duraproof

Technologies for durable solutions

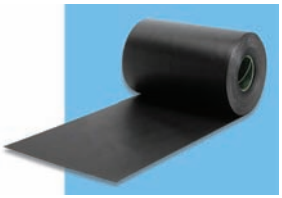
FACADE HANDBOOK

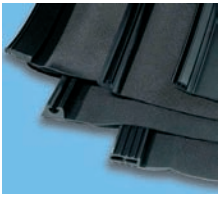
NOVOPROOF® Handbook for Façade Sealing

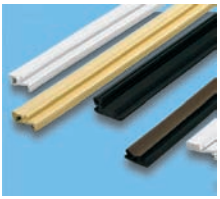
NOVOPROOF®

Sealing for Facades

Company plant
DURAPROOF technologies GmbH







Contents

Page

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Technologies for durable solutions

Preface

for architects, construction engineers, facade builders, planners and fitters

Construction work and the environment – these two concepts are closely linked and complement each other.

The environment creates requirements for construction, while construction work has consequences for the environment. This mainly involves ensuring that available energy resources are used with care and that environmental impact is kept to a minimum. These endeavours can be summed up in just two words:

Saving Energy

Heating energy is a particularly important factor here, as residential heating is the leading source of final energy consumption (accounting for 47%).

The importance of conserving heating energy has long been clear, as it has been the subject of extensive technical requirements legislation for some time.

The German construction contract procedures (VOB), DIN 4108 and thermal insulation regulations, which specify minimum requirements for heat insulation, were effectively the precursors of the German energy saving regulations EnEV. The EnEV has been in force since February 2002, with the aim of significantly reducing heating energy demand.

CO_2 emissions in Germany were to be reduced by a further 25% by 2005, allowing Germany to take a leading international role in the reduction of CO_2 emissions.

Energy conservation has far-reaching effects. It upgrades the building and effectively protects it from structural damage. Buildings become secure long-term investments and more comfortable places to live and work.

The stipulations of the EnEV represent nothing more than the usual standards for a low-energy house.

Low-energy buildings are buildings with no active heating system, or one which is very small (with an energy consumption of roughly 70 kWh/m² a). The annual heating energy requirements for an ultra-low energy building, or **passive house**, are less than 15 kWh/m² a, with a total consumption of primary energy (including domestic electricity) below 120 kWh/m² a.

The EnEV includes legal requirements for more intense thermal insulation. It replaces the German thermal insulation regulations of 1995 (WärmeschutzV) with a complete revision of DIN 4108. The EnEV is intended to reduce CO_2 levels and drastically lower energy consumption (down to the standards of a low-energy house).

This technical progress has been made possible by high-insulation windows and transparent facade elements, which are also making passive house solutions increasingly feasible.

By insulating the building and creating an outer building surface that is impermeable to air allows the legal requirements to be implemented and the drastic energy savings to be made.

Insulating a building is, in itself, relatively straightforward. Joining the individual components together, however, is becoming increasingly complicated. Stringent requirements are made for the exterior of the building:

All connections, i.e. all joints, must be durably airtight.

In most cases, of course, waterproofing is also required and the interior joints need to be impermeable to water vapour.

The **blower door test** prescribed by the EnEV clearly illustrates just how seriously the issue of joint tightness is taken. The test involves checking the outer surfaces of the building for air-tightness. An electric fan is fitted to an outer door or window and negative or positive air pressure is generated. Measuring devices are used to determine the amount of air that flows from the inside to the outside of the building through leaks in the building exterior under a variety of pressure differences. This air quantity can then be compared with the volume of the building to give the n-50 value (i.e. the value under a pressure difference of 50 Pa).
The n 50 value corresponds to the hourly air change.

$$n\,50 = \frac{\text{Air volume that the fan transports outside per hour}}{\text{The building's air volume}}$$

The pressures of 10–60 pascals generated during the test correspond to the dynamic pressure present at wind speeds of 4–10 m/s (= 15–36km/h).

The tightness of the joints is an important variable which the EnEV calculations incorporate into the overall evaluation of insulating measures. Changes may be required as a result of this evaluation. For example, insulation may need to be increased if the joints allow excessive air change.

The aim of this handbook is to make the relevant parties aware of the issues involved in facade sealing, while providing them with support.

- **We have effective solutions based on solid ideas.**
- **We have solutions for the required durability of the seals.**
- **We have solutions that are environmentally friendly.**
- **We have solutions made from high-performance rubber**

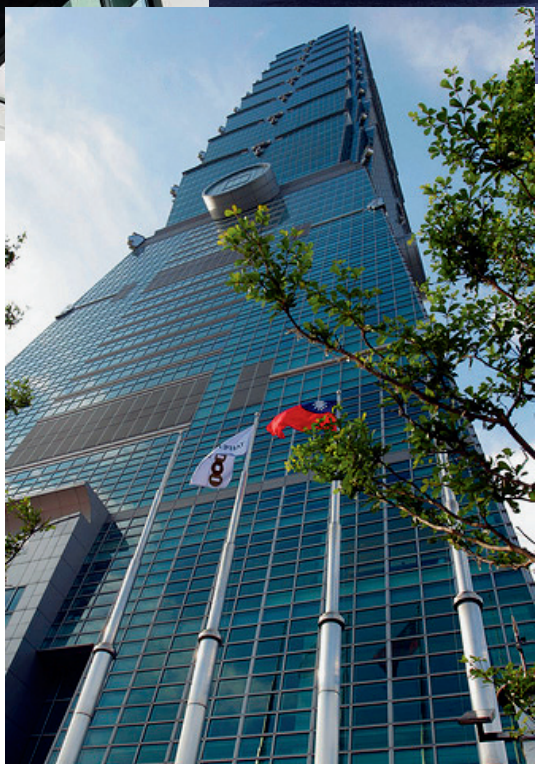
‘Facade sealing with DURAPROOF systems’

DURAPROOF systems are straightforward and efficient.

The factors that need to be taken into account when choosing a sealing system are given below. These factors can be split into two main groups: structural conditions and building physics requirements.

To fit a sealing system successfully, it is vital that building physics conditions are specified effectively and comprehensively on the basis of examples. No one will be prepared to work with the required amount of care and produce good durable results unless they have access to the necessary background information.

All the following information, particularly suggestions for the handling and use of our products, is provided on the basis of our knowledge and experience. Materials and structural situations, working and fitting conditions differ from case to case and are out of our control. We therefore recommend that you carry out your own tests for your particular application to determine the suitability and the correct use of our products.



Facade Sealing Options for Particular Conditions

Expansion joints[1] are created wherever materials and structural elements meet. These joints must be filled with a suitable joint sealant or bridged with elastic sealing strips.

The same requirement applies for all materials:

A durable elastic seal must be created.

Three sealing systems may used, depending on the joint size, the cross-sectional fluctuations and, most importantly, the characteristics of the joint edges:

1) Nozzle-application seal with back-fill material

2) Impregnated foam plastic tape

3) EPDM rubber joint strips

The sealing system should be selected on the basis of the given conditions and the external loads.

The following factors should be taken into account:

- Wind-driven rain
- Wind
- Noise
- Prevention of condensation water in and around the joint
- Chemical compatibility of all materials in the joint area
- Thermal movements in the joint area
- The shape and material of the structural element that is to be joined
- Condition and strength of the adjoining materials

1
Expansion joints are joints that are subject to cross-sectional changes throughout their service life. Such changes are caused by thermal influences (causing changes in length), shrinkage and swelling, settlement and external forces such as wind suction and wind pressure. Typical expansion joints are the joints used where window and facade elements meet the main body of the building. They require durable elastic seals.

This is particularly important for facade construction, and even more so in the case of multi-layer facades.

The design principles are determined by the building physics requirements and must always be very consistent.

