

ADVICE

GENERAL ADVICE



Run-off water from copper items must not touch or be left to pool in robust items!

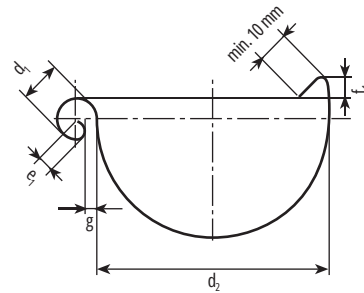


Treat materials with care!

Dimensions for Half-Round Gutters

All dimensions indicated in mm

nominal size			400	333	280	250
par ts			5	6	7	8
cut width		+1/-2	400	333	280	250
	d ₁	±1	22	20	18	18
	d ₂	+2/0	192	153	127	105
	e ₁	±1	9	9	7	7
	f ₁	min.	11	11	11	10
	g	±1	6	6	6	5

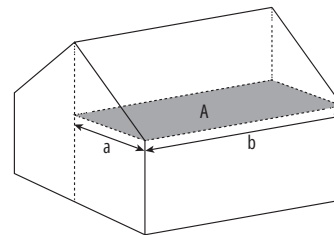


d_1 and d_2 = external dimensions

Determination of Gutter Size

The size of the down pipe results from the choice of the outlets.

connected roof area A	benchmark for gutter	benchmark for outlet
up to 70 m ²	250	250/80
up to 80 m ²	280	280/80
up to 150 m ²	333	333/100
up to 240 m ²	400	400/120



connected roof area $A = a * b$

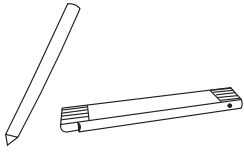
NOTES

A blue rectangular box is drawn on the right side of the grid. It is approximately 10 units wide and 10 units high, with its bottom-left corner at (550, 100) and its top-right corner at (650, 200).

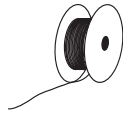
TOOLS

Choosetoolaccording to installation as required.

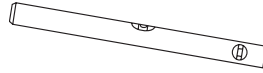
Pencil & Yardstick



Plumb Line



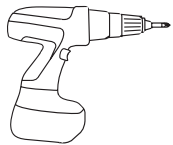
Level



Plastic / Soft Face Hammer

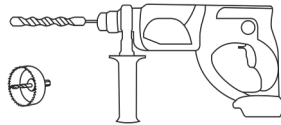


Cordless Screwdriver



Drill

Depending on requirement



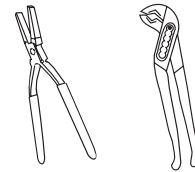
Gutter Hook Bending Tool

alternative: vise

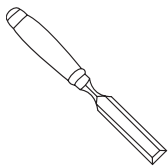


Flat Pliers

alternative: pipe wrench



Crowbar



Hacksaw & Woodsaw

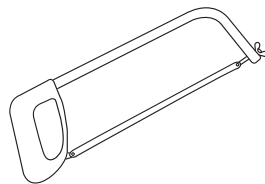
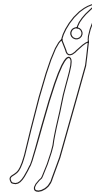
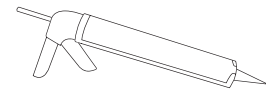


Plate Shears

alternative: ideal / round shear (left, right)



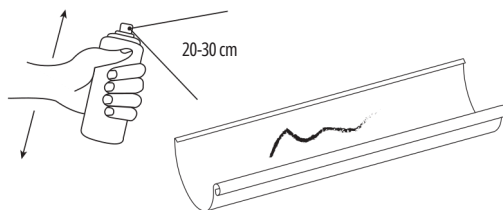
Sealant Gun



CORRECTION SPRAY

use correction spray for small scratches on painted gutter system

A Correction Spray

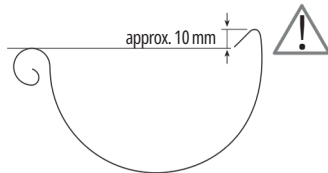


- ① Clean surface
- ② Shake tin thoroughly
- ③ Spray evenly thin coats of varnish from a distance of 20-30 cm

