

APPLICATION GUIDE

Rain gutter system



TABLE OF CONTENTS

TABLE OF CONTENTS.....3

I. Standards and regulations4

II. Gutter and drainpipe materials4

 Instructions for use and machining6

III. Sizing based on the standard rainwater load.....7

IV. Fastening the rain gutter9

 1. Fixing the rain gutters.....9

 2. Gutter extensions and dilations:.....12

 3. Drain pipe and its components16

CREATON South-East Europe Kft.

Technical department

H-8960 Lenti, Cserépgyár utca 1.

The informations provided in this documents, the textual guidelines, the datas in the form of technical drawings correspond to the current technical level at the time of publication and based to the experience of CREATON South-East Europe Kft.. This application guide contains only a part of the product informations. The described applications, examples, do not take into account the special features that may arise in individual cases.

All datas and the suitability of the material for the intended use must always be checked on the construction site! CREATON South-East Europe Kft. disclaims all warranties related the provided informations. This includes typographical errors and the subsequent changes to the specifications.

I. Standards and regulations

General design and construction rules and regulations for the swissporTON rain gutter system. Compliance with regulations and rules is important because warranty claims can only be enforced if the regulations are complied and the original accessories are installed.

The following standards and rules applies to the manufacturing, planning and construction of the roof rainwater drainages:

- DIN 18460 External rainwater pipes and eaves gutters; concepts and design principles
- DIN 1986 Drainage systems on private ground
- EN 612:1998 Eaves gutters with bead stiffened fronts and rainwater pipes with seamed joints made of metal sheet
- EN 1462:1998 Brackets for eaves gutters. Requirements and testing
- Rainwater collected on the surfaces of roofs and balconies must be drained using a properly sized and designed drainage system.
- The cross-section of the drainage system must not narrow in the flow direction!
- Rainwater collected from roof surfaces is usually drained outside of the building (e.g. drain pipe). If the rainwater can flow away from the building without any obstacle (or the building is adequately secured against wetting) the rainwater can be drained freely.
- Use standpipes made of a suitable material in the areas where there is mechanical damage can occur!

II. Gutter and drainpipe materials

swissporTON gutter systems are made of two materials:

- Corrosion resistant steel sheet
- Aluminum sheet

Contact with certain metals with different properties (such as copper and zinc) causes so-called contact corrosion. By this is meant the chemical or electrochemical reaction of metals, which in the case of direct contact, can occur under the influence of a liquid (e.g. water or higher air humidity). As the service life of metal components is greatly affected, corrosion protection must be precisely designed. The following table provides recommendations for corrosion protection.

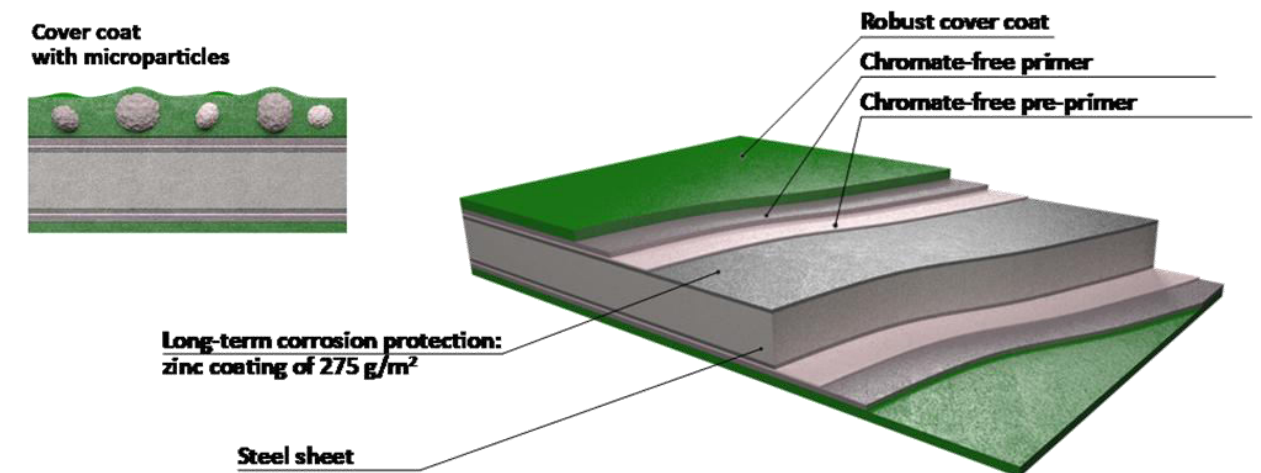
		Al	Pb	Cu	Zn	NrS	St
Aluminium	Al	✓	✓	✗	✓	✓	✓
Lead	Pb	✓	✓	✓	✓	✓	✓
Copper and its alloys	Cu	✗	✓	✓	✗	✓	✗
Zinc	Zn	✓	✓	✗	✓	✓	✓
Stainless steel	NrS	✓	✓	✓	✓	✓	✓
Galvanized steel	St	✓	✓	✗	✓	✓	✓

swissporTON hot-dip galvanized steel ducts may come into direct contact with the following materials:

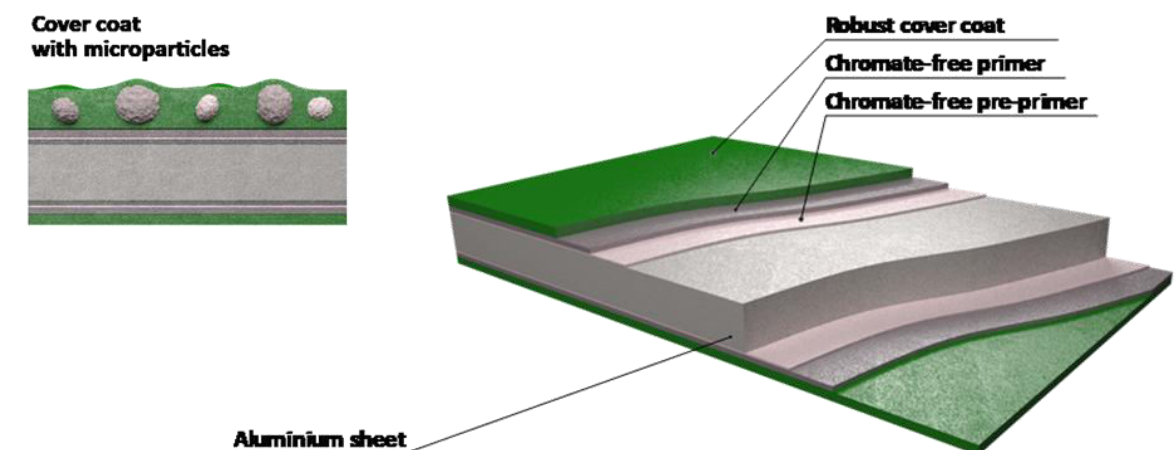
- with aluminum (both uncoated and coated)
- with lead
- with stainless steel
- with galvanized steel (here traces of rust run-off, for example due to cut edges, are not excluded)

Damage may occur in the case of assembly with copper.

The elements of the swissporTON gutter system are equipped with a special surface treatment called "ROBUST", which has been specially developed for the protective layer of structures exposed to the effects of the weather (moisture, UV radiation, heat).



The aluminum gutter system components are also coated with a "ROBUST" surface treatment. The layer order differs between the two raw materials only in that it is not necessary to use a zinc coating in the case of aluminum (since the aluminum material alone can be considered corrosion resistant).



“ROBUST” surface treatment not only plays a role in corrosion protection, but also provides a much higher level of resistance to mechanical impacts, especially scratches, compared to conventional coating layers.

This is ensured by the microparticles in the outer surface layer.

In addition to its mechanical resistance, the “ROBUST” surface also meets the highest level of UV resistance, so the UV resistance category is RUV 4.

