

M A N U A L



NOVOPROOF®
Installation instructions
for sealing systems

NOVOPROOF®

Installation instructions



The DURAPROOF technologies GmbH works

dura
proof

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Insist on nothing else: **NOVOPROOF® EPDM Rubber**

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DURAPROOF offers a unique product range of EPDM rubber. With its permanently reliable, solution-orientated sealing products for flat roofs, green roofs and ponds, and its highly-resistant sealing profiles and strips for windows and façades, DURAPROOF is amongst the world's leading suppliers in its field.

DURAPROOF technologies GmbH benefits from over five decades of expertise in the development and production of innovative rubber products for the building industry.

Developed to satisfy customer requirements, our sealing systems for the building industry have been proven in many international applications.

With its workforce of around 150 employees in Germany, DURAPROOF manufactures high-quality rubber products.

The range includes **NOVOPROOF®** roof sealing sheets and membranes together with profiles for window construction and sealing strips for façades.

For flat roofs in particular, the **NOVOPROOF® system** provides both an ecologically as well as economically sensible alternative to thermoplastic and bituminous materials.

Following intensive development work, 1988 saw the market launch of the Thermofast® welding technology, which perfectly combines functionality, reliability and commercial efficiency in joining **NOVOPROOF®** roof sealing materials. Using normal hot air equipment, this technique allows rapid installation meeting the needs of craftsmen, even under extreme temperature conditions.

Our customer service is just as flexible as our product. In close co-operation with architects and technicians, DURAPROOF also offers comprehensive additional services: from establishing the actual condition of old sealing to the development of practical sealing solutions, the compilation of suggested texts for performance specifications, project-related installation plans and on-site support, to make sure that everything runs according to plan.

Our services are rounded off by training, introducing and presentation events.

Insist on more information. Take advantage of the opportunity for a personal discussion with our service team.

Note:

The roof constructions, connection details, installation and fixing plans shown in these installation instructions are given for example purposes only, and serve to explain the relevant installation procedures.

The illustrations are sketches only, and are not necessarily to scale.

No guarantee can be offered for the technical or factual accuracy of these examples.

These installation instructions represent the current status of the technology.

Subject to technical amendment and further development.



the material for flat roofs and more

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EPDM is a synthetic rubber. Thanks to the specific selection of the basic product, the researchers and developers at DURA-PROOF have succeeded in manufacturing a tailor-made rubber product. Suited for the most demanding requirements of many different areas – e.g. high-quality sealing products both for new buildings as well as for renovation.

NOVOPROOF® sealing sheets are manufactured according to our own proprietary formulations and mixtures in a continuous process using sheet die extruders, calender lines and vulcanizing channels.

In order to guarantee the consistent high quality standard of all products, DURA-PROOF applies a voluntary external monitoring, in addition to its own internal controls.

Just a few good reasons for using NOVOPROOF® sealing strips and sheets:

- excellent weathering resistance
- light, ozone and UV-resistant
- bitumen-compatible
- acid and lye resistant
- good tensile strength and elongation to rupture over a wide temperature range
- extreme durability
- processing and installation under wide temperature conditions
- reliable and homogenous sealing
- detailed solution for every problem case

NOVOPROOF® products offer an individual solution for every waterproof sealing task.

NOVOPROOF® TE and NOVOPROOF® DA-P (membranes)

Installation under superimposed load

NOVOPROOF® DA-P is factory prefabricated using sheets of **NOVOPROOF® DA** to form tailor-made membranes up to a size of approx. 900 m². This allows maximum installation reliability, widely independent of meteorological conditions.

NOVOPROOF® DA-P is laid loose and weighted down against wind suction uplift with gravel, paving tiles or roof vegetation.

NOVOPROOF® TE is specially designed for use under water.



NOVOPROOF® DA-K, NOVOPROOF® DA-G, NOVOPROOF® DA-S

Installation without superimposed load

For concealed mechanical fastening, the material is supplied in 1.30 m wide sheets, either in standard lengths of 20 m or cut to length according to the relevant specifications. Sheets are also supplied in a width of 1.30 m for partially adhered areas.

NOVOPROOF® DA-K

NOVOPROOF® DA-K sheets in a nominal thickness of 1.3 mm consist of an EPDM covering layer and a non-woven backing for fold-free, fast installation.

NOVOPROOF® DA-G

NOVOPROOF® DA-G sheets in a nominal thickness of 1.5 mm consist of an EPDM covering layer and a non-woven backing for fold-free, fast installation.

NOVOPROOF® DA-S

NOVOPROOF® DA-S sheets in a nominal thickness of 2.5 mm consist of an EPDM covering layer and a thick non-woven backing and are particularly suited for roof renovation on a rough subsurface, since this can lead to damage to conventional roofing strips during the installation period. The thick fleece backing ensures excellent levelling of uneven subsurfaces.

NOVOPROOF® preforms

Accurately fitting preforms from the DURAPROOF range guarantee the optimum in reliability, eliminating possible sources of faults resulting from conventional methods of manual jointing.

The DURAPROOF product range includes both standard preforms as well as special preforms to individual size specifications.

NOVOPROOF® strip products

For perimeter edge areas, **NOVOPROOF® DA**, **NOVOPROOF® DA-K**, **NOVOPROOF® DA-G** are also available in form of narrow strips.

The Thermofast® welding technology

The Thermofast® welding technology guarantees a homogenous, reliable and user-friendly jointing of the **NOVO-**

PROOF® system components to each other. The long edges of membranes, sheets, strips and preforms are provided with the Thermofast® welding technique, so that they can be properly jointed on site.



DA-P 13, DA-P 15, TE, DA *Product information*

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Trade name:	NOVOPROOF® DA-P 13
	NOVOPROOF® DA-P 15
	NOVOPROOF® TE
	NOVOPROOF® DA
Material:	EPDM rubber
Design:	Sealing sheets, non-backed to DIN EN 13956, EN 13967, EN 13361

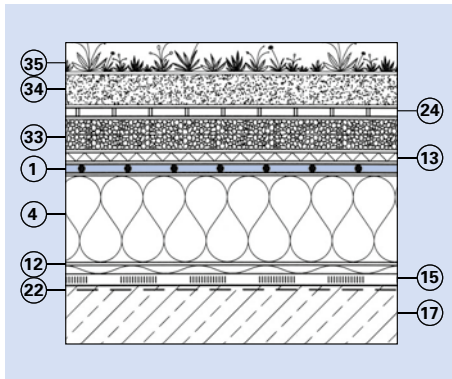
Delivery form: **NOVOPROOF® DA-P 13 Membranes**

Nom. thickness:	1.3 mm
Length:	≤ 48.0 m
Size:	property related
Colour:	black

Delivery form: **NOVOPROOF® DA-P 15 Membranes**

Nom. thickness:	1.5 mm (optionally 2.0 mm)
Length:	≤ 48.0 m
Size:	property related
Colour:	black

NOVOPROOF® DA-P 15 laid loose with superimposed load
Supporting structure: reinforced concrete
 (with insulation)



- | | |
|-----------------------------------|---|
| 35 vegetation | 12 vapour barrier layer with metal strip insert |
| 34 substrate layer | 15 partially adhered bituminous coating |
| 33 non-woven filter fabric | 22 concrete sealer |
| 33 drainage layer | 17 reinforced concrete |
| 13 separation or protective layer | |
| 1 NOVOPROOF® DA-P 15 | |
| 4 insulation layer | |

Areas of application:

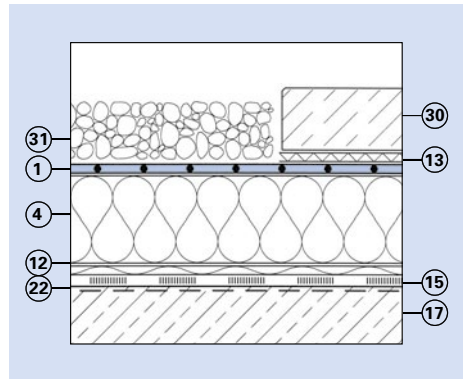
NOVOPROOF® DA-P 13, DA-P 15

- All flat roofs with substructures made of wood, concrete, aerated concrete, trapezoidal steel sheeting
- For new buildings and renovation
- With superimposed load
- Utilised roof areas, planted roofs, balconies, terraces, parking areas
- Outer sealing of tunnel constructions, bridges and underpasses
- Construction work sealing in accordance to DIN 18195