GUTTER BRACKETS

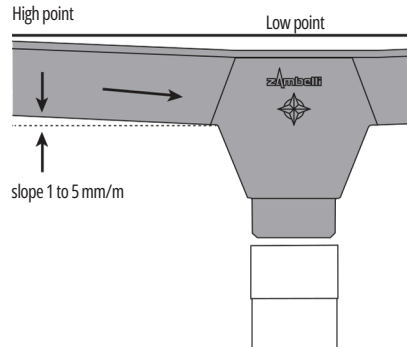
Fall of Gutters

The fall of the gutters avoids dammed water from overflowing over the front of the gutter.



Slope

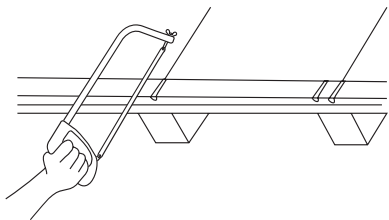
Install gutter bracket with a slope of 1 to 5 mm/m in direction of the outlet.



A Gutter Hook - Plumbers Solution

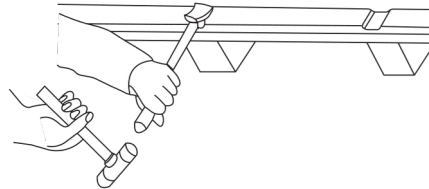
for installation on the rafters rather than on the fascia board

①



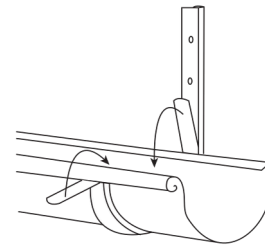
Saw a shallow recess for gutter hook at rafter spacing with a woodsaw.

②



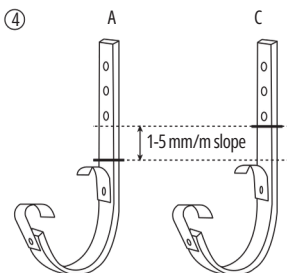
Chisel out or rout recess for gutter hook.

③



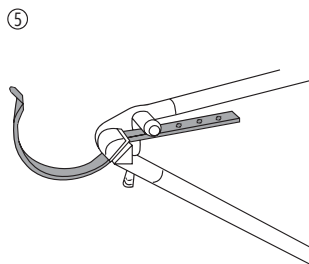
Place external gutter hooks A and C at the end of the gutter so that they line up at the bulge and bend the springs of the gutter hook. Then remove the gutter from the gutter hooks keeping the springs closed.

④



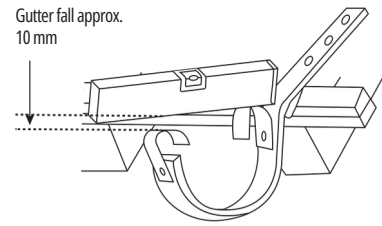
Mark the high and low points on the gutter hook A and C according to the slope (1-5 mm/m) to determine the bending point.

⑤



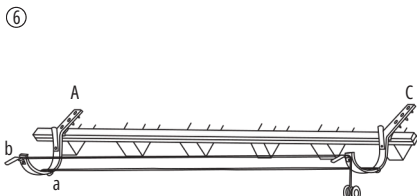
Bend external gutter brackets A and C at the respective marking with gutter hook bending tool.

Gutter fall approx. 10 mm



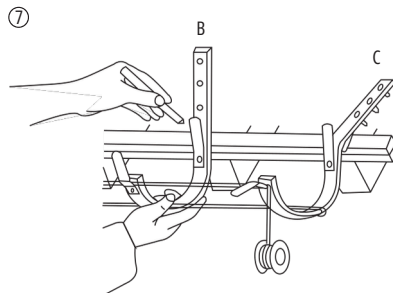
Check, whether the gutter fall created is approx. 10 mm (see infobox above)

⑥



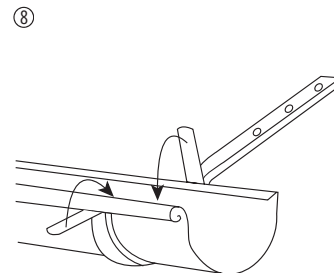
Fix the first gutter hook (A) at the lowest point and the last hook (C) at the highest point in the sawn recesses. Pull a plumb line taut between both brackets at the bottom centres (a) and over the open springs (b).

