Akasison XL
Siphonic Roof Drainage

akasison

Specification manual

aliaxis

Practical by principle

With Akasison, we have the practical solution in roof drainage. A special name, and one presented with pride. It stands for a group of specialists that always strive for better. Faster, smarter, safer. For Aliaxis it is always about the best system and solution.

We are very principled but not rigid. Because we are present on the roof, we are fully aware that a building is not designed to fit the roof drainage system, but the other way around. Rainwater drainage is only part of a larger context in which our system has to function. Which is why we like to work together.

It is about drainage based on tried and tested systems, and to never just follow the common herd. It is about craftsmanship, taking responsibility and providing top quality products and projects. Searching for innovation based on many years of experience. Improving systems and avoiding mistakes. The most valuable combination that a customer could wish for. There is nothing left to chance.

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Information and safety recommendations

Validity
This Akasison XL specification manual 2024 is valid from May 2024. With the release of this edition all previous specification manuals are no longer valid. The latest valid technical information can be downloaded from www.akasison.com.

This Specification Manual is produced with extreme care. All measurements and weights are approximate and errors and changes are reserved. Aliaxis Nederland B.V. does not accept any liability for damage caused by omitted or incorrectly referenced data in this manual.

Important information and pictograms
This manual contains pictograms to emphasize important or beneficial information:

Important information to take into account.

Consult Akasison Sales or Customer Service.

Benefit.

Additional information.

Safety and operating instructions
- Read the safety and operating instructions for your own safety and the safety of others carefully and completely before start of installation.
- Store the operating instructions and keep them available.
- If the safety instructions or operating instructions are unclear, please contact the Aliaxis Nederland Sales Office.

General precautions
- Keep your work area clean and free of obstructing objects.
- Provide adequate lighting of your work area.
- Keep unauthorized persons away of tools and the work area, especially at renovations in inhabited area.
- Use only Aliaxis Nederland and Akasison system components.

During assembly
- Always read and follow the operating instructions of the respective used tool.
- Improper use of tools can cause severe cuts, cause bruising or dismemberment.
- Improper use of tools can damage components and cause leaks
- Pipe cutters have a sharp blade. Store and handle without risk of injury.
- Note, when cutting the pipes, the safety distance between holding hand and cutting tool.
- Never grip the cutting zone of the tool or moving parts during the cutting process.

Recycling
HDPE pipes and fittings are 100% recyclable. Left over materials should be recycled as follows:
- Remainder pipe: residual waste
- Remainder fittings: residual waste
- Cleaning cloths: residual waste
- Wooden crating: recycled wood
- Carton boxes: recycled paper

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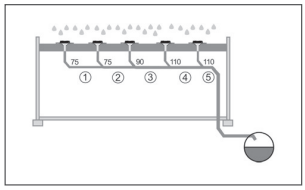
1 Applications and design guidelines

1.1 Siphonic roof drainage system explained

The Akasison system for siphonic roof drainage considerably expands the possibilities for buildings with large and complex roofs. To respond, whether a consultant or installer, to the challenges faced by your clients and end users the Akasison system offers the following benefits:

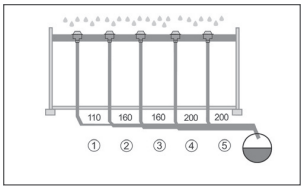
- Save space for the function and mechanical services of the building
- Total freedom & flexibility of roof drainage design
- Economical installation with a light, plastic (HDPE) and welded pipe system
- Full peace of mind from a sophisticated risk management system

Siphonic roof drainage



- Fewer down pipes
- Level pipe work
- Smaller diameters
- Less groundwork in building structure
- Use of full discharge capacity
- Self-cleaning pipes

Conventional roof drainage



- Many down pipes
- Gradient pipe work
- Larger diameters
- Groundwork in building structure
- Reduced drainage capacity due to combination of water and air

The Akasison siphonic roof drainage system is engineered on the concept of full bore (a fill rate of 100%). This implies that rainwater flows at high speed through small diameter pipe work, at normally zero gradient. This siphonic effect is created by the (kinetic) energy derived from the hydraulic head, caused by the difference in height between the roof outlet and the discharge point in a building. Specialised roof outlets prevent air from being sucked into the system. The engineering principle of siphonic roof drainage design is based on the Bernoulli energy equation for a steady flow of an incompressible fluid with constant density. In order to balance the equation, and to guarantee the required siphonic effect according to the rainfall's intensity, the ideal pipe dimensions per flow path need to be determined.

$$\rho_1 + h_1\rho g + \tfrac{1}{2}\rho V_1^2 = \rho_2 + h_2\rho g + \tfrac{1}{2}\rho V_2^2$$

Equation 1.1

1.1.1 Basic principles

The capacity of siphonic roof drainage systems is calculated according to national standards and guidelines. The basic principles of a siphonic system are:

- Rain intensity for a primary system is measured in l/s/ha according to national legislation. For Dutch legislation, for example, this intensity relates to the rain intensity that occurs on average twice a year.
- Rain intensity for emergency overflow systems also need to be installed to conform to national legislation. According to national legislation, either the emergency system, or the combination of the standard and the emergency system, must be able to fulfil that capacity.
- Collectors should be installed without any incline.
- For optimum performance, the collector pipe should be installed between 0,8 m and 1,0 m below the roof.
- Different roofs can be connected to one siphonic roof drainage system if the height difference of the roof surface is less than one metre.
- Roof sections with equal runoff coefficient can be combined on a single system. Roofsections with different runoff coefficients cannot be combined.
- Large roof surfaces (approximately 5.000 m^2) must be connected to at least two independent down pipes.

1.1.2 Design

The total volume of rainwater that has to be evacuated by the system can be calculated using equation 1.2.

$$V = i \,.\, \alpha \,.\, \beta \,.\, A/10.000$$

Equation 1.2

V = total drainage volume (l/s)
i = rain intensity (l/s/ha)
α = reduction factor roof type
β = reduction factor effective roof surface with roof under an angle
A = effective roof surface (m2)

Having calculated the total volume of rainwater that has to be drained, the number of roof outlets can be calculated using equation 1.3.

$$N_{DT} = V / V_{DT}$$

Equation 1.3

N_{DT} = number of roof outlets
V = total drainage volume
V_{DT} = drainage capacity of one roof outlet (l/s)

To determine the number of roof outlets, the structural details of the building like fire walls, roof construction and other (small) roofs that drain their rainwater onto the calculated roof surface must be taken into account. A roof outlet has to be placed on each lowest point of the roof construction. The maximum distance between two outlets is 20 m. The correct roof outlet can be chosen from the product range depending on roof construction, roof membrane, and the need for a heating element.

1.1.3 Calculation principles

A roof from which rainwater is drained by means of a siphonic system generally contains several roof outlets that are collected into a single downpipe. The Bernouli equation needs to be applied to every flow path from roof outlet (entry point) to the transition to partial filling (exit point).

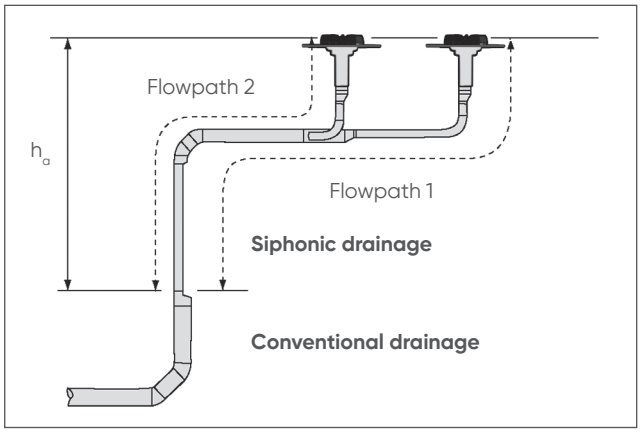


Illustration 1.1

The purpose of the calculation is to design a balanced system. A residual pressure at the exit point of every flow path of +/-100mBar is acceptable.

The static residual pressure of a flow path is equal to the available pressure difference created by the height difference between the entry point and the exit point (h_a in equation 1.5) minus the pressure loss caused by the pipe friction in the auxiliary sections of the system.

$$\Delta p_{rest} = \Delta p_{available} - \Delta p_{loss}$$

Equation 1.4

The available pressure difference is calculated as indicated in equation 1.5.

$$\Delta p_{available} = \Delta h_a \,.\, g \,.\, \rho$$

Equation 1.5

Δha = available height from roof membrane to exit point
ρ = mass density of water at 10°C: 1.000 kg/m³
g = gravitational acceleration: 9,81 (m/s²)

Pressure loss is calculated as specified in equation 1.6.

$$\Delta p_{loss} = \Sigma\,(l \,.\, R + Z)$$

Equation 1.6

l = pipe length (m)
R = pipe friction pressure loss (Pa/m) = (λ/d_i) (0,5 . v² x r) with:
λ = pipe friction factor according to Pradtl-Colebrook (wall roughness kb = 0,25 mm)
d_i = pipe section design diameter (m)
v = flow velocity in flow path (m/s) = Q_h/d_i
ρ = mass density of water at 10°C: 1.000 kg/mq
Q_h = rainwater load for the total roof section drained by the pipe
Z = minor losses of fittings (pa)

1.4.4 Calculations

The calculation of the various flow paths must begin with the most unfavourable flow path (insofar as pipe friction is concerned). In most cases, this flow path is from the roof outlet furthest removed from the exit point. To properly calculate the pressure difference and pressure loss for every flow path, and to test it against the 100 mbar standard, every flow path is divided into pipe sections (PS), see illustration 1.2. The pressure loss calculations for each individual section are summed up (Σ in equation 1.6) and subtracted from the summed up pressure differences for each pipe section. The pipe section runs from fitting (change of direction or diameter) to fitting, with the roof outlet being a separate pipe section (RO).

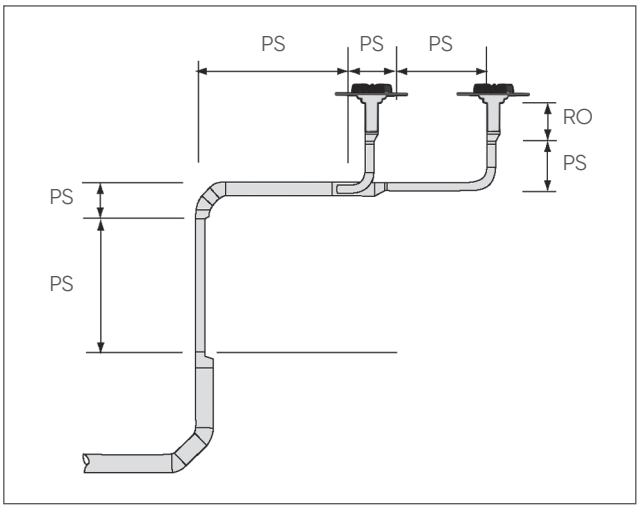


Illustration 1.2

Calculating the pressure difference of a pipe section

The available pressure difference of a pipe section is computed by replacing the Δh_a of equation 1.5 by the height difference of the pipe section.

$$\Delta p_{available,\,ls} = \Delta h_{ls} \,.\, g \,.\, \rho$$

Equation 1.7

Calculating the pressure loss of a pipe section

The pressure loss of a pipe section is calculated by using equation 1.6.

$$\Delta p_{loss,\,ls} = l \,.\, R + Z$$

Equation 1.8

l = pipe length (m) = the length of the pipe section
R = pipe friction pressure loss (Pa/m) = (λ/d_i) (0,5 . v² x r) with:
λ = pipe friction factor according to Pradtl-Colebrook (wall roughness kb = 0,25 mm)
d_i = pipe section design diameter (m)
v = flow velocity in flow path (m/s) = Q_h/d_i
ρ = mass density of water at 10°C: 1.000 kg/m²
Q_h = rainwater load for the total roof section drained by the pipe

The flow path design diameter (d_i) is the only variable in the entire calculation (with the exception of down pipe diameter) that can be modified if the 100 mbar standard cannot be met.

Pipe friction is calculated in equation 1.9.

$$Z = \Sigma\, \zeta \,.\, (0{,}5 \,.\, v^2 \times \rho)$$

Equation 1.9

ζ = *pipe friction of fitting*
v = *flow velocity in flow path (m/s)*
ρ = *mass density of water at 10°C: 1.000 kg/m²*

Minor losses of fittings can be calculated via equation 1.9.

In contrast to a standard reduction, the exit point (transition to partial filling) has a larger friction factor. This point can be incorporated in the downpipe but also in the underground pipe (horizontal).

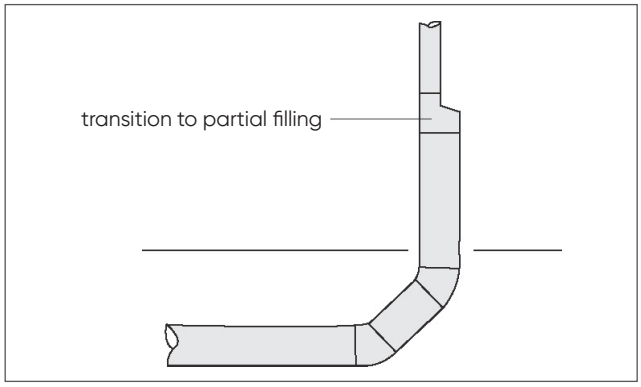


Illustration 1.3

The residual pressure is then determined by accumulating and offsetting the pressure differences and pressure losses of every pipe section.

$$\Delta p_{rest} = \Sigma\, \Delta p_{available} - \Sigma\, \Delta p_{loss}$$

Equation 1.10

If the result of the residual pressure does not remain under the stated standard of ±100 mbar, the design diameters of one or more pipe section must be adjusted and retested.

1.1.5 System requirements

This paragraph provides details about the most important factor affecting the performance of a siphonic system: the static residual pressure of ± 100 mbar at the exit point. In addition, there are a few other requirements relating to pipe strength, self-cleaning, flow velocity and the design diameter of the downpipe.

Static pressure

Due to pipe strength, the static pressure at any given point (x) in a flow path must remain within the below-stated limits:

40 - 160 mm (s12,5) : -800 mbar
200 - 315 mm (s12,5) : -800 mbar
200 - 315 mm (s16) : -450 mbar

In contrast to the exit point where the residual pressure only entails static pressure, the residual pressure at every other point (x) in the pipe system consists of static and dynamic pressure. The equation for residual pressure at point x is:

$$\Delta p_{rest,\,x} = \Delta p_{static} + \Delta p_{dynamic,\,x}$$

Equation 1.11

The dynamic pressure in the system is calculated using equation 1.12.

$$\Delta p_{dynamic,\,x} = 0{,}5 \,.\, v_x^{\,2} \times \rho$$

Equation 1.12

v_x = *flow velocity at point x*

The available pressure difference and the flow losses for point x must then also be calculated. Equation 1.12 can hence be re-written as equation 1.13.

$$\Delta p_{static,\,x} + \Delta p_{dynamic,\,x} = \Delta p_{available,\,x} - \Delta p_{loss,\,x}$$

Equation 1.13

The applicable equation for static pressure at point x can now be written as equation 1.14.

$$\Delta p_{static,\,x} = \Delta p_{available,\,x} - \Delta p_{loss,\,x} + \Delta p_{dynamic,\,x}$$

Equation 1.14

$\Delta p_{available,\,x}$ = $\Delta h_x \,.\, g \,.\, \rho$ *(available height difference between the entry point and point x)*
$\Delta p_{loss,\,x}$ = Σ *(l.R + Z) (summed losses until point x)*

Self-cleaning and velocities

To ensure the self-cleaning effect, the velocity in the system must be higher than 0,7 m/s. The permitted maximum discharge velocity is limited only by the technical limitations of the non-siphonic system into which the water discharges and, if applicable, the maximum exit velocity prescribed in the standard.

Design diameter of the down pipe

The start up volume flow can be calculated via equation 1.15

$$Q_{start} = Q_h \cdot \sqrt{\frac{\Delta H_i}{\Delta H_a}}$$

Equation 1.15

Q_{start} = *minimum drainage at the transition point from the collector pipe to the down pipe (l/s)*
Q_h = *total rainwater load connected to the down pipe (l/s)*
ΔH_i = *height difference between entry point and the midpoint of the collector pipe (m)*
ΔH_a = *height difference between entry point and exit point (m)*

Subsequently determine the design guidelines for the downpipe according to EN 12056, in which $Q_{start} > 1{,}2.\ Q_{min}$ and the length of the down pipe must be at least 4 m.

1.4.5 Emergency overflow

According to the standards, every flat roof should be able to cope with the five minute rainfall with a return period of 100 years. A light construction (steel) roof should always have an emergency overflow system. With all other roofs it needs to be checked if an emergency overflow system is necessary. This depends on the construction and shape of the roof and the expected rainfall. The emergency overflow should be able to drain the amount of rainfall exceeding the amount on which the standard system was calculated, or even the maximum 100 year storm. This differs per country, and sometimes by region.

An emergency overflow system can be constructed in a number of ways:

- Spouts through the roof edge
- Traditional gravitational system
- Siphonic roof drainage system

In a standard situation, an emergency overflow is a rectangular or round opening. This is the most economical solution, but not always possible or desired. In many projects it is necessary to drain the extra rainfall with emergency overflow roof outlets which are placed higher than the roof surface.

In the case of a siphonic emergency overflow system, the location of the emergency overflow roof outlets is important to prevent the intake of air. The location must be determined in collaboration between the builder and the designer of the emergency overflow system. In addition, the roof outlets and the connected pipes of the emergency overflow system can be divided into smaller drainage areas, with each collector having a separate outlet. The emergency overflow system must not be connected to the sewer. The individual emergency overflow roof outlets should be no more than 30 m apart.

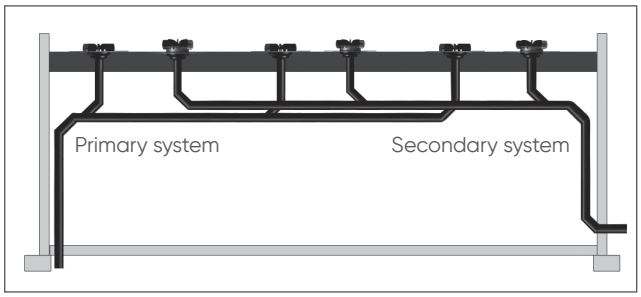


Illustration 1.4: Siphonic roof drainage system with siphonic emergency overflow (not connected to sewer)

Overflow raising piece

Several Akasison emergency outlets are available. Standard outlets can also used as long as they are installed 40 mm higher than the roofing. The required solution differs by country.

Illustration 1.5 Examples of Emergency outlets

The capacity of roof outlets with overflow raising pieces is the same as their original capacity, but without overflow raising pieces (capacity as defined in standard EN 1253).

1.2 Reinforcement of the roof profiles

The holes required for the roof outlets impair the strength of the trapezoidal roof profiles. According to local legislation these impairments may need to be (partly) compensated.

The reinforcement plate compensates for the impairment of the trapezoidal roof profiles. The plate is 660x660 mm, and 1,5 mm thick. The plate needs to cover at least two full sections of the trapezium profile at each side of the roof outlet. This specific plate is approved for Salzgitter types PS35, PS40, PS40S, PS85, PS100, PS135, PS153 and PS158 with a maximum thickness of 1,0 mm.

The reinforcement plate also absorbs tension/movement of the roof outlets caused by extensions of the drainage system (e.g. due to fluctuations in temperature) and prevents the roof outlet damaging the surface of the roof.

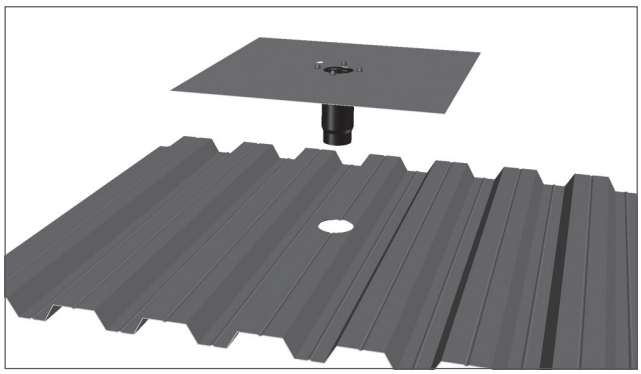


Illustration 1.6

The reinforcement plate also has the advantage that the pipe and mounting system can be installed independently from the installation of the outlets.

1.3 Vapour barrier/damp proof membrane

The vapour barrier prevents moisture from penetrating roof insulation and protects from a loss of thermal insulation value. The vapour barrier is usually a foil layer below the thermal insulation. The holes required for the roof outlets will usually perforate this vapour barrier, which can lead to local moist accumulation. However, the damp proof membrane can be sealed to the Akasison reinforcement plate, providing a simple solution for any type of damp proof membrane.

Installation socket
The 75 mm (200x200 mm) or 90 mm (220x220 mm) installation socket has the advantage of independent installation. The vapour layer can also be sealed to the installation socket. This product is used as an alternative for situations where reinforcement is not required.

Illustration 1.7 installation socket

1.4 Fire prevention

Fire prevention measures are designed to reduce the risk of fire. They also ensure that if a fire does occur, its spread is delayed long enough to allow the occupants of a building to escape safely. The necessary measures will vary according to local requirements and legislation often differs by region and country. These requirements may relate to the time a building needs to be protected against collapse, the ability of fire barriers, and requirements related to the flammability of materials used.