NOVOPROOF® TE

- For pools, ornamental ponds, fishponds and pools
- For water treatment basins
- For rainwater retention basins
- For ponds on golf courses
- Alternative thicknesses: 1.0 mm / 1.15 mm

NOVOPROOF® DA-P 13 laid loose with superimposed load
Supporting structure: reinforced concrete
 (with insulation)



- | | |
|-----------------------------------|---|
| 30 paving tiles | 12 vapour barrier layer with metal strip insert |
| 31 gravel ballast | 15 partially adhered bituminous coating |
| 13 separation or protective layer | 22 concrete sealer |
| 1 NOVOPROOF® DA-P 13 | 17 reinforced concrete |
| 4 insulation layer | |



Laying method:

Loose laying with superimposed load (flat roof directives and/or DIN 1055)

Seam welding:

Factory prefabrication: Thermofast® welding technology (machine-assisted hot bonding)

Site:

Thermofast® welding technology
Hot air machine-assisted/manual
Heating wedge, machine-assisted

Adhesive:

for joints to ascending components:
Contact adhesive TA

Mechanical fastening:

all suitable and tested fasteners in the seam area

Preforms:

Factory prefabricated internal, external and domelight corners, collars for chimneys, domelights/skylights, fans and other roof structures, special preforms

Accessories:

- Joint paste
- **NOVOPROOF®** cover strip, w = 20 cm
- Rubber supporting strip
- Coated metal sheets for edge details

Delivery form: NOVOPROOF® DA

Strips (black)

Thickness:	1.3 mm / 1.5 mm
Width:	1.30 m / 0.65 m / 0.43 m
Colour:	black

Thermofast® welding edge along both sides

Areas of application:

Joining sheets and strips for **NOVOPROOF® DA-P** und **NOVOPROOF® TE**

Remarks

Features:

- Efficient and environmentally compatible Thermofast® welding technology
- Hot air machine-assisted/manual
- Efficient laying, irrespective of weather conditions
- Elastic between -40 °C to +120 °C (-40 °F to +248 °F)
- Root-resistant
- Rhizome-proof against couch-grass
- Environmentally compatible
- Bitumen-compatible
- Ozone-resistant
- UV-resistant

Monitoring:

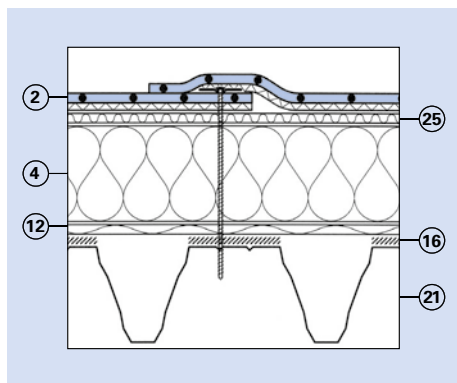
Monitored by TÜV, Saarland
Our quality management system fulfills the requirements of DIN EN ISO 9001:2008

Trade name:	NOVOPROOF® DA-K
Material:	EPDM rubber
Design:	Sealing sheets
	non-woven backing in accordance to EN 13956, EN 13967
Delivery form: Sheets	
Nom. thickness:	1.3 mm
	1.5 mm property related on request
Width:	1.30 m/0.65 m/0.43 m
	Thermofast® welding edge along both sides
Length:	20 m (variable lengths available for projects from 500 m ² up)
Colour:	black

Areas of application:

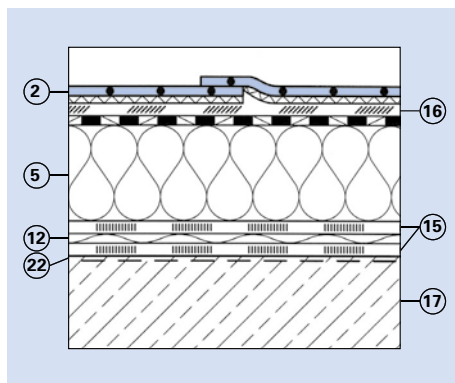
- All flat roofs with substructures made of wood, concrete, aerated concrete, trapezoidal steel sheeting
- For new buildings and renovation
- Special roof shapes
- With and without superimposed load
- Construction work sealing to DIN 18195
- Façade cladding

NOVOPROOF® DA-K
with mechanical fastening
Supporting structure: trapezoidal steel profile
(with insulation)



- 2** NOVOPROOF® DA-K
- 25** fire barrier layer (raw glass non-woven fabric)
- 4** polystyrene insulation layer
- 12** vapour barrier layer with metal strip insert
- 16** adhering with polymeric synthetic rubber adhesives
- 21** steel trapezoidal profile

NOVOPROOF® DA-K
with partial adhesion
Supporting structure: reinforced concrete
(with insulation)



- 2** NOVOPROOF® DA-K
- 16** partial adhesion with adhesive F
- 5** insulation layer, bitumen-backed
- 15** partially adhered bituminous coating
- 12** vapour barrier layer with metal strip insert
- 22** concrete sealer
- 17** reinforced concrete

Laying methods:

Partially or fully adhered
Mechanical fastening in the seam area

Seam welding:

Site: Thermofast® welding technology
Hot air machine-assisted/manual

Adhesive:

For surface: Surface adhesive F
For joints: Contact adhesive TA

Mechanical fastening:

For surface: all suitable fasteners in the seam area, number of fasteners in accordance with national regulations
For joints: connecting rails, suitable fastening elements

Preforms:

Factory prefabricated internal, external and domelight corners, collars for chimneys, domelights/skylights, fans and other roof structures, special preforms

Accessories:

- **NOVOPROOF®** Joint paste
- **NOVOPROOF®** cover strip, w = 20 cm
- Rubber supporting strip
- Coated metal sheets for edge details
- Spouter

Remarks

Features:

- Efficient and environmentally compatible Thermofast® welding technology
- Hot air machine-assisted/manual
- Efficient laying, irrespective of weather conditions
- Elastic between -40 °C to +120 °C (-40 °F to +248 °F)
- Root-resistant
- Environmentally compatible
- Bitumen-compatible
- Ozone-resistant
- UV-resistant

Monitoring:

Monitored by TÜV, Saarland
Our quality management system fulfills the requirements of DIN EN ISO 9001:2008

Trade name:	NOVOPROOF® DA-G
Material:	EPDM rubber
Design:	Sealing sheets
	non-woven backing in accordance to EN 13956

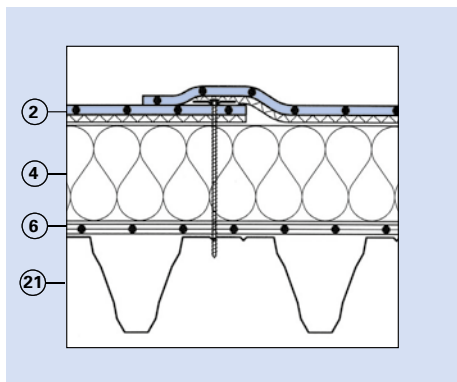
Delivery form: Sheets

Nom. thickness:	1.5 mm
Breite:	1.30 m/0.65 m, Thermofast® welding edge along both sides
Length:	20 m (variable lengths available for projects from 500 m ² up)
Colour:	light grey

Areas of application:

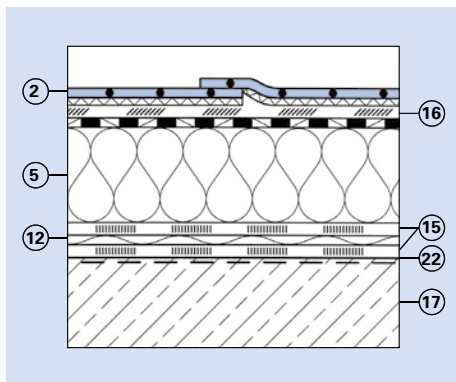
- All flat roofs with substructures made of wood, concrete, aerated concrete, trapezoidal steel sheeting
- For new buildings and renovation
- Special roof shapes
- Without superimposed load
- Façade cladding

NOVOPROOF® DA-G with mechanical fastening
Supporting structure: trapezoidal steel profile
 (with insulation)