⑦



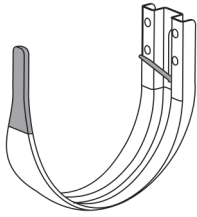
Lay the next gutter bracket (B) against the plumb line, mark the next bending point on the bracket, bend the bracket and affix it into its recess.

⑧

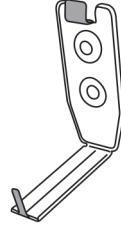


Remove plumb line, insert gutter and fix gutter in place by bending both springs (first front springs, then rear springs).

Springs on Gutter Hooks

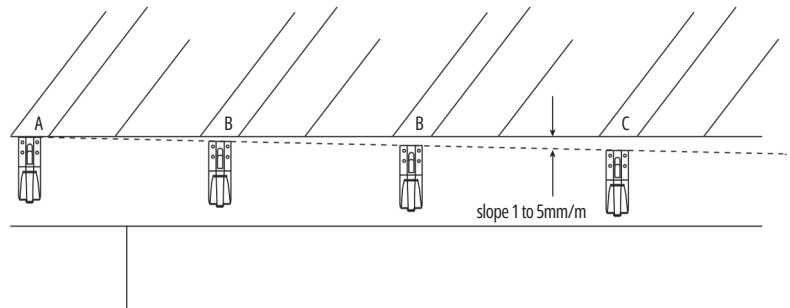
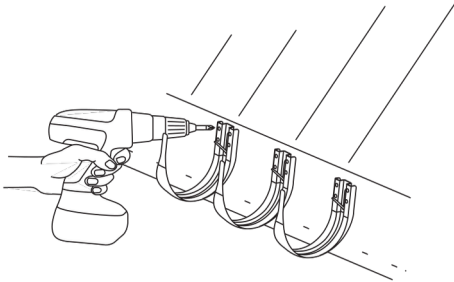


Safety Spring on Adjustable Unit



B Fascia Hanger

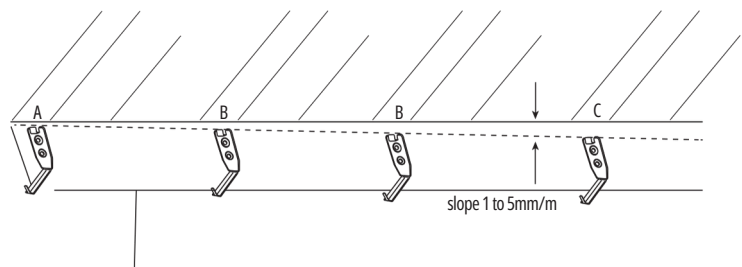
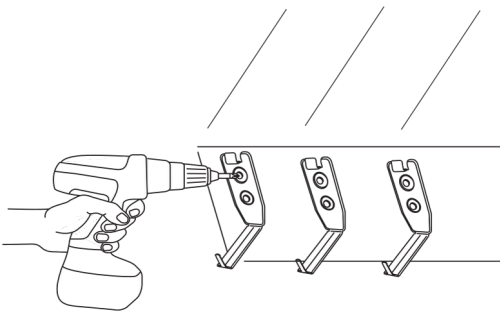
for installation on vertical fascia board



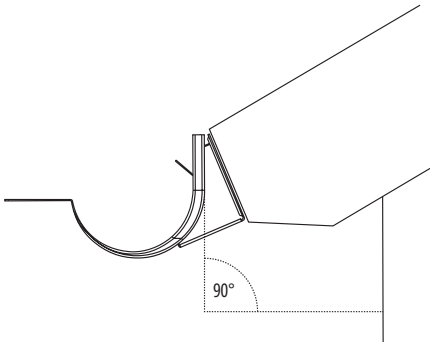
- ① Install first (A) and last (C) fascia hanger by the rafter clearance. Allow a slope of 1-5mm/m.
- ② Stretch plumb line between the two fascia hangers (A+C) and align the other fascia hangers (B) on the plumb line to ensure the slope.
- ③ Remove plumb line and insert gutter.
- ④ Fix gutter in place by bending the two springs (first the front springs, then the rear springs) of the fascia hangers.