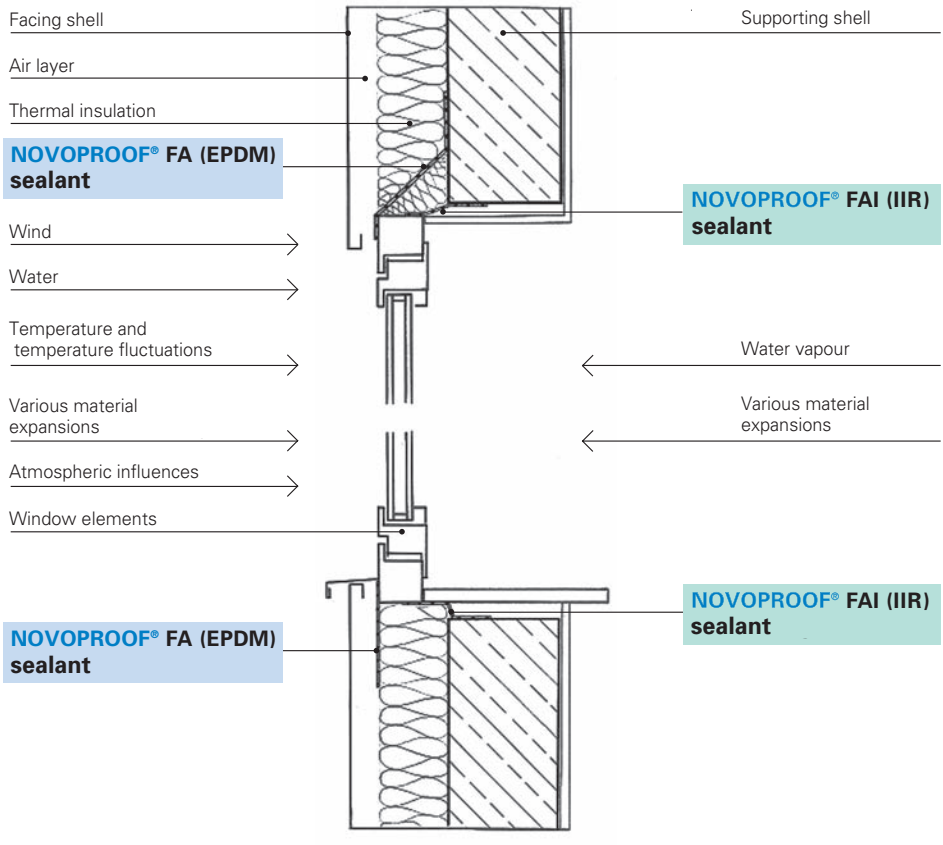
A durable barrier is required between the window/facade element and the main body of the building in all building designs.

Joint areas measuring roughly 20–100 mm or more must be bridged with joint strips that can absorb comparatively large movements – the joint must be 100% reliable.

Using maintenance joints[2] in such areas is out of the question, as the seals cannot be accessed or visually assessed once they have been fitted. Any checks or maintenance work would be impossible without major consequences.

2
Joints with seals that allow them to be checked and repaired throughout their service life.

The Design Principle Behind Multi-Layer Rear-Ventilated Facades



The main purpose of these seals with rubber strips is to create a durable barrier against wind and water on the outside of the building and make the inside impermeable to water vapour.
The **NOVOPROOF®** system allows the seal to be fitted quickly and securely. The corresponding adhesives are suitable for almost all applications.

The NOVOPROOF® Sealing System

NOVOPROOF®
Kleber TA adhesive

NOVOPROOF®
Kleber FA/FA+
and **FA spezial**
adhesive

NOVOPROOF®
Reiniger cleaner

NOVOPROOF®
Primer

NOVOPROOF®
Anschlusspaste
joint paste

NOVOPROOF® FAI

NOVOPROOF® FAI-SELF

NOVOPROOF® FA (EPDM)

EPDM[3] Rubber strip to DIN EN 13859-2
Nominal thickness: 0.6; 0.75; 1.0; 1.3; 1.5 mm
Width: 100; 150; 200; 250; 300; 400 mm
Length: 20 m, on roll

Water vapour diffusion resistance
μ = **60.000**[4]

For outdoor use (cold side)

NOVOPROOF® FAI (IIR)

IIR[5] Rubber strip to DIN EN 13859-2
Nominal thickness: 1.0 mm
Width: 100; 150; 200; 250; 300; 400 mm
Length: 20 m, on roll

Water vapour[4]diffusion resistance
μ = **156,000**[4]

For vapour-tight adhesion indoors (warm side)

NOVOPROOF® FA-SELF (EPDM)

The same as **NOVOPROOF® FA (EPDM)**, but with
self-adhesive edges[6]
Nominal thickness: 1.0 mm
(Width: 150; 200; 250; 300; 400 mm)

NOVOPROOF® FA-SELF (IIR)

The same as **NOVOPROOF® FA (IIR)**, but with self-adhesive edges[7]
Nominal thickness: 1.0 mm
(Width: 150; 200; 250; 300; 400 mm)

Other thicknesses, widths and roll lengths on request

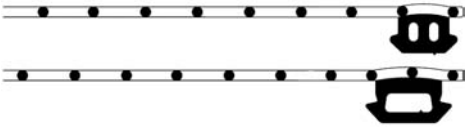
3
EPDM = Abbreviation for synthetic rubber (from the **M** class). Molecular structure: terpolymer made from **E**thylene, **P**ropylene and a **D**iene with a saturated diene in the side chain (named in DIN 1629; formerly EPTR).

4
μ = Non-dimensional number that specifies the water-vapour resistance of a material in comparison with an air layer of the same thickness

5
IIR = Abbreviation for isobutylene-isoprene rubber This butyl rubber displays low permeability for gas molecules and is used in NOVOPROOF systems as a water-vapour barrier.

6, 7
see Usage Guidelines

NOVOPROOF® KE with keder strip:
The same as **NOVOPROOF® FA/FAI**, but with EPDM clip-in profile for fastening in holding grooves without any adhesive or sealant. Also available with self-adhesive edge as made-to-order design; minimum purchase volumes apply (widths on request).



NOVOPROOF® Kleber FA/FA+ adhesive:
Construction adhesive with paste consistency for rough uneven surfaces. Also available as filler for holes and uneven surfaces for use in conjunction with **NOVOPROOF® FA/FAI-SELF** (600 ml foil tube bag).[10]

NOVOPROOF® Kleber TA adhesive:
Classic contact adhesive for smooth even surfaces (800 g tin and 4.7 kg container)[9]

NOVOPROOF® Kleber FA Spezial adhesive:
(NEW!)
Construction adhesive with paste consistency for rough uneven surfaces, low in solvents. Also available as filler for holes and uneven surfaces for use in conjunction with **NOVOPROOF® FA/FAI-SELF** (600 ml foil tube bag).[10]

NOVOPROOF® Primer:
Primer for porous surfaces, for use in conjunction with **NOVOPROOF® FA/FAI-SELF** and primer for damp porous surfaces and adhesion temperatures down to –10 °C for **NOVOPROOF® Kleber TA** and **NOVOPROOF® Kleber FA** (4.7 kg container).[11]

NOVOPROOF® Reiniger cleaner:
To clean and degrease surfaces for adhesion (1 l cylinder, 5 l container).

NOVOPROOF® Anschlusspaste joint paste:
For additional sealing of joints, based on high-quality silicone (310 ccm cartridge)

Prefabricated corners:
Use these parts in corner areas to guarantee optimum proofing reliability.

Water, air and water-vapour tightness are no longer dependent on the geometric cut of the sealing strip and how it is adhered in the corners.

Fitting time is significantly reduced.

Overall, a less expensive and more reliable solution.