- 2 NOVOPROOF® DA-G
- 4 mineral fibre insulation layer
- 6 plastic vapour barrier layer
- 21 steel trapezoidal profile

NOVOPROOF® DA-G with partial adhesion
Supporting structure: reinforced concrete
 (with insulation)



- 2 NOVOPROOF® DA-G
- 16 partial adhesion with adhesive F
- 5 insulation layer, bitumen-backed
- 15 partially adhered bituminous coating
- 12 vapour barrier layer with metal strip insert
- 15 partially adhered bituminous coating
- 22 concrete sealer
- 17 reinforced concrete



Laying methods:

Partially or fully adhered
Mechanical fastening in the seam area

Seam welding:

Site: Thermofast® welding technology
Hot air machine-assisted/manual

Adhesive:

For surface: Surface adhesive F
For joints: Contact adhesive TA

Mechanical fastening:

For surface: all suitable and tested fasteners in the seam area, number of fasteners in accordance with DIN 1055
For joints: connecting rails, suitable fastening elements

Preforms:

Factory prefabricated internal, external and domelight corners, collars for chimneys, domelights/skylights, fans and other roof structures, special preforms

Accessories:

- Joint paste
- **NOVOPROOF®** cover strip, w = 20 cm
- Rubber supporting strip
- Coated metal sheets for joints

Remarks

Features:

- Efficient and environmentally compatible Thermofast® welding technology
- Hot air machine-assisted/manual
- Efficient laying, irrespective of weather conditions
- Elastic between -40 °C to +120 °C (-40 °F to +248 °F)
- Root-resistant
- Environmentally compatible
- Bitumen-compatible
- Ozone-resistant
- UV-resistant

Monitoring:

Monitored by TÜV, Saarland
Our quality management system fulfills the requirements of DIN EN ISO 9001:2008

Trade name:	NOVOPROOF® DA-S
Material:	EPDM rubber
Design:	Sealing sheets
	thick non-woven backing in accordance to EN 13956, EN 13967

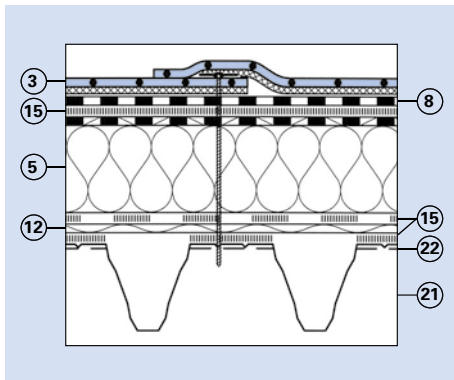
Delivery form: Sheets

Nom. thickness:	2.5 mm
Width:	1.30 m/0.65 m
Length:	20 m (variable lengths available for projects from 500 m ² up
Colour:	black

Areas of application:

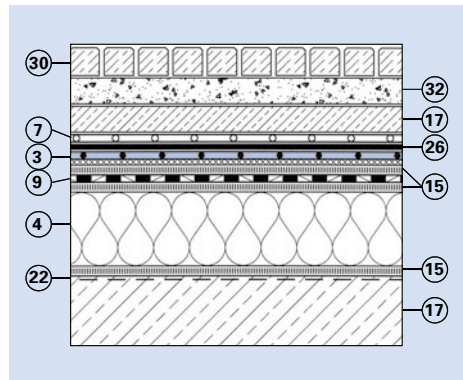
- All flat roofs with substructures made of wood, concrete, aerated concrete, trapezoidal steel sheeting
- For new buildings and renovation
- Special roof shapes (vaults, double-ridged roofs, lean-to roofs)
- With and without superimposed load
- Renovation of roof tops with uneven subsurface
- Utilised roof tops, planted roofs, balconies, terraces, parking areas
- Outer sealing of tunnel constructions, bridges and underpasses

Roof renovation without additional insulation
NOVOPROOF® DA-S
with mechanical fastening
Supporting structure: trapezoidal steel profile
 (with insulation)

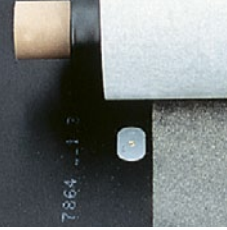


- | | |
|--|--|
| 3 NOVOPROOF® DA-S | 12 vapour barrier layer with metal strip insert |
| 8 bituminous strip | 15 fully adhered bituminous coating |
| 15 fully adhered bituminous coating | 22 concrete sealer |
| 5 insulation layer, bitumen-backed | 21 steel trapezoidal profile |
| 15 partially adhered bituminous coating | |

Utilised roof areas (with reinforced concrete protective layer)
NOVOPROOF® DA-S
flame application
Supporting structure: reinforced concrete
 (with insulation)



- | | |
|--|---|
| 30 paving tiles/compound bricks | 9 bitumen roof strip with glass fibre insert |
| 32 fine gravel/grit | 15 fully adhered bituminous coating |
| 17 reinforced concrete | 4 insulation layer |
| 7 plastic protective strip | 15 fully adhered bituminous coating |
| 26 rubber protective layer | 22 concrete sealer |
| 3 NOVOPROOF® DA-S | 17 reinforced concrete |
| 15 fully adhered bituminous coating | |



Laying methods:

Partially or fully adhered
Mechanical fastening in the seam area

Seam welding:

Site: Thermofast® welding technology
Hot air machine-assisted/manual

Adhesive:

For surface: Surface adhesive F
bituminous adhesion (flame application)
For joints: Contact adhesive TA

Mechanical fastening:

For surface: all suitable fasteners in the
seam area, number of fasteners in accordance
with national regulations
For joints: connecting rails, suitable
fastening elements

Preforms:

Factory prefabricated internal, external and
domelight corners, collars for chimneys,
domelights/skylights, fans and other roof
structures, special preforms

Remarks

Features:

- Efficient and environmentally compatible Thermofast® welding technology
- Hot air machine-assisted/manual
- Efficient laying, irrespective of weather conditions
- Elastic between -40 °C to +120 °C {-40 °F to +248 °F}
- Root-resistant
- Environmentally compatible
- Bitumen-compatible
- Ozone-resistant
- UV-resistant

Monitoring:

Monitored by TÜV, Saarland
Our quality management system fulfills
the requirements of DIN EN ISO 9001:2008

Adhesive F

Delivery form: drums of 20 kg

Low-solvent area adhesive on PU-basis for the adhering of backed **NOVOPROOF® DA-S, DA-K, DA-G** sheets.

Please comply with the handling and safety regulations printed on the drum labels.

Adhesive TA

Delivery form: drums of 800 g and 4.7 kg

Solvent-based contact adhesive for adhering to customary materials used on site, e.g. wood, concrete, aerated concrete, brickwork, timber-based materials, steel, sheet metal, etc.

Steel and sheet metal need to be pre-cleaned with a purifier-

A pre-coat (mixing ration 1:1, consisting of purifier / adhesive TA, consumption approx. 150 g/m² is recommended on absorbent undersurfaces.

Adhesive consumption depending on sub-surface: 400 - 600 g/m². Please comply with the handling and safety regulations printed on the drum labels.

Joint paste

Delivery form: cartridges of approx. 310 cm³

For sealing of wall connection profiles and closures at penetrations.

Purifier

Delivery form: drums of 1.000 cm³ and 5000 cm³

Purifying agent for the purification of bonding subsurfaces such as e.g. domelight crowns, metals, etc. as well as to produce a first coat for absorbent subsurfaces.

NOVOPROOF® cover strip

Delivery form:

w = 20 cm, l = 20 m, d = 1.3 mm (black) or 1.5 mm (light grey)

Repair strips are supplied with a fully applied TF-coating for the sealing of butt-end joints, mechanical damages, etc.

Rubber supporting strip

Delivery form:

w = 15 cm, d = approx. 6 mm, l = 20 m

Processing aid for seam welding when using an older hot-air apparatus. When using newer hot-air equipment such as a Leister Varimat 4 G 1 or Meistermat 2000 D, the use of the rubber supporting strip is unnecessary.