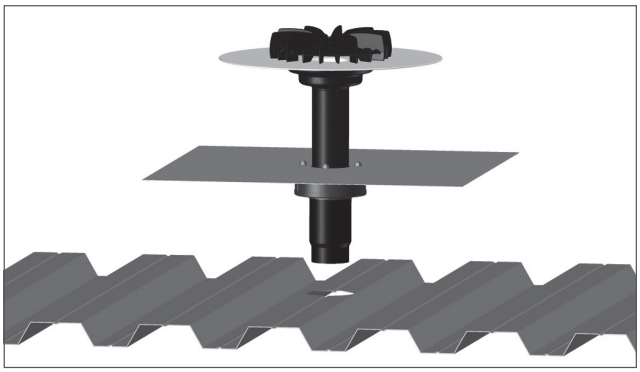


Illustration 1.8

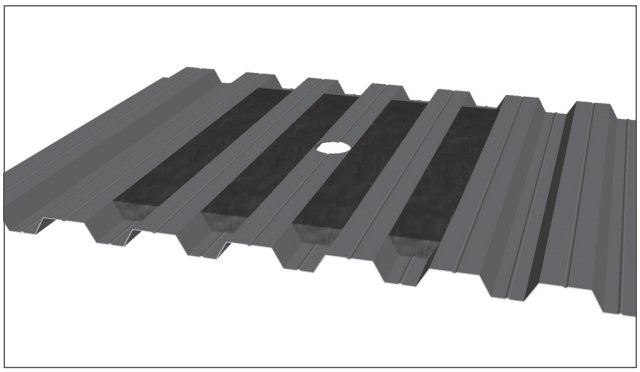


Illustration 1.9

In case of fire this sleeve closes the roof outlet completely to prevent any chimney effect taking place and to prevent the fire from skipping to the insulation or roof surface .

The Akasison fireproof version is tested in accordance with DIN 18234/IndBauRL by the Research Centre for Fire Protection at the Karlsruhe Institute of Technology.

To ensure good fire protection, it is important to fill the cavities between reinforcement plates and trapezoidal profiles with fire resistant material.

1.5 Condensation

Condensation occurs when water vapour present in the air makes contact with a 'colder' surface. Air at a given temperature can contain only a certain amount of water vapour. If the air temperature drops when it comes into contact with a colder pipe system, the excess water vapour will condense. The temperature of the air at which it becomes saturated with water vapour is called the 'dew point'. Condensation occurs when pipework has a temperature under the dew point of the surrounding air. Condensation depends on a number of factors:

- Room temperature
- Relative humidity of the air
- Temperature of the pipe surface

Akasison rain drainage has a relatively good thermal coefficient. Experience shows that HDPE used in heated buildings (with an inside temperature of around 17°C) no condensation should occur during a short storm.

To determine exactly when and how to insulate, an h-x (Mollier) diagram should be used and a detailed calculation performed. The type and function of the building determines whether condensation can be permitted.

When insulating the pipe system, diffusion-proof, closed cell insulation material should be used. Open cell insulation must have an impermeable outer layer. The entire pipe network must be insulated and an insulated pipe system must always be a closed circuit.

1.6 Mounting system

The Akasison mounting system is designed specifically for horizontal siphonic roof drainage pipe systems. It absorbs changes in length without transferring tension onto the roof construction. The brackets can be installed single-handedly using easy clip on mounting. This allows maximum freedom of movement high in the building.

Benefits of this fixing system:

- Larger spans possible
- Less mounting onto the roof construction
- Prefabrication on ground level possible
- Only simple tools needed
- Room to apply insulation

2 Material properties

Polyethylene (PE for short), is a semi crystalline thermoplastic and is a generic term for many variations of the polymer. The most common are:

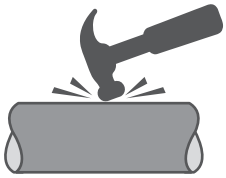
- LDPE (density: 0,9 - 0,91 g/cm²)
- MDPE (density: 0,93 - 0,94 g/cm²)
- HDPE (density: 0,94 - 0,965 g/cm²)

Aliaxis Nederland uses High Density Polyethylene (HDPE) for its products. The mechanical characteristics (elasticity, and stiffness) are important for the production of our pipes and different fittings. HDPE has a high resistance to damage from acids, bases and aqueous salt solutions. HDPE also has good resistance against light ionised radiation without becoming radioactive itself. The properties and benefits of Akatherm HDPE are highlighted in table 2.1 and 2.2.

Property	Unit	Test method	Value
Density at +23°C	g/cm²	ISO 1183	0,954
Elasticity modulus (secant betw. 0,05% and 0,25% expansion)	N/mm²	ISO 527	850
Tensile creep modulus 1 hr. value 1000 hrs. value	N/mm²	ISO 899	 640 300
Bending creep modulus 1 min. value	N/mm²	DIN 54852-Z4	 1000
Tensile strength	N/mm²	ISO 527 Test speed 50 mm/min	22
Elongation at break +23°C	%	ISO R 527	300
3,5% Bending stress	N/mm²	ISO 178 Test speed 2 mm/min	19
Average linear expansion coefficient	mm/*K	DIN 53752	0,18
Shore hardness		ISO 868	61
Operational temperature range without mechanical stress	°C	-	-40 bis +100
Fire behaviour		DIN 4102	B2
Water absorption at +23°C (96h)	mg	ISO 62	< 0,5
Melt Flow Rate MFR 190 / 5	g/10 min	ISO 1133	0,43

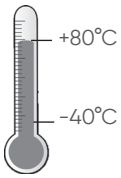
Table 2.1

Material advantages



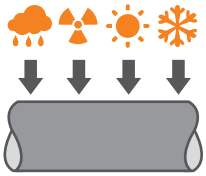
Impact-resistant and tough:
Unbreakable at temperatures above 5°C

Elastic and flexible:
Adjusts to local ground movement for underground use

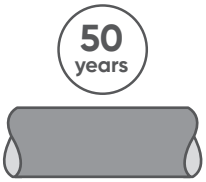


Thermal resistant:
Applications possible between -40°C and 80°C. Up to 100°C for short periods of time.

Chemical resistant:
Suitable for transport of polluted waste water

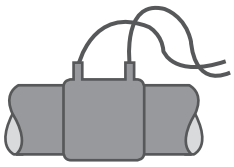


UV & weather resistant:
Unrestricted outside use through carbon black additives



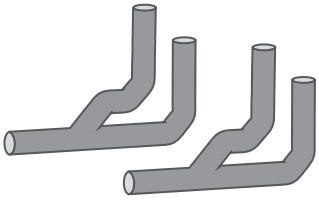
Wear resistant:
Lower cost due to long lifetime

System advantages



Welded system:
Simple and secure installation using buttwelding and electrofusion

Homogeneous welded joints:
Pull tight and leak proof for a completely closed system



Prefabrication:
Fast and cost-saving installation of repetitive systems

Light in weight:
Cost saving in transport and handling

Low heat conductivity:
No condensation insulation required during short periods of cooling

Nontoxic:
100% recyclable and environmental friendly

Table 2.2

3 Standards and quality

Akasison stands for best quality products and services. To ensure we always meet the highest standards required we follow strict business practices which are externally audited. All certificates are also externally verified and validated.

We are fully ISO 9001 compliant and all our product development and manufacturing adheres to EN 1519 and other international and nationally approved standards.

The Akasison system has the appropriate national approval for most countries. These are all based on the international EN 1519.

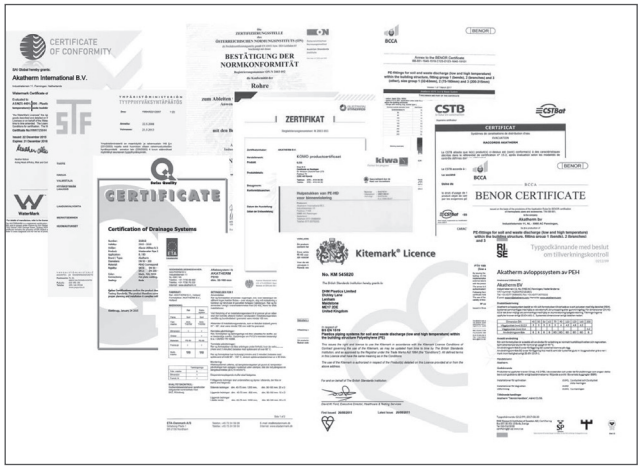


Image 3.1

ISO 9001

Aliaxis Nederland B.V., producer of Akasison, has a quality management system in full accordance with ISO 9001. It includes all business processes within Aliaxis Nederland B.V., ranging from development and production, to marketing and supply of plastic pipe systems. Conformity with ISO 9001 emphasises our quality, care and our continuous improvements in customer satisfaction. The certification of our management systems by Lloyd's Register Quality Assurance, further underscores Aliaxis Nederland B.V.'s standing as a leading brand of specialist drainage systems.


Certificate of Approval
Aliaxis Nederland B.V.
ISO 9001:2015

Image 3.2

ISO 14001

Aliaxis Nederland B.V., producer of Akasison, has integrated the ISO 14001 environmental management system into our quality management. ISO 14001 is a standard which controls and improves our overall environmental performance and focuses our attention on environmental factors during our everyday operations. It ensures that we make permanent environmental improvements and that we conform with all rules and regulations.


Certificate of Approval
Aliaxis Nederland B.V.
ISO 14001:2015

Image 3.3

Warranty

Above all, we provide our customers with peace of mind. We go to great lengths to ensure that our products perform as intended. The training we provide before installation begins; our technical support during construction, and inspection afterwards if required, allow us to guarantee the proper functioning of your Akasison system. All Aliaxis Nederland B.V. products have a 15 year warranty (details available on request).

4 Installation instructions

Scan the QR code or click on the hyperlink for the last updated installation instruction.

4.1 Roof outlets bitumen

Base roof outlet Akasison XL75 metal for bitumen

Code: 747342

747342

Base roof outlet Akasison XL75 metal for bitumen (heated)

Code: 747343

747343

Base roof outlet Akasison XL90 metal for bitumen

Code: 749342

749342

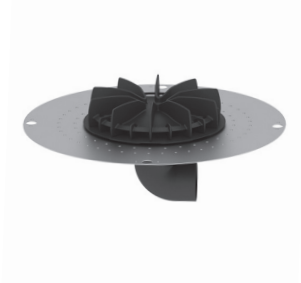
Base roof outlet Akasison XL90 metal for bitumen (heated)

Code: 749343

749343

Roof outlet Akasison XL75 metal for bitumen horizontal

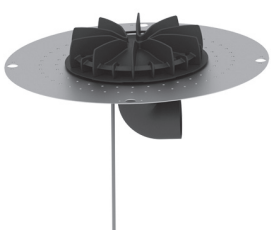
Code: 747382



747382

Roof outlet Akasison XL75 metal for bitumen horizontal (heated)

Code: 747383



747383

4.2 Roof outlets PVC

Base roof outlet Akasison XL75 PVC

Code: 747544

747544

Base roof outlet Akasison XL75 PVC (heated)

Code: 747545

747545

Base roof outlet Akasison XL90 PVC

Code: 749044

749044

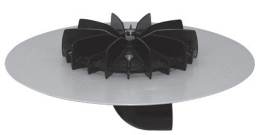
Base roof outlet Akasison XL90 PVC (heated)

Code: 749045

749045

Roof outlet Akasison XL75 PVC horizontal

Code: 747584



747584

Roof outlet Akasison XL75 PVC horizontal (heated)

Code: 747585

747585

4.3 Roof outlets FPO/TPO - PP

Base roof outlet Akasison XL75 FPO/TPO - PP

Code: 747546

747546

Base roof outlet Akasison XL75 FPO/TPO - PP (heated)

Code: 747547

747547

Base roof outlet Akasison XL90 FPO/TPO - PP

Code: 749046

749046

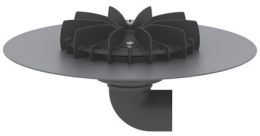
Base roof outlet Akasison XL90 FPO/TPO - PP (heated)

Code: 749047

749047

Roof outlet Akasison XL75 FPO/TPO - PP horizontal

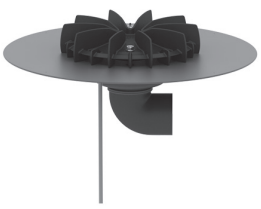
Code: 747586



747586

Roof outlet Akasison XL75 FPO/TPO - PP horizontal (heated)

Code: 747587



747587

4.4 Roof outlets FPO/TPO - PE

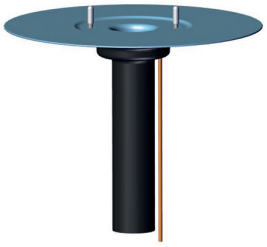
Base roof outlet Akasison XL75 FPO/TPO - PE

Code: 747548

747548

Base roof outlet Akasison XL75 FPO/TPO - PE (heated)

Code: 747549



747549

Base roof outlet Akasison XL90 FPO/TPO - PE

Code: 749048

749048

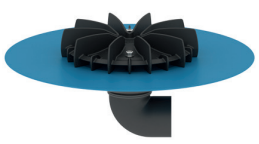
Base roof outlet Akasison XL90 FPO/TPO - PE (heated)

Code: 749049

749049

Roof outlet Akasison XL75 FPO/TPO - PE horizontal

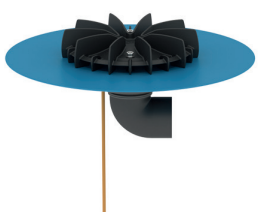
Code: 747588



747588

Roof outlet Akasison XL75 FPO/TPO - PE horizontal (heated)

Code: 747589



747589

4.5 Roof outlets clamp flange

Base roof outlet Akasison XL75 clamp flange

Code: 747540

747540

Base roof outlet Akasison XL75 clamp flange (heated)

Code: 747541

747541

Base roof outlet Akasison XL90 clamp flange

Code: 749040

749040

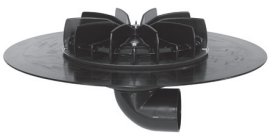
Base roof outlet Akasison XL90 clamp flange (heated)

Code: 749041

749041

Roof outlet Akasison XL75 HR clamp flange horizontal

Code: 747580



747580

Roof outlet Akasison XL75 HR clamp flange horizontal (heated)

Code: 747581

747581

4.6 Installation sockets

Akasison XL75 installation socket

Code: 747713

747713

Akasison XL90 installation socket

Code: 749713

749713

4.7 Reinforcement plates

Akasison XL75 reinforcement plate without connector

Code: 747712

747712

Akasison XL75 reinforcement plate with vapour barrier connection

Code: 747711

747711

Akasison XL75 reinforcement plate with vapour barrier connection and fire protection

Code: 747723

747723

Akasison XL90 reinforcement plate with vapour barrier connection

Code: 749711

749711

Akasison XL90 reinforcement plate with vapour barrier connection and fire protection

Code: 749722

749722

4.8 Air baffles

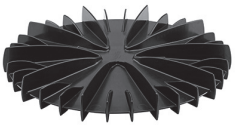
Air baffle with integrated leafguard 250

Code: 747550

747550

Air baffle with integrated leafguard 420

Code: 749053



749053

Air baffle with integrated leafguard height adjustable emergency overflow XL75

Code: 747551

747551

Air baffle Airlock with integrated leafguard height adjustable emergency overflow XL75

Code: 747554

747554

Air baffle with integrated leafguard emergency overflow

Code: 747552

747552

4.9 Gutter outlets

Roof outlet Akasison XL75 for metal gutter

Code: 747800

747800

Roof outlet Akasison XL75 for metal gutter covered

Code: 747802

747802

Roof outlet Akasison XL75 with clamp flange for metal gutter

Code: 747808

747808

Roof outlet Akasison XL90 for metal gutter

Code: 749800

749800

Roof outlet Akasison XL90 with clamp flange for metal gutter

Code: 749808

749808

Roof outlet Akasison XL75 for concrete gutter

Code: 747801

747801

Roof outlet Akasison XL75 for concrete gutter covered

Code: 747803

747803

Roof outlet Akasison XL90 for concrete gutter

Code: 749801

749801

5 Mounting system

The Akasison XL system includes a unique fixing system. This system ensures the correct installation of the Akasison drainage system.

5.1 Akasison fixing system

The Akasison XL system has to be fixed to the roof construction using the Akasison fixing system. The fixing system is a rigid installation with anchor points that will absorb any expansion and contraction of the HDPE as a result of temperature changes. It protects the integrity of the HDPE installation.

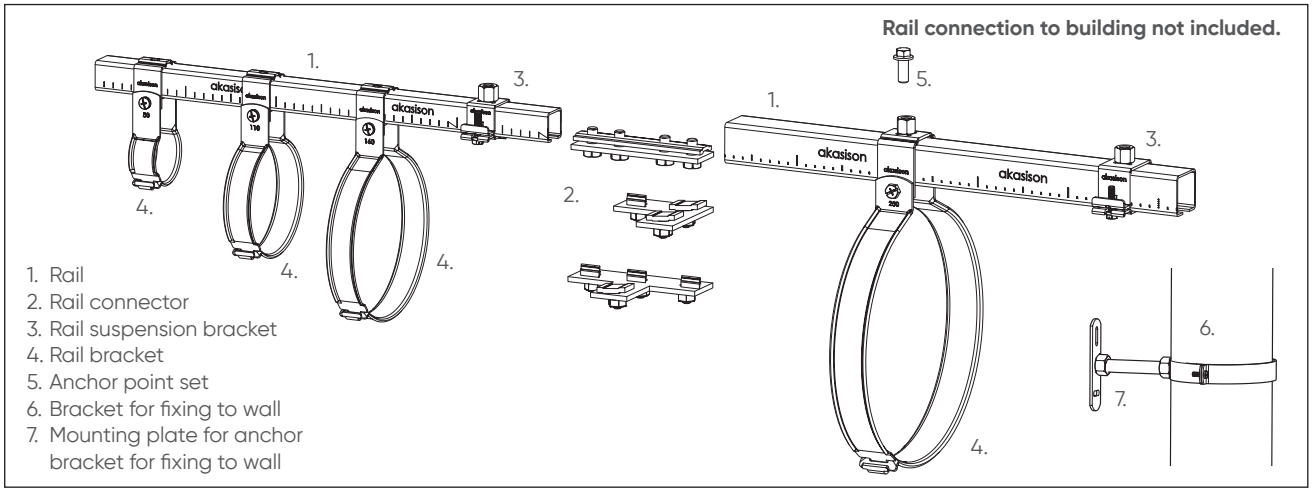


Illustration 5.1

Rail

Type	Code	Application
30x30 mm x 5 m	700005	Rail bracket 40-200 mm
41x41 mm x 5 m	700007	Rail bracket 250 and 315 mm

Table 5.1

Rail connector

Type	Code	Application
Rail connector straight	700015	Rail 30x30 and 41x41 mm
Rail connector L	700016	Rail 30x30 and 41x41 mm
Rail connector T	700017	Rail 30x30 and 41x41 mm

Table 5.2

Rail suspension bracket

Type	Code	Application
30x30 mm	700025	Rail 30x30 mm
41x41 mm	700027	Rail 41x41 mm

Table 5.3

Rail bracket

Type	Code
40 mm	750435
50 mm	750535
56 mm	755635
63 mm	750635
75 mm	750735
90 mm	750935
110 mm	751135
125 mm	751235
160 mm	751635
200 mm	752035
250 mm	752535
315 mm	753135

Table 5.4

Anchor point

Type	Code	Application
M10x20 (Set of 2)	730025	Anchorpoint for d_1 = 200 mm
M10x45 (Set of 2)	730027	Anchorpoint for d_1 ≥ 250 mm

Table 5.5

Bracket for fixing to wall

Diameter	Code	Thread
40 mm	700478	½"
50 mm	700578	½"
56 mm	705678	½"
63 mm	700678	½"
70 mm	700778	½"
90 mm	700978	½"
110 mm	701178	½"
125 mm	701278	½"
160 mm	701678	½"
200 mm	702080	1"
250 mm	702580	1"
315 mm	703180	1"

Table 5.6

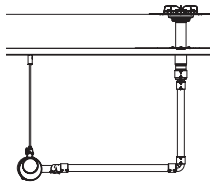
Mounting plate for ½" and 1" anchor bracket

Thread	Code
½"	709478
1"	709480

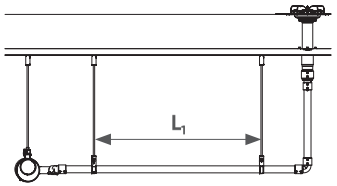
Table 5.7

5.2 Overview of Akasison fixing system

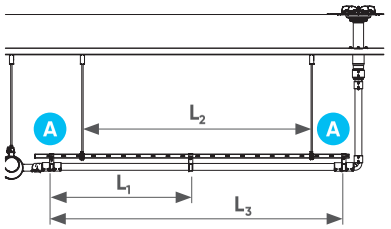
Roof outlet -collector pipe < 0.8m
Without bracketing and rail