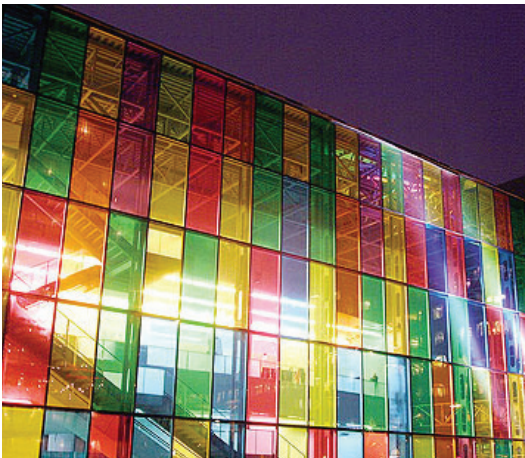
These corners are generally manufactured individually for specific applications. Corners can be made for almost any geometric forms.

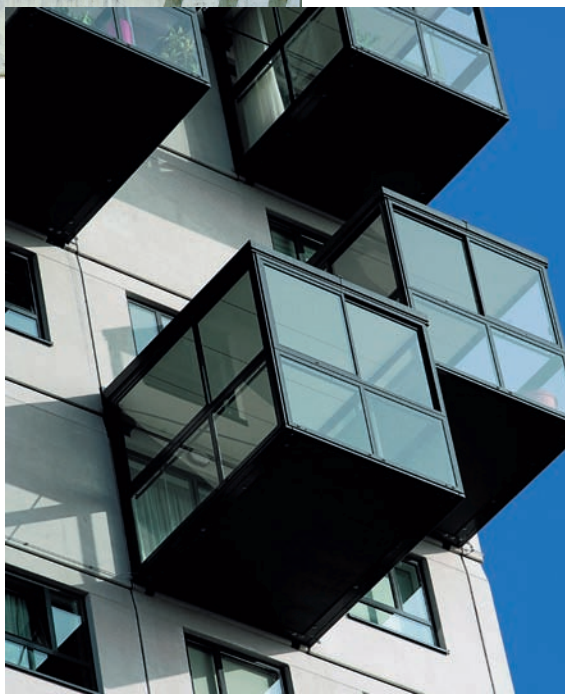
Please contact us for a non-binding quote.

9, 10, 11
see appendix:
Usage Guidelines

Product Benefits at a Glance

- Material approved to DIN EN 13859-2 and DIN EN 14909
- Using **NOVOPROOF® Kleber TA, FA, FA+** and **FA spezial** means that **no additional mechanical fixing** of the strip is required (so no bolt strips are needed).
- With **NOVOPROOF® Primer**, adhesion is possible on **damp structural surfaces** (including porous surfaces)
- When **NOVOPROOF® Primer** is used, adhesion can be carried out at **temperatures as low as –10 °C**
- With the 4 varieties of adhesive (**Kleber TA; Kleber FA/FA+** and **FA spezial**; **NOVOPROOF® FA/FAI-SELF)**, there is a suitable adhesive for any application.
- Strips fitted with **keder strip** (clip-in profiles) can be fitted **quickly and reliably, regardless of weather conditions.**
- **Complete adhesion** system with few product components (e.g. a primer for 3 different adhesive types, **Kleber FA/ FA+** also usable as priming filler material in conjunction with **NOVOPROOF® FA/FAI-SELF)**
- Fully **durable, elastic, highly ageing-resistant** materials
- Extremely **resistant** to all atmospheric conditions
- No problematic plasticisers; **chemically neutral** material, **compatible** with almost all standard construction substances
- **Preassembly of corners or entire sleeves** reduces fitting times and enables a **efficient**, **inexpensive** and above all **reliable seal** of all critical points.
- **Water vapour diffusion resistances** for indoor and outdoor use coordinated to allow even **critical climatic conditions** to be overcome reliably.
- **Additional all-round product-related customer service, including consultation, recommendations and fitter training**





NOVOPROOF®
FA/FAI

Usage Guidelines

Product description:
With our **NOVOPROOF® strips**, you can create window and facade joints to DIN 4108 and RAL quality guidelines with reliable air, water and water-vapour tightness with the required durable elasticity.

The EnEV energy saving regulations have further increased the requirements made of joint seals in the shell of the building.

The required values may also be tested at any time (using the blower door test). The main purpose of the barrier strips is to bridge and seal expansion joints in any type of window and facade construction project. The materials are categorised into two main groups: materials that can diffuse water vapour and those that are vapour-proof:

For water-vapour diffusion (outdoors) NOVOPROOF® FA (formerly NOVAwall EPDM / SG TAN)

For vapour-proofing (indoors) NOVOPROOF® FAI

(formerly NOVAwall IIR / SG TYL)

To help you to differentiate between the two types, **NOVOPROOF® FAI** rolls are embossed with the initials **'IIR'**.

Both types of strip are fitted in exactly the same way; the information given below applies to both groups.

Colour of strip material:
Black

Strip width in mm:
100; 150; 200; 250; 300; 400 (other widths on request)

Material thickness in mm
1.0 (other thicknesses on request)

Product benefits:

- Material approved to DIN EN 13859-2 and DIN EN 14909 (CE product data sheets available on request)
- Fully environmentally friendly
- Durable expansion capacity across a temperature range of –40 to 100 °C
- Absolute ozone and UV-resistance

v Highly ageing-resistant

- Bitumen resistant
- Resistant to a large number of chemical and mechanical influences
- Neutral reaction to most standard construction materials

- No problematic plasticisers
- Water vapour diffusion resistances of both strip types coordinated to allow even critical climatic conditions to be overcome reliably.
- No additional mechanical fixing of the strip is required (See adhesive usage guidelines)
- Preassembly of corners and form parts or entire sleeve reduces fitting times to a minimum, enabling a rational, inexpensive and above all reliable seal of all critical points.

The following principles must be observed when the films are applied:

Never adhere or fasten material when it is in a tensed state. Always ensure that the material is free from tension before fitting.

Before adhesion work is begun, ensure that the material (and the surface) is clean, dry and free from oil, grease and separating agents (e.g. silicone spray).

Ensure that the adhesion usage guidelines are adhered to.

If lubricants are used as an aid to fitting in conjunction with clip-in profile strips, ensure that the surface is totally free from separating agents if adhesion work is performed at a later date.

Caution: Most lubricants are also releasing agents. Water or a mixture of water and standard household detergent are therefore preferable to silicone spray and the like.

If the material is stored correctly, it can be used directly from the original packaging.

If any dirt is present, clean the surface with **NOVOPROOF® Reiniger** cleaner.

NOVOPROOF® FA is compatible with **NOVOPROOF® FAI**; the materials can adhere in any combination.

The strips are compatible with the majority of standard construction materials. Unusual materials can be tested for tolerance in our lab.

For all applications, users should ascertain appropriate use and suitability by performing sufficient test adhesions and their own tests.