Preforms and collars with Thermofast® welding edge

- External corner
- External corner with triangular rail
- External corner, cone-shaped (dome-light corners)
- Internal corners
- Pipe sleeves, closed
Ø 35 - 500 mm
- Pipe sleeves, one-side open
Ø 70 - 175 mm
- Gully/Drain collars
Ø 35 - 175 mm
- Pipe sleeves, cone-shaped,
Ø 70 -150 mm
- Lightning rod sleeve
- Collars in accordance with site dimensions
- Special preforms
- Emergency overflows/spouts of aluminium with **NOVOPROOF®** connection flange

Transport and storage

duraproof

Technologies for durable solutions

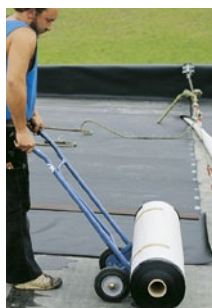
Heat-shrunk wrapping of pallets ensures that **NOVOPROOF**® membranes are largely protected against all weather effects.

NOVOPROOF® sheets are rolled and wrapped in protective film.

EPDM reacts to UV radiation by forming an oxidation layer a few microns thick, which in the same way as copper, forms a protective surface layer. Further oxidation is therefore prevented for a long time. This protective layer can however impair homogenous welding using the Thermofast® welding technique. **NOVOPROOF**® products are therefore protected against UV radiation before processing by being wrapped in film sheets at the works. In the case of **NOVOPROOF**® products that have been exposed to the weather, even for extended periods, the surface can be prepared for welding in the area of the joint seam by sanding off the oxidation layer (see section on Thermofast® welding technology).

If the shrink wrapping is undamaged, the rolls can be stored on the roof, although they should however not be exposed to permanent wet or damp. If the wrapping is damaged, the products must be repacked.

Rolls should always only be unpacked immediately prior to laying. Opened rolls should always be repacked and stored as described above.



Correct transportation of **NOVOPROOF**® rolls



Packaging of preforms

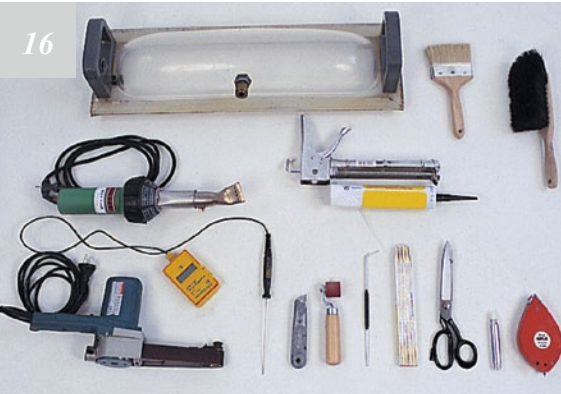
NOVOPROOF® preforms are wrapped in plastic foil bags at the factory. The packaging should only be opened when the parts are to be installed. Preforms which are not required should also be stored in a light- and weather-protected manner.

Important

- Damaged or opened packaging of strips, sheets or preforms should always be resealed.
- Protect against moisture and exposure to light.
- Only unpack **NOVOPROOF**® products immediately prior to installation.

Processing tools and devices

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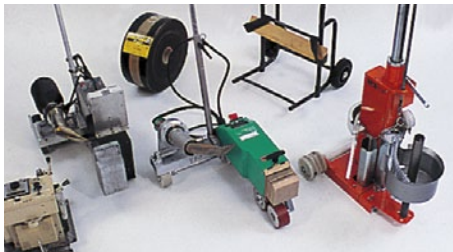


Quality-tested, craftsmanship tools are a prerequisite for the perfect performance of waterproof sealing.

The following items are required for the laying of NOVOPROOF® sealing sheets and membranes:

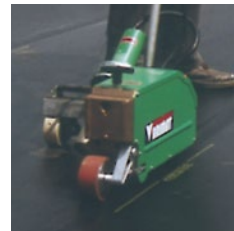
- Hand welding equipment
- Silicone pressing roller
- Belt grinder/sander
- Pair of scissors
- Crayon
- Emery paper
- Coloured marking string
- Angled scribe probe
- Adhesive application cart
- Supporting strip
- Automatic setting machine
- Automatic welding machine
- Hand gun for joint paste
- Thermometer
- Voltage tester
- Cable drum

Automatic welding machine



**Recommended brands:
Automatic welding machine for the closing of overlapping seams**

- Leister Varimat 4 G1-1 with 220 V connection
- Leister Varimat 4 G1.2 with 400 V connection



Automatic setting machine



Hot-air apparatus

Hot air apparatus for the joining of preforms and collars

Leister Triac 1 G3.3

- with nozzle
40 mm/30 B 1
- with nozzle
40 mm, perforated on one side /
30 B 2
- silicone pressing roller 28/40 mm
22 F/22 D
- angled scribing probe



Supplier:

HEISSLUFTTECHNIK

Flocke GmbH

Elsässer Straße 14-18
42697 Solingen

Germany

Phone: +49 2 12 / 3 82 60-0

Fax: +49 2 12 / 31 23 24

e-mail: info@heisslufttechnik.de

Thermometer to check the welding temperature

- Digital-seconds pocket thermometer
GTH 11 50
- Immersion probe GTF 1200

Suppliers:

Greisinger Electronic GmbH

Hans-Sachs-Straße 26

93128 Regenstauf

Germany

Phone: +49 94 02 / 93 83-0

Fax: +49 94 02 / 93 83-33

e-mail: info@heisslufttechnik.de

Belt grinder to grind the square T-joints

- Makita belt sander 9031
- Emery paper grain 80/100/120

Supplier:

Makita Werkzeug GmbH

Keniastraße 20

47269 Duisburg

Germany

Phone: +49 2 03 / 97 57-0

Fax: +49 2 03 / 97 57-1 28

With the environmentally compatible Thermofast® jointing technique - without the use of adhesives and solvents - DURAPROOF has successfully developed a reliable sealing method for EPDM rubber sheets. All products are manufactured with the Thermofast® seam welding edge, guaranteeing durable seams between NOVOPROOF® sealing sheets or membranes and preforms.

Important welding parameters and notes

To achieve an optimum welded seam, welding temperature, application force and welding speed have to be matched to each other. NOVOPROOF® seams which are to be welded must be dry and clean.

Welding temperature

Manual hand welding unit and machine-assisted with automatic welding machine approx. 420 - 470 °C {790 – 880 °F}.

The temperature must be checked at the welding nozzle with the aid of a suitable thermometer.

Welding speed

Machine-assisted with automatic welding machine approx. 2 m/min.

Application force

When welding manually with hand welding units, the required application force on the lap seam is exerted with the aid of the pressing roller.

Automatic welding machines in turn require additional weights of approx. 8 kg to achieve the optimum application force.

Experimental welds provide information as to a satisfactory application force. This force can only be applied effectively if compression-resistant heat insulation, level substrate backings or similar are used as a backing strip.

Experimental welds

Before starting with the seam welding work and after longer work interruptions, experimental welds must be carried out. The welding parameters which have been set beforehand need to be verified and if necessary, corrected.

Seam width

As a rule, the seam width is 30 mm.

Sanding after weathering





Sanding after weathering

Weathering exposure

When installing **NOVOPROOF®**, it must be ensured that all seams are closed and all collars, corner preforms, connecting strips, etc. are welded together by the end of every day of installation.

To continue with the surface welding work on the following day, the overlapping area of the first strip is placed below the Thermofast® edge of the sheet last laid and can then be immediately welded without any particular measures being required.

This method has proven most efficient in practice.

If for one reason or another a sheet or membrane has been exposed to weathering for more than 24 hours, preparatory treatment of the seaming area is necessary to achieve an optimum bond.

The exposed weathered strip surface in this particular area then needs to be sanded with a belt sander down to the embossing depth, with dust and dirt particles removed before welding.

Low temperatures

Outside temperatures ranging between +5 °C {41 °F} and approx. -10 °C {14 °F} make it necessary to adapt the welding parameters to the changed conditions and thus necessitate a reduced welding speed and increased welding temperature. An experimental weld should always be carried out.

Thermofast® seam welding with hot-air apparatus and roller



Temperature control of hot-air apparatus



Manual welding

- Switch on hand welding unit and check the temperature at the welding nozzle, i.e. approx. 420 – 470 °C {790 – 880 °F} with a thermometer.
- Overlap the **NOVOPROOF®** sheets not less than 4 cm, pre-tack the strip lying on top in the shape of a line at the rear of the overlapping area. This measure ensures an improved temperature transfer in the seam area and also ensures that the parts to be welded are perfectly positioned.
- When using the Thermofast® technique, the hot-air apparatus and pressing roller must be guided evenly so as to achieve an optimum welding temperature and application force.
- The pressing roller is guided parallel the welding nozzle opening at a distance of approx. 15 - 20 mm.

