If a buildings wall is water leaking (rainwater), it leads often to mold and mildew (often hidden and unnoticed)! That happens especially at stud walls.

That is very unhealthy!

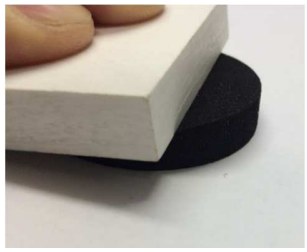
Plus, if the insulation inside a stud wall is wet and therefore "sacking", the insulation is no longer well distributed. That's why the insulation value becomes very poor. Therefore the energy efficiency is even worse!

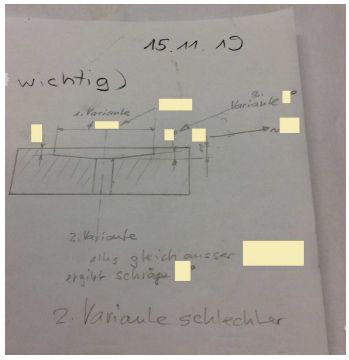
That means; We must design energy efficient plus healthy buildings! "Most Defined" is responsible and established the all new option "built-in gasket" for their thermal breaks!

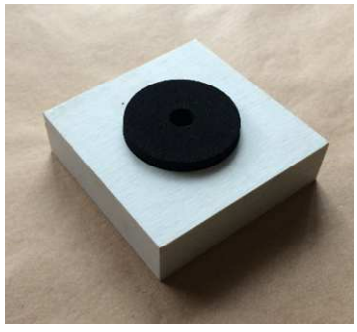
The Gasket

At the beginning was a goal:

To equip our existing and popular thermal breaks with an option "built-in gasket" in order to have a solution for energy efficient **plus healthy** façade attachments.
(mostly for rainscreen facades or curtain walls, (sealing in addition to the weather barrier WRB).





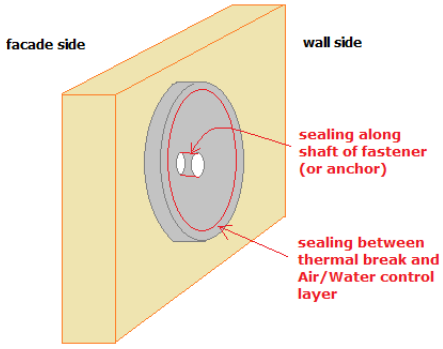


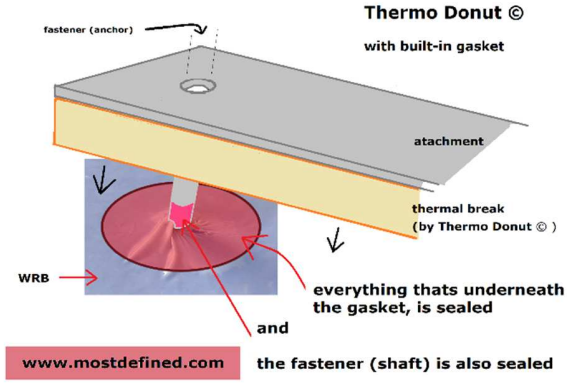
After many calculations and tries, the optimal material, diameter, depth and hardness of the gasket as well as the best form, dimensions and angles of the pit in the thermal break were determined. The design phase was completed. Afterwards we carried out following inhouse tests:

The Gasket

Inhouse testings: visible test (part 1)

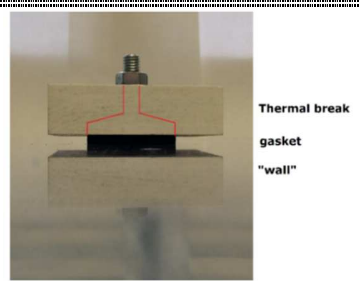
It was obvious that the gasket will seal between thermal break and Air/Water control layer (WRB, wall). But what about sealing along the fastener (anchor)?