In the case of doubt, or if you have any queries, please contact our product application department

Product description		
European standard		
Properties	**Standard**	**Unit**
Thickness	EN 1849-2	mm
Length		m
Width		mm
Straightness		–
Weight per unit area		g/m²
Reaction to fire	EN 13501-1	
Resistance to water penetration	EN 1928 B	
Water vapour resistance μ	EN 1931	–
Resistance to air penetration	EN 12114	m³/ (m²xhx50 Pa)
Maximum tensile load	EN 12311-1	N/50 mm
Breaking extension	EN 12311-1	%
Tear-growth resistance	EN 12310-1	N
Dimensional change after warm storage	EN 1107-2	%
Cold bending properties	EN 1109	°C
Artificial ageing with combined constant exposure to UV radiation and increased temperature as per Appendix C	tensile strength	N/50 mm
	tensile strain	%
	Resistance to water penetration	Class W1,2 or 3

NOVOPROOF® FA EPDM strip, homogeneous	NOVOPROOF® FAI Butyl rubber strip, homogeneous	
DIN EN 13859-2	DIN EN 13859-2	
Value	**Value**	**Results**
0,6/0,75/1,00/1,3/1,5 ± 0,15	0,75/1,00/1,3/1,5 ± 0,15	
≥ 20	≥ 20	MLV
100 – 1300 ± 0,2%	100 – 1300 ± 0,2%	MDV
passed	passed	–
750/950/1250/1625/1870 ± 10%	950/1250/1625/1870 ± 25%	MDV
Class E	Class E	fulfilled
W1	W1	
60.000 ± 20.000	156.000 ± 20.000	MDV
≤ 0,1	≤ 0,1	MLV
≥ 210/≥ 260/≥ 350/≥ 450/≥ 460	≥ 170/≥ 250/≥ 300/≥ 380	MDV
≥ 500	≥ 500	MDV
≥ 80/≥ 80/≥ 90/≥ 90/≥ 130	≥ 100/≥ 120/≥ 140/≥ 180	MDV
≤ 0,5	≤ 0,5	MLV
≤ -30	≤ -30	MLV
230/306/414/567/657 ± 20/± 45/± 67/± 90/± 108	221/302/387/468 ± 36/± 45/± 63/± 77	MDV
450 ± 15%	450 ± 15%	MDV
W1	W1	

FA-SELF/FAI-SELF

Usage Guidelines

Product description:
With our **NOVOPROOF® FA-SELF** sealing strips, you can create window and facade joints to DIN 4108 and RAL quality guidelines with reliable air, water and water-vapour tightness with the required durable elasticity. The EnEV energy saving regulations have further increased the requirements made of joint seals in the shell of the building.

The required values may also be tested at any time (using the blower door test). The barrier strips are fitted with self-adhesive edges. Their main purpose is to bridge and seal expansion joints of all kinds. The materials are categorised into two main groups: materials that can diffuse vapour and those that are vapour-proof:

For vapour-proofing
(outdoors)
NOVOPROOF® FA-SELF
(formerly NOVAwall Self EPDM)

For vapour-proofing
(indoors)
NOVOPROOF® FAI-SELF
(formerly NOVAwall Self IIR)

To help you to differentiate between the two types, **NOVOPROOF® FAI-SELF** rolls are embossed with the initials '**IIR**'. Both types of strip are fitted in exactly the same way; the information given below applies to both groups.

Colour of strip material and adhesive edges:
Black

Cover foil:
Transparent

Widths of strips and adhesive edges:
Strip 150 mm with 20 mm adhesive edges

Strip 200, 250 mm with 30 mm adhesive edges

Strip 300, 400 mm with 40 mm adhesive edges

The adhesive is applied to the strip with a thickness of 0.8–1 mm. The strip is 1 mm thick (standard).(Provided on roll, 20 m on cardboard core)

Product benefits:
Rapid, clean adhesion on all smooth surfaces. Adhesion possible at temperatures as low as –10 °C
NOVOPROOF® Primer
This primer allows adhesion to be performed on damp surfaces (such as concrete).

Surfaces
The surface must be free from oil, grease and dust and capable of bearing a load.

Only surfaces that are genuinely smooth and even may be used.

Porous, absorbent surfaces:
These surfaces must always be treated with primer in advance.

If the primer cannot achieve effective wetting and hold on damp stone and concrete surfaces, the base surface is too damp. Adhesion is not possible in such cases.
Adhesion on damp porous concrete is not possible as such surfaces cannot adequately bear a load.

Adhesion can be performed at temperatures as low as –10 °C. Ensure that there is no risk of ice forming on the base surface.

The roughness or the unevenness of the surface is a crucial factor in determining whether the **NOVOPROOF® FA-SELF** system can be used or an alternative DURAPROOF adhesion system should be selected (e.g. **NOVOPROOF® Kleber FA/FA+** for rough and uneven surfaces).

In the case of doubt, or if you have any queries, please contact our product application department.

Non-porous, smooth surfaces
such as untreated aluminium, anodised aluminium, powder-coated aluminium, steel, galvanised steel, powder-coated steel, stainless steel, hard PVC (window-frame material), zinc sheets and the strip material itself must be clean, dry and free from grease. (Clean and degrease with **NOVOPROOF® Reiniger** cleaner)
Polystyrene thermal insulation (e.g. PS 20) is also compatible with adhesion. If the surface is dirty, however, **NOVOPROOF® Reiniger** must not be used (because of the solvent content). If in doubt, please get in touch with our product application department.

Adhesive is applied to the surfaces directly after they have been cleaned; they do not need to be primed.

Adhesion work may only be performed at low temperatures (down to –10 °C) if there is absolutely no risk that ice will form.
Films of moisture caused by condensation water also prevent correct adhesion.

Usage Guidelines

Adhesion

Apply a coat of NOVOPROOF® Primer (as required)

Stir the primer well before use. The primer can be applied with a paintbrush or a roller. Apply a thin and even coat of primer. 10 g of primer will cover an area of roughly 5 × 100 cm, depending on how porous the base surface is. Leave to dry for roughly 5–20 minutes, depending on weather conditions. The primer has been aired sufficiently when you can touch it with your finger and no threads are formed as you remove your finger (err on the side of caution – it is better to wait slightly longer). Tools can be cleaned with ethyl acetate or petrol.

Caution:

NOVOPROOF® Primer contains highly flammable solvents. While working with the primer, do not smoke and keep away from sources of ignition. The solvents will attack polystyrene foam.

Adhesion on primed and non-primed surfaces:

Cut the strip to the appropriate length, as required. Peel away the protective film of one of the adhesive edges a few cm (as required) and press the adhesive edge precisely on to the selected surface. Gradually peel away the protective film and press the edge of the strip precisely on to the selected area.

Caution:

Avoid all corrections where possible. Ensure that any corrections made are very minor.

Hold the strip in place with your hand and press the adhesion area once again with a hand roller, firmly and evenly. Repeat for the second adhesive edge. No tension should be present when the strip is applied, to prevent tensile load on the adhesive joint.

Thanks to the glue's outstanding adhesive properties, direct adhesion to the base surface is achieved as soon as the strip has been applied.

The adhesive strength increases after roughly 1–2 days, thanks to the glue's special affinity with the base surface. The quality of the adhesion should therefore only be assessed after this period has passed.

Comments:
The usage temperature range covers –10 °C to +35 °C. The rolls should be stored in a cool place in the case of high summer temperatures. If adhesion work is to be performed at low temperatures, **NOVOPROOF® FA/FAI-SELF** should be stored at room temperature in advance.

Storage time:
The rolls can be stored for 12 months if they are kept upright and protected from pressure, dirt and heat. DIN 7716 also applies for the storage conditions.

The recommended steel pressure rollers are available from specialist roofing stores.

Special conditions

Observe the following during the strip's service life:
If any unusual structural or dynamic loads that will result in corresponding unusual high loads for the adhesive can be expected for the sealing strip joint for any reason, the joint must be secured by being fixed mechanically.

In the case of high summer temperatures, the glue material will soften and its adhesive properties will be reduced. This can cause a joint strip to sink into the adhesive joint as a result of its own weight.

The glue regains its adhesive strength when temperatures return to normal, without losing its plasto-elastic adhesive properties. If such temperatures prevail over a longer time period, the joint should be secured by fixing it mechanically.

For all applications, users should ascertain appropriate use and suitability by performing sufficient test adhesions and their own tests.

Subject to technical changes without notice.

Kleber FA/FA+

Usage Guidelines

NOVOPROOF® Kleber FA/FA+ is a ready-to-use special glue paste for the high-strength adhesion of:
NOVOPROOF® FA (EPDM strips, able to diffuse vapours, formerly SG TAN)
and
NOVOPROOF® FAI (butyl strips, vapour-proof, formerly SG TYL)

The glue is especially suited for rough uneven surfaces.