C Fascia Hanger with Adjustable Unit

for installation on inclined fascia board

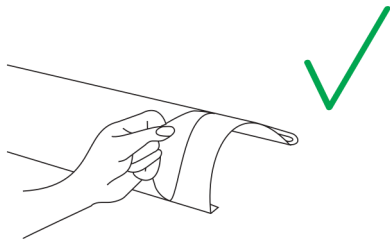


You can make the gutter brackets perpendicular with the help of the adjustment facility. The adjustable unit can be installed at 8°-44°. So, the angle of the fascia board no longer matters and doesn't need to be made perpendicular itself.

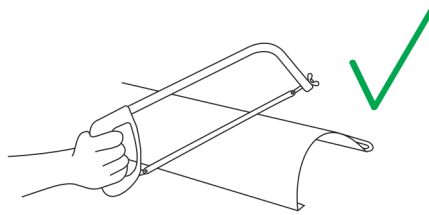


- ① Install first (A) and last (C) adjustable unit at rafter centres on fascia board. Allow a slope of 1-5mm/m.
- ② Stretch plumb line between the two fascia hangers (A+C) and align the other fascia hangers (B) on the plumb line to ensure the correct slope. Install fascia hanger in rafter centres.
- ③ Remove plumb line and mount fascia hanger on top.
- ④ Close upper flap of the fascia hanger.
- ⑤ Adjust all fascia hangers (same position for all fascia hangers) so that the fascia hangers are plumb (90°).
- ⑥ Close lower safety flap of the fascia hanger.
- ⑦ Fix gutter in place by bending the two springs (first the front springs, then the rear springs) of the fascia hangers.

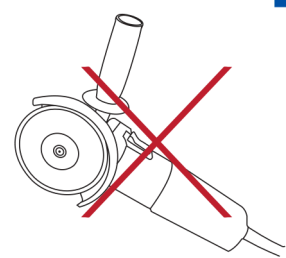
GUTTER



Remove protective film from gutters and pipes!



Gutter has to be cut cold!

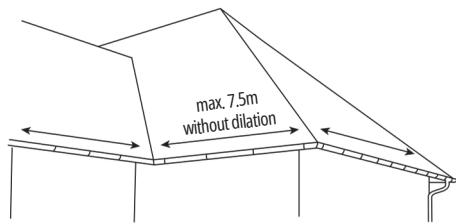


Don't use a cutting machine!

Expansion

Some materials expand and contract more (or less) than others in differing temperatures. This potential for expansion, though small, can be allowed for by the following possibilities.

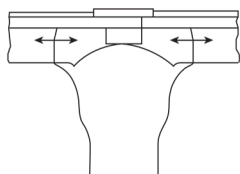
steel	0,012 mm/mK
copper	0,017 mm/mK
titanium-zinc	0,022 mm/mK
aluminum	0,024 mm/mK



Maximum length possible before allowance for expansion must be included: 15m
For distances between corners only half length is appropriate.

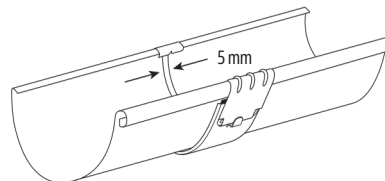
The following options can be used to allow for expansion:

Low Point Sliding Joint



overlap of both gutters: 80mm

Gutter Connector

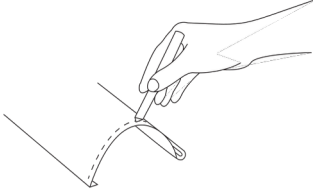


gutter connector with a distance of 5mm between the gutters allows for expansion (only with steel)

A STOP END

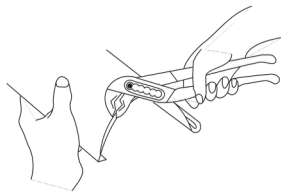
for seaming

①

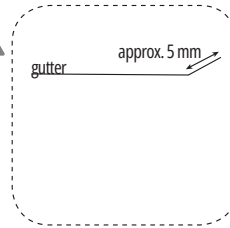


Make a marking at approx. 5mm from gutter end.