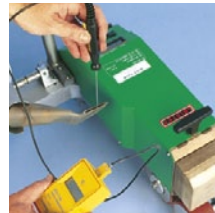


Machine-assisted welding

- Switch on automatic welding machine, set temperature (420 – 470 °C {790 – 880 °F}) and check at the welding nozzle with a thermometer.
- Set welding speed to approx. 2 m/min. and verify.
- When using older models of hot-air apparatus, a rubber supporting strip must be placed onto the lap to be sealed, even with the front edge of the strip, and removed after welding.
- When using newer models of hot-air apparatus it is possible to do without this strip. The strip ensures a level position of the strips in the lap seam area.

Square T-joint, butt joint

- Special care needs to be taken when executing T-joints or butt joints. The area of the joint must be marked.
- With a customary belt sander, (approx. 15 - 30 mm sanding width, emery paper grain 80 to 120 - see equipment list), the lap seam area is evenly sanded and levelled.
- The covering strip which has been cut to size is first fixed spot-wise before it is fully attached with a hot welding machine using the Thermofast® method.



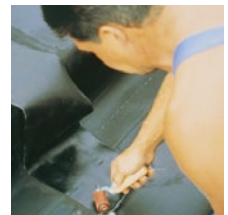
Temperature check



Sanding the lap seam



Prepared lap seam



Step-by-step fixing

Checking of lap seams

The lap seams are of particular importance if the seal is to function properly. The test methods described below are suitable control measures:

• Angled scriber probe

All seams produced on site must be checked with the angled scriber probe. Flaws must be identified and refinished with a hand welding unit.

• Vacuum test

(not usually required)

Mainly in underground engineering and landfill construction, joints/seams are checked with a vacuum bell jar. This test is carried out by placing a transparent test bell onto the seam and sucking out the air captured underneath the bell. The test liquid applied to the seam beforehand indicates leaks by the formation of bubbles.



Angled scriber probe



Vacuum test

Repairs

Even after a long period of time, repairs or the subsequent installation of collars and preforms onto **NOVOPROOF®** sheets which have been exposed to weathering can be carried out without any problems. In these circumstances, the weathered sheet surface must be sanded down to embossing depth with a belt sander in order to achieve optimum adhesion.

Important

- Keeping welding devices at a constant temperature and speed guarantees a perfect seam quality and thus a safe and durable seal.
- When welding **NOVOPROOF®** sheets and membranes onto non-backed insulating materials (polystyrene), care must be taken to ensure adequate overlapping (approx. 8 cm); on uneven or rough subsurfaces, it is advisable to place a suitable protective layer (e.g. raw glass non-woven fabric, V 13 bitumen strip) under the seam area.

DA-P under super-imposed load

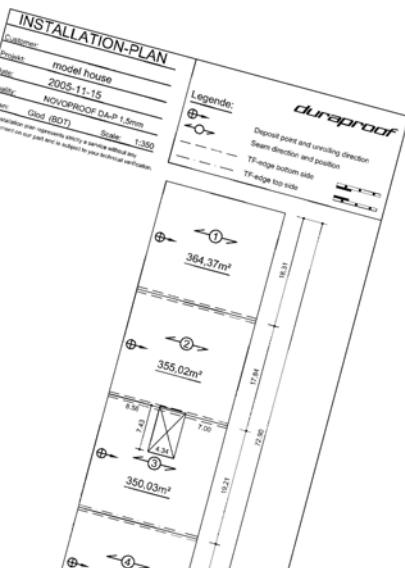
Factory prefabricated membranes enable reliable laying of the sheet with a superimposed load for renovation as well as new buildings, largely independent of weather conditions. Made-to-measure solutions with a minimum of seams. In particular for roof structures with multi-layered, heavy structures resting on the membrane, this is an invaluable advantage for all those who are responsible for the safety of the waterproof seal: architects and craftsmen.

The substructure with its assembly of functional layers is an important prerequisite for a long-term, safely functioning waterproof seal. Thus, every membrane sealing must also be matched to its subsurface.

NOVOPROOF® membranes are compatible with bitumen and all customary insulating materials.

However, a separating layer is recommended to be able to compensate for the different movements or, in the case of concrete or compressed gravel roofs, etc., to protect the membrane against mechanical damage.

Laying plan



- **NOVOPROOF®** membranes are supplied clearly marked with a special label.
- Heat-shrunk wrapped onto pallets and marked, the membranes can be positioned according to the laying plan. However, when doing so, attention must be paid to the load capacity support of the subsurface/structure.
- The rolled-up membranes are brought into position according to the laying plan on the prepared and well-swept clean substrate surface, rolled out, unfolded and pulled up to the required parapet or joint heights. Afterwards, seams are securely closed with an automatic welding machine.
- Immediately after installing loosely laid **NOVOPROOF®** membranes, they must be secured against wind suction uplift with an adequate superimposed load. The overlap of the seams must be at least 4 cm.



Membrane identification



Rolling out



Unfolding



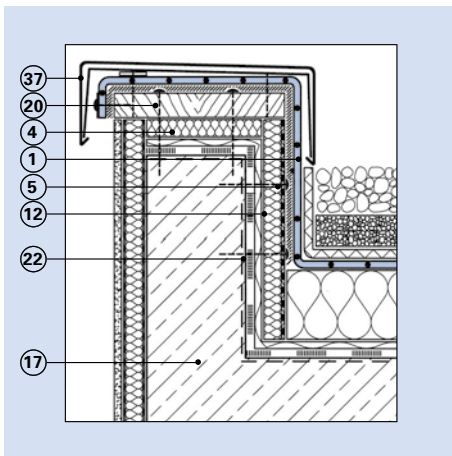
Welding

Formation of parapet details

- **NOVOPROOF®** membranes are pulled up from the horizontal sealing plane to the vertical joint area without interruption.
- Membranes or overhanging strips should always be fully adhered with adhesive TA (consumption approx. 500-600 g/m²).
- Parapet heights and details need to be performed in accordance with flat roof directives.

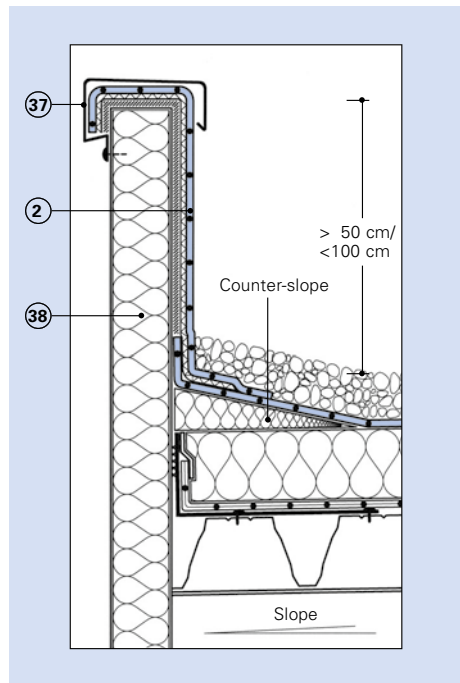
- Two-piece strips are recommended for parapet heights exceeding 50 cm. In these cases, the **NOVOPROOF®** membrane is pulled up several centimetres up the vertical line.
- The overhanging strip of **NOVOPROOF® DA-K/NOVOPROOF® DA** is matched to the geometry of the parapet and welded to the **NOVOPROOF® DA-P** using the Thermofast® welding technique.

Parapet detail
NOVOPROOF® DA-P



- | | |
|--|--|
| 37 masonry | 5 heat insulation layer, bitumen-backed, mechanically fastened |
| 20 wooden materials/ planks | 12 vapour barrier layer with metal strip insert |
| 4 insulation | 22 concrete sealer |
| 1 NOVOPROOF® DA-P 15 fully adhered with adhesive TA | 17 reinforced concrete |

Parapet detail
NOVOPROOF® DA-P, two-part



- | |
|---|
| 37 masonry covering |
| 2 NOVOPROOF® DA-K overhanging strip fully adhered with adhesive TA |
| 38 sandwich element/ façade element |



NOVOPROOF® TE membranes factory prefabricated to the largest size that can be moved with the equipment available on the construction site. The membranes are made-to-measure to suit the local conditions, thus reducing the number of seams that have to be joined on site.