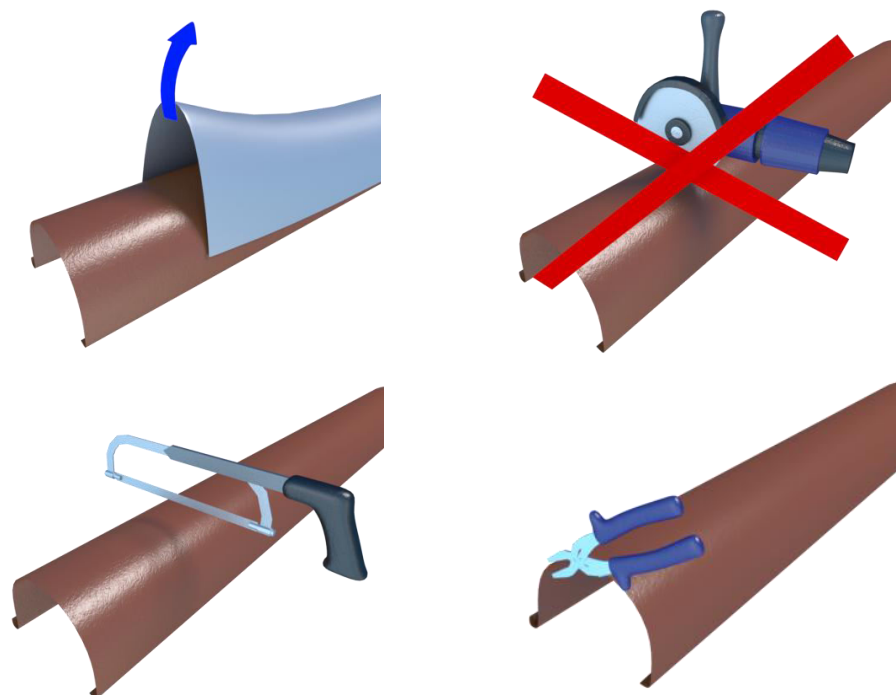
Instructions for use and machining

swissporTON rain gutter and drain pipe elements are covered with a protective film. This protective foil must be removed within 15 days after installation!

Gutter and drain elements must be stored horizontally and on a stable surface!

If the surface of the gutter is damaged, apply the color matching repair paint to prevent corrosion!

Do not use an angle grinder for cutting, as this will heat up the material and the flying hot particles will damage the coating. Cut the duct elements and drain pipes with a hacksaw or sheet metal shears and remove the burrs formed during cutting with the sheet metal shears as well! When cutting steel-based elements, the zinc layer that protects the surface is pressed to the cut edge by the edge of the cutting shears, so that it remains corrosion-resistant. In the case of aluminum elements, the base material provides the corrosion resistance.



The installation of the swissporTON rain gutter system can therefore be carried out with conventional hand tools (deconger, plastic hammer, hacksaw, screwdriver, measuring rod / cord, sheet metal shears, etc.).

Do not use a high-pressure cleaner when cleaning the gutter system!

III. Sizing based on the standard rainwater load

The required size of the gutter and the drain pipe can be calculated according to the German DIN 1986 standard. When sizing, the following must be taken into account:

- roof surface size
- runoff coefficient
- specific value of the rainfall intensity

According to the specification, the size of the gutter is assigned to the cross-section of the drain pipe.

It is important to note that the "specific value of the rainfall intensity" does not mean the average annual rainfall. It refers to a short-term rainwater flow with a higher load (e.g. the specific water flow of the most intense 5 minutes of a downpour). As this value can be extremely diverse even within a typical area, the standard sets a benchmark for each country (and typical regions within a country).

In Hungary, this value varies between $0.0159 \text{ l/s} \cdot \text{m}^2$ and $0.0274 \text{ l/s} \cdot \text{m}^2$

For safety, it is usually rounded up to $0.03 \text{ l/s} \cdot \text{m}^2$

The “runoff coefficient” takes into account the time delay between the occurrence of the peak rainfall and the actual run-off of precipitation (this value therefore shows a significant difference especially for green roofs, where the time difference increases highly).

Thus, using the factors detailed above, we can calculate the amount of rainwater to be drained as follows:

$$V = \psi * A * \frac{r}{10000} \quad [\text{l/s}], \text{ where}$$

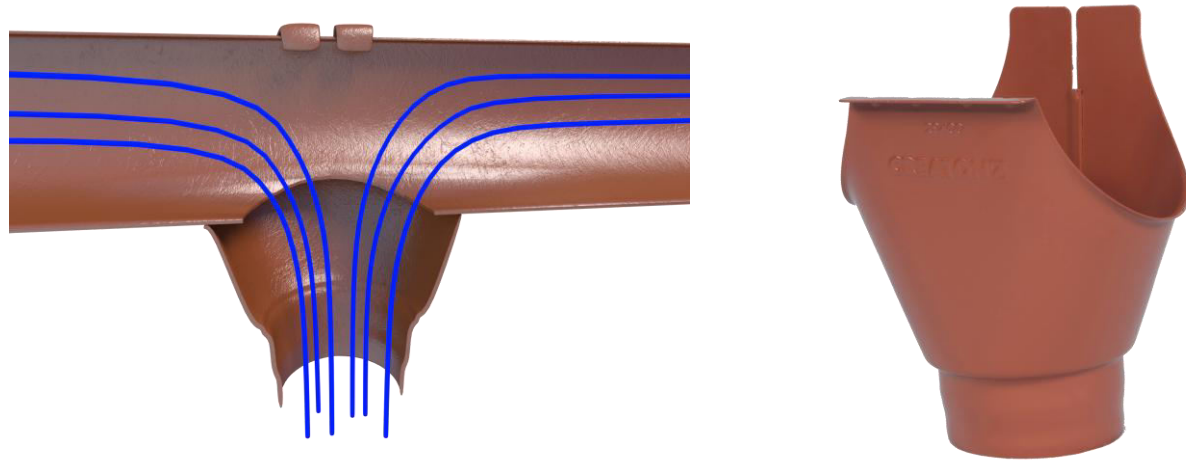
- V: amount of rainwater to be drained [l / s]
- ψ : runoff coefficient (always 0.3 for high roofs)
- A: connecting roof surface sizes [m²]
- r: specific value of the rainfall intensity [l / s * ha] (so the dividing in the formula means the conversion of square meters into hectares). Its value in Hungary is 300 l/s*ha

The cross-section of the drain pipe must therefore drain the amount of rainwater calculated in this way. The following table contains the drain pipe cross-section values, which are capable to drain a certain amount of rainwater. It also contains necessary rain gutter nominal sizes which are matching with the drain pipe size.

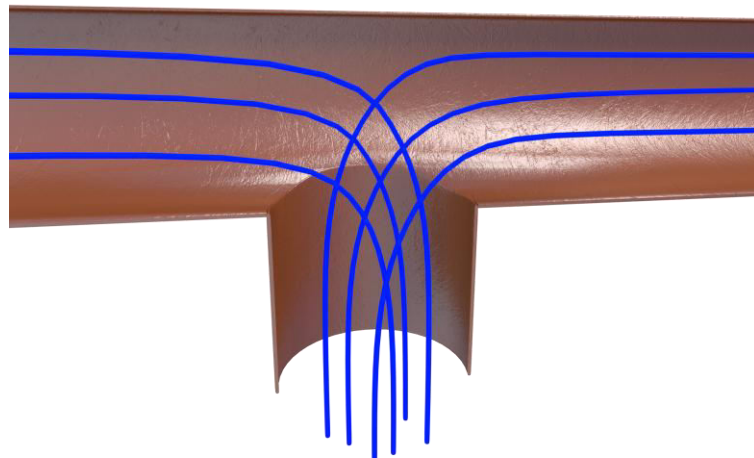
V (amount of rainwater) [l/s]	D _i (drain pipe diameter) [mm]	cross-section [cm ²]	D _{cs} (gutter nominal size) [mm]
1,2	60	28	200
2,6	80	50	280
4,7	100	79	333
7,6	120	113	400
13,8	150	177	500

If the size of the roof surface exceeds a certain size, the drain pipe should drain such a high amount of rainwater that we do not find a suitable diameter in the table. In these cases, it is advisable to build two (or more) drainpipes for a gutter section instead of one. Thus, the size of the gutter is not need to be changed, so e.g. if the amount of rainwater is 9 l / s, then by installing two 100 drain pipes, it is still enough to use a 333 gutter.