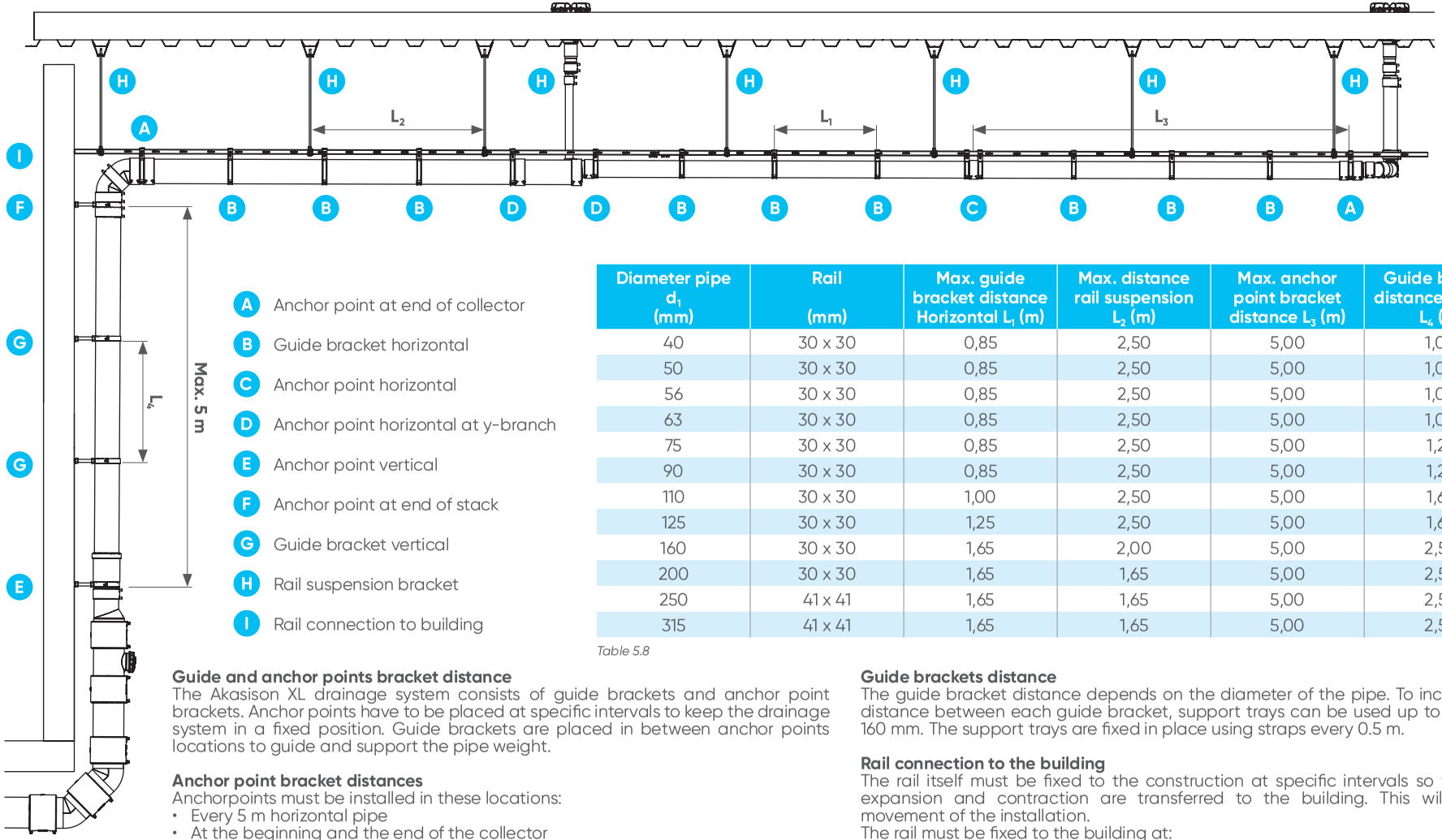


Roof outlet -Collector pipe >0.8m, <3.0m
With bracketing, without rail



Roof outlet -Collector pipe >3.0m
With bracketing and rail





- A Anchor point at end of collector
- B Guide bracket horizontal
- C Anchor point horizontal
- D Anchor point horizontal at y-branch
- E Anchor point vertical
- F Anchor point at end of stack
- G Guide bracket vertical
- H Rail suspension bracket
- I Rail connection to building

Diameter pipe d_1 (mm)	Rail (mm)	Max. guide bracket distance Horizontal L_1 (m)	Max. distance rail suspension L_2 (m)	Max. anchor point bracket distance L_3 (m)	Guide bracket distance vertical L_4 (m)
40	30 x 30	0,85	2,50	5,00	1,00
50	30 x 30	0,85	2,50	5,00	1,00
56	30 x 30	0,85	2,50	5,00	1,00
63	30 x 30	0,85	2,50	5,00	1,00
75	30 x 30	0,85	2,50	5,00	1,25
90	30 x 30	0,85	2,50	5,00	1,25
110	30 x 30	1,00	2,50	5,00	1,65
125	30 x 30	1,25	2,50	5,00	1,65
160	30 x 30	1,65	2,00	5,00	2,50
200	30 x 30	1,65	1,65	5,00	2,50
250	41 x 41	1,65	1,65	5,00	2,50
315	41 x 41	1,65	1,65	5,00	2,50

Table 5.8

Guide and anchor points bracket distance
The Akasison XL drainage system consists of guide brackets and anchor point brackets. Anchor points have to be placed at specific intervals to keep the drainage system in a fixed position. Guide brackets are placed in between anchor points locations to guide and support the pipe weight.

Anchor point bracket distances
Anchorpoints must be installed in these locations:
- Every 5 m horizontal pipe
- At the beginning and the end of the collector
- At every 45° branch
- At every change of direction
- At the beginning and end of the pipe from roof outlet to collector (>3m)

Guide brackets distance
The guide bracket distance depends on the diameter of the pipe. To increase the distance between each guide bracket, support trays can be used up to diameter 160 mm. The support trays are fixed in place using straps every 0.5 m.

Rail connection to the building
The rail itself must be fixed to the construction at specific intervals so the HDPE expansion and contraction are transferred to the building. This will prevent movement of the installation.
The rail must be fixed to the building at:
- The beginning of each horizontal pipe section
- Every 12 m of each horizontal pipe section
- A horizontal direction change
- A wall-interruption at both sides of the wall
- A vertical direction change

5.3 Guidelines for the performance of horizontal anchor point and horizontal guide bracket

5.3.1 Overview

The Akasison XL drainage system consists of guide brackets and anchor points brackets. Anchor points have to be placed at specific intervals to keep the drainage system in a fixed position. Guide brackets are placed in between anchor point locations to guide and support the pipe weight.

When installing an Akasison rail system, an anchor point needs to be applied:

- Every 5 metres of horizontal pipe section
- At the beginning and end of the collector
- At every 45° Y-branch
- At every bend and every change of direction
- At the beginning and end of the drain connection line > 3,0 m

Between anchor points, horizontal guide brackets need to be installed. The maximum distance between the brackets (guide-guide or guide-anchor point) are indicated as L_1 in the table of paragraph 5.2. A standard anchor point is installed with two rail brackets and an electrofusion coupler. The rail brackets are mounted on both sides of the electrofusion coupler. It is also possible to use two electrical couplers and one rail bracket. This is mainly used in combination with fittings. To prevent the brackets from sliding, the screws of the brackets need to be firmly tightened. Extra anchorpoint screws are also used for 200-315 mm brackets.

5.3.2 Examples of Anchor points and guide brackets

Anchor point in the horizontal collector

Diameter 40-160 mm

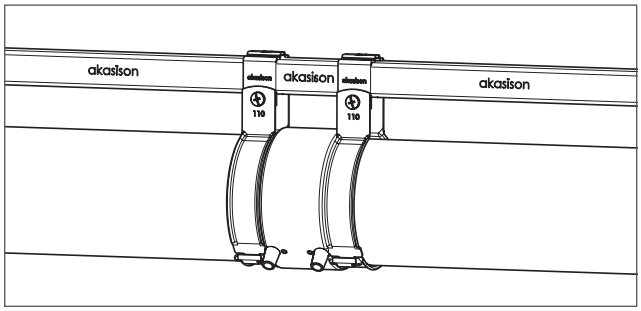


Illustration 5.2

1 x electrofusion coupler
2 x rail brackets

Diameter 200-315 mm

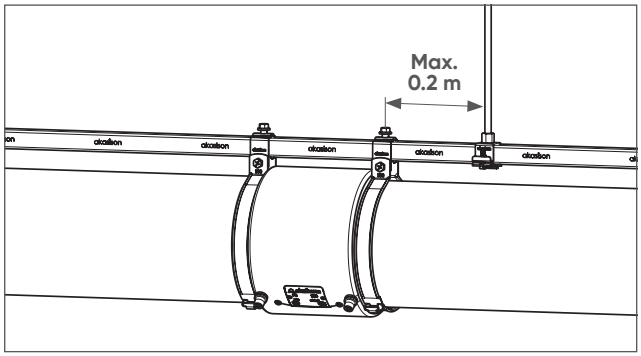


Illustration 5.3

1 x electrofusion coupler
2 x rail brackets
2 x anchor point sets

Anchor point at the beginning of the collector

Diameter 40-160 mm

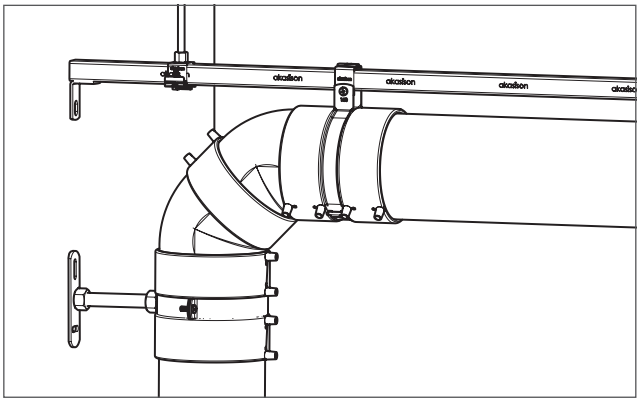


Illustration 5.4

2 x electrofusion couplers
1 x rail bracket

Diameter 200-315 mm

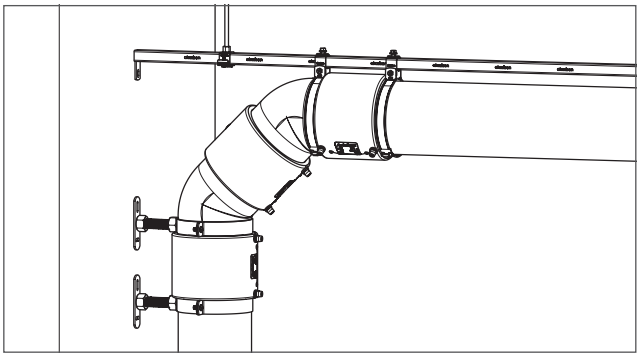


Illustration 5.5

1x electrofusion coupler
2 x rail brackets
2 x anchor point sets

Anchor point at the end of the end of the collector

Diameter 40-160 mm

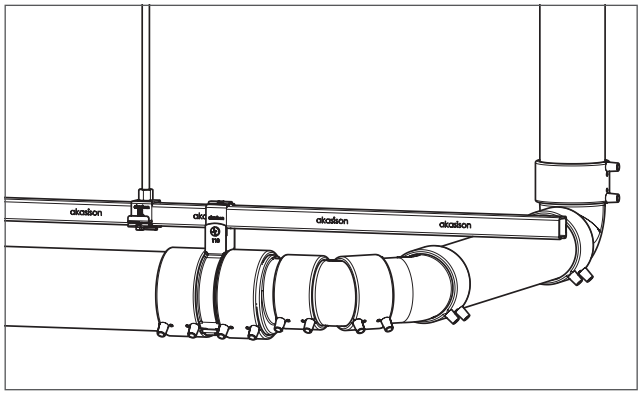


Illustration 5.6

2 x electrofusion couplers
1 x rail bracket

Anchor point 45° Y-branch

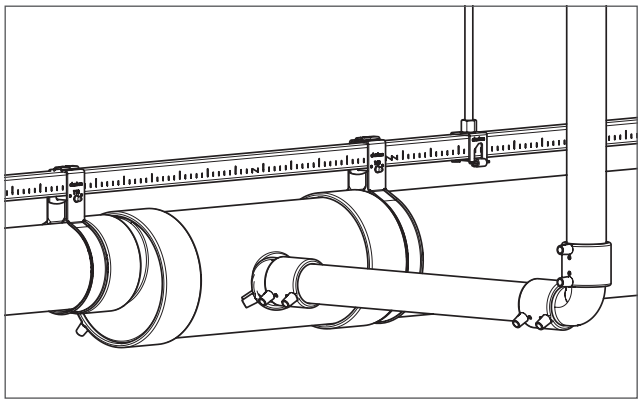


Illustration 5.7

2 x electrofusion couplers
2 x rail brackets

Anchor point by change of direction

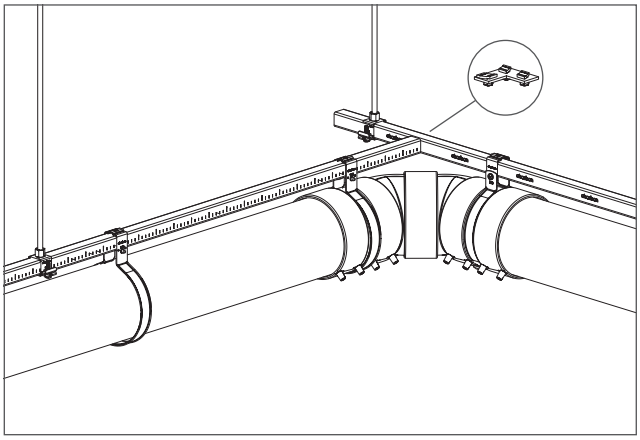


Illustration 5.8

2 x electrofusion couplers
1 x rail bracket

Guide bracket

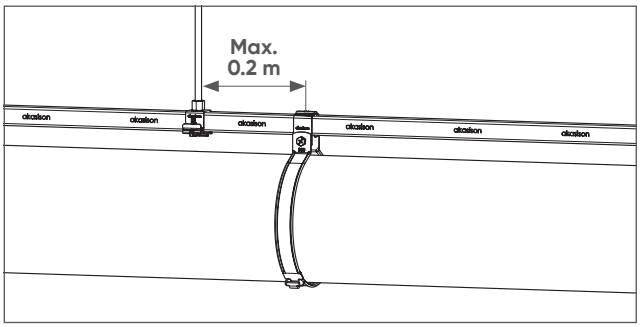


Illustration 5.9

1 x rail bracket

5.4 Guidelines for the performance of vertical anchor point and guide bracket

5.4.1 Overview
When installing an Akasison rail system, an anchor point needs to be applied:
- Every 5 metres in the vertical collector pipe
- At the beginning (top) of the vertical collector pipe

Between anchor points, vertical guide brackets need to be applied. The maximum distance between the brackets (guide-guide or guide-anchor point) are indicated as L4 in the table 5.8 of paragraph 5.2.

For the installation of the system to the wall, a mounting plate and a wall bracket is used. For diameters up to 160 mm ½" is used. For diameters above 200 mm 1" is used. The required threaded rod is not included. For an anchor point, an electrofusion coupler and a expansion socket are also used.

5.4.2 Examples of anchor points and guide brackets

Anchor point

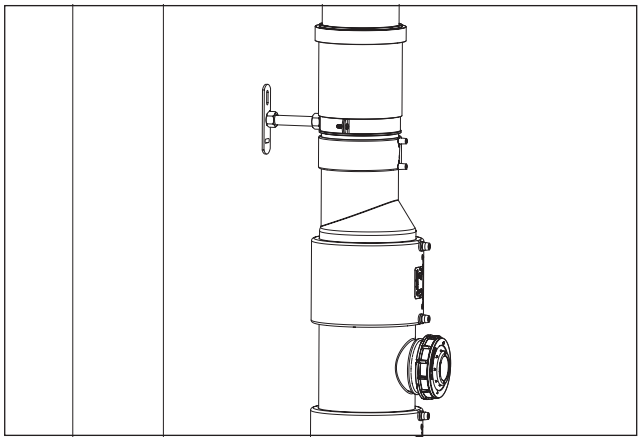


Illustration 5.10

1 x expansion socket
1 x electrofusion coupler
1 x rail bracket
1 x mounting plate

Anchor point at the beginning of the collector

Diameter 40-160 mm

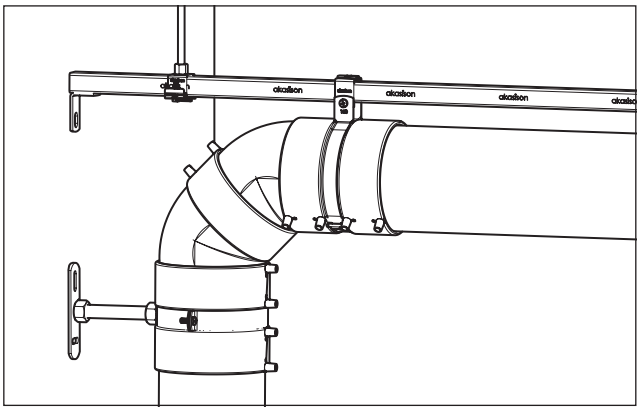


Illustration 5.11

2 x electrofusion couplers
1 x rail bracket
1 x mounting plate ½"

Diameter 200-315 mm

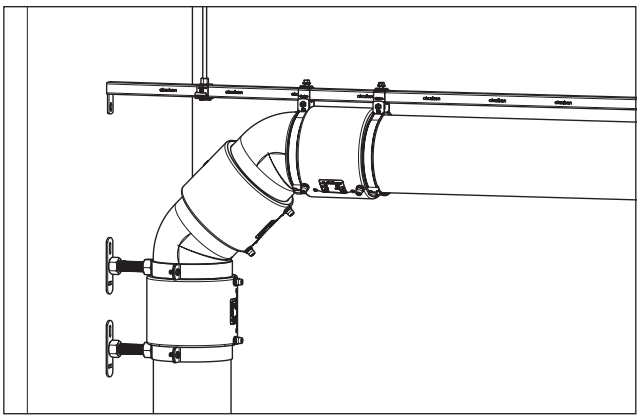


Illustration 5.12

1x electrofusion coupler
2 x rail brackets
2 x mounting plates 1"

Anchor point at the beginning of the collector with reduction

Diameter reduction 200-300 mm

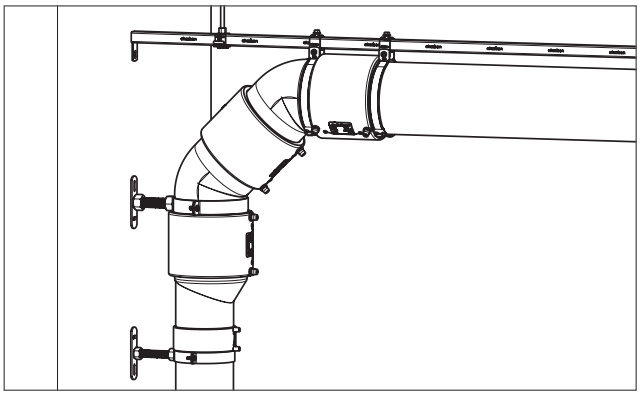


Illustration 5.13

2 x electrofusion couplers
2 x rail brackets
2 x mounting plates 1" (when diameter after reduction is > 160 mm)

or

2 x electrofusion couplers
2 x rail brackets
1 x mounting plate 1"
1 x mounting plate ½ " (when diameter after reduction is ≤ 160 mm)

Diameter 40-160 mm

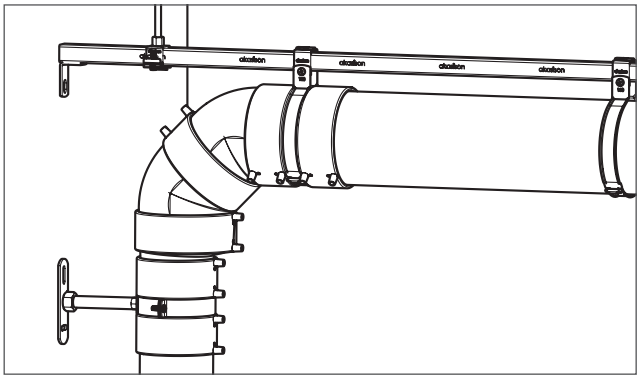


Illustration 5.14

2x electrofusion coupler
1 x rail bracket
2 x mounting plate ½"

Guide bracket

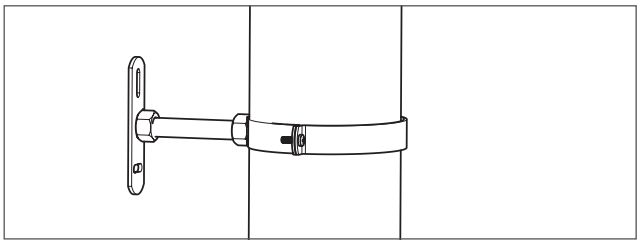


Illustration 5.15

1 x rail bracket
1 x mounting plate ½" (diameter ≤160) or 1 x mounting plate 1" (diameter > 160 mm)

5.4.3 Maximum distance between wall and drainage system

The threaded rods for the fixation of the mounting plate to the bracket is limited.

For a distance up to 100 mm of 40-160 mm pipe, a ½" bracket and mounting plate is needed. For 200-315 mm pipe, a 1" mounting plate and bracket is required.

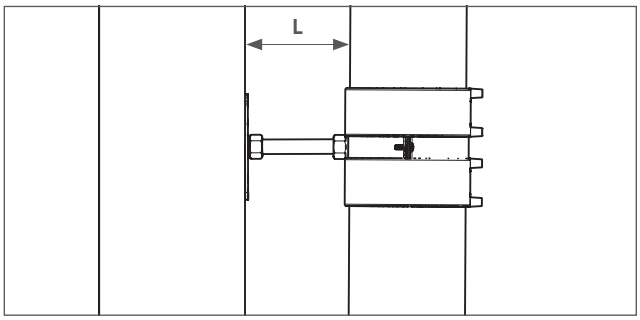


Illustration 5.16

5.5 Attachment of the mounting system to the building construction

5.5.1 Overview

Akasison rails need to be attached the building:

- at the start and end of a horizontal collector pipe
- at every 12 metres of the collector pipe
- at every transit of the wall, at both sides of the wall
- at every vertical change of direction

5.5.2 Examples the attachment of the system to the building

At the beginning of the horizontal collector pipe

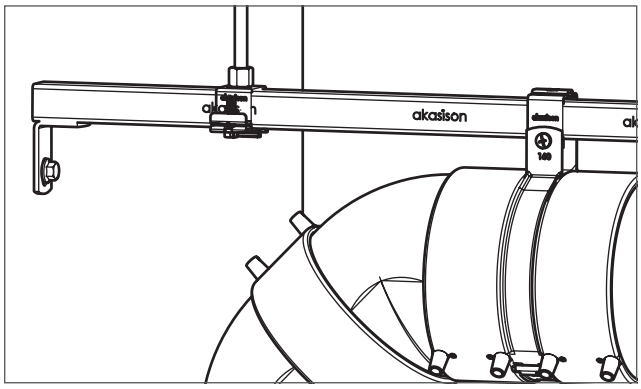


Illustration 5.17

Connection with a horizontal beam (both sides)

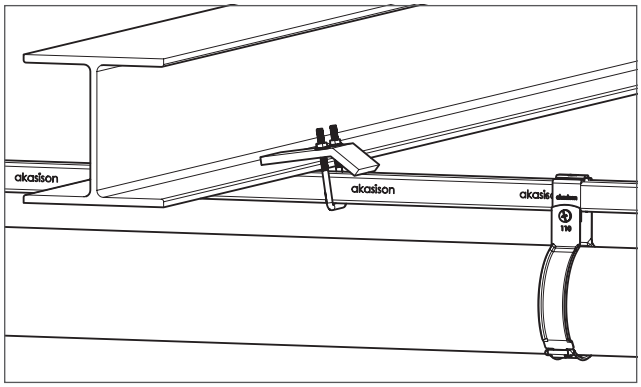


Illustration 5.18

Connection with a concrete beam (both sides)

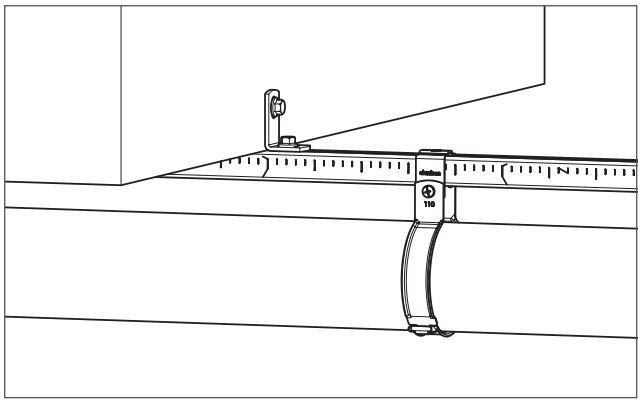


Illustration 5.19

Connection with the transit of a wall (both sides)

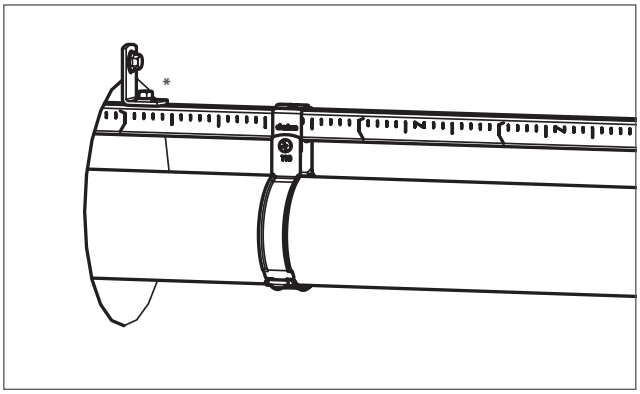


Illustration 5.20

* Rail can be used upside down.