NOVOPROOF® Kleber FA+ is based on the established **Kleber FA**. This glue offers optimum ease of use with excellent adhesion values. The glue is also designed to be applied to the base surface or the film edges with a spatula if required.
A spatula is not needed for standard application.

Surfaces:

- All standard mineral construction surfaces (concrete, lightweight and porous concrete, brick, sand-lime brick, clinker, plaster)
- PVC windows
- Aluminium (untreated/anodised/powder-coated)
- Steel (bare, galvanised, powder-coated)
- Wood (please perform a test adhesion for painted wood)
- Sticking sealing strips together

The base surfaces must be clean, dry, firm and free from grease, oil and separating agent.

Scratch concrete surfaces with your nail to check for cement residue, even if they seem suitable for adhesion.

Adhesion temperature:
≥ 5 °C
With **NOVOPROOF® Primer**, adhesion work can be performed at temperatures as low as –10 °C and on damp (porous) construction surfaces.

Only porous surfaces require primer. Non-porous surfaces must be clean, dry, firm and free from grease, oil and separating agent.

Adhesion work may only be performed at low temperatures if there is absolutely no risk that ice will form.

If the base surface is too damp for the primer to achieve adequate hold and wetting, the moisture content of the surface is too high.

Adhesion is not possible in such cases.

Adhesion on damp porous concrete is not possible as such surfaces cannot adequately bear a load.

Applying the adhesive:
Only apply adhesive to the base surface. Apply 2–3 beads from the tube bag gun, roughly 2 cm apart. The beads should be 10–15 mm wide, depending on the particular surface properties.

The adhesive forms a skin. This skin will burst when the film is applied and rolled on.

Adhesion:
Place the strip on to the fresh bead on the surface. Roll the steel roller over the strip until the adhesive has formed a layer that is roughly 1 mm thick and 8 cm wide. This layer can be up to roughly 4 mm thick, depending on requirements and the particular surface properties. While the bond is still fresh, it can be corrected with ease.

The bond can also be corrected by peeling off the entire strip and rolling it back on to the surface.

The strips should be free from tension when they are adhered.

As the adhesive contains solvent, it may soften as a result of climatic conditions and the surface properties and become less adhesive. The solvent content generally evaporates within 10 to 14 days and the adhesive reaches its final strength.

Application widths:
At least 8 cm
No additional mechanical fixing is required.

If an 8 cm-wide adhesion is not possible, the application width can be reduced down to 4 cm. If such narrower adhesions are used, special care must be taken to ensure that the adhesive covers the entire surface.

The user is responsible for ensuring that the strips cannot slide off from the surface as a result of their own weight or other influences while the adhesive is drying.

Mechanical fixing may be required for this purpose.

Initial adhesiveness may be increased by removed the strip from the surface after it has been pressed by the roller, briefly allowing the adhesive to air and then reapplying the strip with the roller (i.e. by using a procedure similar to contact bonding).

Adhesive coverage:
Roughly 100 g/m for an 8 cm-wide application. An adhesion that is roughly 7 m long and 8 cm wide can be achieved with one film bag.

Form of delivery:
600 ml film bag,
12 per box

Storage:
Cool, dry, free from frost,
no direct sunlight
Can be stored for roughly 12 months.

Safety notes:
NOVOPROOF® Kleber FA/FA+ is highly flammable.
Keep away from sources of ignition.
Do not inhale vapours. Do not smoke.

Application tools:
Manual cartridge gun:
Beyer + Otto GmbH
Postfach 1240
63798 Kleinostheim
Germany
Tel.: +49 6027 6044 - 45

Kleber FA spezial

Usage Guidelines

NOVOPROOF® Kleber FA spezial is a single-component elastic system adhesive for **NOVOPROOF®** facade strips.

Application areas:

NOVOPROOF® Kleber FA spezial is a low-solvent, ready-to-use polyurethane-based adhesive paste for **NOVOPROOF® FA (EPDM)** and **NOVOPROOF® FAI (butyl)** films.

Adhesion:

The adhesion surfaces must be clean, free from dust and grease and able to bear a load. Cut the foil tube bag at one end and place it in the gun. The nozzle diameter and the number of adhesive strips that should be applied are dependent on the particular surface properties. A thin film of adhesive (roughly 1 mm thick) needs to be applied across the base surface at an appropriate width. Place the **NOVOPROOF®** facade strips in the adhesive immediately (or within 15 minutes at the latest) and apply pressure. The precise waiting time is dependent on the temperature, layer thickness and the porousness of the surface. In the case of doubt, perform a trial adhesion.
While the adhesive is still wet, strips over 1.3 mm in thickness may slip downwards as a result of their own weight. To prevent this, peel away the strip after it has been applied and pressed. Then re-apply the sealing strip and roll it firmly.

Chemical resistance:

Resistant to water, salt water, hard water, neutral water-based cleaning agents.

Form of delivery:

600 ml film bag,
20 bags per box

Product features:

- Reliable application, good stability
- Sticks to concrete, bare and powder-coated aluminium, hard PVC, wood and other standard construction materials
- Apply adhesive to one surface only
- Levels uneven surfaces
- Dries rapidly (roughly 4 mm in 24 h)
- Application temperature +5 °C to +35 °C

Usage restrictions:

Do not use on bituminous surfaces or other surfaces that secrete oil or plasticiser, such as natural rubber.
In a non-hardened state, **NOVOPROOF® Kleber FA** spezial must not be mixed or come into contact with isocyanate-reactive substances, particularly alcohols, as this will impair or prevent the material's reaction (bonding). Such substances can be found in ethyl alcohol, many thinners, cleaning agents and formwork oil.

Storage:
Up to 12 months in a cool, dry place in original containers at temperatures between +10 °C and +25 °

Kleber TA

Usage Guidelines

NOVOPROOF® Kleber TA is a ready-to-use contact adhesive for the high-strength adhesion of:
NOVOPROOF® FA (vapour-diffusion EPDM strips)
and
NOVOPROOF® FAI (vapour-proof butyl strips)

The adhesive is only suitable for smooth even surfaces.

Surfaces:

- All standard mineral construction surfaces (concrete, lightweight and porous concrete, brick, sand-lime brick, clinker, plaster)
- PVC, aluminium, wood window frames Aluminium (untreated, anodised, powder-coated)
- Steel (bare, galvanised, powder-coated)
- Wood (please perform a test adhesion for painted wood) and for sticking sealing strips together
- A base coat is needed for very porous surfaces (such as porous concrete).

The base surfaces must be clean, dry, firm and free from grease, oil and separating agent.

Check concrete surfaces by scratching them with your nail, even if they seem suitable for adhesion (Cement residue may be present.).

Caution:
As this adhesive uses classic contact adhesion with little application thickness, it is only really suitable for smooth even surfaces.

If in doubt, or if higher levels of impermeability are required, use NOVOPROOF® Kleber FA/ FA+.

Adhesion temperature:
≥ 5 °C
With **NOVOPROOF® Primer,** adhesion work can be performed at temperatures as low as –10 °C and on damp (porous) construction surfaces.

Only porous surfaces require primer. Non-porous surfaces must be clean, dry, firm and free from grease, oil and separating agent.

Adhesion work may only be performed at low temperatures if there is absolutely no risk that ice will form.

If the base surface is too damp for the primer to achieve adequate hold and wetting, the moisture content of the surface is too high.

Adhesion should not be attempted in such cases.

Adhesion on damp porous concrete is not possible as such surfaces cannot adequately bear a load.

Applying the adhesive:
Stir the adhesive thoroughly before use. Apply the adhesive to both surfaces evenly, using a paintbrush or roller.

Allow to air for 5–20 min. (depending on weather conditions). Check that the adhesive has aired adequately by pressing it with your finger. If no threads are formed as you remove your finger, airing is complete.