The subsurface should be firm and level. Sharp-edged, uneven areas constitute a latent danger of mechanical damage during the laying work, and must be removed in advance. The surface should be levelled if necessary by a bed of sand (particle size 0/2 mm, depth 4 cm) or a protective layer

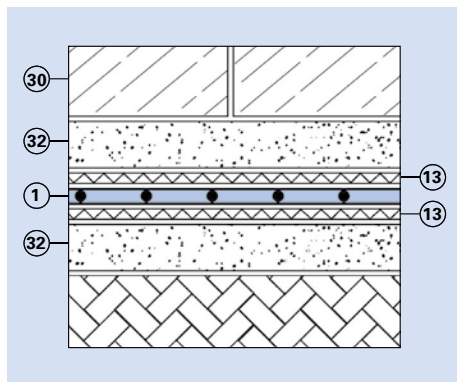
JOINTS AROUND THE EDGE OF POOLS AND GROUND AREAS

The membranes can be fixed at the edge area by

- digging them into the ground
- application of lean concrete
- edging stones in frost-free foundations or prefabricated concrete components
- metal linings



NOVOPROOF® TE
as sealing membrane
in a water treatment basin



- 30** compound bricks
- 32** protective sand layer, approx. 5-10 cm
- 13** geo-textile, approx. 400 g/m²
- 1** NOVOPROOF® TE
- 13** geo-textile, approx. 400 g/m²
- 32** supporting undersurface (0-2 mm) (proctor density 95 %)

Closures to ascending components

Closures to ascending components must be secured by drawing in the edge of the sheet in grooves, or by the waterproof application of clamping rails. The membrane must also be drawn up high enough above the maximum water level.

Preforms

Penetrations, connections and closures must be properly finished so that they still fulfil their function completely under slight movements of the components and the water pressure. DURAPROOF here offers a wide range of standard preforms, together with individually tailored parts, that can be joined to the sealing using the Thermofast® welding technique.

DA-K, DA-G, *partially adhered*

NOVOPROOF® DA-K/DA-G sheets are adhered sheet-by-sheet if mechanical fastening or, for structural reasons, a superimposed load is not feasible for the roof substructure.

For roof systems of this type, in the particular case of renovations, the secure position of the individual layers and bonding surfaces of the roof deck need to be thoroughly checked.

The slope also needs to be taken into account. Slopping decks below 5° require no additional fastening devices to prevent slippage or lateral displacement. In the case of a roof deck with a slope exceeding 5°, sheets have to be fixed at the high points to protect them against slippage and lateral displacement, as the adhesives do not bond instantaneously.

All suitable means of fastening are approved for this purpose.

The advantages of this laying technique are:

- Possibility of counterbalancing movement in the unbonded areas.
- The hollows between the adhesive strips permit a vapour pressure equalization.
- Possibility to adhere directly even on old bitumen surfaces covered with slate or sand.
- Economic laying method thanks to 1.30 m wide sheets, standard roll length 20 m, or factory pre-cut specific lengths which can match the building dimensions best.

Prerequisites for NOVOPROOF® area sheets adhered in a stable positional manner:

- Roof surfaces should be level and free of hollows and the substructure must have no loose components.
- Bonding subsurfaces should be clean, dry, and compatible with adhesive F (non-backed polystyrenes, bare bitumen welding sheets and asphalt/goudrons are not suitable for bonding with adhesive F).
- Renovation surfaces must be equipped with wind-suction/uplift-proof adhesive joints on all bonding areas.
- The adhesive bonding to the subsurface must be established by means of an experimental adhesion test. The manufacturer's processing guidelines apply for the processing temperature of the adhesive used.

Important

- When bonding **NOVOPROOF® DA-K** or **NOVOPROOF® DA-G**, it is important that an adequate amount of adhesive is applied and that the reverse side of the sheet is sufficiently wetted. If necessary, an experimental adhesion test should be carried out to determine the required amount of adhesive.

NOVOPROOF® sheets, partially adhered with Adhesive F

- Place adhesive drum onto the adhesive application cart and fasten.
- Punch outlets 10 -12 mm in diameter in the bottom at regular intervals: spacing approx. 7 cm, and punch air inlet openings in the top of the canister: apply required amount of adhesive by steadily moving the application cart back and forth.
- Consumption of adhesive in the case of closed buildings up to a height of 20 m
Surface: approx. 200 - 400 g/m², depending on the subsurface
Edges and corners: approx. 500 - 600g/m²
- When adhering **NOVOPROOF® DA-K** or **NOVOPROOF® DA-G**, it is important that an adequate amount of adhesive is applied and that the reverse side of the sheet is sufficiently wetted. If necessary, an experimental adhesion test should be carried out to determine the required amount of adhesive.
- Roll **NOVOPROOF® DA-K/DA-G** sheets into the fresh adhesive and press down with a broom or roller (overlapping at least 4 cm).
- **For roof edge fastening and parapet details, see page 29**



Adhesive drum with outlet openings



Application of adhesive



Rolling



Pressing down

DA-S *partially adhered* *Fully adhered flame application*

Sheet-by-sheet adhesion of NOVOPROOF® DA-S with adhesive F.

• Adhesive F

Consumption of adhesive in the case of closed buildings up to a height of 20 m: area approx. 500 g/m²

edges and corners: approx. 800 g/m²

- With approx. 8 cm overlapping, roll the **NOVOPROOF® DA-S** sheets into the fresh beads of adhesive and press or roll down

Fully adhered flame application of NOVOPROOF® DA-S

- If the subsurface is suitable, a fully adhered flame application of the **NOVOPROOF® DA-S** sheets is possible (with weldable bitumen).

This is done by slightly liquefying the surface and rolling the **NOVOPROOF® DA-S** sheet into the bitumen while applying light pressure and allowing for an overlap of approx. 8 cm.

Important

- The required amount of adhesive depends on the quality of the subsurface. We recommend an experimental adhesion test be carried out before laying commences. Care should also be taken to ensure adequate coating of the rear of the sheet.

Roof edge fastening

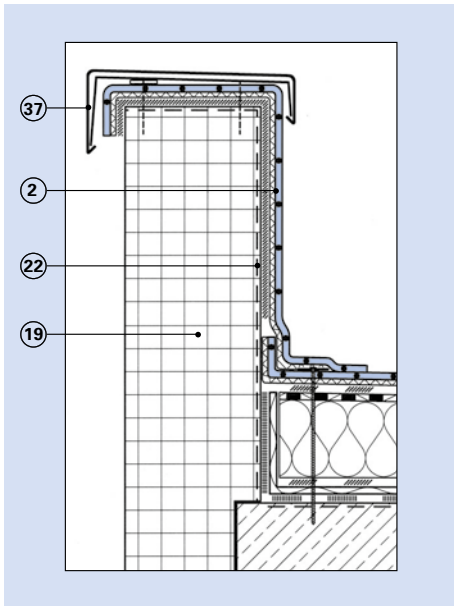
In the case of **NOVOPROOF® DA-S/DA-K/DA-G** sheets adhered sheet-by-sheet and **NOVOPROOF® DA-S** sheets fully adhered by means of flame application, a linear roof edge fastening must be fitted along roof edges, channels, ascending building components and roof penetrations by means of suitable fastening elements in accordance with flat roof directives, spacing 25 cm, 4 per metre.

Formation of parapet details

Connections to parapets, roof edges, rows of windows, ascending building components and roof penetrations must always be carried out in two parts.

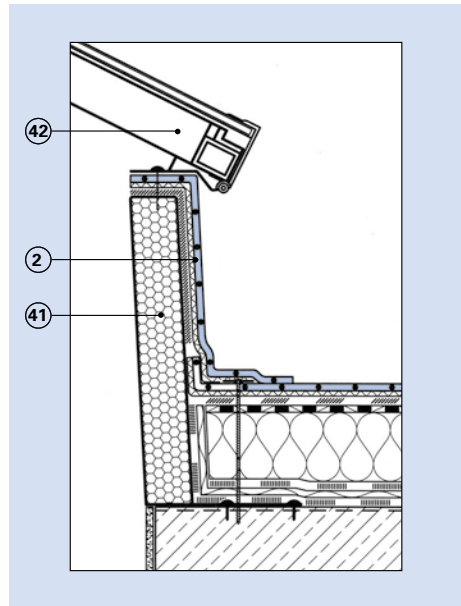
NOVOPROOF® DA-K/DA-G connecting strips must be fully adhered with adhesive TA (consumption approx. 500 - 600 g/m²). For formation of connection details on sub-surfaces unsuitable for adhesive, see pages 32/33.