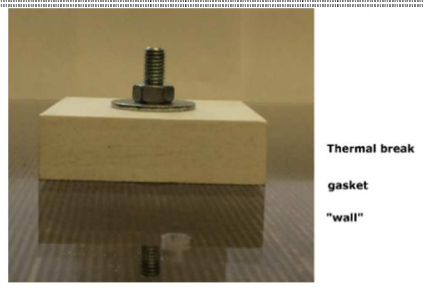




At the tests below, the wall is faked by a transparent glass plate)

before tightening (distance to „wall") after tightening (no distance to „wall")

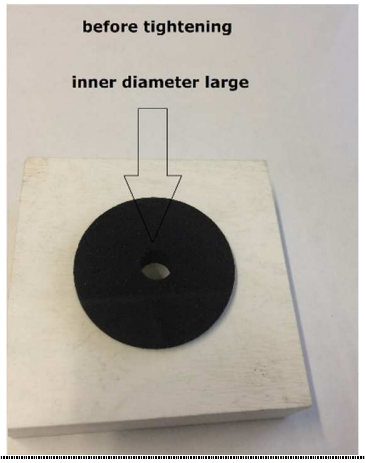


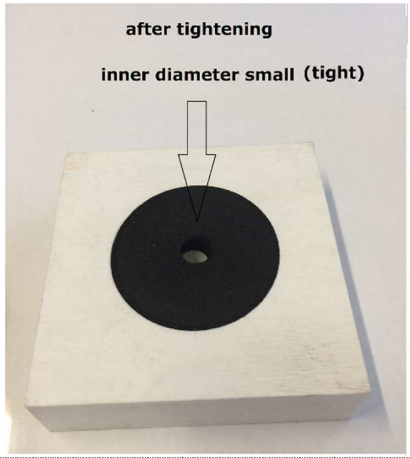


View from the side:

gasket:

Cellular EPDM; compressible, elastic, soft Shore (durometer), water resistant, very long-lasting, though, temperature and weather resistant, etc.





View from the bottom:
(equal to wall-side, view through the glass plate)

see also video on youtube:
"the gasket 1"

result: gasket seals;

A: between thermal break and wall.
as well as
B: along the shaft of the anchor (fastener, inner diameter narrows when tightening).

The Gasket

Inhouse testings: sealant test with water (part 2)

After seeing that the gasket works, we wanted to carry out tests with water and pressure. For this we put a waterproofed and transparent hood onto the glass plate (over the thermal break that is fixed by a fastener which goes through the plate, hole in the plate with "notch" so the hole is for sure not sealed!). We filled water into the hood and added pressure (test at ca. 4 °C).

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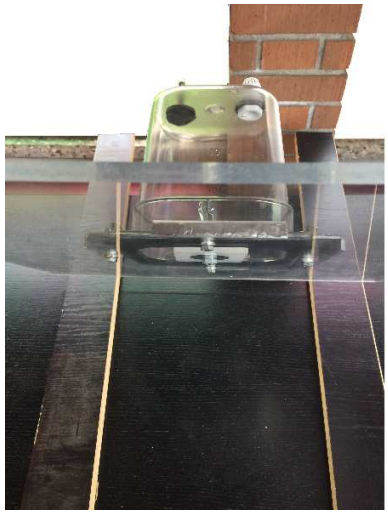

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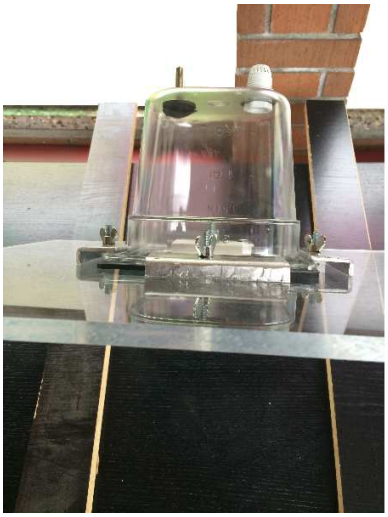