The values in the table can only be used if the geometry of the outlet is „cone shaped” (like the swissporTON outlet). The design of these outlets ensures the laminar water flow inside, which provide an optimal water drainage.



In cases where a cylindrical (non-conical) drain is used, a 30% larger drain pipe must be chosen! The water flow parameters of these cylindrical outlets are much less favorable.



It is also necessary to choose a larger drain pipe for taller urban buildings, where the risk of ice plugs may increase (due to the longer drain pipe on the one hand and the shading effect of adjacent buildings on the other).

IV. Fastening the rain gutter

1. Fixing the rain gutters

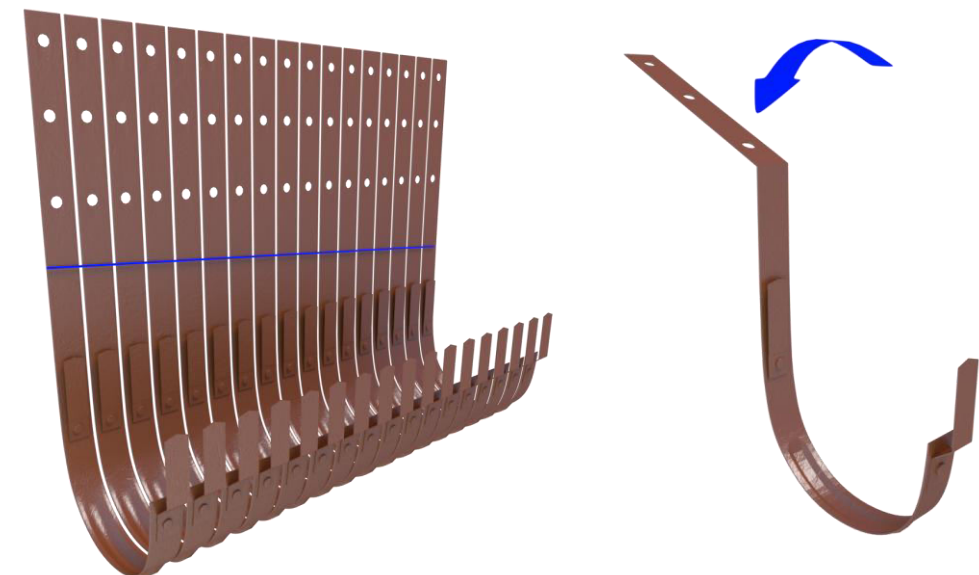
There are several solutions for rain gutter supports. In the swissporTON gutter system, two products are available for this purpose, the gutter hook and the eave board bracket.



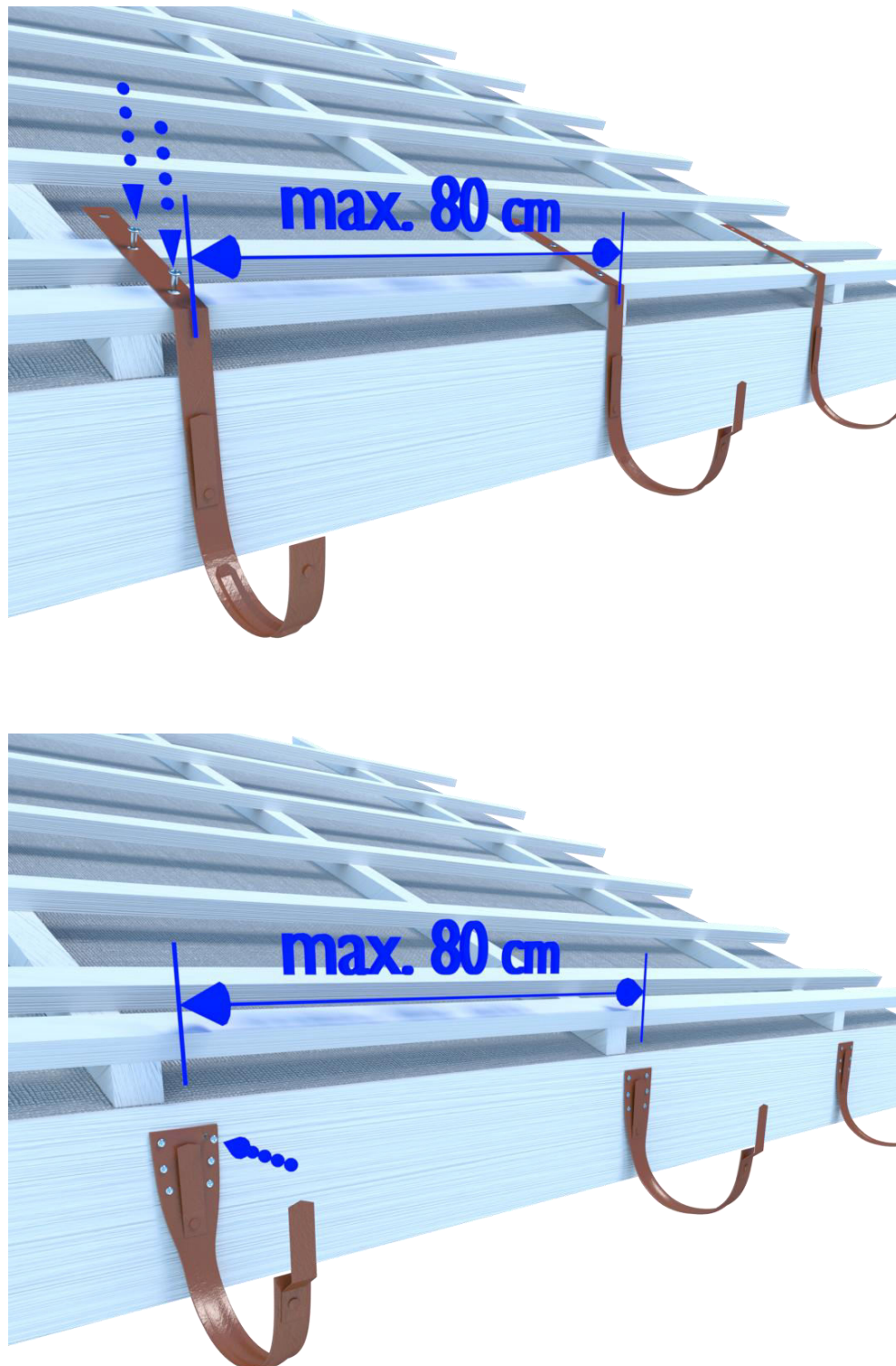
The various gutter brackets must comply with EN 1462 („Brackets for eaves gutters”) standard. The gutter hook should be mounted on the eave plank or at the end of the rafters/counter battens, while the eave board bracket should be attached to a fascia board with an appropriate. Corrosion-resistant screws or nails are usually used for fastening.