5.6 Attachment of the rail suspension bracket to the trapezoid roof profile

5.6.1 Overview

The maximum distance of the rail suspension (as defined in the table f paragraph 5.2) must not be exceeded. The construction of the roof might limit this maximum distance. The impact on the construction of the drainage system needs to be approved by the constructor responsible before starting the installation the system.

In the table below the total weight and forces of the system are given, by the maximal distance of the suspension brackets.

Operational system (pipe, mounting system, totally filled with water)

d_1 [mm]	40	50	56	63	75	90	110	125	160	200	250	315
G [kg/m]	2,9	3,7	4,2	4,8	6,2	8,1	11,2	14,0	21,8	33,3	51,9	81,0
F [kg/T]	7,4	9,1	10,4	12,1	15,4	20,3	28,1	35,0	43,7	55,0	85,7	133,7

Table 5.8

Non-operational system (pipe, mounting system, no water)

d_1 [mm]	40	50	56	63	75	90	110	125	160	200	250	315
G [kg/m]	2,0	2,2	2,2	2,2	2,5	2,7	3,1	3,5	4,7	6,5	10,3	14,6
F [kg/T]	5,0	5,4	5,6	5,6	6,2	7,7	8,9	8,9	9,4	10,8	17,0	24,1

Table 5.9

G = weight of the system

F = resulting point load applying the maximum distance between the suspension brackets

In the table below maximum distances between the suspension brackets (L_2) are calculated based on a maximum point load.

d_1 [mm]	15 kg/m² L_2 [m]	20 kg/m² L_2 [m]	25 kg/m² L_2 [m]	30 kg/m² L_2 [m]	35 kg/m² L_2 [m]	40 kg/m² L_2 [m]	45 kg/m² L_2 [m]	50 kg/m² L_2 [m]
40	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
56	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
63	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
75	2,40	2,50	2,50	2,50	2,50	2,50	2,50	2,50
90	1,80	2,50	2,50	2,50	2,50	2,50	2,50	2,50
110	1,30	1,80	2,20	2,50	2,50	2,50	2,50	2,50
125	1,10	1,40	1,80	2,10	2,50	2,50	2,50	2,50
160	-	-	1,10	1,40	1,60	1,80	2,00	2,00
200	-	-	-	-	1,10	1,20	1,40	1,50
250	-	-	-	-	-	-	-	-
315	-	-	-	-	-	-	-	-

Table 5.10

Distances less than one metre, there is no standard connection possible. In that case a project solution needs to be derived. A possible solution is to divide the load, or mount the system to metal beams.

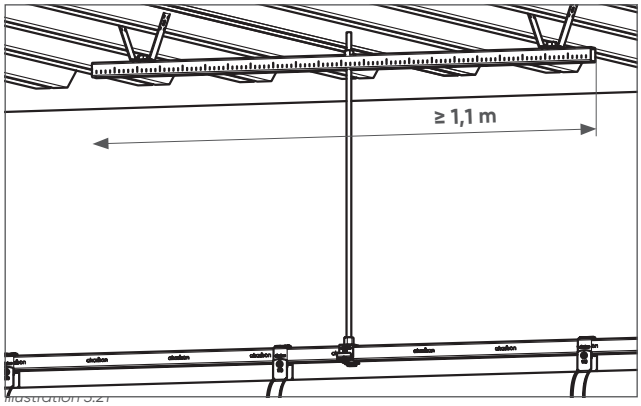


Illustration 5.21

6 Pipe system

6.1 Connection to the roof outlet

The connection of the roof outlet to the Akatherm PE pipe system depends on the roof outlet.

Roof outlet	Connection method	Art. Nr.
Roof outlet 75	Electrofusion coupler 75 mm	410795
Roof outlet 90	Electrofusion coupler 90 mm	410995

Table 6.1 Roof outlet connection to the pipe system

The isometric drawing will list the outlet and transition to the PE pipe as a separate pipe section (according to VDI 3608). The length of this pipe section is the height of the roof outlet. The parts list will separately specify the connection piece and the possible reduction to the diameter of the following pipe section.

The transition from the vertical to the horizontal pipe section under the roof outlet must be done under a 90° angle for optimal siphonic priming. A 90° bend can be used but requires a buttweld on one end. Use an 88.5° elbow for an installation that can be 100% electrofused.

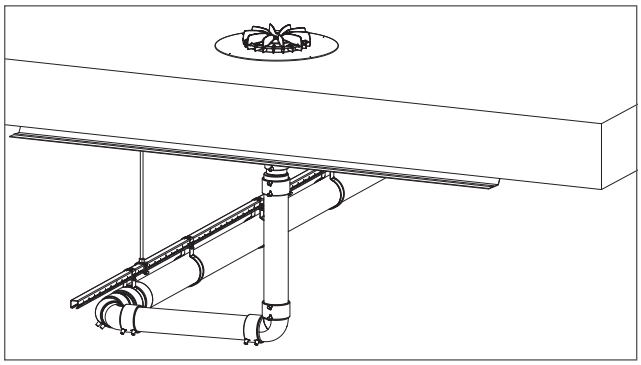


Illustration 6.1

6.2 Change of direction

Except for the transition underneath the roof outlet, the pipe system does not include any 90° bends. All changes of direction are made by using 45° elbows.

6.3 Branches

Only branches of 45° are used in the PE pipe system. For the connection to the main collector a 45° branch and a 45° elbow are combined to make the angle of 90°. At a horizontal or vertical branch the rules for direction changes and branches are combined.

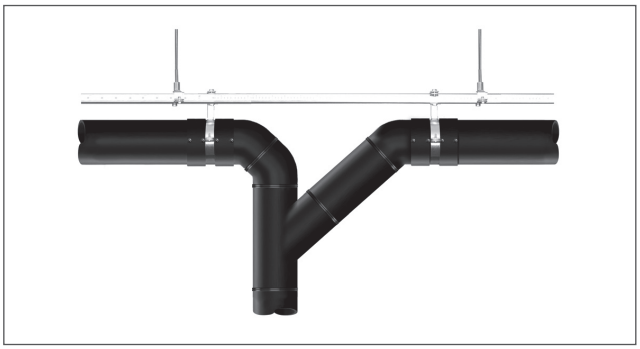


Illustration 6.1

6.4 Reductions

It is not permitted to reduce the pipe diameter in the direction of flow, except in the vertical pipe section directly underneath the roof outlet, and in the downpipe. Only eccentric reducers are used. When a diameter change is needed directly underneath a roof outlet, a centric reducer can be used.

6.5 Emergency overflow

Every roof should be equipped with an emergency overflow system. This system operates when the primary system cannot deal with the rainwater. This can be the case when the amount of rain exceeds the rainfall on which the system was dimensioned, or by a blocked sewer. For the dimensioning and design of the emergency overflows, the local standards prevail. The system can be designed as a siphonic system, a traditional system, or with spouts in the facade of the roof. In this case the emergency system works as an early warning that something is amiss.

The emergency overflow system cannot be connected to the main sewer but has to exit freely.

6.6 Maintenance and cleaning when in use

It is important that the roof is kept clean in spite of the self-cleaning of the Akasison siphonic roof drainage system.

Items such as leaves and plants that are on the roof should be removed regularly to prevent blocking pipes and obstructing water flow. The frequency of inspection and cleaning depends largely on the surroundings of the building. A location with large trees in the vicinity will need a more frequent inspection than a location in an open field. When cleaning the roof outlet, the air baffle can be easily removed to clean the roof outlet on the inside.

A roof covered with snow needs particular attention. The heating elements in the roof outlets will only melt the snow in the roof outlet and the siphonic system will only drain melted snow. Snow is a good insulator and so even with temperatures above 0°C the bottom layer of snow will not necessarily melt, and draining will be minimal. The outlets have to be cleared of snow. When the snow load exceeds the maximum load allowed on the roof it needs to be removed.

7 Jointing methods

7.1 Joint methods

Akatherm HDPE is suitable for High Density Polyethylene, a material made with welded joints. Secure and durable connections lasting 50 to 100 years. Welded joints are made without the need for glue or rubber ring joints and are actually stronger than the surrounding piece of pipe or fitting. HDPE welded joints are both pull tight and leak proof, once tested there is very little risk of future failure because of the flexibility, impact resistance and overall toughness of the material.

Besides welded joints Akatherm HDPE pipes and fittings can be joined by different methods, depending on the applications. Joints are divided in welded/mechanical and pull-tight/not pull-tight. Pull tight joints can't come apart under influence of external forces.

To be opened (dismountable)
This are jointing methods which can be disconnected after assembly. These jointing methods are ideal for pipe sections which need to be cleaned, calibrated, inspected or dismantled on a regular basis.

Not to be opened (fixed)
This are jointing methods which cannot be disconnected after assembly. These are permanent joints in which the joints can remain closed for their lifetime.

Tension-resistant (pull tight: PT)
This are connections which withstand tensional forces. This is ideal when thermal movement is expected or gravity pulls on the connection.

Non-tension-resistant (not pull tight: NPT)
This are connections which cannot withstand tensional forces. This joint is used when the pipe system is designed to accommodate movement without risk that the joint is pulled apart.

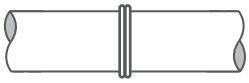
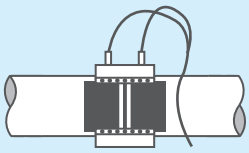
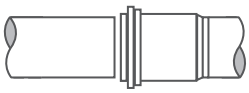
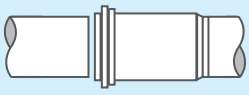
Jointing technique	Product	Welded/mechanical	Pull-tight	Dismountable
Butt-weld joint		Welded	Yes	No
Electrofusion		Welded	Yes	No
Plug-in socket		Mechanical	No	Yes
Expansion socket		Mechanical	No	Yes

Table 7.1

7.2 Butt-weld joint

Butt-welding is an economical and reliable way of jointing without using additional components requiring only butt-welding equipment.

All Akatherm products can be welded using this jointing method (DVS 2207-1). Fittings can be shortened by up to the k-dimension when indicated in the catalogue, still allowing butt-welding. This jointing method is very suitable for prefabrication and producing special fittings.

Preparations
Before starting the welding process it is important to establish a work space where the jointing can be done consistently:

- The temperature of the welding plate needs to be between 200°C and 220°C. In general it is advisable to consider welding with higher temperatures in this temperature range when welding pipes and fittings with small wall-thickness. Pipes and fittings with a relative higher surface area need to be heated more slowly
- Ensure that the welding plate has reached the correct temperature and is thoroughly heated. In order to do so allow for a 10 minute heating period after the correct temperature is measured initially
- Before welding clean the heating element with paper and a pre approved cleaning solution (Ensuring 100% evaporation). Ensure that the heating surface is undamaged
- Establish a work space where the jointing can be done without being affected by major weather conditions. The use of wind shields is advised to keep the weld plate at a constant temperature
- The functionality of the butt welding equipment needs to be checked regularly. Especially on those machines which are used at the building site.

Welding process
In general butt-welds are made using an Akatherm butt-welding machine. Only diameters up to 75 mm can be welded by hand. For diameters at 90 mm and above the welding pressure is too big to make a good weld by hand. The welding process consists of the following steps:

- Preheat: Push the pipe/fittings against the heating plate until the required welding bead has been formed (refer to appendix B)
- Heating up: Hold the pipe/fittings against the heating plate with no pressure (for time see appendix B)
- Change over, welding and cooling: When the spigots are thoroughly heated both parts need to be joined as quick as possible using a gently buildup of pressure. Moving the parts during or after cool down is not permitted. Keep the parts jointed together under pressure as long as the welding bead is still plasticized. Ensure that the joint is allowed to cool down without any additional load.

Using a butt-welding machine gives a better result under all circumstances.

Machining the surface
Both sides should be machined until they run parallel. When machining is finished, open the carriages (the plastic shavings must be continuous and uniform in both sides to weld).

Verify the alignment between the machined surfaces. remove the plastic shaving. Do not touch and keep machined surfaces clean.

Without removing the oxygen layer a weld cannot be guaranteed. The oxidation layer will form again within one hour.

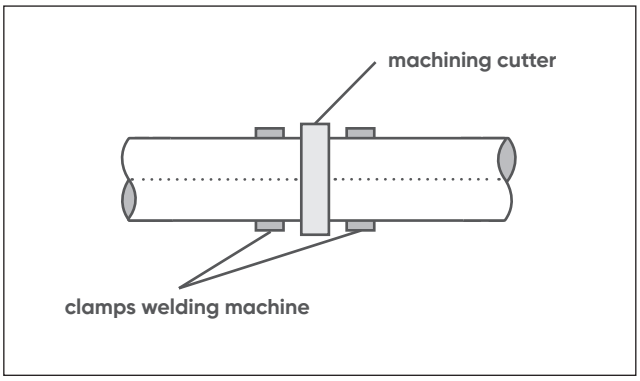


Illustration 7.1 Machining the surface

Preheating under pressure
During heating, the two spigot ends must be placed under low pressure to the heating element (0,2N/mm²). Through contact with the heating element a welding bead will form. The size of the bead is a good indication that the appropriate pressure and time is used. The correct welding bead height and preheating pressure is provided in appendix B.

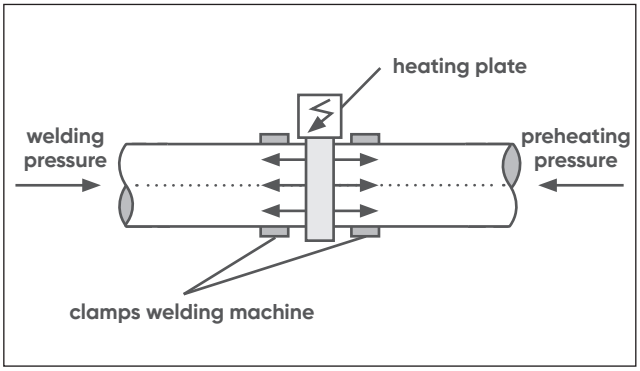


Illustration 7.2 Preheating under pressure

Heating with less pressure
HDPE is a good insulator, therefore at this stage it is necessary that the correct heating depth of the pipe ends is obtained. Only a small amount of pressure 0,01 N/mm² is required to maintain the contact of the ends with the heating element. The heat will gradually spread through the pipe/fitting end. The size of the bead will increase a little. The time and pressure needed for this phase can be found in appendix B.

Change over
Remove the heating element from the jointing areas and immediately join the two end together. Do not push the ends abruptly onto each other. The removal of the heating element needs to be done quickly to prevent the ends from cooling down. The maximum allowed change over times can be found in appendix B.

Welding and cooling
After the jointing areas have made contact they should be joined with a gradual increase in pressure up to the specified value. The build-up of pressure should be done linear and not differ more than 0,01 N/mm^2. When the buildup occurs too fast the plastic material will be pushed away. Contrary, when the buildup is too slow the material cools down before a homogenous weld is formed. In both cases the quality of the weld is questionable. Keep the specified welding pressure at a constant level during the complete cooling period. There must not be any load or strain at the joint.

It is not allowed to artificially cool the joint!

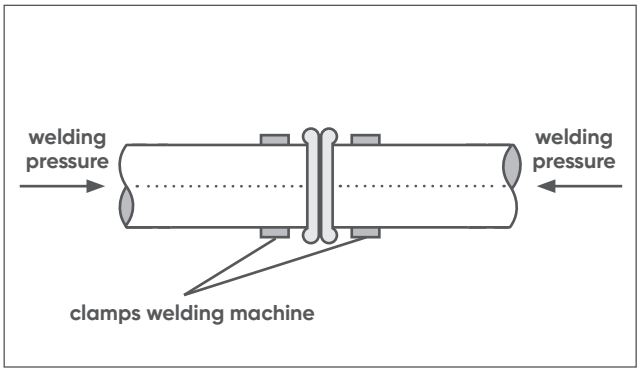


Illustration 7.3

The welded components can be removed from the machine when 50% of the cooling period has elapsed providing the following criteria are met:
- Prefabrication in workplace conditions.
- No load and strain placed on the joint.
- No additional load and strain when the fitting is removed from the clamping equipment.

The weld may only be subjected to full operational load after the cooling time provided in appendix B has elapsed.

Welding by hand
The welding process when welding by hand is in general the same as the welding process by using a machine. The following steps are to be considered

1. **Preheating**: Push the pipe/fittings against the heating plate until the required welding bead has formed (for height of the welding bead see appendix B - welding parameters).
2. **Heating up:** Push the pipe/fittings against the heating plate until the required welding bead has formed (for height of the welding bead see appendix B).
3. **Change over:** As the spigots are thoroughly heated up both parts need to be joined. It is important to minimize the change over time as much as possible. (the maximum allowed change over time is given in appendix B).
4. **Welding:** The jointing has to be carried out accurately. Moving the parts during and after jointing is not possible. (the height of the welding bead is given in appendix B).
5. **Cooling:** Keep the parts jointed together under pressure as long as the welding bead is still plasticized. The joint needs to col down without any additional load. The use of a support structure is recommended when jointing long pipe parts.

The use of a butt-welding machine is highly preferable and will give better and more consistent results.

Evaluating the butt-weld joint

For evaluation of the butt weld on the job site visual inspection methods can be used. Additional testing can be done using both destructive and non-destructive evaluation methods. For these evaluation methods special equipment may be necessary. For a first visual evaluation consider the following factors:

Shape of the welding bead
The shape of the welding bead is an indication for proper operation of the welding process. Both welding beads should have the same shape and size. The width of the welding bead should be approximately 0,5x the height. The height of the welding bead is provided in appendix B. In illustration 7.4 a good weld is shown with a uniform welding bead.

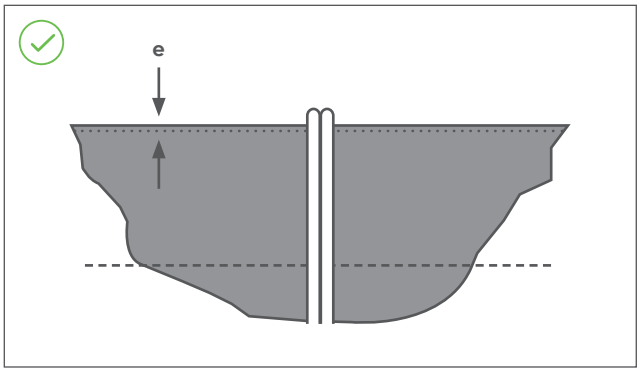


Illustration 7.4 Butt-weld with even welding beads (acceptable)

Differences between the beads can be caused by the difference in HDPE material used in the welded components. Despite the differences in welding bead the butt-weld can be of sufficient strength. In illustration 7.5 a cross-section of a regular, round fusion bead is shown. When differences in welding bead are observed the collar X value is greater than 0.

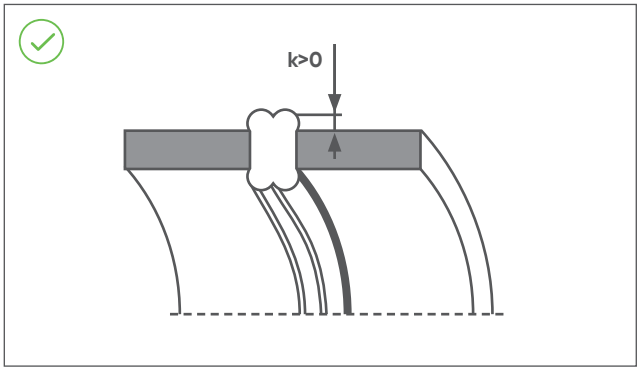


Illustration 7.5 Cross section of a good butt-weld

Alignment
Misalignment between fittings and pipe can occur for several reasons. Oval pipe ends or irregular pipe necking can cause an incorrect fit. If this sagging is less than 10% of the wall thickness the weld can still be classified as acceptable (see illustration 7.6).