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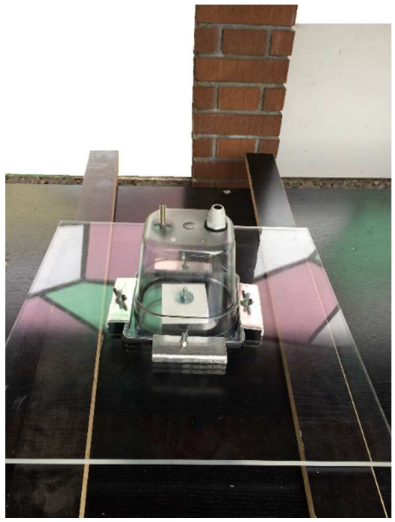

The Gasket

Inhouse testings: sealant test with water (part 2, continuation)

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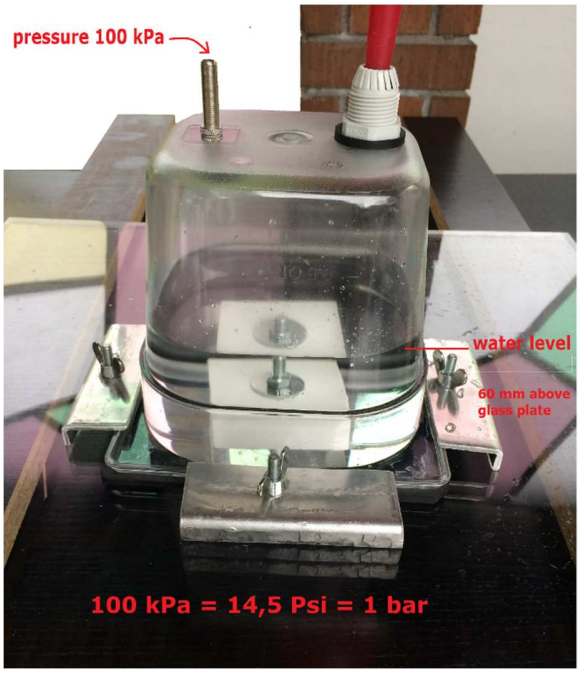

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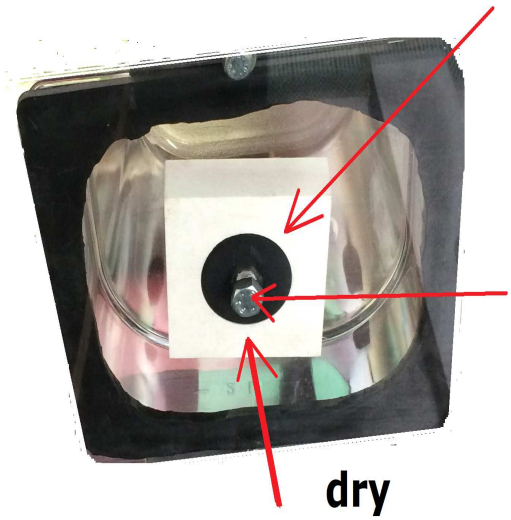

View from underneath the glass plate
(view through the glass plate, only the fastener goes through the plate)

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First we ran a test without gasket (for comparison). Without pressure it was even after 30 Min. (surprisingly) dry. After that time it became wet. And then with pressure (100 kPa) it was leaking badly.

After that, we ran tests with gasket (start Dec 20, 2019). For the first week we ran the test every day and then every week (each time one test run without pressure and three test runs with pressure (one minute apart), test runs each time minimum 20 Min. after filling water into hood).

At all test runs with gasket the fastener (anchor) at the underside of the glass plate remains dry.

Result: dry, Success!

In order to see in addition the long-term effects, we are repeating the tests (tests are still ongoing). And we also run tests with a carved glass plate (simulation of torn borehole).