Gutters must always be installed with a slope, which can be achieved through the gutter brackets. The slope must be at least

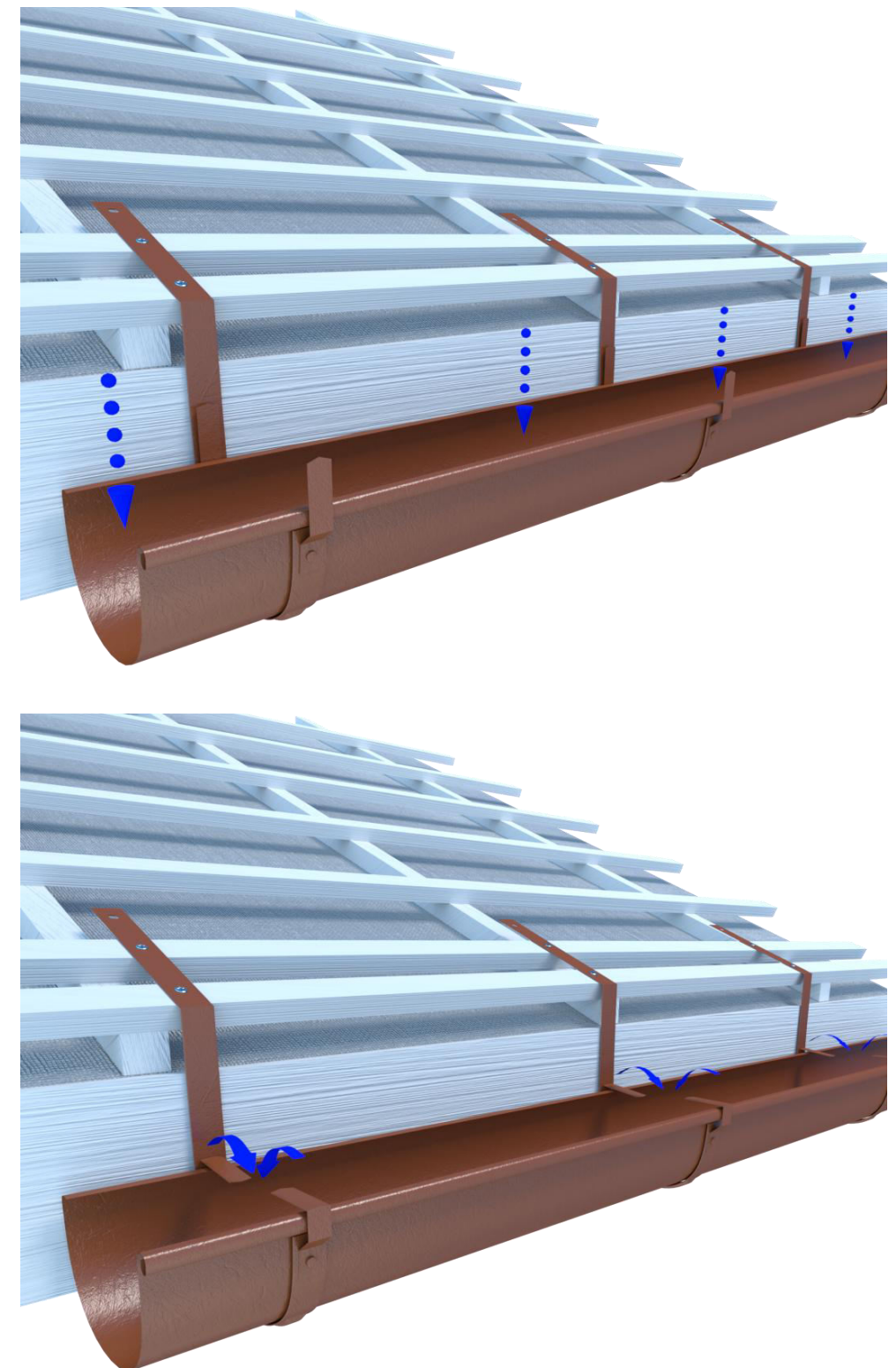
The slope of the gutter can be achieved by properly bending the gutter hooks. It is advisable to mark the bending location in advance on the brackets and then install the bent brackets in the appropriate order.



The distance between the gutter brackets should not exceed 80 cm. The first and last brackets (end brackets) must be placed 10 cm from the edge of the roof.

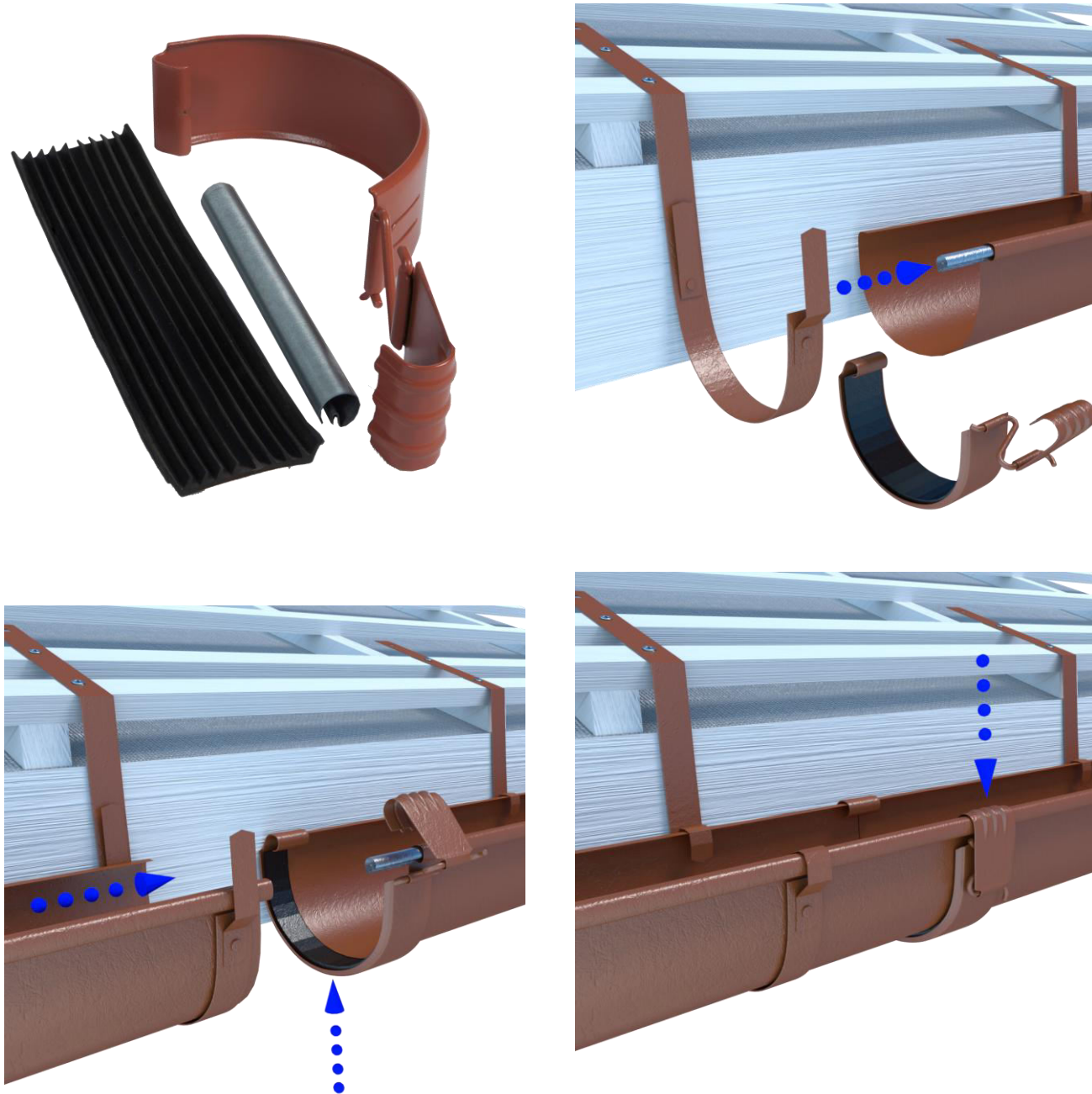


The swissporTON gutter brackets are easy to use due to their design. After they are installed and the gutter is inserted, the two fixing plate must be folded down by hand, to fix the gutter to the bracket properly.