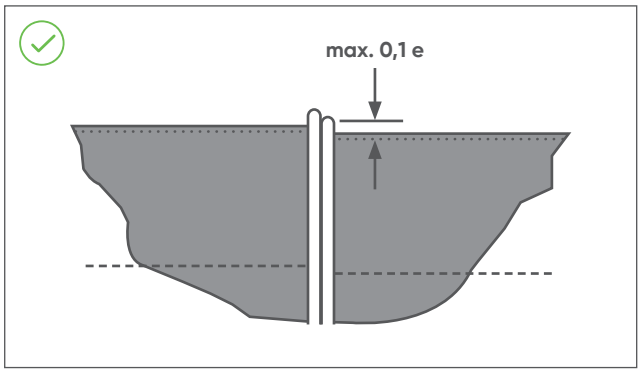


Illustration 7.6 Butt-weld with mis-alignment of pipe (acceptable)

Welding bead size
Illustration 7.7 shows a joint with beads that are too big. The uniformity indicates a good joint preparation. However, heat supply and/or jointing pressure seems to be too high. A purely visual assessment would still classify the weld as acceptable.

Consider illustration 7.5. When the collar value X is greater than 0 the weld can be classified as acceptable regardless of the welding bead shape.

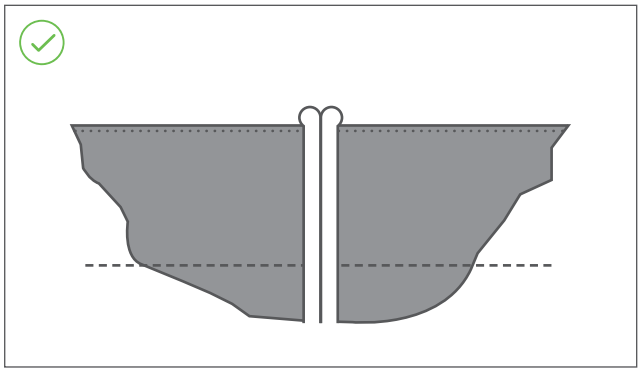


Illustration 7.7 Butt-weld with big welding beads (acceptable)

When there is either insufficient heating up or not enough welding pressure there are hardly any beads. In cases like this thick walled pipes often form shrinking cavities. The weld must be classified as non acceptable

7.3 Electrofusion joint

Electrofusion is a rapid and simple way of permanent jointing. Using the electrofusion coupler and equipment, pipe, fittings and prefabricated pipe section can be efficiently assembled.

All Akatherm products can be welded by electrofusion unless specifically stated in the product table.

It is highly recommended to make use of Akatherm electrofusion equipment as compatibility with other welding machines cannot be guaranteed.

Preparations

The following guidelines are to be respected when welding using the electrofusion process:

- Establish a work space where welding can be done without being effect by major weather conditions. The operating temperature of electrofusion control boxes is -10°C/+40°C. Welding above or below these temperatures may not be possible.
- Check if the equipment functions properly. Welding equipment used on site has to undergo regular maintenance. It is necessary to recalibrate the electrofusion control boxes at least every 2 years.
- The resistance wire in the electrofusion coupler lies at the surface for optimal heat exchange. The resistance wires need to be fully covered by the inserted pipe or fitting.

The resistance wires are positioned in the fusion zone. On both sides of the fusion zones, a cold zone prevents the molten HDPE from outpouring thereby containing the fusion process. During the fusion process the pipe/fitting expands and touches the inner coupler wall. The electrofusion joint is made with the pressure caused by the expanding HDPE and the heat from the resistance wires.

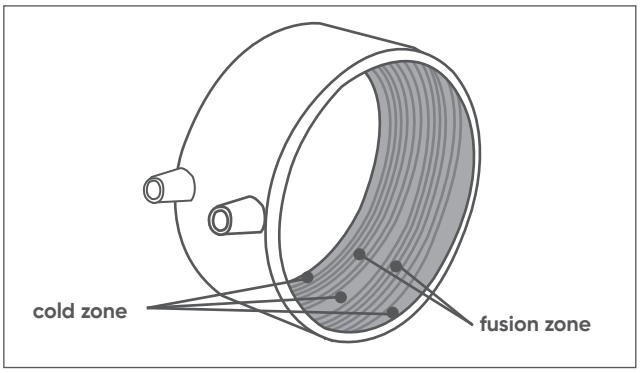


Illustration 7.9

Welding process
In order to make a good electrofusion connection, it is important that the following steps are carried out carefully.

Cut pipe square

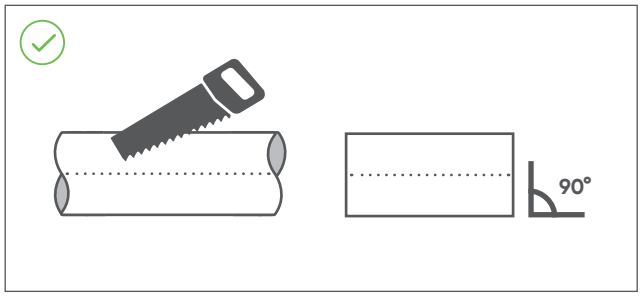


Illustration 7.10

The pipe ends must be cut square to ensure that the resistance wire in the coupler is completely covered by the pipe or fitting

After cutting the pipe ensure that burrs are removed.

Mark surface for scraping
Mark insertion depth to ensure that across the full welding zone the oxidized layer will be removed.

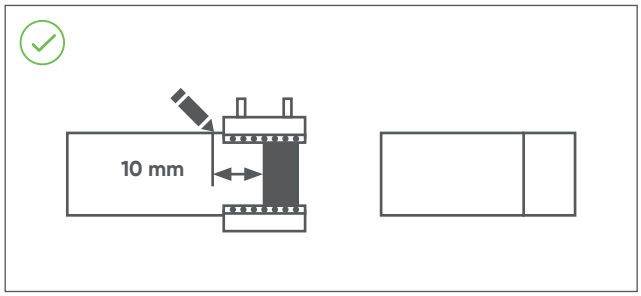


Illustration 7.11

Scrape pipe and mark insertion depth
The full outer surface of the pipe that will be covered by the coupler must be scraped. Scraping depth must be approximately 0,2 mm deep to remove any surface 'oxidation'. The insertion depth should be marked again to safeguard full insertion.

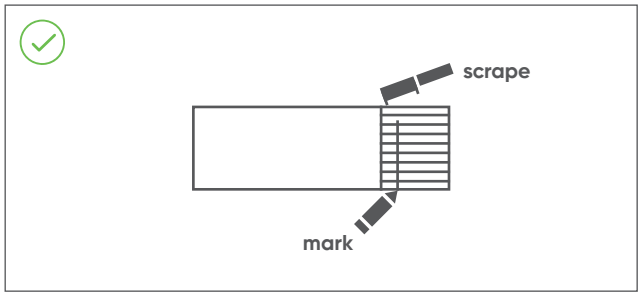


Illustration 7.12

Without removing the oxidation layer a weld cannot be guaranteed. The oxidation layer will form again within one hour. The butt-weld needs to be made right after scraping the ends.

Clean electrofusion coupler
Before assembling the pipes into the coupler ensure that all to be welded surfaces are clean and dry.

Before welding clean the electrofusion coupler and the to be welded spigot ends with paper and a pre approved cleaning solution (Ensuring 100% evaporation). Do not touch the inside of the electrofusion coupler or outside of the spigot ends after cleaning!

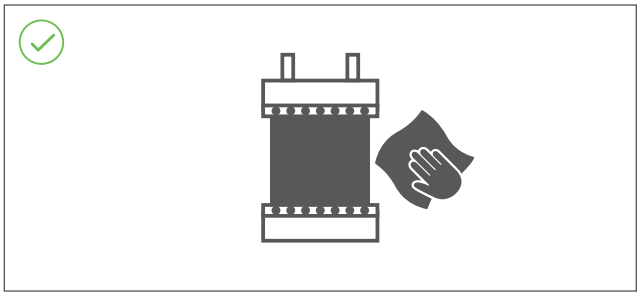


Illustration 7.13

Insert pipe/fitting

Insert pipe/fitting until marked line.

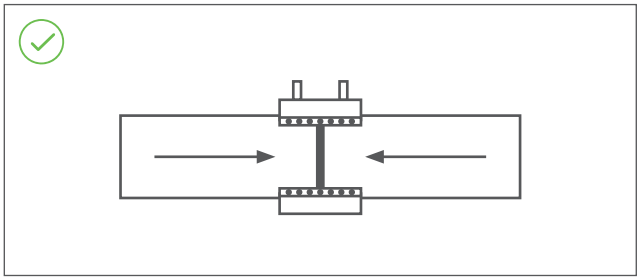


Illustration 7.14

Ensure that the pipe is pushed into the coupler as straight as possible up to the marked insertion depth This will ensure that all the wires are covered with HDPE during the fusion cycle. Misalignment will cause extra load on the fusion zone causing additional HDPE to melt resulting in the outpouring of HDPE or wire movement.

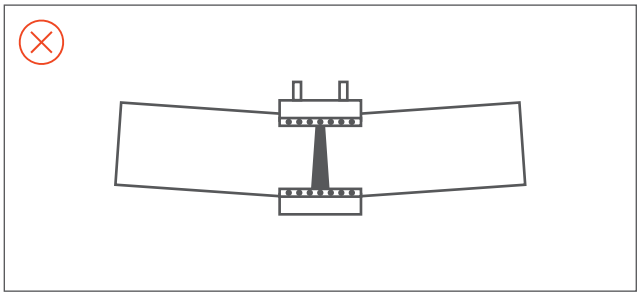


Illustration 7.15

The movement of the pipe can cause melted HDPE to flow out of the joint. This can result in wire movement and possibly a short circuit and thus a bad weld or fire hazard.

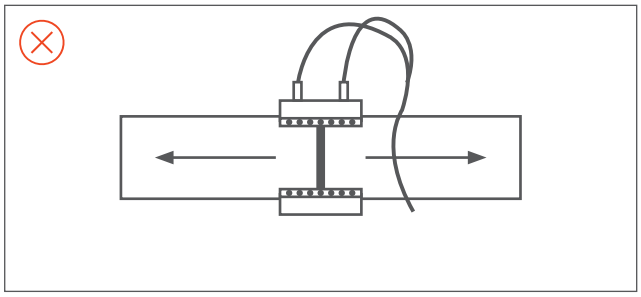


Illustration 7.16

When an electrofusion coupler is used as a repair coupler the center stop is to be removed. This may result in the coupler sliding down when placed vertically. Ensure that the coupler cannot move. Movement may result in short circuit and thus a bad weld or fire hazard.

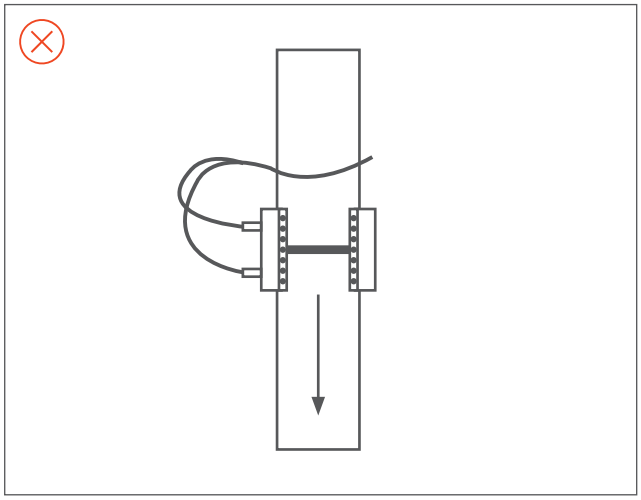


Illustration 7.17

An additional load on the vertical pipe will transfer extra HDPE material to the fusion zone. This will cause movement of the wires and possibly a short circuit and thus a bad weld or fire hazard.

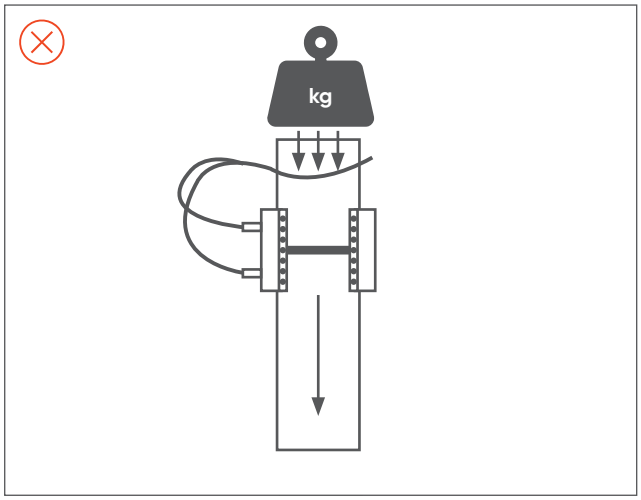


Illustration 7.18

Welding electrofusion coupler and cooling down

After connecting the cables of the control box the fusion process can be commenced by pushing the start button. Both the CB315 and CB160 control boxes adapt the welding time to the ambient temperature. When it is colder than 20°C the welding time is extended and when the ambient temperature exceeds 20°C the welding time is shortened. Welding below an ambient temperature of -10°C is not recommended.

Ambient temperature °C	40-160 mm	200 - 315 mm
-10	97 s	482 s
-5	95 s	469 s
0	92 s	455 s
5	90 s	442 s
10	87 s	428 s
15	84 s	415 s
20	82 s	401 s
25	79 s	388 s
30	77 s	374 s
35	74 s	361 s
40	72 s	347 s
45	69 s	334 s
50	66 s	320 s

Table 7.2 welding time

Cooling times for the 40-160 range are 20 minutes, whilst a cooling time of 30 minutes has to be respected for the 200-315 range products. The cooling period can be reduced by 50% when there is no additional load or strain during cooling (in workshop setting)

Never weld a coupler twice.

During the fusion cycle the right amount of energy is put into the fusion zones. A second fusion cycle would put so much energy into the joint causing the HDPE to melt extensively. This will cause movement of the wires and possibly a short circuit. In the extreme case it may even cause fire.

Assessing an electrofusion weld
Compared to a butt- weld, it is harder to judge a good electrofusion weld. The welding indicators on the electrofusion coupler provide only an indication if the weld has actually been executed. However, they do not guarantee the integrity of the joint. The amount of movement of the pop-out depends on several factors including the size tolerances of the components and any ovality of the pipe or fitting.

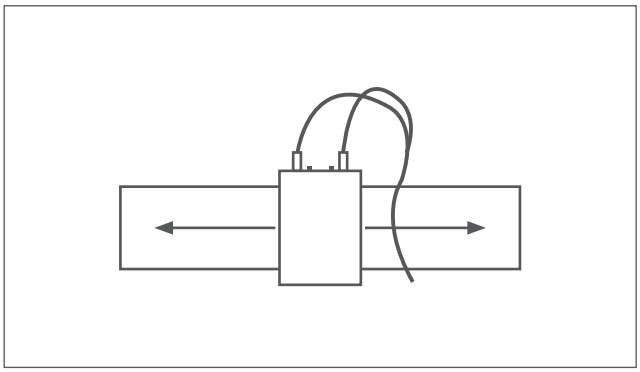


Illustration 7.19

A joint can be marked o.k. when the welding indicators are protruded, all welding preparations such as marking insertion depth, scraping, making sure that there was no additional load during welding and cooling have been executed successfully. If a significant quantity of melt flows out from the fitting after welding, there may be a misalignment of the components, the tolerances may be excessive or a second welding may have accidentally occurred. The integrity of such a joint is suspicious.

Please note that the fitting will become too hot to touch during the welding process. The temperature will continue to increase for some time after the fusion process has been completed.

Deformation
A too big deformation can cause problems during assembly and welding of the components. The maximum allowed deformation of pipe or fitting spigot is 0,02 x d_1. This results in a maximum difference between the largest and smallest diameter corresponding with table 7.3. The pipe or fitting spigot needs to be "rounded" using clamps when the deformation is larger.

diameter d_1 (mm)	d_1 max - d_1 min (mm)
40	1,0
50	1,0
56	1,0
63	1,0
75	1,5
90	2,0
110	2,0
125	2,5
160	3,0
200	4,0
250	5,0
315	6,0

Table 7.3 Deformation pipe

7.4 Rubber ring joints

Plug in joint

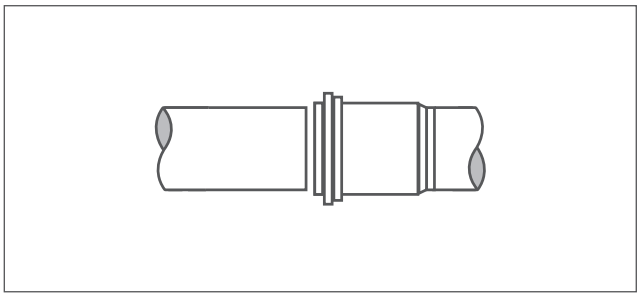


Illustration 7.20

A plug-in joint is an easy to make, detachable and not pull-tight jointing method. Additionally, expansion sockets allow for expansion compensation in the piping system using the same easy to make joint.

Snap joint
For making pull-tight rubber ring joint connections, snap sockets are available. These sockets are rubber ring joints with an additional snap ring which provides, in combination with a groove in the pipe, a pull-tight connection.

Jointing process

1. Cut pipe square and remove burrs

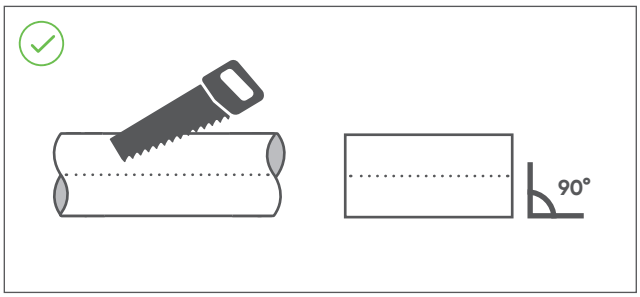


Illustration 7.21

2. Mark Insertion depth

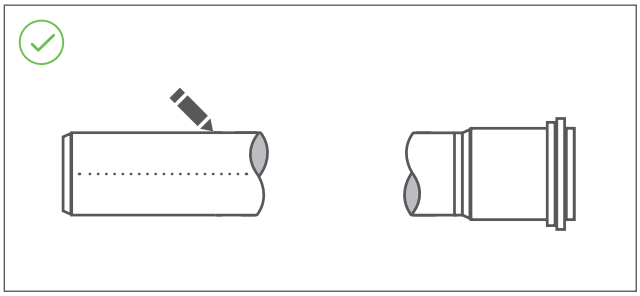


Illustration 7.22

Expansion socket
An expansion socket is used to accommodate the expansion and contraction of a pipe system.

The insertion depth is marked on the socket for both ambient temperatures of 0° and 20°C. For detailed information on insertion depth expansion and socket calculation see paragraph 7.4.

3. chamfer pipe end

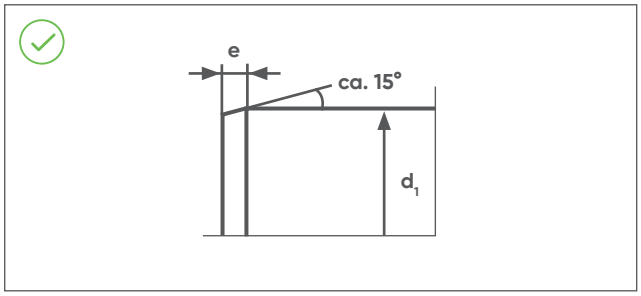


Illustration 7.23 Plug-in joint

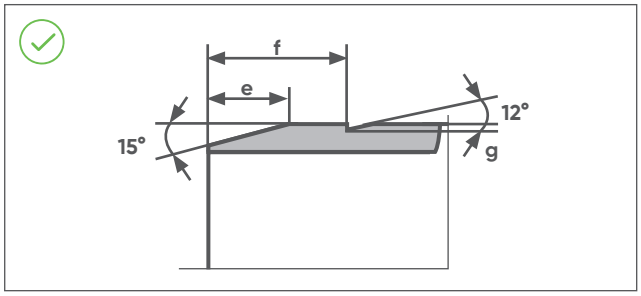


Illustration 7.24 Snap joint

The pipe-ends needs to be chamfered under an angle of 15°. A chamfering tool should be used to get an even cut and chamfer.

When using snap joints a groove needs to be cut under an angle of 12°. The correct dimension can be found in table 7.5. To get an even cut and chamfer it is recommended to use an Akatherm groove cutter.

When no groove is made, the Akatherm snap sockets are detachable like a non pull-tight joint.

d_1 (mm)	e	f	g
40	5	15	1
50	5	15	1
56	5	15	1
63	5	15	1
75	5	15	1
90	6	15	1
110	8	15	1
125	9	15	1
160	11	15	1
200	11	30	2
250	15	30	2
315	18	50	3

Table 7.4 Dimensions chamfer and groove

4. Make joint
Lubricate the pie end and insert the pipe up to the marked insertion dept. When jointing a snap joint a distinguished click can be heard when the snap ring is engaged to the groove.

8 Product range

The following pages provide an overview of the Akasison product range. This includes:
- Roof technology
- Fixing technology
- Pipes
- Fittings
- Tools
- Spare parts

8.1 Dimensions

The dimensions of the pipes and fittings in the product tables are all in mm unless otherwise stated. The European standard EN12056 has been applied since 2001 and replaces local standards. EN12056 dimensions are based on the outside diameter, compared with wall thickness.

DN	e (S12,5)	Application
32	3	BD
40	3	BD
50	3	BD
56	3	BD
63	3	BD
75	3	BD
90	3,5	BD
110	4,2	BD
125	4,8	BD
160	6,2	BD
200	7,7	BD
250	9,6	BD
315	12,1	BD

Table 8.1

DN	e (type S16)	Application
200	6,2	B
250	7,7	B
315	9,7	B

Table 8.2

Scope application B = inside the building structure
Scope application BD = inside and buried outside the building structure

8.2 Pipe

Akatherm HDPE pipes are produced according to EN1519.

Akatherm HDPE pipes are suitable for applications in which the temperature of the pipe can get relatively high, or vary considerably.

Akatherm HDPE pipe has a standard length of 5 m and is produced to high quality standards with many international approvals.

8.3 Electrofusion

Aliaxis Nederland products can be welded by electrofusion unless stated otherwise in the product table. Electrofusion is the preferred method of on-site jointing.