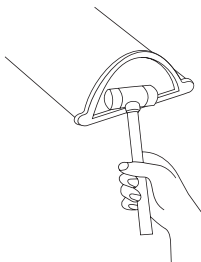
②



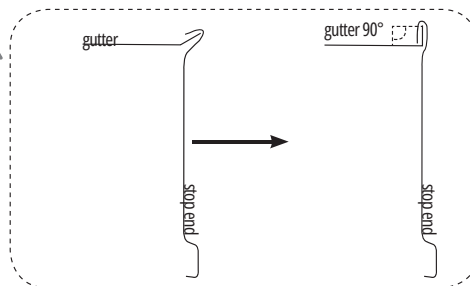
Seam outward at the marking approx. 5mm with the help of flat pliers



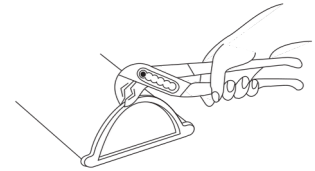
③



Put on the stop end and hammer firmly all round until it reaches 90°.



④



Close seam with flat pliers. Attention: Don't scratch!

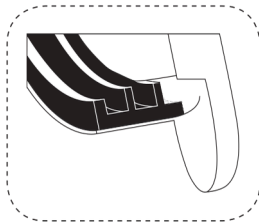
B Stop End for Push-On

for simple push-on

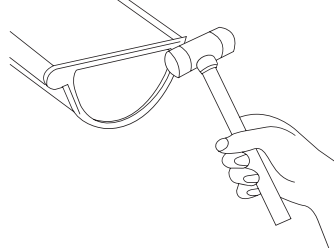
①



Insert rubber seal. The direction of the rubber is important to the quality of the seal: The edge beginning with the three peaks should be toward the gutter.



②

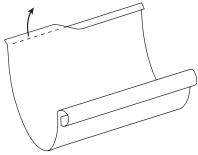


Push on the stop end and bear it with a soft face hammer.

CONNECTING GUTTERS

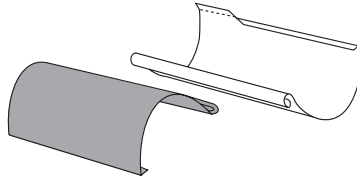
A Glue

①



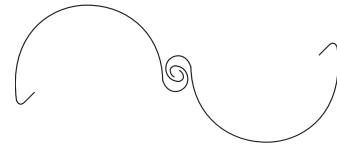
Open water seam sufficiently with the help of flat pliers.

②



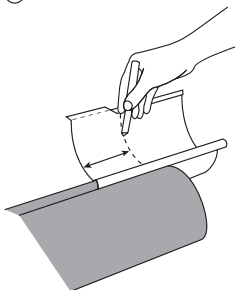
Position gutters shifted with beads to each with the required overlap of approx. 80mm.

③



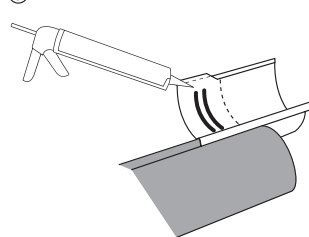
Twist both gutters together by the beads.

④



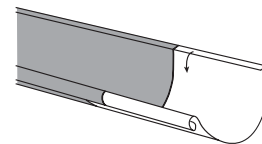
Make sure to have enough overlap of the gutters and mark the overlap.

⑤



Apply two rows (minimum 8mm apart) Dicht7 adhesive on at the cleaned, dry gutter end (marked area).