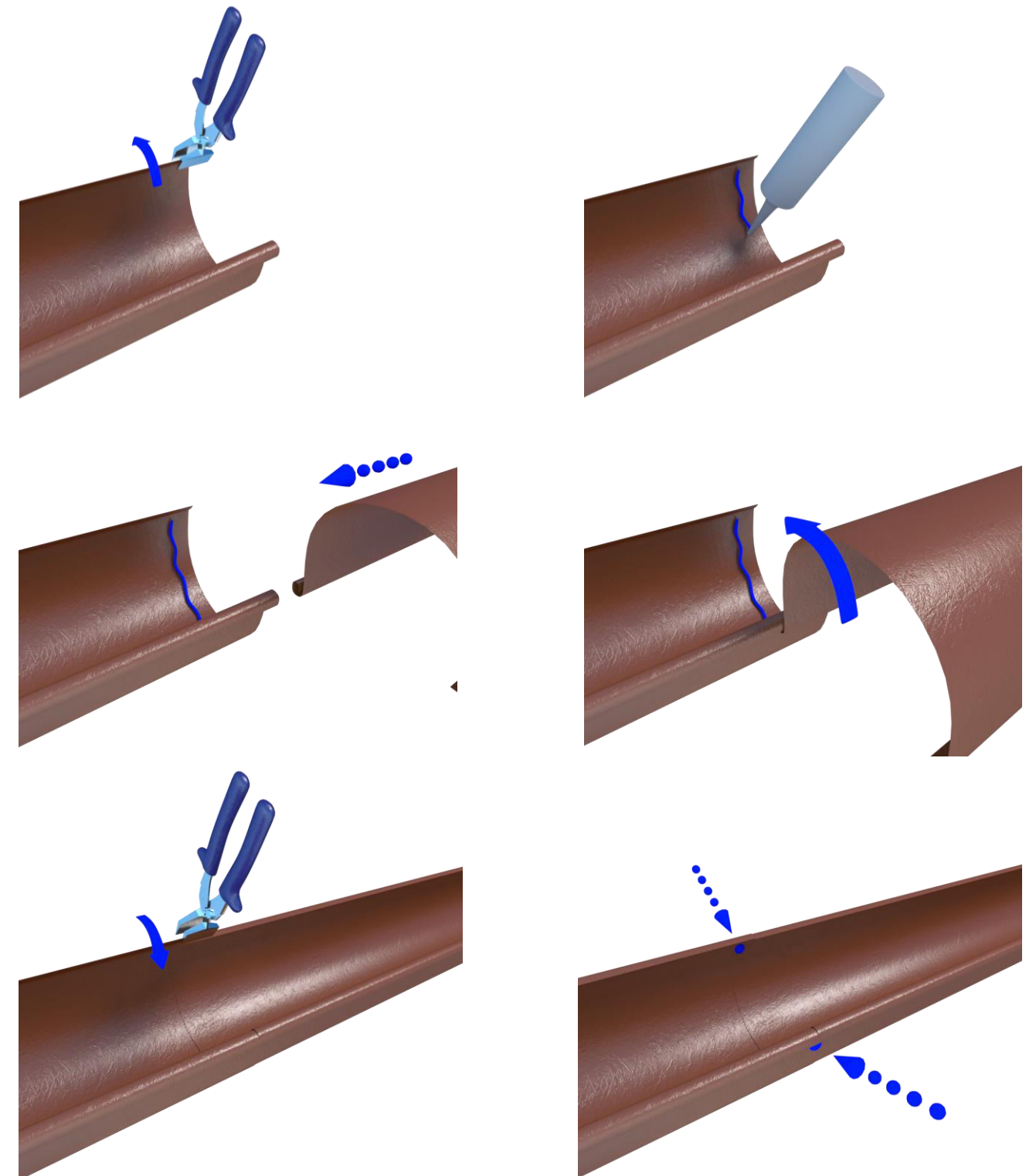


2. Gutter extensions and dilations:

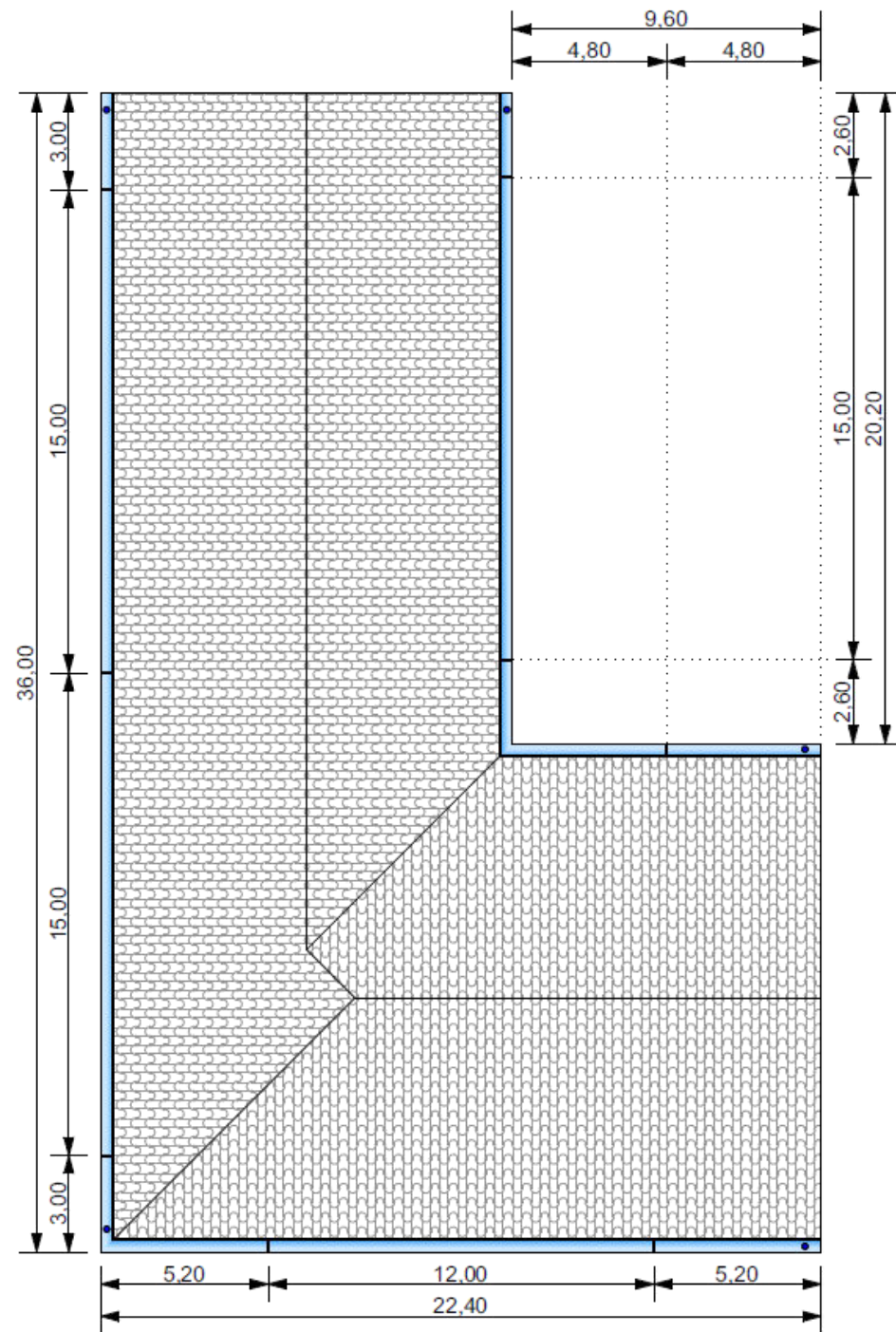
The individual gutter pieces must always be connected to each other in a watertight way. This purpose is served by e.g. the sealing connector shown in the figures below. It provide a quickly and safe connection for the gutters. The same element can be used to connect external / internal corner elements.