Parapet detail for systems NOVOPROOF® DA-K/DA-G/DA-S



- 37 masonry covering
- 2 **NOVOPROOF® DA-K/DA-G** overhanging strips fully adhered with adhesive TA
- 22 concrete sealer
- 19 lightweight concrete

Connection detail for skylight windows for systems NOVOPROOF® DA-K/DA-G/DA-S



- 42 window
- 2 **NOVOPROOF® DA-K/DA-G** connecting strips fully adhered with adhesive TA
- 41 window frame

DA-K, DA-G, DA-S, mechanically fastened

NOVOPROOF® DA-S/DA-K/DA-G sealing sheets should always be mechanically fastened if allowed by the subsurface. The sealing sheets are mechanically fastened in the overlapped strip margin and the seams closed using the Thermofast® technique using a hot air machine, without the use of adhesives or solvents.

Fastening in the overlapped strip margin requires various roll widths.

NOVOPROOF® DA-K

- 1,300 mm
- 650 mm
- 430 mm

NOVOPROOF® DA-G

- 1,300 mm
- 650 mm

NOVOPROOF® DA-S

- 1,300 mm
- 650 mm

The standard length is 20 m. Depending on the project, the **NOVOPROOF®** sheets are cut into lengths at the factory in accordance with the prevailing roof surface conditions.

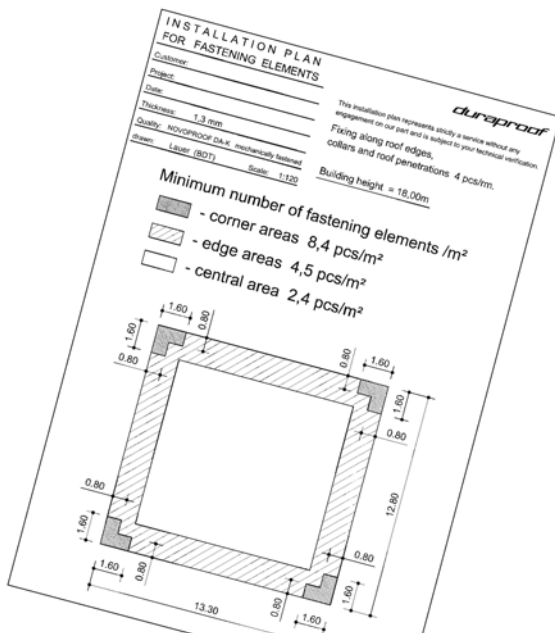
The substructure with its assembly of functional layers is an important prerequisite for a long-lasting, safely functioning seal.

Mechanically fastened **NOVOPROOF®** sealings may only be carried out on sufficiently tread-proof subsurfaces.

In general, on roofs with steel trapezoidal sheeting, sealing sheets are laid transverse to the top ridges. If no mathematical verification in accordance with national regulations is required, the number and arrangement of fastening elements is determined in accordance with the flat roof directives.

In the case of buildings exceeding a height of 30 m, an individual verification (in accordance with national regulations) must be carried out.

Mechanical fastenings may only be carried out with tested and suitable fastening elements. When fasteners are used, their suitability is to be verified and confirmed by the manufacturer by means of pull-out tests.



DA-K, DA-G, DA-S, *mechanically fastened*

32

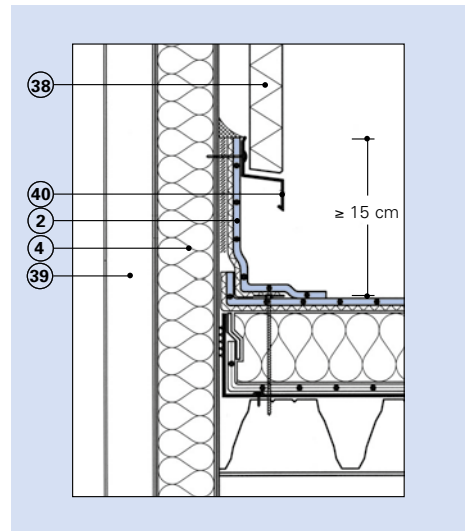


Formation of parapet details

Connections to parapets, roof edges, rows of windows, ascending building components and roof penetrations must always be carried out in two parts.

NOVOPROOF® connecting strips must be fully adhered with adhesive TA (consumption approx. 500 - 600 g/m²). The adhesive bonding to the subsurface must be established by means of an experimental adhesion test (see also page 29).

Wall connection for systems **NOVOPROOF®** DA-K/DA-G/DA-S



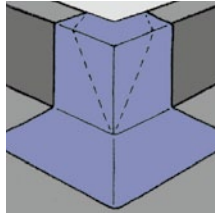
- 38 sandwich element/
façade element
- 40 wall connection profile
- 2 **NOVOPROOF®** DA-K/DA-G
overhanging strip fully
adhered with adhesive TA
- 4 heat insulation layer
- 39 supporting construction

Membrane flashings

34

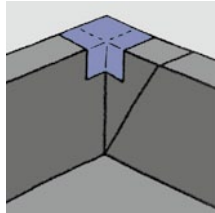
1. Formation of external corner NOVOPROOF® membranes

- Guide NOVOPROOF® membranes up to the crest of the wall
- Cut membrane at the salient point of the corner as far as the foot
- Weld on external corner preform
- Fully adhere the membrane to the parapet with adhesive TA



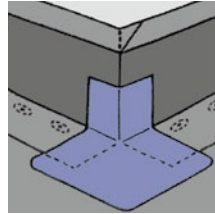
2. Formation of internal corner NOVOPROOF® membranes

- Fold the NOVOPROOF® membrane into the corner areas
- Cut open the membrane at the upper salient point of the corner on the crest of the wall
- Weld over the open corner point with a preform
- Fully adhere the membrane with adhesive TA



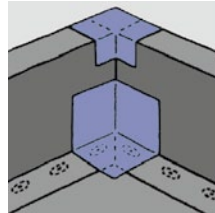
3. Formation of external corner, two-parts

- Guide overhanging strip down the parapet so that the fastening elements are overlapped at least 5 cm
- Cut overhanging strip at the lower salient point of the corner and fold in at the upper point
- Fully adhere the strip to the parapet with adhesive TA
- Weld parapet strip to the horizontal seal
- Weld on the external corner preform



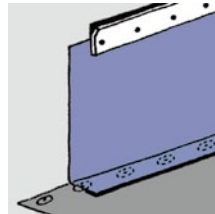
4. Formation of internal corner

- Contrary to the formation of external corners, the parapet strips are in this case cut at the upper and lower salient point of the corner and welded over with preforms



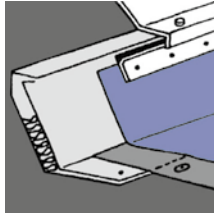
5. Wall flashing

- Guide strip up the perpendicular (min. 15 cm above upper edge of covering), fully adhere with adhesive TA
- Mechanically fasten the aluminium wall connection profile and seal at the upper side with joint paste



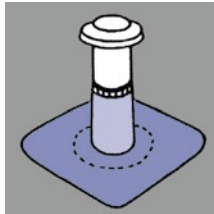
6. Domelight flashing

- Adjust domelight collar prefabricated at the factory and adhere to cleaned crest with adhesive TA
- Weld collars to the sheet
- Make the upper edge connection with a wall connection profile, incl. sealing on the top side



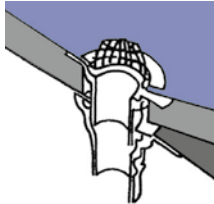
7. Exhaust Fan preform

- Adjust factory prefabricated pipe sleeve
- At the upper edge, apply joint paste between the pipe and collar then fix with a rustproof pipe clamp
- Weld collar to the sheet