8.4 Buttwelding and the k-dimension

All Aliaxis Nederland products can be welded using this jointing method. Fittings can be shortened by up to the k-dimension (when indicated in the catalogue), thus allowing buttwelding on a standard buttwelding machine.

Only identical materials can be welded.

8.5 Abbreviations

Abbreviation	
A	Cross section area flow
Code	Article number
D	External dimension fitting part
d_1, d^2 ...	External dimension fitting/pipe
DN	Nominal size
e	Wall thickness
k_1, k_2 ...	Maximum length for shortening fittings
L	Total length fitting
l_1, l_2 ...	Partial length of fitting
S	Pipe class according to ISO-S (SDR-1)/2
SDR	Ratio diameter/wall thickness d_1/e

Table 8.3

8.6 Handling and storage

Pipes
The high impact strength of Akatherm HDPE provides some protection against damage, but care should still be taken at all stages of handling, transportation and storage. Pipe must be transported by a suitable vehicle and properly loaded and unloaded. Whenever possible it should be moved by hand or mechanical lifting equipment. Pipes must not be dragged across the ground. The storage should be flat, level, and free from sharp objects.

Lengths
Pipe lengths stored individually should be stacked in a pyramid of not more than one metre high, with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens up to one metre apart. On site, pipes may be laid out individually. Where appropriate, protective barriers should be placed with adequate warning signs and lamps.

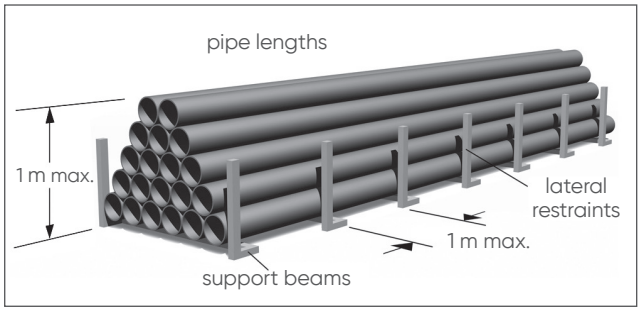


Image 8.2

Bundles
Bundled packs of pipe should be stored on clear, level ground with the battens supported from the outside by timber or concrete blocks. For safety, bundled packs should not be stacked more than 3 m high. Smaller pipes may be nested inside larger pipes. Side bracing should be provided to prevent stack collapse.

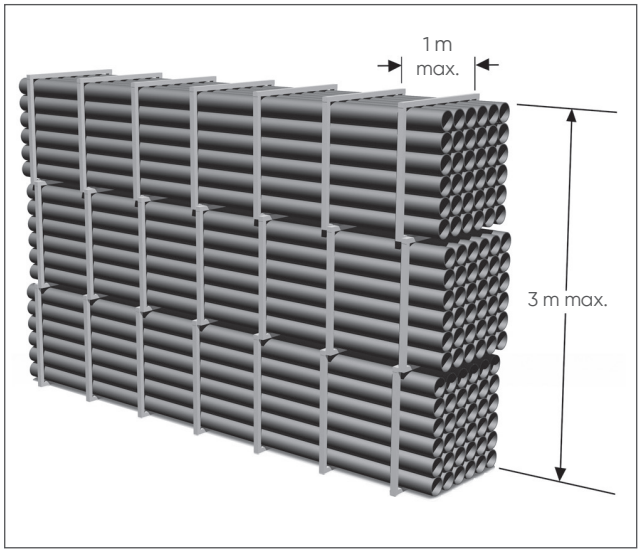


Image 8.3

Fittings
Fittings and electrofusion couplers need to be stored in a dry place. To prevent oxidation and contamination, it is recommended to leave fittings in their original packaging until required for use.

Tools
All tools - especially electrical - ones must be protected against moisture and dust, and should not be dropped.

Recycling residual waste
To comply with regulations, residual waste materials should be recycled:

PE/electrofusion couplers:	recycle/residual waste
Carton boxes	: recycled paper
Plastic containers	: residual waste
Chips	: residual waste
Cleaning cloths	: residual waste

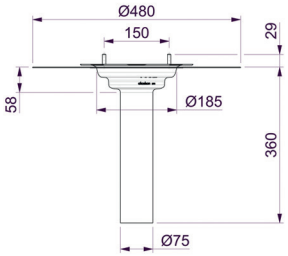
Base roof outlet Akasison XL75 metal for bitumen

AISI 304/HDPE

with 75 mm connection

d_1	Code		Type	Description
75	747342		Akasison XL75 metal	Metal
75	747343		Akasison XL75 H metal	Metal, heated

Metal roof outlet acc. to EN 1253 for bitumen roof membranes for siphonic roof drainage systems.



Delivery includes : Roof outlet with metal clamp flange for connection with bitumen roof membrane.
ASA anti punchring for protection of bitumen membrane.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Fireproof lid for protection during application of roofing membrane.
Optional without extra charge EPS insulating block.

Application : Cold roof/warm roof.
Insulation thickness : Insulation between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d75 mm Code 410795.
Drilling core size : Ø ☐ 80 mm.
140 mm in combination Code 747711 and 747713.
Outlet : d_1 = 75 mm.
Performance : 1-17,7 l/s meassured according to EN1253 setup.
Material : AISI 304, HDPE (UV-stabilized).

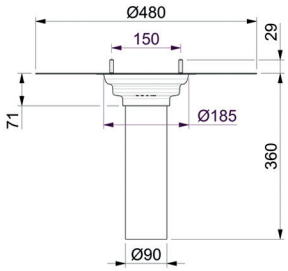
Base roof outlet Akasison XL90 metal for bitumen

AISI 304/HDPE

with 90 mm connection

d_1	Code		Type	Description
90	749342		Akasison XL90 metal	Metal
90	749343		Akasison XL90 H metal	Metal, heated

Metal roof outlet acc. to EN 1253 for bitumen roof membranes for siphonic roof drainage systems.



Delivery includes : Roof outlet with metal clamp flange for connection with bitumen roof membrane.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Fireproof lid for protection during application of roofing membrane.
Optional without extra charge EPS insulating block.

Application : Cold roof/warm roof.
Insulation thickness : Insulation between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Drilling core size : Ø ☐ 100 mm.
140 mm in combination Code 749711 and 749713.
Connection : HDPE Ø 90mm.
Outlet : d_1 = 90 mm.
Performance : 1-29,0 l/s meassured according to EN1253 setup.
Material : AISI 304, HDPE.

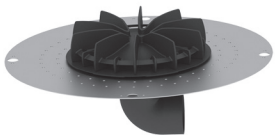
Overview air baffles

					
Code	745550	749053	747551	747554	747552
Type	primary	primary	secondary	secondary	secondary
Air baffle diameter (mm)	Ø250	Ø420	Ø250	Ø320 Ø250	Ø250
Pipe (mm)			Ø75	Ø75	
Suitability XL75	++	++	++	++	++
XL90	-	++	-	-	++
Capacity	combination tested and approved according to EN1253				

Roof outlet Akasison XL75 metal for bitumen horizontal

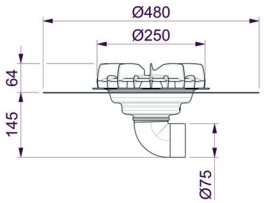
HDPE/ASA/AISI 304

with 75 mm horizontal connection



d_1	Code		Type	Description
75	747382		Akasison XL75 HR metal	Metal
75	747383		Akasison XL75 HR H metal	Metal, heated

Metal roof outlet acc. to EN 1253 for bitumen roof membranes for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of bitumen roof sealing membrane.



Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
ASA anti punchring for protection of bitumen membrane.
Horizontal connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Fireproof lid for protection during application of roofing membrane.
Application : Cold roof/warm roof.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm horizontally.
Performance : 1-17,7 l/s.
Material : AISI, HDPE, ASA (UV-stabilized).

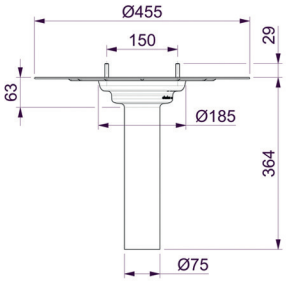
Base roof outlet Akasison XL75 PVC

HDPE/PVC

with 75 mm connection

d_1	Code		Type	Description
75	747544		Akasison XL75 PVC	PVC foil
75	747545		Akasison XL75 H PVC	PVC foil, heated

Roof outlet with PVC clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of PVC roof sealing membrane.

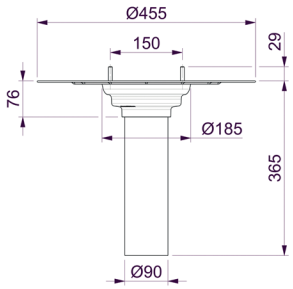


Delivery includes : Roof outlet with PVC clamp flange or connection with PVC roof sealing.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d75 mm Code 410795.
Drilling core size : Ø ☐ 80 mm.
140 mm in combination Code 747711 and 747713.
160 mm in combination with Code 747723.
Outlet : d_1 = 75 mm.
Performance : 1-17,7 l/s.
Material : PVC, HDPE.

Base roof outlet Akasison XL90 PVC

HDPE/PVC

with 90 mm connection



d_1	Code		Type	Description
90	749044		Akasison XL90 PVC	PVC
90	749045		Akasison XL90 H PVC	PVC heated

Roof outlet with PVC clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of PVC roof sealing membrane.

Delivery includes : Roof outlet with PVC clamp flange or connection with PVC roof sealing.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : between 60 and 300 mm.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Drilling core size : Ø □ 100 mm.
140 mm in combination Code 749711 and 749713.
160 mm in combination with Code 749713.
Performance : 1-29,0 l/s.
Material : PVC, HDPE.

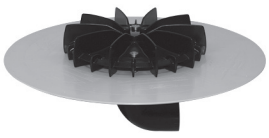
Overview air baffles

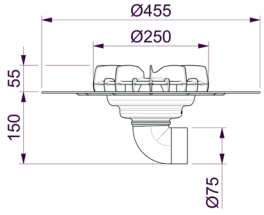
					
Code	745550	749053	747551	747554	747552
Type	primary	primary	secondary	secondary	secondary
Air baffle diameter (mm)	Ø250	Ø420	Ø250	Ø320 Ø250	Ø250
Pipe (mm)			Ø75	Ø75	
Suitability XL75	++	++	++	++	++
XL90	-	++	-	-	++
Capacity	combination tested and approved according to EN1253				

Roof outlet Akasison XL75 PVC horizontal

HDPE/ASA/PVC

with 75 mm horizontal connection





d_1	Code		Type	Description
75	747584		Akasison XL75 HR PVC	PVC
75	747585		Akasison XL75 HR H PVC	PVC, heated

Roof outlet with PVC clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of PVC roof sealing membrane.

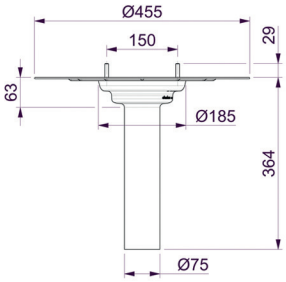
Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Roof outlet incl. PVC flange.
Horizontal connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm horizontally.
Performance : 1-17,7 l/s.
Material : PVC, HDPE, ASA (UV-stabilized

with 75 mm connection

d_1	Code		Type	Description
75	747546		Akasison XL75 FPO/TPO - PP	FPO/TPO
75	747547		Akasison XL75 H FPO/TPO - PP	FPO/TPO, heated

Roof outlet with PP clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Roof outlet with PP clamp flange for connection with FPO/TPO roof sealing membrane.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d75 mm Code 410795.
Drilling core size : Ø ☐ 80 mm.
140 mm in combination with Code 747711 and 747713.
160 mm in combination with Code 747723.
Outlet : d_1 = 75 mm.
Performance : 1-17,7 l/s.
Material : PP, HDPE.



Base roof outlet Akasison XL90 FPO/TPO - PP

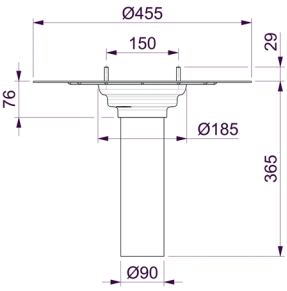
HDPE/PP

with 90 mm connection

d_1	Code		Type	Description
90	749046		Akasison XL90 FPO/TPO	PP
90	749047		Akasison XL90 H FPO/TPO	PP, heated

Roof outlet with UV-stabilized PP clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Roof outlet with PP clamp flange for connection with FPO/TPO roof sealing membrane.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 300 mm.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Drilling core size : Ø ☐ 100 mm.
140 mm in combination Code 749711 and 749713.
160 mm in combination with Code 749713.
Performance : 1-29,0 l/s.
Material : PP, HDPE.



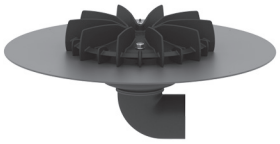
Overview air baffles

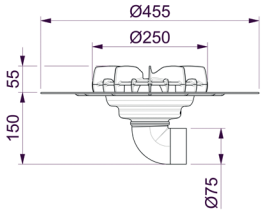
					
Code	745550	749053	747551	747554	747552
Type	primary	primary	secondary	secondary	secondary
Air baffle diameter (mm)	Ø250	Ø420	Ø250	Ø320 Ø250	Ø250
Pipe (mm)			Ø75	Ø75	
Suitability XL75 XL90	++ -	++ ++	++ -	++ -	++ ++
Capacity	combination tested and approved according to EN1253				

Roof outlet Akasison XL75 FPO/TPO - PP horizontal

HDPE/ASA/PP

with 75 mm horizontal connection





d_1	Code		Type	Description
75	747586		Akasison XL75 HR FPO/TPO - PP	FPO/TPO
75	747587		Akasison XL75 HR H FPO/TPO - PP	FPO/TPO, heated

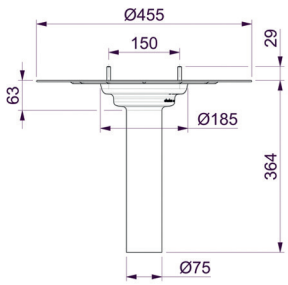
Roof outlet with PP clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Roof outlet incl. FPO/TPO flange.
Horizontal connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm horizontally.
Performance : 1-17,7 l/s.
Material : PP, HDPE, ASA (UV-stabilized).

Base roof outlet Akasison XL75 FPO/TPO - PE

HDPE/PE

with 75 mm connection



d_1	Code		Type	Description
75	747548		Akasison XL75 FPO/TPO - PE	FPO/TPO
75	747549		Akasison XL75 H FPO/TPO - PE	FPO/TPO, heated

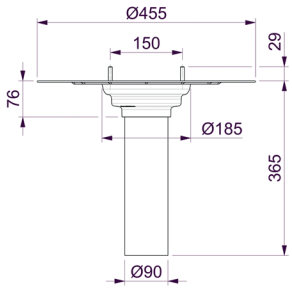
Roof outlet with PE clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Roof outlet incl. FPO/TPO flange.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : between 60 and 330 mm.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Drilling core size : Ø ☐ 80 mm.
140 mm in combination with mounting sleeve Code 747711 and 747713.
160 mm in combination with reinforcement plate with fire protection Code 747723.
Outlet : d_1 = 75 mm.
Performance : 1-17,7 l/s.
Material : PE, HDPE.

Base roof outlet Akasison XL90 FPO/TPO - PE

HDPE/PE

with 90 mm connection



d_1	Code		Type	Description
90	749048		Akasison XL90 FPO/TPO - PE	FPO/TPO
90	749049		Akasison XL90 H FPO/TPO - PE	FPO/TPO, heated

Roof outlet with UV-stabilized PE clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Roof outlet with PE clamp flange for connection with FPO/TPO roof sealing membrane.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 300 mm.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Drilling core size : Ø □ 100 mm.
140 mm in combination Code 749711 and 749713.
160 mm in combination with Code 749713.
Performance : 1-29,0 l/s.
Material : PE, HDPE.

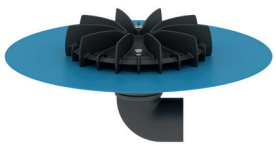
Overview air baffles

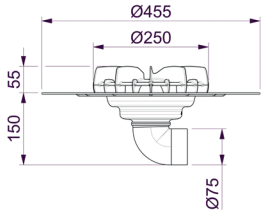
					
Code	745550	749053	747551	747554	747552
Type	primary	primary	secondary	secondary	secondary
Air baffle diameter (mm)	Ø250	Ø420	Ø250	Ø320 Ø250	Ø250
Pipe (mm)			Ø75	Ø75	
Suitability XL75	++	++	++	++	++
XL90	-	++	-	-	++
Capacity	combination tested and approved according to EN1253				

Roof outlet Akasison XL75 FPO/TPO - PE horizontal

HDPE/ASA/PE

with 75 mm horizontal connection





d_1	Code		Type	Description
75	747588		Akasison XL75 HR FPO/TPO - PE	FPO/TPO
75	747589		Akasison XL75 HR H FPO/TPO - PE	FPO/TPO, heated

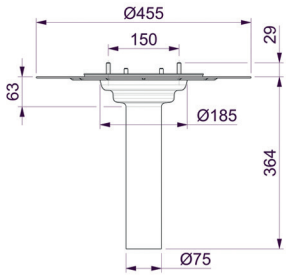
Roof outlet with PE clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for homogeneous securing/sealing of FPO/TPO roof sealing membrane.

Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Roof outlet incl. FPO/TPO flange.
Horizontal connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm horizontally.
Performance : 1-17,7 l/s.
Material : PE, HDPE, ASA (UV-stabilized).

Base roof outlet Akasison XL75 clamp flange

HDPE/stainless steel

with 75 mm connection



d_1	Code		Type	Description
75	747540		Akasison XL75 C	Clamp flange
75	747541		Akasison XL75 HC	Clamp flange, heated

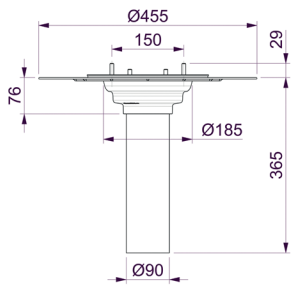
Roof outlet with clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for mechanical securing/sealing of roof sealing membrane.

Delivery includes : Clamp flange with prefixed seal.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm.
Drilling core size : Ø □ 80 mm.
140 mm in combination with mounting sleeve Code 747711 and 747713.
160 mm in combination with reinforcement plate with fire protection Code 747723.
Performance : 1-17,7 l/s.
Material : stainless steel, HDPE.

Base roof outlet Akasison XL90 clamp flange

HDPE/stainless steel

with 90 mm connection



d_1	Code		Type	Description
90	749040		Akasison XL90 C	Clamp flange
90	749041		Akasison XL90 HC	Clamp flange, heated

Roof outlet with clamp flange without air baffle and leaf guard acc. to EN 1253 for siphonic roof drainage systems. Suitable for mechanical securing/sealing of roof sealing membrane.

Delivery includes : Clamp flange with prefixed seal.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : Between 60 and 330 mm.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Outlet : d_1 = 90 mm.
Drilling core size : Ø □ 100 mm.
140 mm in combination Code 749711 and 749713.
160 mm in combination with Code 749713.
Performance : 1-29,0 l/s in combination with Ø 420 mm air baffle.
Material : HDPE/stainless steel.

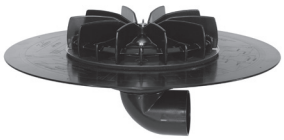
Overview air baffles

					
Code	745550	749053	747551	747554	747552
Type	primary	primary	secondary	secondary	secondary
Air baffle diameter (mm)	Ø250	Ø420	Ø250	Ø320 Ø250	Ø250
Pipe (mm)			Ø75	Ø75	
Suitability XL75	++	++	++	++	++
XL90	-	++	-	-	++
Capacity	combination tested and approved according to EN1253				

Roof outlet Akasison XL75 HR clamp flange horizontal

HDPE/ASA/stainless steel

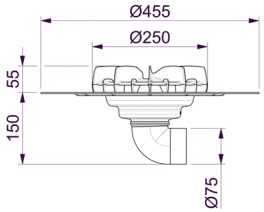
with 75 mm horizontal connection



d_1	Code		Type	Description
75	747580		Akasison XL75 HR C	Clamp flange
75	747581		Akasison XL75 HR H C	Clamp flange, heated

Roof outlet with clamp flange acc. to EN 1253 for siphonic roof drainage systems. Suitable for mechanical securing/sealing of roof sealing membrane.

Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Clamp flange with prefixed seal.
Connection to HDPE.
Heated models include a self regulating 230V heating element, cable length 1 m.
Application : Cold roof/warm roof.
Insulation thickness : 140 mm.
Connection to HDPE : with electrofusion coupler d75 mm Code 410795.
Outlet : d_1 = 75 mm horizontally.
Performance : 1-17,7 l/s.
Material : ASA, stainless steel, HDPE.



Akasison XL75 installation socket

HDPE/galvanised steel/stainless steel

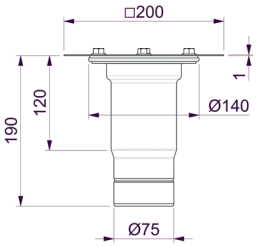
according to DIN 18807
SBR and EPDM seal

d_1	Code		n	M
75	747713		4	8

Akasison XL75 installation socket for pre-completion building drainage when insulation and roof outlets are not yet installed.

Delivery includes : Galvanised plate.
HDPE socket with SBR seal.
Flange and EPDM seal.
Application : Warm roof and applications according to DIN 18234
Connection pipe system : Electrofusion coupler d75 mm Code 410795.
Ring groove for snap socket d75 mm Code Nr. 400730.
Outlet : d_1 = 75 mm.
Drilling core size : Ø ? 160 mm.
Material : HDPE, galvanised steel, stainless steel, SBR, EPDM.