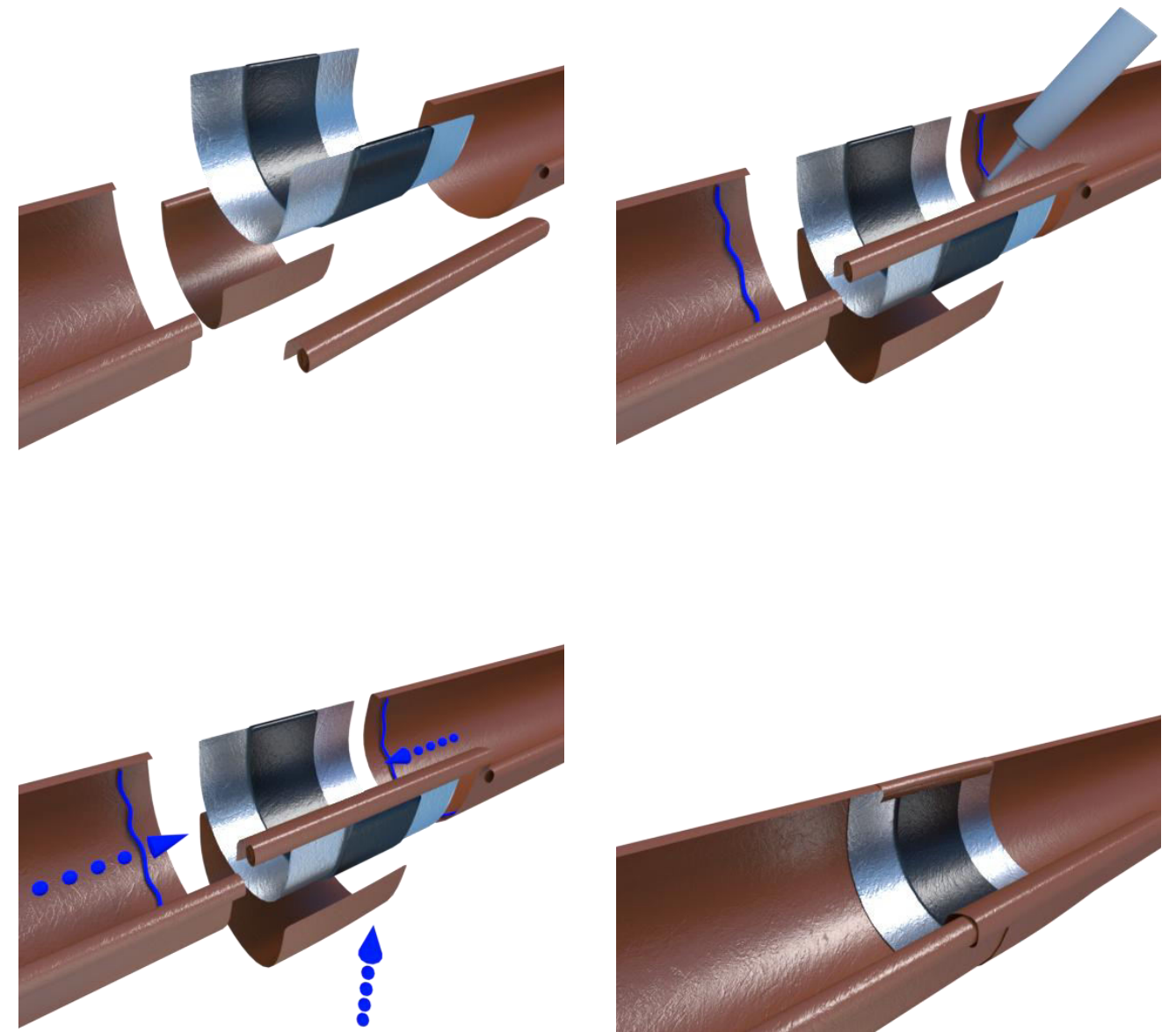
The joiner element can be used only for the steel gutter. The extension of the aluminium gutters can be made with rivets and with silicon-glue.



The dilatation movement has to be provided for the long continuous gutter sections, even when they consist several shorter gutter pieces, connected with the joiner element. The length of each expansion section must not exceed the guideline value of 15 m. The corners (inner, outer) and the ends of the channel are considered fixed points. For these, always take into account half of the guideline value! Gutter sections exceeding the guide length must be dilated either with a flat EPDM expansion filler or with a movable connection in the outlet (the CREATON outlet element is not suitable for this purpose).



The use of an in-plane dilatation filler is a more flexible and simpler solution, as it allows the drainpipe sections to be located independently of the dilatation points. The following illustrations help you to use the dilatation filler. For such a connection, use a silicone sealant between the dilatation filler and the gutter.

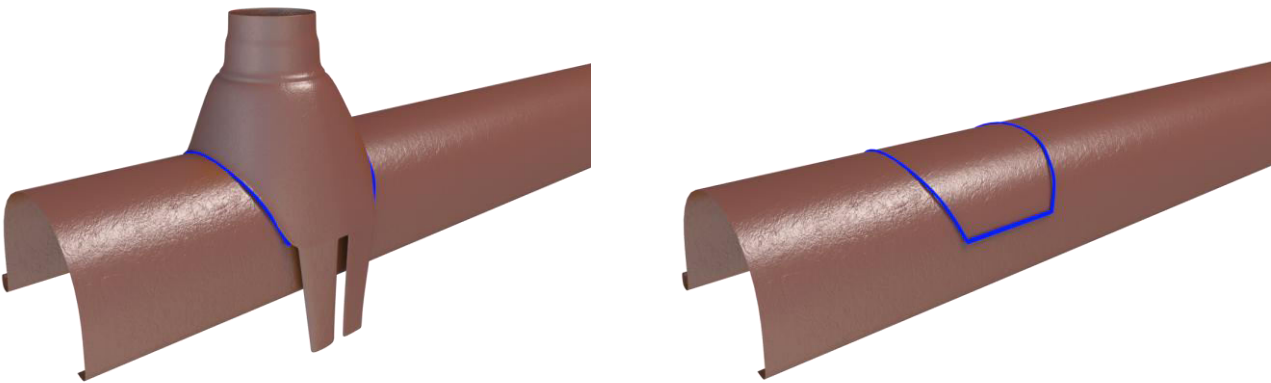


3. Drain pipe and its components

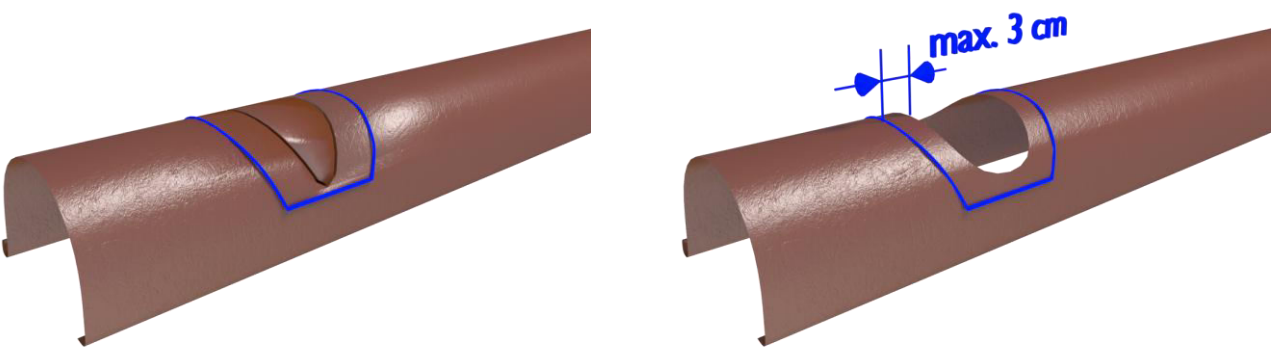
3.1. The outlet

The rainwater captured and collected by the gutter is conveyed to the ground level (or a drainage system below ground level) through the drain pipe. The watertight connection of the gutter and the drain pipe can be made using the swissporTON outlet, which also ensures the laminar flow of rainwater from the gutter.