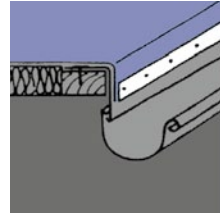
8. Drain/gully preform

- Depending on the type of drain/gully, cut out the **NOVO-PROOF®** sealing sheets smaller than the drain/gully sleeve
- Connect the sheet with a clamp or flange ring so as to prevent blockages. When using strips with a non-woven backing, the backing must be removed in this area



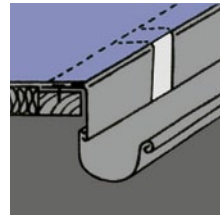
9. Mechanically fastened eaves

- Guide **NOVO-PROOF® DA-P** membranes or **NOVOPROOF®** sheets over the eaves sheet into the perpendicular and fully adhere with adhesive TA. When using strips with a non-woven backing, the backing must be removed in this area



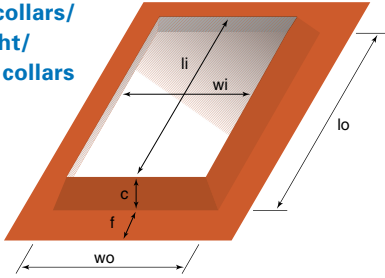
10. Eaves connection with composite gutter

- Weld over composite joint with **NOVOPROOF®** covering tape
- Weld **NOVOPROOF®** connecting strips with the Thermofast® edge onto the composite sheet steel recommended by DURAPROOF



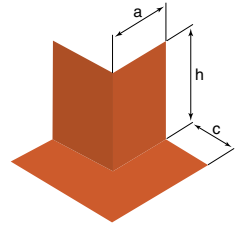
The corners of preforms and covering tapes should be rounded off with sheets/membranes before welding.

Square collars/ domelight/ skylight collars MV KO



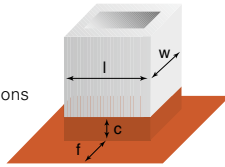
required ordering dimensions
 Li = length inside
 Lo = length outside
 Wi = width inside
 Wo = width outside
 C = crown height
 F = flange height

External corner AE

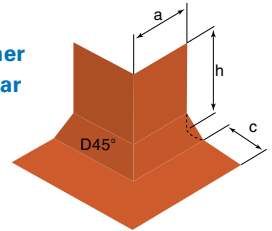


Square collars MV

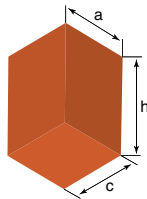
required ordering dimensions
 L = length
 W = width
 C = crown height
 F = flange height



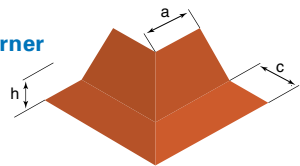
External corner with triangular cant strip AE DKL



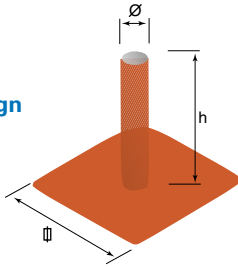
Internal corner IE



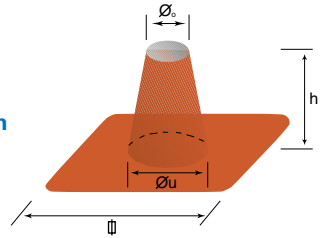
External corner conical AE KO



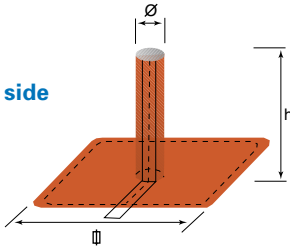
**Pipe sleeves
standard design
R closed**



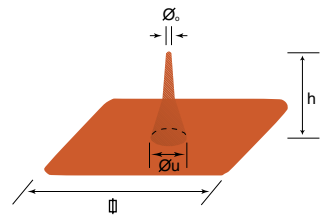
**Pipe sleeves
conical
special design
R KO**



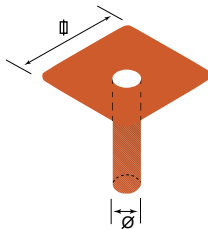
**Pipe sleeves
open on one side
R EO**



**Pipe sleeves
lightning rod
RB**



**Pipe sleeves for
drain/gully
standard design
RG**



Questions?

The answers are close at hand.

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For DURAPROOF, being in close contact with customers also means maintaining a wide distribution network. With field staff and franchise partners both at home and abroad, we are able to provide answers at any time by phone or to discuss plans in detail in a personal meeting.

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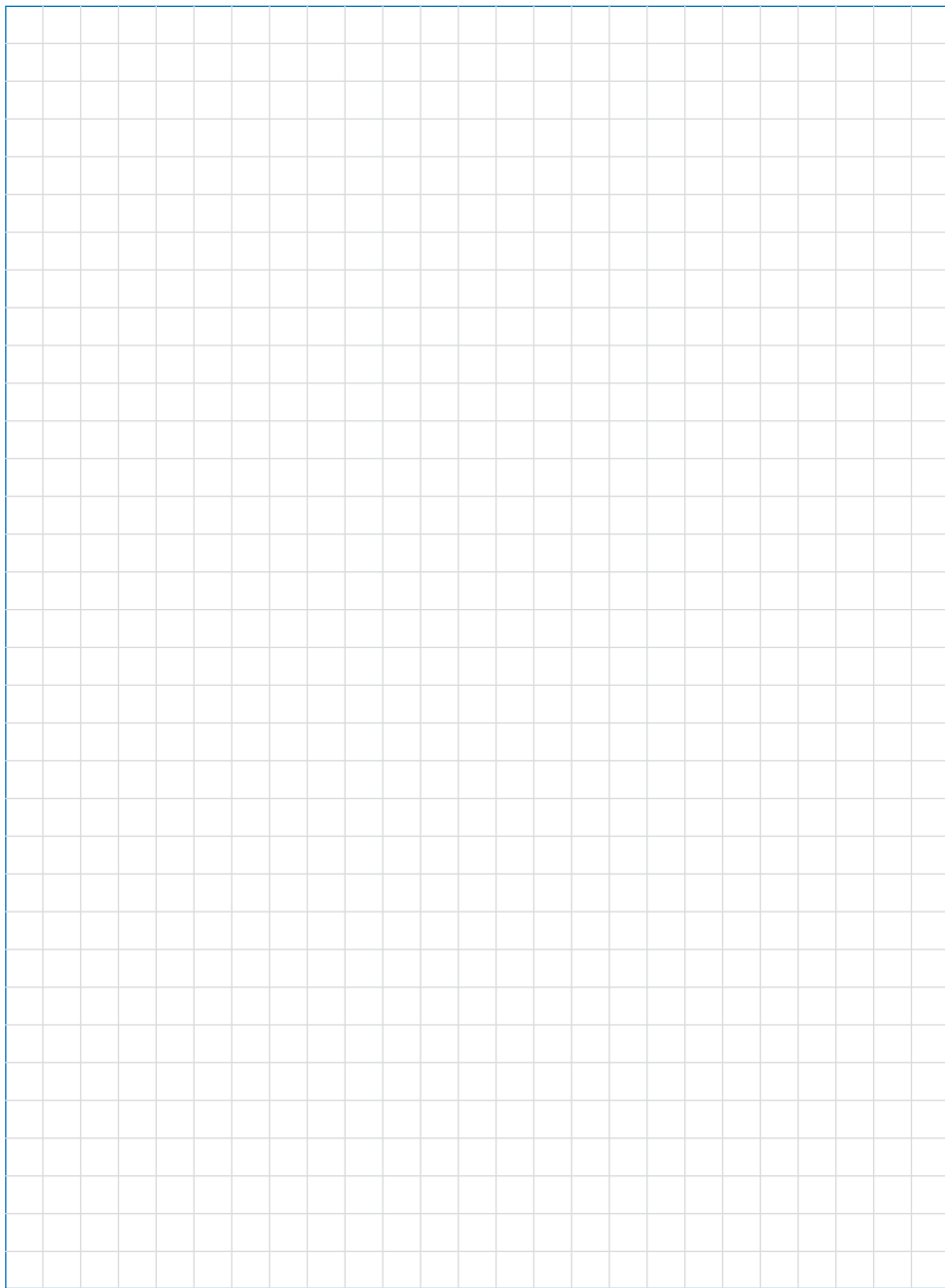
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Note

This edition of the installation instructions replaces all previous versions. The information in this brochure is based on the latest level of knowledge and experience.



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