Adhesion:
Apply the strip to the selected point precisely and press it in place firmly with a roller. It is the amount of pressure that is important here, not how long the pressure is applied.
No corrections are possible once adhesion has begun.
The strips should be free from tension when they are adhered.

In the case of longer application times, stir the adhesive again to prevent the solids and the solvents from separating.

Application widths:
At least 8 cm
No additional mechanical fixing is required.
If an 8 cm-wide adhesion is not possible, the application width can be reduced down to 4 cm. If such narrower adhesions are used, special care must be taken to ensure that the adhesive covers the entire surface.
The user must ensure that the strips are fixed durably. Mechanical fixing may be required for this purpose.

Adhesive coverage:
roughly 400–500 g/m2, depending on surface Roughly 50 g/m for an 8 cm-wide application.
800 g of adhesive is sufficient for a surface of roughly 16 m (with an 8 cm width).

Precoat:
For very porous surfaces, mix one part NOVOPROOF® Reiniger cleaner to one part Kleber TA adhesive.

Storage:
Cool, dry, free from frost, no direct sunlight.
Can be stored for roughly 12 months at temperatures between +5 °C and +25 °C.

Safety notes:
NOVOPROOF® Kleber TA is highly flammable.
Keep away from sources of ignition.
Do not inhale vapours. Ensure that sufficient ventilation is provided.
Do not smoke.

Anschlusspaste (joint paste)

Description

NOVOPROOF® Anschlusspaste is a single-component silicone rubber with a MEKO content of less than 1% and a medium modulus of elasticity.

NOVOPROOF® Anschlusspaste bonds under the influence of air moisture to form a durably elastic, weather-resistant seal, with little odour.

Properties

Once the bonding reaction has been completed, **NOVOPROOF® Anschlusspaste** is very resistant to UV-ageing and weather impact. **NOVOPROOF® Anschlusspaste** is resistant to brief exposure to diluted acids and alkalis (< 5%) and standard household cleaning agents. **NOVOPROOF® Anschlusspaste** can form a very effective bond with brickwork, glass, enamel, tiles, glazed ceramics, various plastics and smooth metals, without any primer. The antifungal properties provide protection from the micro-organisms that tend to be a problem in damp locations.

Applications

Suitable applications for **NOVOPROOF® Anschlusspaste** are the sealing of fireplace outlets, capping or connection strips and through-holes for dome lights. Antennae, ventilation ducts, joints between metal, wood or PVC frames and mineral construction materials. Sealing glass and frames made from metal, wood and PVC etc.

The joint paste is also suitable for the additional sealing of strip edges, (N**NOVOPROOF® FA** and **NOVOPROOF® FAI**), particularly when the strips have been adhered with **NOVOPROOF® Kleber TA**.

Technical data

- Bonding system: neutral
- Consistency: paste-like, firm
- Density: approx. 1.4 g/ml
- Skin-formation time*: approx. 10 min
- Dry to the touch after*: approx. 30 min
- Thorough hardening (bonding speed)*:
    - in 24 h, approx. 2 mm
    - in 7 days, approx. 7 mm
- Volume change (DIN 52451): approx. 5%
- Shore A hardness (DIN 53 505)*: approx. 18
- Elastic recovery (EN 27389): approx. 95%
- Total permitted deformation: 25%
- Application temperature: +5 to +40 °C
- Temperature resistance: –50 to +150 °C

* at a temperature of 23 °C and a relative air humidity of 50%

Mechanical characteristics of a 2 mm-thick layer as per DIN 53 504:

- Modulus 100%: < 0.4 MPa
- Tensile strength: > 1.0 MPa
- Elongation at rupture: > 500%

Mechanical characteristics of a sample specimen as per EN 28339:

- Modulus 100%: < 0.4 MPa
- Tensile strength: > 0.5 MPa
- Elongation at rupture: > 300%

Industrial standards

The material meets the requirements of DIN 18540 and DIN 18545 Part 2 Group E.

Usage

Preparation of the surfaces:

The surfaces must be clean, dry, free from dust and grease and able to bear a load. Clean smooth, close-pored surfaces with a good degreasing solvent that evaporates with no residue and a clean lint-free cloth or industrial paper. Allow the cleaner sufficient time to evaporate. In the case of plastics and coatings, ensure that the solvent does not begin to attack the surface. If required, carefully prime the surfaces. A chemical reaction may occur on non-ferrous metals (copper, brass etc.).

Joint formation:

The formation of the joint must comply with the standards DIN 18540 (construction expansion and joints) or DIN 18545 (glazing). Joints with minor total deformation (< 5%) can also be attached to triangular joints.

A back-fill material may need to be applied (closed-cell polyethylene foam). The back-fill material must be compatible with the joint sealant and must not absorb water. Ensure that deformation of the joint sealant is not hindered any more than is permitted. Back-fill materials that contain bitumen, tar, oil or plasticisers are not suitable. After it has been installed, the back-fill material must provide sufficient resistance when the joint sealant is retracted and smoothed.

Anschlusspaste joint paste

Smoothing agent:
Any smoothing agent used must be neutral and not cause any discolouration to the **NOVOPROOF® joint paste** or leave a film on its surface. The adhesion on the joint edges must not be impaired.

Applying the sealant:
NOVOPROOF® joint paste must be applied to the joint evenly, with no air bubbles, within the application temperature range. If the surface is pretreated with primer, the primer must be allowed sufficient airing time. Press and smoothen the joint to ensure effective contact with the joint edges, using as little smoothing agent as possible. The amount of time needed for complete reaction of the sealant is partly dependent on the amount of sealant used and the environmental temperature. Excess material and impurities can be removed with a cleaner, such as petroleum ether, before the sealant is dry. Hardened material can only be removed with **silicone remover** or mechanically.

Paint compatibility:
NOVOPROOF® joint paste is considered compatible with standard paint systems according to
DIN 52 452 Part 4. It is recommended that the entire surface is covered in paint as the coat of paint has little capacity to deform. A joint movement could create cracks in the paint and damage the joint seal.

Note:
Preliminary tests are required as a result of the large number of possible applications and the natural variations in surface properties, particularly in the case of natural stone (marble, granite, slate etc.). The preliminary tests must be repeated at appropriate time intervals as the bond between the paint systems and the contact materials can alter over time.

Coverage
For joint dimensions of 5 × 5 mm, approx. 12 m / cartridge,
10 × 10 mm, approx. 3 m / cartridge,
15 × 10 mm, approx. 2 m / cartridge and
20 × 15 mm, approx. 1 m / cartridge.

Paint
Black

Form of delivery
310 ml cartridge

Storage and storage life

If stored in unopened original containers in a cool, dry place, **NOVOPROOF® joint paste** can be kept for at least 6 months.

Usage restrictions

Do not use **NOVOPROOF® joint paste** in joints that are subject to intense traffic or walking load, that come into direct contact with food or in structural glazing, underwater or aquarium applications. Use **food-grade silicone** for aquarium and food applications. No adhesion can be achieved on: PTFE (Teflon), polyethylene, PU foam or silicone.

NOVOPROOF®
Primer

Usage Guidelines

NOVOPROOF® Primer is a ready-to-use precoat, suitable **only for porous construction surfaces. Primer is not needed for non-porous surfaces.**
The primer coat acts as a bonding agent to aid the adhesion of **NOVOPROOF® facade seals**.

Usage:
As a bonding agent, generally for use with **NOVOPROOF® FA-SELF** and **NOVOPROOF® FAI-SELF** sealing strips

As a bonding agent in conjunction with **NOVOPROOF® Kleber TA** and NOVOPROOF® **Kleber FA/ FA+**, if the adhesion surface is damp and porous or for use at temperatures between +5 °C and –10 °C.

Check concrete surfaces by scratching them with your nail, even if they seem suitable for adhesion (Cement residue may be present.).

The surface must be clean, firm and free from grease, oil, and separating agent.