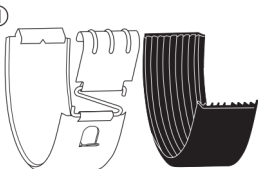
⑥



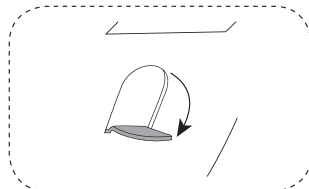
Fold gutter and close water seam with flat pliers.

B Gutter Connector

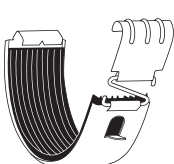
①



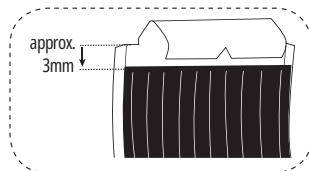
Open security tab on the gutter connector.



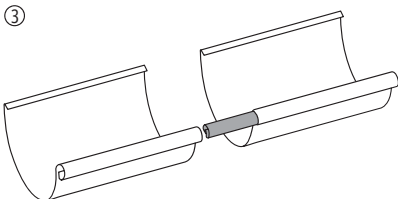
②



Stick in rubber seal approx. 3mm below the notch and make it slightly stick out.

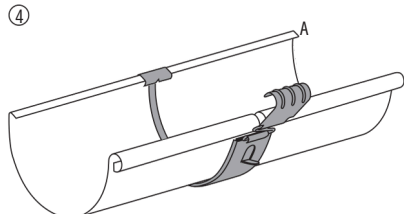


③



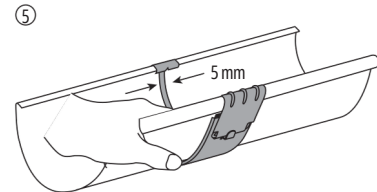
Insert the bead connector up to the fixing point (not needed with repairs). Install gutters with a distance of 5mm for dilation.

④



Hang on gutter connector first over the water seam, and then pull slightly downwards and forwards in direction of the bead.

⑤

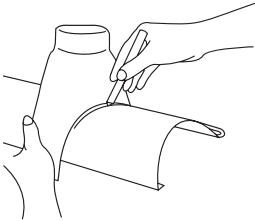


Put the clip over the bead with a bit of pressure with the heel of your hand and let it 'snap' into place. Close security tab.

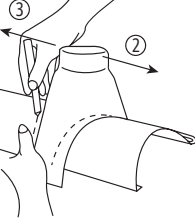
OUTLET

A Simple Installation of the Outlet

①

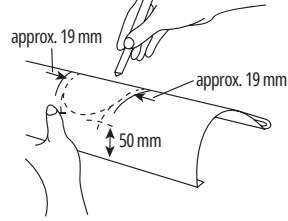


Put outlet on the gutter.
Mark outer edges of the outlet, to the left and right, on the gutter.



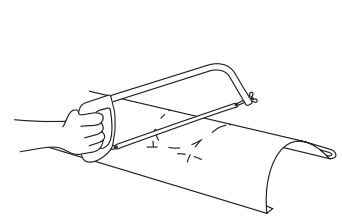
Mark again 19mm inwards from the original markings by moving the outlet accordingly (on the right and on the left).

④



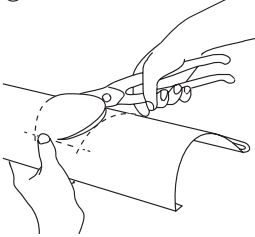
Measure 50 mm upwards of the gutter edge and mark.
Combine with the inner outlet markings to make a circle (see above).

⑤



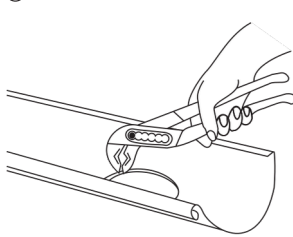
Saw slightly in the middle with a hacksaw.