As a first step, the bottom of the gutter must be cut out where the drain pipe will connect to it. Mark the cutting area by placing the outlet element into its future position.



It is advisable to start the cutting with a hacksaw and then expand it into a circular shape with sheet metal scissors. The cutting edge should be at max. 3 cm from the marking. Do not use an angle grinder for cutting, as this will heat up the duct material or hot bouncing particles will damage the coating.

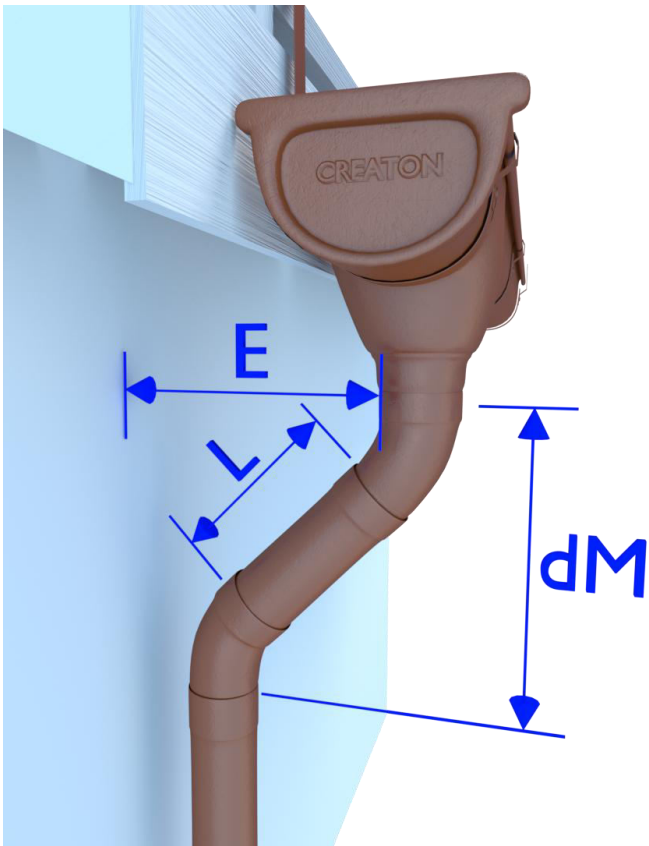


After the gutter has been cut out, the cutted edge is hammered off so it will not influence the flowing water. Then the outlet can be easily fitted and secured by folding down the locking tabs by hand.

3.2. Drain elbow design

When designing the drain pipe elbow, the overhang of the roof eaves (E) and the height difference (dM) between the gutter (in this case the lower plane of the outlet element) and the upper plane of the drain pipe must be taken into account. The swissporTON gutter system also includes 42 ° and 72 ° elbows. A cutted piece from the drain pipe with the appropriate length (L) is inserted between the two elbow elements. The drain pipe is cut with a hacksaw and the burr formed during cutting is removed with a plate-cutting scissors! The values in the table below were determined using two 72 ° elbow elements!

E	dM [mm]	L
220	275	0
270	290	100
300	300	135
350	320	185
400	340	240
450	355	290
500	375	345
550	395	400
600	410	455
650	430	505
700	450	560
750	465	610
800	485	665
850	505	720
900	520	770
950	540	825
1000	555	880
1050	575	930
1100	595	985
1150	610	1040

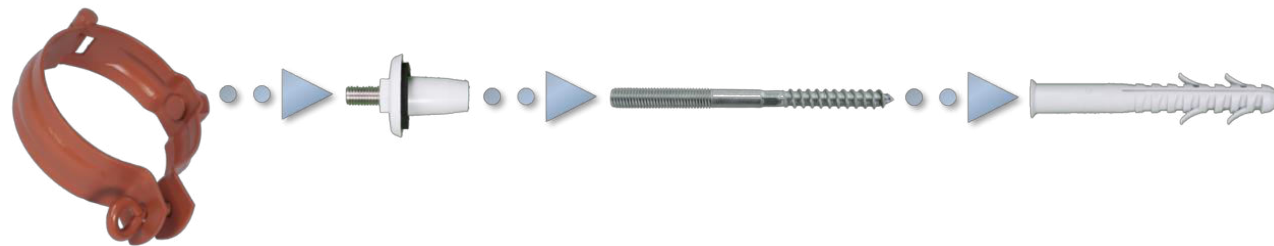


3.3. Fixing and installing the drain pipe

Drain pipes of different lengths must be fastened to the façade of the building with pipe clamps with min. 2 cm gap to the façade. Use the accessories of the swissporTON gutter system for fixing on thermally insulated facades. For different thermal insulation thicknesses, 5 different sized spacers are available („Drain pipe clamp support for thermal insulation“). These contain an integrated thermal bridge breaker.



When using screws with dowel (mostly for post-installation), a thermal bridge breaker (called "Thermo stop") must be used against the formation of point-like thermal bridges.



In all cases, the drain pipes must be secured with drain pipe clamps at least every 1.5 m!

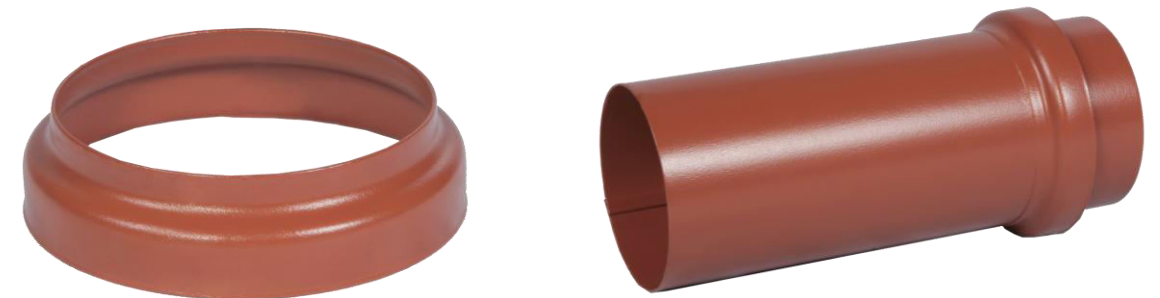
One end of the drain pipes in the swissporTON gutter system has a larger diameter. Thus, it is not necessary and not recommended (to allow the heat movement) to solder the two drainpipes to each other. If the height of the building requires the cutting of the drain pipes, we can connect the two cut elements easily with the help of the drain pipe adapter.