Caution:
Adhesion work may only be performed at low temperatures if there is absolutely no risk that ice will form on the surface.

Usage:
Stir the primer well before use. Apply a thin and even coat of primer with a brush or roller. Allow the coat to air thoroughly (This will take 5–15 min, depending on weather conditions.).
To test whether the primer has been aired sufficiently, touch the primer with your finger. The primer is ready if no threads are formed as you remove your finger (err on the side of caution – it is better to wait slightly longer).

The primed surface can be left for several hours before adhesion.

Ensure that no dirt or moisture comes into contact with the primed surface during this time.
Adhesion should then be performed as described in the relevant usage guidelines.

In the case of longer application times, stir the primer again to prevent the solids and the solvents from separating.

Coverage:
Roughly 10–15 g/m with an application width of 5 cm, depending on the base surface.

Storage conditions:
Cool, dry, free from frost, no direct sunlight. Keep container tightly closed.

Safety notes:
NOVOPROOF® Primer is highly flammable.
Keep away from sources of ignition.
Do not inhale vapours. Ensure that sufficient ventilation is provided.
Do not smoke.

TÜV SAARLAND

Certificate 71 100 J 182/1

The management system of

DURAPROOF technologies GmbH

Eisenbahnstraße 24
D-66687 Wadern-Büschfeld

has been assessed and certified as meeting the requirements of

ISO 9001:2008

for the following activities

sales and design of sealing and absorption systems based on elastomers

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization

This certificate is valid from 12/05/2010 until 11/05/2013

Multiple certificates have been issued for this scope
The main certificate is numbered 71 100 J 182

Authorised by

TÜV SAAR CERT Certification Body of TÜV Saarland e. V.
Am TÜV 1, 66280 Sulzbach (Germany)
t +49 (0)68 97-506-114 f +49 (0)68 97-506-229 www.tuev-saar-cert.de

Page 1 of 1

IAF

TQA-ZM-05-08-00

TÜV SAAR CERT ISO 9001:2008

Certificate

The verifier **Dr. Andreas Riss** herewith certify that the

Saargummi Deutschland GmbH, the Saargummi International GmbH and the DURAPROOF technologies GmbH

production site Wadern-Büschfeld

has implemented and maintains an environmental managementsystem according the standard

DIN EN ISO 14001:2009

The conformity was inspected during a certification audit.

This certificate is valid until: 13.05.2012.

Perl, 27.04. 2010

Dr. Andreas Riss, Umweltgutachter

riss Certification

Nr. 4 / 2009070419

Zugelassener Umweltgutachter
EMAS
DAU DE-V-0115
DIN EN ISO 14001
Dr. Andreas Riss

Akkreditiert durch
DAU
Deutsche Akkreditierungs- und Zulassungsgesellschaft für Umweltgutachter mbH
Bonn

Water vapour

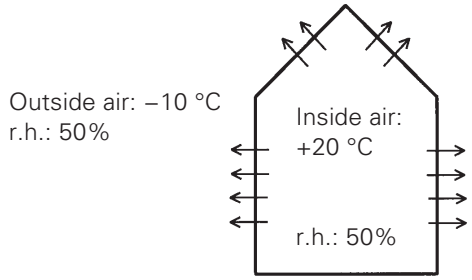
Water vapour is an invisible odourless gas. The air's maximum water vapour capacity is dependent on the air temperature. Air humidity is measured as a percentage of relative humidity or grams of absolute humidity[12].

Graph:

The air's maximum possible water vapour content in relation to the air temperature.
Condensation water is produced if these quantities are exceeded.

This difference in temperature results in different concentrations of water vapour inside and outside the building.

An example is given below by way of explanation:



These conditions correspond to the winter climate of Central Europe.

Although the same relative humidity values are present inside and outside the building, there is considerably more water vapour inside the building.

12
Relative humidity:
(% r.h.): States the air's water vapour content as a percentage of the maximum possible water vapour content (100%). The relative humidity is measured with a hygrometer. The r.h. is so dependent on air temperature that the air temperature is always needed to determine the correct percentage.
Absolute humidity: States the air's water vapour content in grams per cubic metre of air.

The graph gives a maximum humidity of 2.1 g for a temperature of –10 °C.

The relative humidity is 50% (i.e. 50% of the maximum possible humidity is present): 50% of 2.1 g = 1.05 g This is the absolute humidity, i.e. 1.05 g of water is present in gaseous form in 1 m^3 of air.

The graph gives a max. water vapour content of 16.5 g for an inside temperature of +20 °C.

As before, the relative humidity is 50%. The absolute humidity is therefore 50% of 16.5 g (= 8.25 g).

This example shows that the temperature conditions inside the building result in humidity levels that are many more times higher than those outside.

Diffusion processes[13] result in some levelling of the two vapour concentrations as vapour moves from the area of high concentration to the area of low concentration. These levelling movements take place through the outer surfaces of the building.

What happens to the water vapour when it flows outside?
In our example, the outside temperature is –10 °C.

This means that the water vapour will become increasingly colder as it advances outside (The temperature gradient of the exterior wall structure sinks from the inside out.).

The graph shows that the air's capacity to hold water vapour drops sharply as temperatures decrease.

Water vapour will condense if it is allowed to stream outside unhindered, soaking the building structure and causing structural damage. This problem is particularly relevant for connection areas, including joints.

Thermal insulation is needed for the joints and it is easy for water vapour to flow through this insulation (as mineral-based seals and PU installation foams allow diffusion). The insulation will therefore become soaked through by vapour that condenses to form water. Damp or wet thermal insulation loses its ability to function as a heat barrier.
The affected areas thus often form thermal bridges[14], causing them to become colder, which results in even greater water vapour condensation[15].

13
Diffusion: The migration of liquids or gases through other substances; automatic mixing of gases, solutions or miscible liquids as the result of thermal molecule movements ('Brownian motions').

Steps must therefore be taken to prevent condensation. This can be achieved by fitting vapour barriers[16] to the warm side of the joints (i.e. the inside). These barriers prevent water vapour from entering.

The following rule therefore applies for joints based on the NOVOPROOF® system:

Vapour-proof

NOVOPROOF® FAI-butyl strips for the inside

Water-vapour diffusion

NOVOPROOF® FA EPDM strips for the outside

NOVOPROOF® FAI strips have a **µ value of 156,000**

and

NOVOPROOF® FA strips have a **µ value of 60,000**

The difference is large enough to prevent condensation problems even in challenging climates (such as swimming pools, commercial kitchens and laundries).

To compare the effectiveness of multiple strips, the **s_d value**[17] must be used as the strips will each have different thicknesses and µ values.

14
Certain zones within a heat insulation area that display significantly worse insulation properties. The inner surface temperature in these zones is significantly reduced and the risk of water vapour condensing to form liquid is particularly high.

15
A change in the physical condition of water, from water vapour (gaseous) to water (liquid).

16
Films, strips or coats of paint that function as vapour barriers or vapour retarders. Vapour barriers are generally applied to the warm side of joints (the inside) to prevent vapour from diffusing into the joint area. Particular care needs to be taken when these films (NOVOPROOF® FAI) are adhered.

17
sd value = air layer thickness with equivalent water-vapour diffusion
The sd value can be found by multiplying the µ value with the material thickness (of a connection strip, for example) in meters.

The sd value is calculated on the basis of the μ value and the strip thickness as follows:

s_d = μ × strip thickness (in metres)

Example:

What is the sd value of a 1.5 mm-thick **NOVOPROOF® FAI** strip?

s_d = 156,000 × 0.0015 m = 234 m

s_d = 234 m

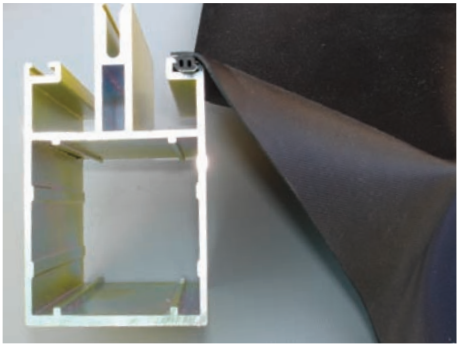
The sd value is given in metres. In this case, the sd value indicates that the 1.5 mm-thick **NOVOPROOF® FAI** strip has the same insulating effect as a 234 m-thick layer of air.