⑥

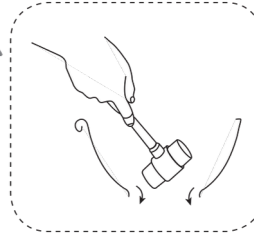


Cut out the circle with plate shears.

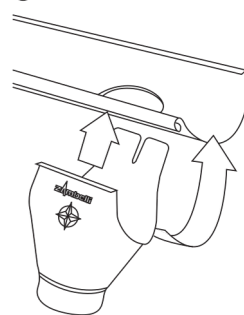
⑦



Seam with flat pliers and crimp it with a hammer.

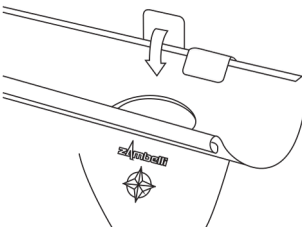


⑧



Install outlet on the gutter central to the whole.

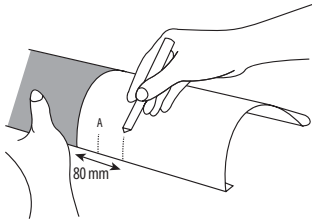
⑨



Close rear flaps.

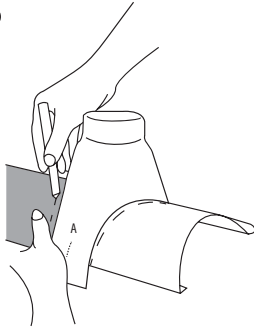
B Installation of Outlets with Low Point Sliding Joint

①



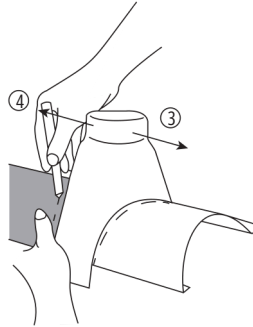
Slide gutters into each other overlapping by 80mm (see p.10/A, attention: don't use glue!). Mark 40mm in from the upper gutter's edge (A, centered to 80mm marking).

②



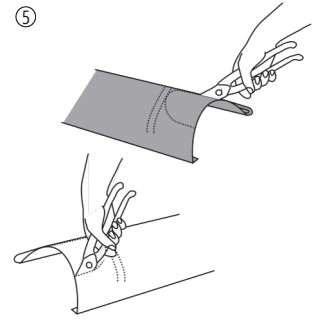
Place the outlet over the two gutters with its centre on the 40mm mark (A). Now mark the outer edges of the outlet on the two gutters - to the left and to the right.

③



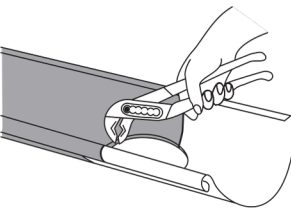
Mark 19 mm inwards from the original marks. Measure 50 mm up from gutter edge and mark that, too. Combine this with the inner outlet marks to make a circle.

④

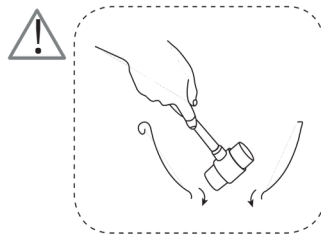


Cut out the extended semicircles on both gutters with metal shears (add semicircle on second gutter).

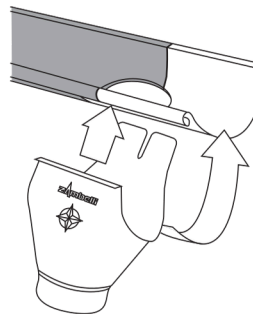
⑤



Connect gutters again (overlap by 80 mm). Seam with flat pliers and crimp it with a hammer.

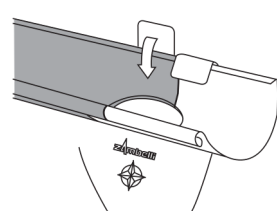


⑥



Install outlet on the gutter central to the whole.

⑦



Close rear flaps.

APPLICATION EXAMPLE OF A ROOF DRAINAGE SYSTEM