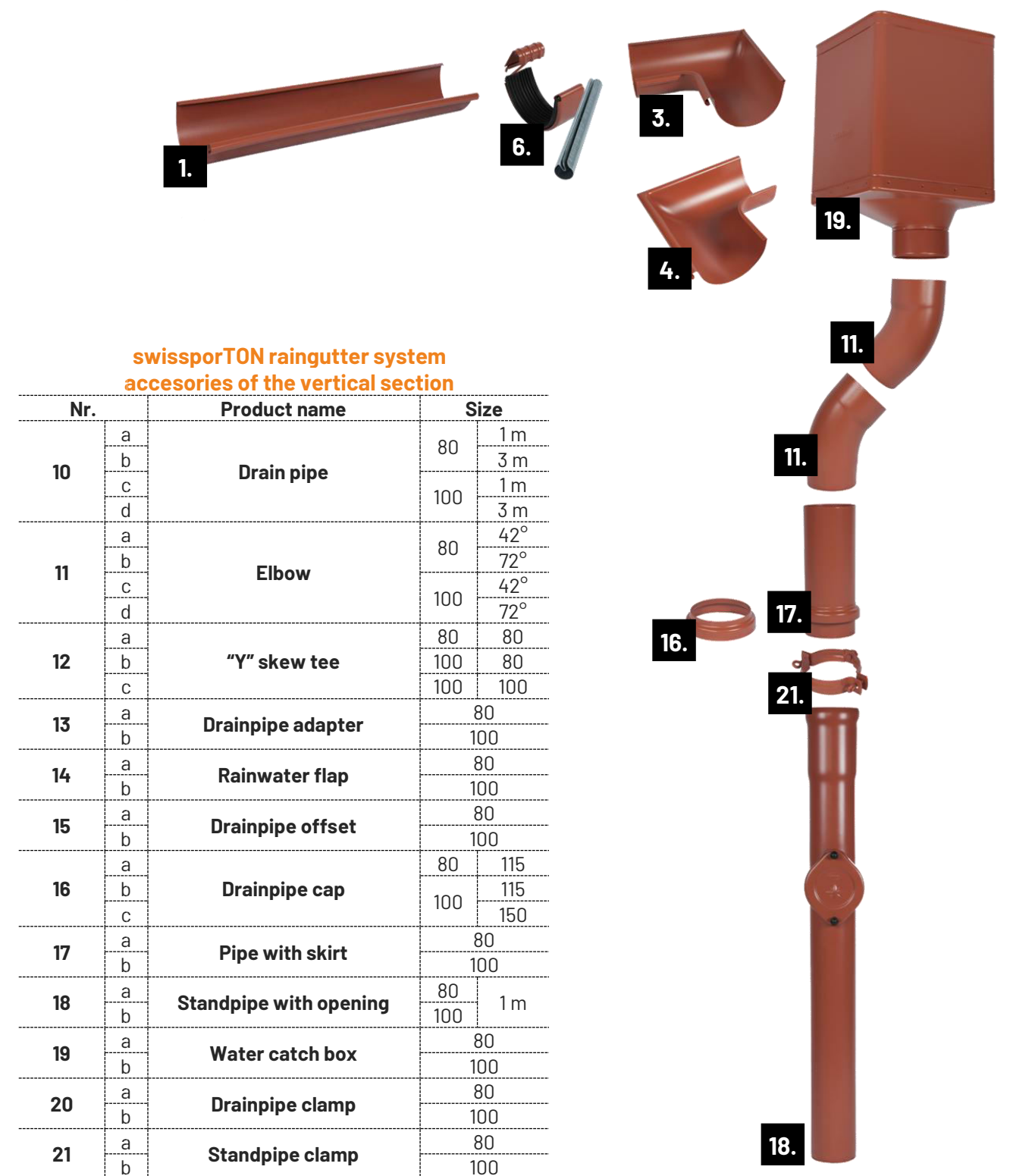
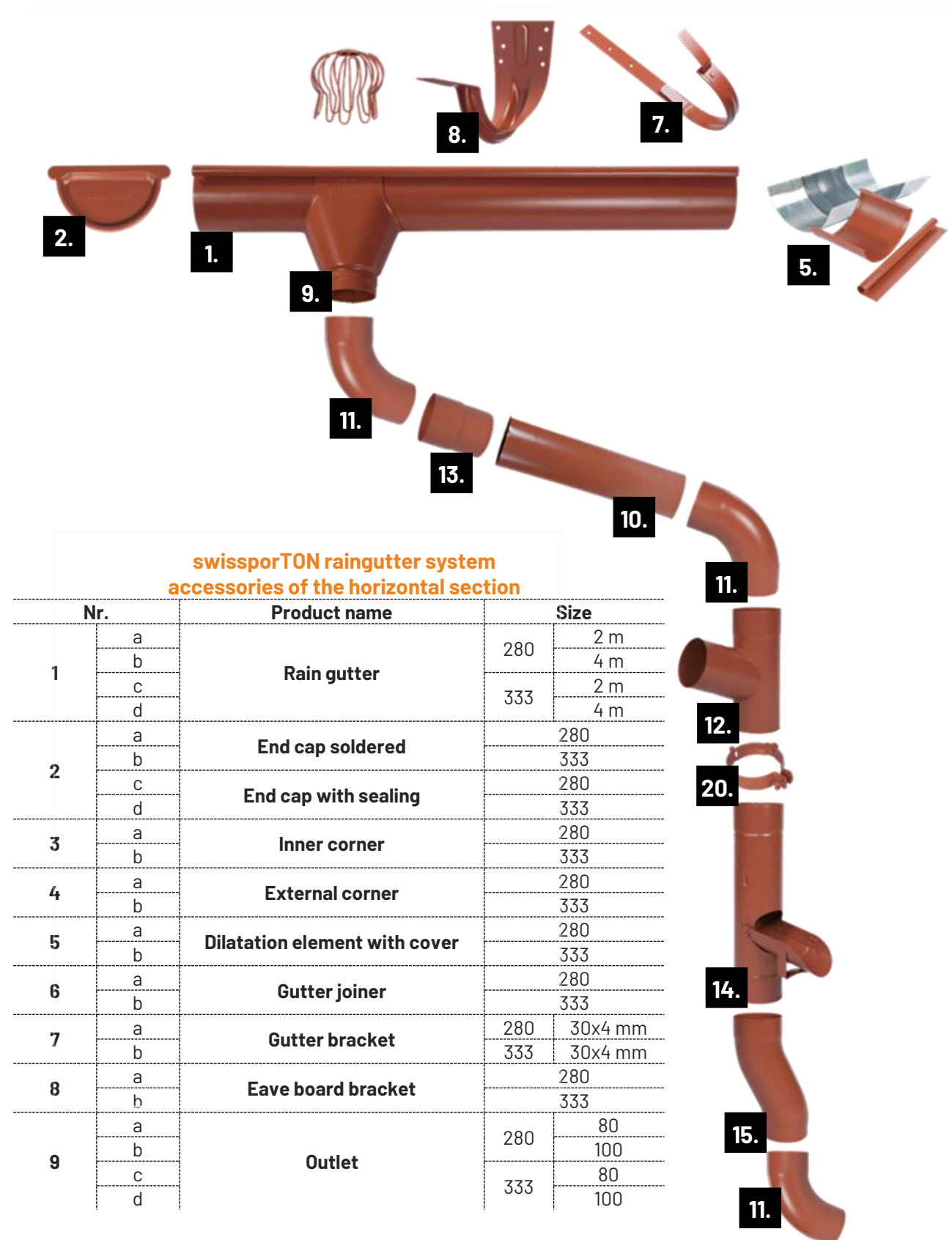


If there is pedestrian or vehicle traffic next to the building, the lower section of the drain pipes can be replaced with a reinforced standpipe. The standpipe has a larger wall thickness than the drain tube, making it more resistant to possible damages.



The standpipe include a cleaning opening. The connection between the drainpipe and the standpipe can be made easily with the skirted pipe or with the drain pipe closer.





This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



CREATON South-East Europe Kft.

8960 Lenti, Cserépgyár u. 1.

Tel: +36 92 551 550

Fax: +36 92 551 559

e-mail: info@swisspor.hu

swissporTON.hu

We reserve the right for color changes due printing and technical changes.
Content closed 2025 September