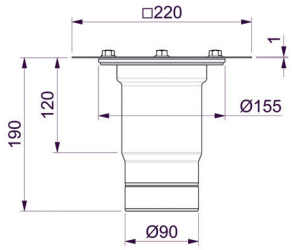
n = number of bolts
M = thread



Akasison XL90 installation socket

HDPE/galvanised steel/stainless steel

according to DIN 18807
SBR and EPDM seal



d_1	Code		n	M
90	749713		4	8

Akasison XL90 installation socket for pre-completion building drainage when insulation and roof outlets are not yet installed.

Delivery includes : Galvanised plate.
HDPE socket with SBR seal.
Flange and EPDM seal.
Application : Warm roof and applications according to DIN 18234
Connection pipe system : Electrofusion coupler d90 mm Code 410995.
Outlet : d_1 = 90 mm.
Drilling core size : Ø ? 160 mm.
Material : HDPE, galvanised steel, stainless steel, SBR, EPDM.

n = number of bolts
M = thread

Akasison XL75 reinforcement plate without connector

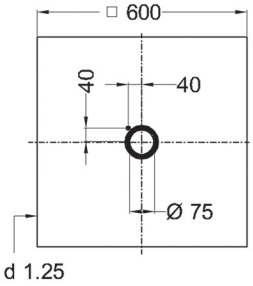
Galvanised steel/EPDM

according to DIN 18807
EPDM seal

	Code		
	747712		

Akasison XL75 reinforcement plate according to DIN 18807 for the vapour barrier connection in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL75. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs the metal plate can be used as reinforcing plate.

Delivery includes : Galvanised plate.
Application : Warm roof and applications acc. to DIN 18234.
Material : Galvanised steel, EPDM.



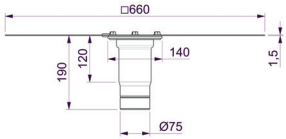
Akasison XL75 reinforcement plate with vapour barrier connection

HDPE/galvanised steel

according to DIN 18807
SBR and EPDM seal

d_1	Code		n	M
75	747711		4	8

Akasison XL75 reinforcement plate according to DIN 18807 for the vapour barrier connection in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL75. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs the metal plate can be used as reinforcing plate. The HDPE socket can be connected for pre-completion building drainage when insulation and roof outlets are not yet installed.



Delivery includes : Galvanised plate.
HDPE socket.
Flange and EPDM seal.
Application : Warm roof (Metalleichtbau) and applications acc. to DIN 18234.
Connection pipe system : Electrofusion coupler d75 mm Code 410795.
Ring groove for snap socket d75 mm Code 400730.
Outlet : d_1 = 75 mm.
Drilling core size : Ø □ 140 mm.
Material : HDPE, galvanised steel, SBR, EPDM.

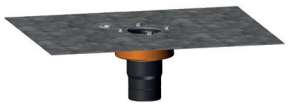
n = number of bolts
M = thread

Akasison XL75 reinforcement plate with vapour barrier connection and fire protection

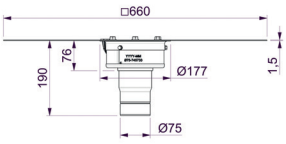
HDPE/intumescent material/
galvanised steel/stainless steel

according to DIN 18234 to 18807
SBR and EPDM seal

d_1	Code		n	M
75	747723		4	8



Akasison XL75 reinforcement plate according to DIN 18807 for the vapour barrier connection and fire collar according to 18234 in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL75. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs, the metal plate can be used as reinforcing plate. The HDPE socket can be connected for pre-completion building drainage when insulation and roof outlets are not yet installed.



Delivery includes : Galvanised plate incl. Akasison fire collar.
HDPE socket with SBR seal.
Flange and EPDM seal.
Application : Warm roof (Metalleichtbau) and applications acc. to DIN 18234.
Connection pipe system : Electrofusion coupler d75 mm Code 410795.
Ring groove for snap socket d75 mm Code 400730.
Outlet : d_1 = 75 mm.
Drilling core size : Ø □ 160 mm.
Material : HDPE, galvanised steel, stainless steel, SBR, EPDM.

n = number of bolts
M = thread

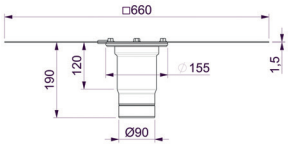
Akasison XL90 reinforcement plate with vapour barrier connection

HDPE/galvanised steel/stainless steel

according to DIN 18807
SBR and EPDM seal

d_1	Code		n	M
90	749711		4	8

Akasison XL90 reinforcement plate according to DIN 18807 for the vapour barrier connection in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL90. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs the metal plate can be used as reinforcing plate. The HDPE socket can be connected for pre-completion building drainage when insulation and roof outlets are not yet installed.



Delivery includes : Galvanised plate.
HDPE socket.
Flange and EPDM seal.
Application : Warm roof (Metalleichtbau) and applications acc. to DIN 18234.
Connection pipe system : Electrofusion coupler d90 mm Code 410995.
Ring groove for snap socket d90 mm Code 400930.
Outlet : d_1 = 90 mm.
Drilling core size : Ø □180 mm.
Material : HDPE, galvanised steel, stainless steel, SBR, EPDM.

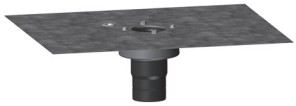
n = number of bolts
M = thread

Akasison XL90 reinforcement plate with vapour barrier connection and fire protection

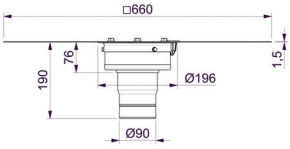
HDPE/intumescent material/
galvanised steel/stainless steel

according to DIN 18234 to 18807
SBR and EPDM seal

d_1	Code		D	H
90	749722		4	8



Akasison XL90 reinforcement plate according to DIN 18807 for the vapour barrier connection and fire collar according to 18234 in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL90. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs, the metal plate can be used as reinforcing plate. The HDPE socket can be connected for pre-completion building drainage when insulation and roof outlets are not yet installed.



Delivery includes : Galvanised plate incl. Akasison fire collar.
HDPE socket with SBR seal.
Flange and EPDM seal.
Application : Warm roof (Metalleichtbau) and applications acc. to DIN 18234.
Connection pipe system : Electrofusion coupler d90 mm Code 410995.
Ring groove for snap socket d90 mm Code 400930.
Outlet : d_1 = 90 mm.
Drilling core size : Ø □ 180 mm.
Material : HDPE, galvanised steel, stainless steel, SBR, EPDM.

n = number of bolts
M = thread

Air baffle with integrated leafguard 250

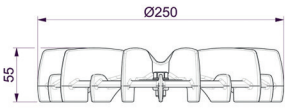
ASA

Including fixing bolts.

d_1	Code
250	747550

Air baffle for base outlet for siphonic roof drainage systems.
For application in combination with Akasison XL75 and XL90 base outlet.

Performance : With Akasison XL75 base outlet 1-17,7 l/s.
With Akasison XL90 base outlet 1-29,0 l/s.
Combination with base outlet tested and approved to EN1253.
Material : ASA (UV-stabilized).



Air baffle with integrated leafguard 420

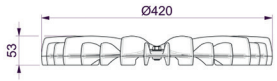
ASA

Including fixing bolts.

d_1	Code
420	749053

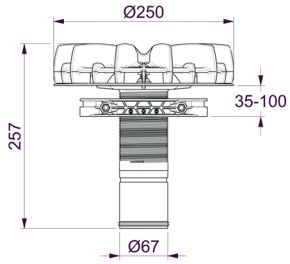
Air baffle for base outlet for siphonic roof drainage systems.
For application in combination with Akasison XL75 and XL90 base outlet.

Performance : With Akasison XL75 base outlet 1-17,7 l/s.
With Akasison XL90 base outlet 1-29,0 l/s.
Combination with base outlet tested and approved to EN1253.
Material : ASA (UV-stabilized).



Air baffle with integrated leafguard height adjustable emergency overflow XL75

ASA



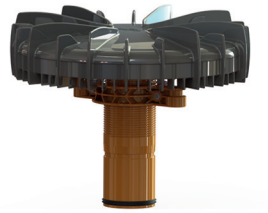
d_1	Code		Description
75	747551		Air baffle Ø 250 mm

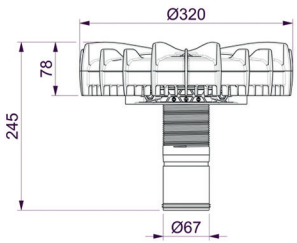
Air baffle for base outlet for emergency overflow siphonic roof drainage systems.
For application in combination with Akasison XL75 base outlet.

Performance : With Akasison XL75 base outlet 1-17,7 l/s.
Combination with base outlet tested and approved to EN1253.
Material : ASA (UV-stabilized).
Height adjustable : 40-85 mm.
Separate seal : Code 745803

Air baffle Airlock with integrated leafguard height adjustable emergency overflow XL75

ASA





d_1	Code		Description
75	747554		Airlock Ø 320 mm

Air baffle for base outlet for emergency overflow siphonic roof drainage systems.
For application in combination with Akasison XL75 base outlet.

Performance : With Akasison XL75 base outlet 1-17,7 l/s.
Combination with base outlet tested and approved to EN1253.
Material : ASA (UV-stabilized).
Separate seal : Code 745803

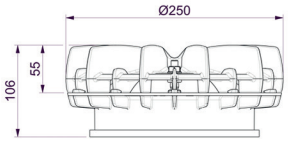
Air baffle with integrated leafguard emergency overflow

ASA

d_1	Code		
250	747552		

Air baffle for base outlet for emergency overflow siphonic roof drainage systems.
For application in combination with Akasison XL75 amd XL90 base outlet.

Performance : With Akasison XL75 base outlet 1-17,7 l/s.
With Akasison XL90 base outlet 1-29,0 l/s.
Combination with base outlet tested and approved to EN1253.
Material : ASA (UV-stabilized).



Roof outlet Akasison XL75 for metal gutter

with 75 mm connection

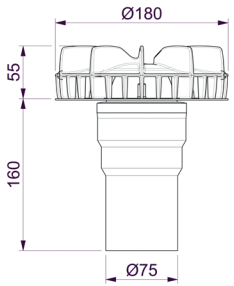
HDPE/ASA/stainless steel

d_1	Code		Type	Description
75	747800		Akasison XL75 MET	Metal gutter
75	747802	1)	Akasison XL75 COV MET	Metal gutter with covering

1) with flange for installation covered gutter

Roof outlet for gutter flange acc. to EN 1253 for siphonic roof drainage systems.
With holes for application in metal gutter.

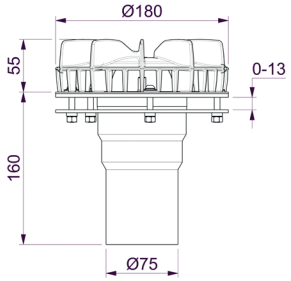
Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Connection to HDPE.
Application : Gutter.
Insulation thickness : n.a.
Connection to HDPE : Electrofusion coupler d75 mm Code 410795.
Dimensions : d_1 = 75 mm.
Drilling core size : Ø ? 110 mm.
Performance : 1-18,0 l/s.
Material : ASA, stainless steel, HDPE.



Roof outlet Akasison XL75 for metal gutter clamp flange

HDPE/ASA/stainless steel

with 75 mm connection



d_1	Code		Type	Description
75	747808		Akasison XL75 MET Clamp	Metal gutter

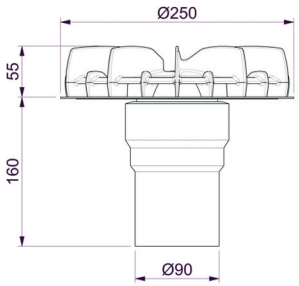
Roof outlet with clamp flange for gutter acc. to EN 1253 for siphonic roof drainage systems.
With holes for application in metal gutter.

Delivery includes	: Air baffle with integrated leafguard (UV-stabilized). Clamp flange with prefixed seal. Connection to HDPE.
Application	: Gutter.
Insulation thickness	: n.a.
Connection to HDPE	: Electrofusion coupler d75 mm Code 410795.
Dimensions	: d_1 = 75 mm.
Drilling core size	: Ø ☐ 110 mm.
Performance	: 1-18,0 l/s.
Material	: ASA, stainless steel, HDPE.

Roof outlet Akasison XL90 for metal gutter

HDPE/ASA/stainless steel

with 90 mm connection



d_1	Code		Type	Description
90	749800		Akasison XL90 MET	Metal gutter

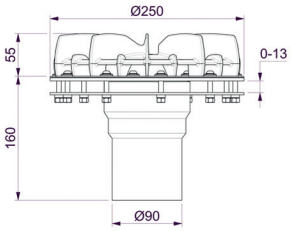
Roof outlet for gutter acc. to EN 1253 for siphonic roof drainage systems.
With holes for application in metal gutter.

Delivery includes	: Air baffle with integrated leafguard (UV-stabilized). Connection to HDPE.
Application	: Gutter.
Insulation thickness	: n.a.
Connection to HDPE	: Electrofusion coupler d90 mm Code 410995.
Drilling core size	: Ø ☐ 130 mm.
Performance	: 1-27,5 l/s.
Material	: ASA, stainless steel, HDPE.

Roof outlet Akasison XL90 clamp flange for metal gutter

HDPE/ASA/stainless steel

with 90 mm connection



d_1	Code		Type	Description
90	749808		Akasison XL90 MET Clamp	Metal gutter

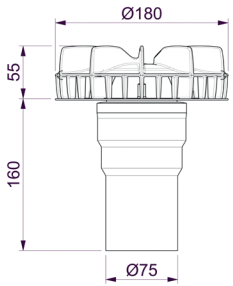
Roof outlet with clamp flange for gutter acc. to EN 1253 for siphonic roof drainage systems.
With holes for application in metal gutter.

Delivery includes	: Air baffle with integrated leafguard (UV-stabilized). Clamp flange with prefixed seal. Connection to HDPE.
Application	: Gutter.
Insulation thickness	: n.a.
Connection to HDPE	: Electrofusion coupler d90 mm Code 410995.
Dimensions	: d_1 = 90 mm.
Drilling core size	: Ø ☐ 130 mm.
Performance	: 1-27,5 l/s.
Material	: ASA, stainless steel, HDPE.

Roof outlet Akasison XL75 for concrete gutter

HDPE/ASA/stainless steel

with 75 mm connection



d_1	Code		Type	Description
75	747801		Akasison XL75 CON	Concrete gutter
75	747803	1)	Akasison XL75 COV CON	Concrete gutter with covering

1) with flange for installation covered gutter

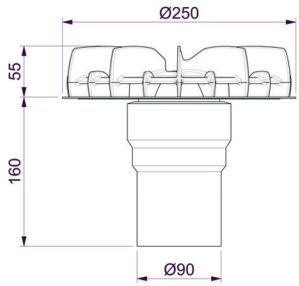
Roof outlet for gutter acc. to EN 1253 for siphonic roof drainage systems.
Gutter outlet with holes for application in concrete gutter.

Delivery includes	: Air baffle with integrated leafguard (UV-stabilized). Knock-in bolts for installation concrete gutter.
Application	: Gutter.
Insulation thickness	: n.a.
Connection to HDPE	: Electrofusion coupler d75 mm Code 410795.
Drilling core size	: Ø ☐ 110 mm.
Performance	: 1-18,0 l/s.
Material	: ASA, stainless steel, HDPE.

Roof outlet Akasison XL90 for concrete gutter

HDPE/ASA/stainless steel

with 90 mm connection



d_1	Code		Type	Description
90	749801		Akasison XL90 CON	Concrete gutter

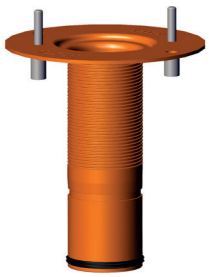
Roof outlet for gutter acc. to EN 1253 for siphonic roof drainage systems.
Gutter outlet with holes for application in concrete gutter.

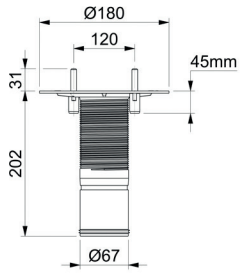
Delivery includes : Air baffle with integrated leafguard (UV-stabilized).
Knock-in bolts for installation concrete gutter.
Application : Gutter.
Insulation thickness : n.a.
Connection to HDPE : Electrofusion coupler d90 mm Code 410995.
Drilling core size : Ø □ 130 mm.
Performance : 1-27,5 l/s.
Material : ASA, stainless steel, HDPE.

Emergency overflow (low) for Akasison gutter outlet XL75

ASA/stainless steel

EPDM seal





d_1	Code		n	M
67	747591		2	8

The emergency overflow set can be applied in combination with Akasison gutter outlets XL75.

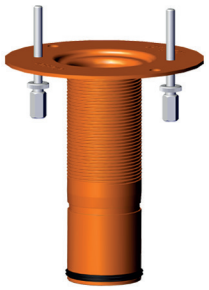
Delivery includes : Emergency overflow flange.
EPDM seal.
Air baffle and leaf guard fixation extension (set of 2).
Height raising element : 45 mm
Application : Emergency overflow system.
Material : ASA, EPDM, stainless steel.

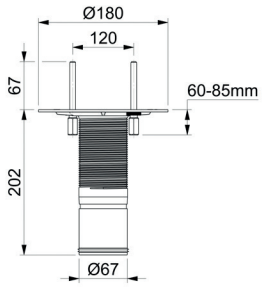
n = number of bolts
M = thread

Emergency overflow (high) for Akasison gutter outlet XL75

ASA/stainless steel

EPDM seal





d_1	Code		n	M
67	747592		2	8

The emergency overflow set can be applied in combination with Akasison gutter outlets XL75. This emergency ring places the air baffle 45mm above the roof surface. Two threaded ends with sockets are included to secure the air baffle to the roof outlet.

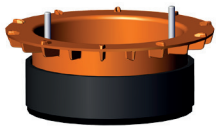
Delivery includes : Emergency overflow flange.
EPDM seal.
Air baffle and leaf guard fixation extension (set of 2).
Height raising element : 60-85 mm
Application : Emergency overflow system.
Material : ASA, EPDM, stainless steel.

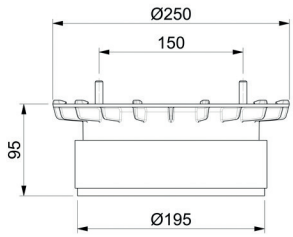
n = number of bolts
M = thread

Emergency overflow raised for Akasison gutter outlet XL90

ASA/stainless steel

EPDM seal





d_1	Code		n	M
195	747593		2	8

The emergency overflow set can be applied in combination with Akasison gutter outlets XL90. <<De noodoverstortring plaatst het functie-element 90 mm boven de afvoerhoogte van het primaire systeem. Twee draadeinden verlengen de bevestigingsbouten van het functie-element en geïntegreerde nokjes zorgen voor de juiste plaatsing van het functie-element.

Delivery includes : Emergency overflow flange.
EPDM seal.
Air baffle and leaf guard fixation extension (set of 2).
Application : Emergency overflow system.
Material : ASA, EPDM, stainless steel.

n = number of bolts
M = thread

Emergency overflow set for Akasison XL75 and XL90

ASA/stainless steel

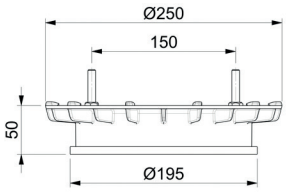
EPDM seal

d_1	Code		n	M
195	747590		2	8

The emergency overflow set can be applied in combination with Akasison roof outlets XL75 and XL90. <<De noodoverstortring plaatst het functie-element 40 mm boven de afvoerhoogte van het primaire systeem. Twee draadeinden verlengen de bevestigingsbouten van het functie-element en geïntegreerde nokjes zorgen voor de juiste plaatsing van het functie-element.>> To be combined with air baffle Ø 250 mm.

Delivery includes : Emergency overflow flange.
EPDM seal.
Air baffle and leaf guard fixation extension (set of 2).
Application : Emergency overflow system.
Material : ASA, EPDM, stainless steel.

n = number of bolts
M = thread



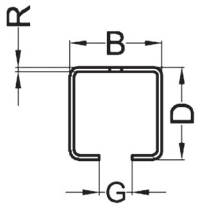
Rail

Galvanised steel

Rail length = 5 m

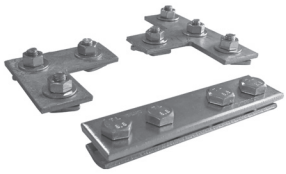
	Code		B	D	G	R
	700005		30	30	14,5	2
	700007		41	41	14,5	2

Application : Code 700005 for brackets 40 to 200 mm.
Code 700007 for brackets 250 and 315 mm.



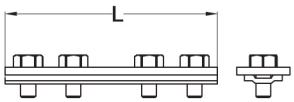
Rail connector

Galvanised steel



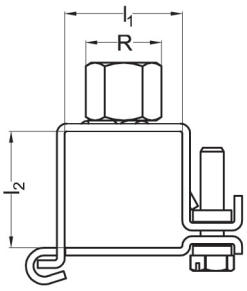
	Code		Type
	700015		straight
	700016		L-angle
	700017		T-angle

Bolts M10.



Rail suspension

Galvanised steel

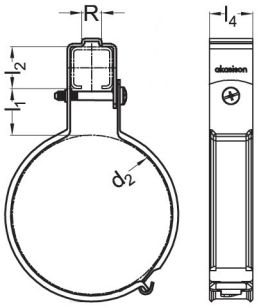


	Code		l_1	l_2	R
	700025		30	30	M10
	700027		41	41	M10

Application : Code 700025 for rail 30 x 30 mm (Code 700005).
Code 700027 for rail 41 x 41 mm (Code 700007).

Rail bracket

Galvanised steel



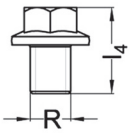
d_1	Code		d_2	l_1	l_2	l_4	R
40	750435		42	35	30	30	M10
50	750535		52	35	30	30	M10
56	755635		58	35	30	30	M10
63	750635		65	35	30	30	M10
75	750735		77	35	30	30	M10
90	750935		92	35	30	30	M10
110	751135		112	35	30	30	M10
125	751235		127	35	30	30	M10
160	751635		162	35	30	30	M10
200	752035		202	35	30	30	M10
250	752535		252	35	41	40	M10
315	753135		317	35	41	40	M10

Anchor point set

Galvanised steel

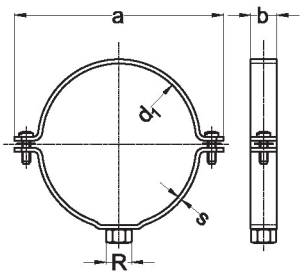
	Code		l_4	R
	730025		21	M10
	730027		40	M10

Application for anchor point d200, 250 and 315 mm.
Includes 2 M10 bolts.