The insulating effect is measured in terms of the thickness of a layer of (non-moving) air as air has very low diffusion resistance for water vapour.

The greater the sd value, the greater the diffusion resistance.

Comment:

Air's capacity to hold water is not solely dependent on the air temperature. The air pressure also plays a minor role. Air pressure is not included in these examples, as it is not relevant for an understanding of the basic issues involved. The partial pressures of the water vapour have therefore been used in the DIN 4108 calculations, rather than the humidities, as the partial pressures are dependent solely on the air temperature and not the atmospheric air pressure. The values given in the graph refer to 960 h Pa at ≈ 400 m above MSL.



NOVOPROOF® KE
with clip-in profile

The Consequences of Inadequate Airproofing

The diffusion processes described in the previous section relate to slow movements that levelled out differing concentrations. Air flows resulting from air leaks in joints can have much more severe consequences, however.

They cause the effectiveness of the thermal insulation to drop uncontrollably and cause condensation water to collect, resulting in structural damage.

The IBP Institute for Building Physics in Stuttgart performed a series of measurements to determine the amount of thermal energy that is lost through joints (based on joint lengths of 1 m). Measurements were taken for various joint widths in the vapour barrier (corresponding to leaks) at various pressure differences, with an insulating layer that was 140 mm thick and 1 m^2 in size.

The thermal loss values for the joint were compared with flow of heat through the insulating layer.

The results indicated that even when the joint was only 1 mm thick and the pressure difference 20 Pa, 4.8 times more thermal energy was lost through the joint.

As a result, the U value (formerly the K value) changes dramatically.

The calculated value is 0.30 $W/m^2 \times K$, the actual U value 1.44 $W/m^2 \times K$. This represents a loss that is 4.8 times larger.

Disproportionately larger losses of air heat were measured for larger joints and greater pressure differences.

This illustrates how a structure's airproofing has a major effect on the effectiveness of the overall insulation.

These uncontrollable losses of energy have negative consequences in terms of condensation water (similar to water vapour diffusion), and the building is put at risk of structural damage.

The series of measurements performed by the university also included the quantity of moisture that flowed through the joints (measured in $g/m \times h$). In practice, this represented the amount of warm interior air that flowed out of the building through the joints. The measured values were compared to the moisture that was diffused through the vapour barrier (sd = 30 m): With a 1 mm-wide joint and a pressure difference of 20 Pa, 800 g/m of moisture passed through the joint, or 1600 times more than was lost through diffusion (0.5 g/m^2h).

This joint leakage is caused by convection[18] and represents an even greater condensation hazard in joint areas.

18
Convections = Air currents In this context, undesired air currents that pass through the shell of the building, causing uncontrollable thermal energy loss. Air passing through the joint areas also increases the risk of condensation and dampening of structural elements.

To keep a building free from structural damage, the following basic rule should be observed for the joint arrangements of windows and facade elements:

Protecting the joint from moisture on the outside and on the inside must be seen as two very separate things.

The fundamental idea is this:
To keep the joint areas free from moisture damage, the window/facade, the joint and the wall need to be seen as one complete system.

In terms of water vapour diffusion, this system needs to be set up in accordance with the following principle:

'LESS PERMEABLE ON THE INSIDE,

MORE PERMEABLE ON THE OUTSIDE'

Fire Protection Requirements

DIN 4102-1, Fire behaviour of building materials, categorises building material as follows:

Building material class	Building inspectorate name
A	Noncombustible
A_1	
A_2	
B	Combustible
B_1	Difficult to ignite
B_2	Normal combustibility
B_3	Easily ignited

A test certificate is needed to verify a particular building material's class. This certificate is awarded on the basis of standardised fire behaviour tests.

NOVOPROOF® FA

and

NOVOPROOF® FAI

comply with the requirements of **building material class B2** of DIN 4102 and Class E of DIN EN 13501-1.

We have independent test certificates that confirm this.
(Test certificates on request)
Less strict requirements, i.e. easily ignited materials from class B3, are not permissible.

Key Industrial Standards

duraproof
Technologies for durable solutions

DIN EN 13859-2
Flexible sheets for waterproofing – Definitions and characteristics of underlays – Part 2: Underlays for walls.

DIN EN 14909
Flexible sheets for waterproofing – Plastic and rubber damp proof courses – Definitions and characteristics

DIN EN 13501-1
Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests

DIN 7716
Rubber products; requirements for storage, cleaning and maintenance

DIN 4102
Fire behaviour of building materials and building components

DIN 4108
Thermal insulation in buildings, Part 7. Specifies the air tightness of building components and joins.

These standards give recommendations for planning and execution along with case studies.

DIN 4109
Sound insulation in buildings; requirements and testing

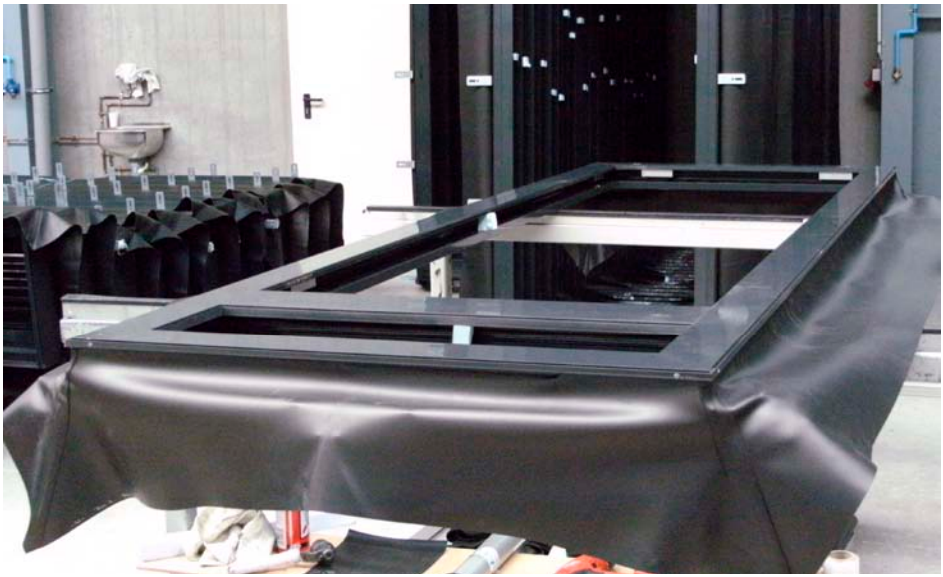
DIN 18195
Waterproofing of buildings

Useful Reference Material

'Leitfaden zur Planung und Ausführung der Montage von Fenstern und Haustüren'
('Guidelines for planning and implementing window and house-door installation')
Publisher: RAL-Gütegemeinschaft Fenster und Haustüren e.V., Frankfurt a. Main

IVD instruction sheet no. 9 'Spritzbare Dichtstoffe in der Anschlussfuge für Fenster und Außentüren'
('Nozzle application sealants in window and exterior door joints'),
Publisher: industrieverband Dichtstoffe e.V.

'Einbau von Fenstern und Fenstertüren mit Anwendungsbeispielen'
('Window and French window installation with sample applications'),
Publisher: Verlagsanstalt Handwerk GmbH



NOVOPROOF®
Sealing systems with classic multi-layer facade design, e.g. all-around sleeves with and without keder strip

Notes

Notes

duraproof

Technologies for durable solutions

DURAPROOF technologies GmbH
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