Guide bracket

Galvanised steel



d_1	Code		a	b	s	R
40	700478		93	30	3	½"
50	700578		104	30	3	½"
56	705678		113	30	3	½"
63	700678		113	30	3	½"
75	700778		126	30	3	½"
90	700978		143	30	3	½"
110	701178		161	30	3	½"
125	701278		178	30	3	½"
160	701678		215	30	3	½"
200	702080		283	40	4	1"
250	702580		333	40	4	1"
315	703180		398	40	4	1"

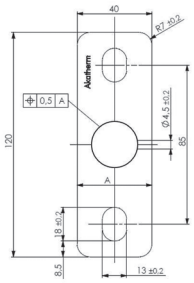
Fully welded.
Thread R ½" = 20,5 mm, R 1" = 33 mm.

Mounting plate for guide bracket

Galvanised steel

	Code		R
	709478		½"
	709480		1"

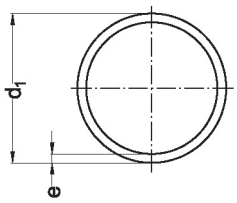
Fully welded.
Thread R ½" = 20,5 mm, R 1" = 33 mm.



Pipe

HDPE

Pipe length = 5 m



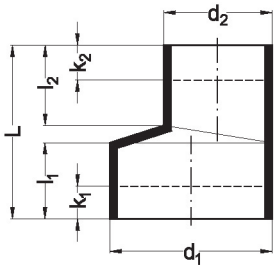
d_1	Code		S	SDR	e	A (cm^2)	kg/m
40	100400		12,5	26	3	9,1	0,36
50	100500		12,5	26	3	15,2	0,45
56	105600		12,5	26	3	19,6	0,51
63	100600		12,5	26	3	25,5	0,58
75	100700		12,5	26	3	37,4	0,7
90	100900		12,5	26	3,5	54,1	0,98
110	101100		12,5	26	4,2	80,7	1,43
125	101200		12,5	26	4,8	104,2	1,85
160	101600		12,5	26	6,2	171,1	3,04
200	102010		12,5	26	7,7	267,6	4,69
250	102510		12,5	26	9,6	418,4	7,3
315	103110		12,5	26	12,1	664,2	11,6

Drainage pipe d40-315 mm according to EN 1519 for application in buildings, d110-315 mm for buried pipe application according EN 12666.

S= pipe class.
A (cm^2) = cross sectional area of flow.

Reducer eccentric

HDPE



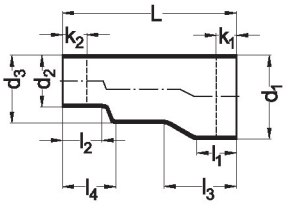
d_1/d_2	Code		L	l_1	l_2	k_1	k_2
50/40	160504		80	35	37	20	20
56/40	165604		80	35	37	20	20
56/50	165605		80	35	37	20	20
63/40	160604		80	35	37	20	20
63/50	160605		80	35	37	20	20
63/56	160656		80	35	37	20	20
75/40	160704		80	35	30	20	20
75/50	160705		80	35	37	20	20
75/56	160756		80	35	37	20	20
75/63	160706		80	35	37	20	20
90/40	160904		80	30	33	20	20
90/50	160905		80	30	34	20	20
90/56	160956		80	30	36	20	20
90/63	160906		80	30	39	20	20
90/75	160907		80	30	44	20	20
110/40	161104		80	31	34	20	20
110/50	161105		80	31	34	20	20
110/56	161156		80	31	35	20	20
110/63	161106		80	31	34	20	20
110/75	161107		80	31	36	20	20
110/90	161109		80	31	41	20	20
125/56	161256		80	35	37	20	20
125/63	161206		80	35	37	20	20
125/75	161207		80	35	30	20	20
125/90	161209		80	35	32	20	20
125/110	161211		80	36	36	20	20
160/110	161611		80	28	36	20	20
160/125	161612		80	32	36	20	20

Reducer eccentric long

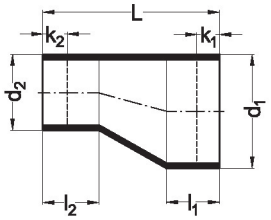
HDPE

d_1/d_2	Code		Type	L	l_1	l_2	l_3	l_4	d_3	k_1	k_2
200/110	142011		A	335	95	36	165	55	160	75	20
200/125	142012		A	335	95	36	165	55	160	75	20
200/160	142016		B	260	95	95				75	75
250/200	142520		B	290	105	95				85	75
315/200	143120		A	580	115	95	235	190	250	95	75
315/250	143125		B	340	115	105				75	85

A

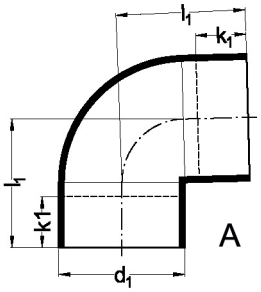


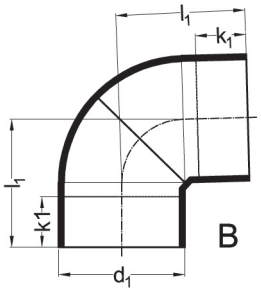
B



Elbow 88,5°

HDPE





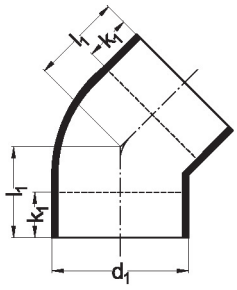
d_1	Code		Type	l_1	k_1
40	120488		A	55	25
50	120588		A	60	20
56	125688		A	65	20
63	120688		A	70	20
75	120788		A	75	20
90	120988		A	80	20
110	121188		A	95	25
125	121288		A	100	25
160	121688		A	120	25
200	122088	1)	B	290	60
250	122588	2)	8	350	60
315	123188	2)	B	360	60

1) fabricated

2) fabricated - wall thickness e according to S12,5

Elbow 45°

HDPE

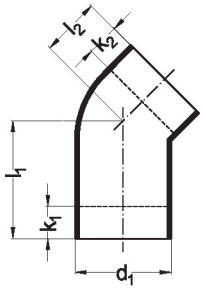


d_1	Code		l_1	k_1
40	120445		40	20
50	120545		45	20
56	125645		45	20
63	120645		50	20
75	120745		50	20
90	120945		55	20
110	121145		60	25
125	121245		65	25
160	121645		69	20
200	122045		173	60
250	122545	1)	182	60
315	123145	1)	195	60

1) wall thickness e according to S12,5

Elbow 45° with long side

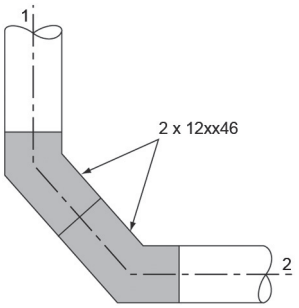
HDPE



d_1	Code		l_1	l_2	k_1	k_2
75	120746		145	50	120	25
90	120946		150	55	120	25
110	121146		147	60	120	25

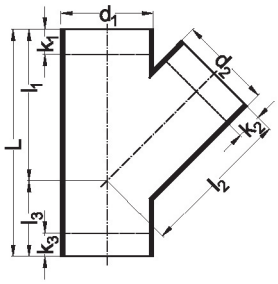
Elbows 45° with long side are applied for making the transition from stack to building drain acc. to EN 12056 (see drawing).

1 stack
2 building drain



Y-branch 45°

HDPE



d_1/d_2	Code		L	l_1/l_2	l_3	k_1	k_2	k_3
40/40	300404		135	90	45	30	30	25
50/40	300504		165	110	55	45	45	40
50/50	300505		165	110	55	20	20	35
56/40	305604		180	120	60	35	30	60
56/50	305605		180	120	60	30	30	40
56/56	305656		180	120	60	25	25	40
63/40	300604		195	130	65	40	45	45
63/50	300605		195	130	65	30	30	50
63/56	300656		195	130	65	25	25	45
63/63	300606		195	130	65	20	20	40
75/40	300704		210	140	70	60	50	65
75/50	300705		210	140	70	40	30	70
75/56	300756		210	140	70	35	25	55
75/63	300706		210	140	70	35	25	45
75/75	300707		210	140	70	25	25	40
90/40	300904		240	160	80	65	55	75
90/50	300905		240	160	80	50	40	80
90/56	300956		240	160	80	45	35	75
90/63	300906		240	160	80	40	30	70
90/75	300907		240	160	80	35	30	65
90/90	300909		240	160	80	20	20	50
110/40	301104		270	180	90	75	60	95
110/50	301105		270	180	90	55	50	95
110/56	301156		270	180	90	45	40	90
110/63	301106		270	180	90	40	35	85
110/75	301107		270	180	90	35	30	75
110/90	301109		270	180	90	30	25	65
110/110	301111		270	180	90	20	20	55
125/50	301205		300	200	100	115	60	75
125/56	301256		300	200	100	110	50	45
125/63	301206		300	200	100	60	45	105
125/75	301207		300	200	100	50	40	95
125/90	301209		300	200	100	35	30	30
125/110	301211		300	200	100	25	25	25
125/125	301212		300	200	100	20	20	20
160/50	301605	1)	375	250	125	120	115	65
160/56	301656	1)	375	250	125	120	115	65
160/63	301606	1)	375	250	125	120	115	65
160/75	301607		375	250	125	120	115	65
160/90	301609		375	250	125	110	105	55
160/110	301611		375	250	125	50	40	45
160/125	301612		375	250	125	10	20	40
160/160	301616		375	250	125	10	15	25
200/50	302005	2)	540	360	180	95	15	175
200/56	302056	2)	540	360	180	95	15	175
200/63	302006	2)	540	360	180	95	15	175
200/75	302007	3)	540	360	180	95	160	175
200/90	302009	3)	540	360	180	80	150	165
200/110	302011	3)	540	360	180	65	140	150
200/125	302012	3)	540	360	180	55	130	140
200/160	302016	3)	540	360	180	35	85	115
200/200	302020	3)	555	375	180	0	0	95

1) fabricated

2) fabricated from branch 200/75 mm with concentric reducer

3) wall thickness e according to S12,5

-- to be continued --

Y-branch 45° - continuation -

d_1/d_2	Code		L	l_1/l_2	l_3	k_1	k_2	k_3
250/75	302507	1)	660	440	220	170	205	235
250/90	302509	1)	660	440	220	160	195	225
250/110	302511	1)	660	440	220	150	185	215
250/125	302512	1)	660	440	220	140	175	205
250/160	302516	1)	660	440	220	120	130	180
250/200	302520	1)	660	440	220	90	50	150
250/250	302525	1)	900	600	300	160	160	250
315/75	303107	1)	840	560	280	255	280	325
315/90	303109	1)	840	560	280	245	270	315
315/110	303111	1)	840	560	280	235	260	305
315/125	303112	1)	840	560	280	220	250	290
315/160	303116	1)	840	560	280	200	205	270
315/200	303120	1)	840	560	280	175	125	240
315/250	303125	1)	840	560	280	140	130	205
315/315	303131	1)	950	610	340	170	170	280

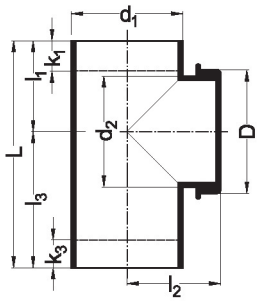
1) fabricated

2) fabricated from branch 200/75 mm with concentric reducer

3) wall thickness e according to S12,5

Clean out branch 90°

HDPE

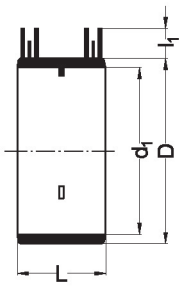


d_1/d_2	Code		D	L	l_1	l_2	l_3	k_1	k_3
40/40	230400		64	130	55	80	75	25	45
50/50	230500		72	150	60	72	90	25	55
56/56	235600		83	175	70	100	105	30	65
63/63	230600		87	175	70	100	105	30	60
75/75	230700		91	175	70	100	105	25	55
90/90	230900		118	200	80	100	120	25	70
110/110	231120		127	225	90	105	135	20	65
125/110	231200		140	250	100	123	150	20	80
160/110	231620		134	350	140	120	210	60	135
200/110	232000		140	360	180	160	180	90	90
250/110	232500		140	440	220	185	220	110	110
315/110	233100		140	560	280	220	280	170	170

Clean out branches 90° can be applied in horizontal and vertical pipes.

Electrofusion coupler

HDPE



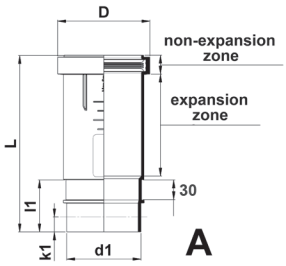
d_1	Code		D	L	l_1	System
40	410495		52	54	16	5A/80s
50	410595		62	54	16	5A/80s
56	415695		68	54	16	5A/80s
63	410695		75	54	16	5A/80s
75	410795		87	54	16	5A/80s
90	410995		102	56	16	5A/80s
110	411195		123	60	16	5A/80s
125	411295		137	66	16	5A/80s
160	411695		172	73	14	5A/80s
200	412065		233	175	21	220V/420s
250	412565		283	175	22	220V/420s
315	413165		349	175	22	220V/420s

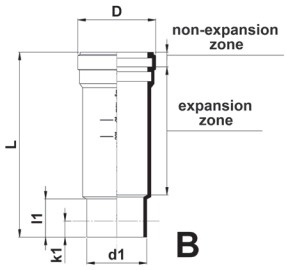
The electrofusion couplers are delivered with centre stops. These stops can easily be removed with a knife or screwdriver (200, 250, 315), so that the coupler can be used as a slide-coupler. Before welding, cut pipe ends squarely with a pipe cutting tool, remove the oxide film with a scraper and mark the insertion depth. The couplers can easily be welded with our Akatherm control box and other suitable control boxes.

Expansion socket with anchor point

HDPE

with protection plug
SBR seal





d_1	Code		Type	D	L	Non-expansion zone	Expansion zone	l_1	k_1	b
40	400420		B	56	172	25	109	35	-	-
50	400520		B	65	172	25	109	35	-	-
56	405620		B	72	172	25	109	35	-	-
63	400620	1)	B	80	155	25	114	15	-	-
75	420720		A	98	255	32	148	72	30	30
90	420920		A	114	255	32	148	72	30	30
110	421120		A	135	260	35	145	76	35	30
125	421220		A	152	260	38	142	76	35	30
160	421620		A	186	266	41	148	76	35	30
200	402020	2)	B	240	300	45	200	55	-	-
200	422020		A	240	435	45	200	180	50	30
250	402520	2)	B	298	300	45	205	55	-	-
250	422520		A	298	460	55	205	200	100	40
315	403120	2)	B	372	355	55	225	68	-	-
315	423120		A	372	495	55	205	235	120	40

1) butt-weld only

2) without protection plug - buttweld only

1 sealing ring

The expansion sockets can absorb length changes of pipes with a max. length of 6 m. A temperature difference of 10°C will result in expansion or contraction of 8 mm. The insertion depths at ambient temperature of 0°C and 20°C are indicated on the sockets.

Expansion sockets d75-315 mm of type A have an integrated anchor point, that is able to incorporate extension of the 5 meter down pipe.

Electrofusion control box CB160-U

d_1	Code		Dim.	V~	Hz	kg	A max	W max
40-160	419830		65x200x85	230	50/60	1,7	5	1150

The Akatherm CB160-U control box is suitable for welding electrofusion couplers from d = 40-160 mm.

Electrofusion control box CB315-U

d_1	Code		Dim.	V~	Hz	kg	A max	W max
40-315	419910		440x220x180	230	50/60	5	10,9	2500

The Akatherm CB315-U control box is suitable for welding electrofusion couplers from d = 40-160 mm (with yellow cable) and electrofusion couplers from d = 200-315 mm (with blue cable).
Yellow and blue output leads and hand scraper are supplied as standard with control box Code 419910.

Output leads for control box CB315-U

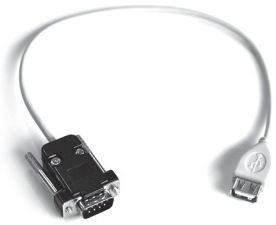
4 pins

d_1	Code		System	Colour
40-160	419971		5A/80s	yellow
200-315	419972		220V/420s	blue

Weld extension cable

d_1	Code		Colour
40-315	419975		black

Connection cable USB



	Code		Colour
	419977		grey

Scraper Spider

	Code		L	B	H	kg
	419860	1)	105	80	60	0,460
	419865	2)	260	210	80	1,600
	419869	3)	260	210	80	1,600

1) excluding Spider accessorries

2) including Spider accessories case, rattle, extension for rattle and blades for replacement

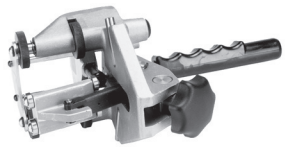
3) inlcuding Spider and accessories case

For the quick removal of the oxide-layer of pipes d50-125 mm.

Spider accessories

	Code		Accessories
	419861		Replacement blades
	419862		Roller set 3x
	419863		Roller holder
	419864		Replacement screw M2, 5x6 for blades
	419866		Case

Scraper FWSG 225



	Code	
	613409	

Rotation scraper for the complete removal of the oxidic layer of PE pipes and fittings d75-225 mm. The scraper is delivered in a useful aluminium transportation case, and includes a set of spare blades.

Manual scraper

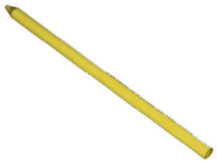
	Code		
	419600		
	419601		replacement blade

PE cleaner

	Code	
	601000	

Reclosable container with 100 cleaning cloths.

Grease pencil



	Code		Description
	419620		PE marker

Package with 12 pencils.

Butt-welding machine 160C

d_1	Code		L	B	H	kg
40-160	492000		835	565	760	87

d_1 = 40-50-63-75-90-110-125-160.
Suitable for welding Y-branches 45°.

Butt-welding machine 250 C

d_1	Code		L	B	H	kg
75-250	493000		835	565	760	160

d_1 = 75-90-110-125-160-200-250.
Suitable for welding Y-branches 45°.

Butt-welding machine 315 C

d_1	Code		L	B	H	kg
90-315	494000		1200	680	1045	187

d_1 = 90-110-125-160-200-250-315.
Suitable for welding Y-branches 45°.

Fixing bolts for Akasison leaf guard (set of 2)

Stainless steel

	Code	
	745551	

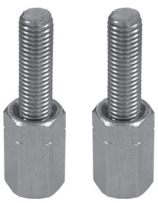
Fixing bolts for Akasison clamp flange (set of 6)

Stainless steel

	Code	
	745562	

Fixing bolts for Akasison emergency overflow (set of 2)

Stainless steel



	Code	
	7465110	

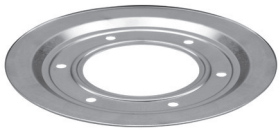
Fixing bolts for reinforcement plate Akasison XL75 (set of 4)

Stainless steel

	Code	
	745723	

Clamp flange Akasison

Stainless steel

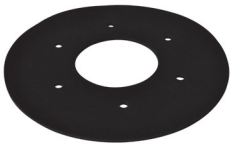


	Code	
	745566	

For roof outlets Akasison Code747540,747541, 747580, 747581, 749040 and 749041.
Without fixing bolts.

Seal for clamp flange Akasison

EPDM



	Code	
	745565	

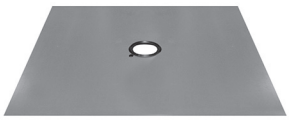
For roof outlets Akasison Code 747540, 747541, 747580, 747581, 749040, 749041.

Akasison XL75 reinforcement plate without connector

Galvanised steel/EPDM

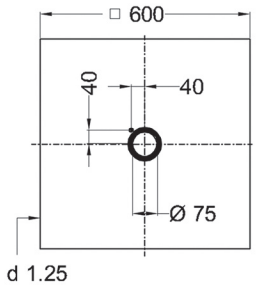
according to DIN 18807
EPDM seal

d_1	Code		
	747712		



Akasison XL75 reinforcement plate according to DIN 18807 for the vapour barrier connection in siphonic roof drainage systems. Applied in insulated metal roofs in combination with roof outlet Akasison XL75. At the top of the metal plate a vapour barrier foil or bitumen can be applied. In combination with specific roofs the metal plate can be used as reinforcing plate.

Delivery includes : Galvanised plate.
Application : Warm roof and applications acc. to DIN 18234.
Material : Galvanised steel, EPDM.



Heating element 230V/7W Akasison

	Code		V	Watt
	745540		230	7

For roof outlets Akasison XL75.
Self regulation heating element.
Direct connection to 230 V.
Including 1 m cable.

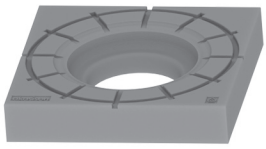
Fire protective collar Akasison

	Code		Description
	747533		3-point fastening

For Akasison XL75 Art. Nr. 747723.
Metal body with intumescent material.

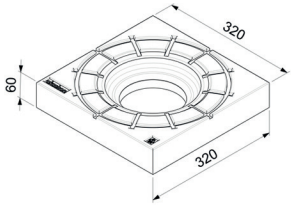
EPS insulation block

EPS



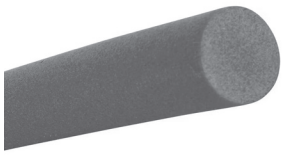
	Code	
	745533	

For Akasison roof outlets XL75.



Temporary foam waterstop

EPS



	Code	
	745564	

For d75 mm outlets, reinforcement plates end installation sockets.

Alphabetical index

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