



# Technical Guide

## AusPress Stainless Drainage Products

The following information is only a guide. All work must comply with AS/NZ 3500 and any other relevant standards applicable to the installation. **For specific installation assistance, or if you're in doubt, please contact us before proceeding.**

As with all work using tools, the following points are to be adhered to and understood, along with the general safety practices such as wearing suitable clothing and equipment, being alert and focused, keeping the work area clear of obstacles and observing WHS (OH&S) requirements.

### Stainless Drainage Pipe & Fittings

#### Installing Stainless Drainage

The socket-spigot stainless drainage system comprises directional pipe and fittings (installed with flow into the socket, out the spigot) with the socket pre-fitted with a rubber ring to seal each joint.

Refer to the installation guides at the front of each AusPress Drainage catalogue section for more information.

#### 1. Cutting

Stainless drainage pipe lengths are supplied in set lengths from 150mm through to 6.0m and may be cold cut using an approved pipe cutter that creates a bevel on the pipe end and assists fitting. Care should be taken as cut ends could be sharp.

Do NOT cut with drop saws or angle grinders.

Ensure the socket is retained on pipe lengths when cutting shorter. Spigot-spigot pipe lengths are not recommended.

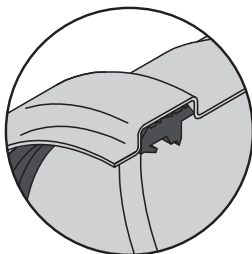
#### 2. Ring Seals

Ring seals are fitted to each socket end with an EPDM type supplied pre-fitted as standard.

Check the ring seal is free of debris and the correct type of seal is fitted for the application and temperatures to be used. **Not sure? Ask!**

Ensure the ring seal is fitted correctly with taper facing outward (see image).

Replace the seal if unsure or incorrect. Remove the seal to see the type labelled on the inside flat surface of the ring seal.



#### 3. Joining

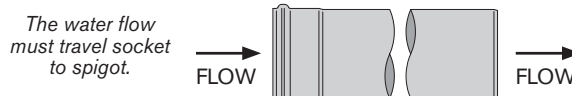
Apply lubricant to ring seal & outside of spigots.

Material	Colour	Application†	Operating Temp
EPDM	Black (Dull)	General use.	-40° to +100°C
FPM	Green (or Purple)	High temp, gas, oil, fuel.	-25° to +200°C
NBR	Black (Shiny)	Gas, oil, fuel.	-30° to +80°C

†Confirm with AusPress prior to installation.

Preferred lubricant is silicon based (such as Super Glidex) but an approved soap based lubricant can also be used. Grease is not to be used as this may damage ring seals.

Push the spigot into the socket fully with a slight turning movement.



Joint is then pulled back 5mm to 10mm to allow for expansion and contraction within the socket.

#### 4. In-Ground Installation

When stainless drainage products are being installed in-ground, grade 316L stainless is to recommended.

Bedding and surrounding fill is to be a minimum thickness of 50mm pH neutral sand, free of chlorides and/or salts.

Crushed aggregate or fine gravel is NOT to be used.

Wrapping of inground drainage is not required for standard applications - contact us if wrapping is required for your installation.

**NOTE:** Check with us prior to installation if soil is constantly damp, wet or subject to often or occasional high water table levels, reclaimed or contaminated soil or soil of unknown origin is used!

#### 5. Bracketing

Bracketing is to comply with AS/NZ 3500.

If a dissimilar bracket metal is used, a protective isolation barrier is to be provided between the stainless surface and the bracket.

Changes of direction on main suspended drainage should be bracketed in both directions as close as possible to bend, to prevent lateral movement.

Extra bracketing may also be required at socket joints to prevent sagging.

#### 6. Good Practice

Preference installing 45° branches.

All main horizontal 90 degree direction changes should be made using 2 x 45° bends with a minimum 150mm length between.

Venting procedures must comply with AS/NZ 3500.

#### 7. Welding

If welding is to be carried out, prior approval must be obtained from AusPress. Purge-welding procedures must be undertaken and all welds are to be pickled and passivated prior to installation and backfilling.

#### 8. Special Applications

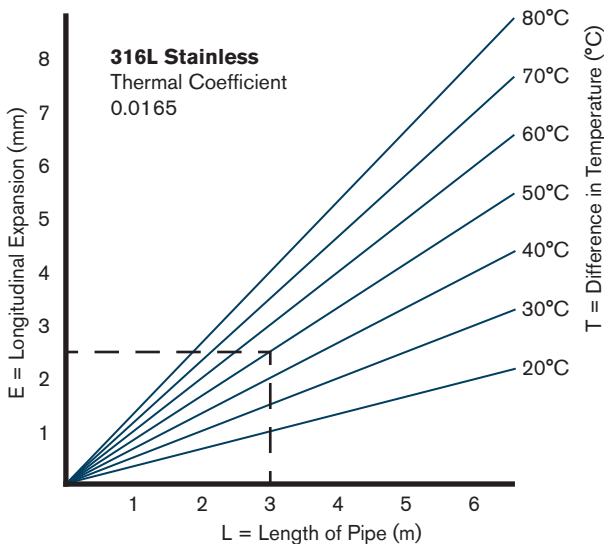
Stainless drainage pipe and fitting products can be used for special applications such as ducting, vacuum, siphonic drainage and low pressure pumping applications. Please consult us for technical advice and vacuum specific products.

## Expansion & Contraction

Pipes in any direction (including horizontal suspended and horizontal in ground) must be supported to prevent the force arising through heat expansion can neither bend the pipes nor pull the spigot ends from the sockets.

Expansion Sockets are available for larger expansion and contraction movements.

The below graphs the expected expansion of grade 316 stainless steel with change in temperature. This is expressed as the formula  $E=L \cdot T$ .



For example:

A 3m length pipe at ambient temperature (20°C) is filled with 70°C hot water. The temperature difference of 50°C (70°C minus 20°C) expands the grade 316L stainless longitudinally approximately 2.5mm overall.

Stainless has a very low coefficient of expansion under normal conditions; as a general rule, fixing points and expansion sleeves may be omitted if the temperature remains under 100°C and the maximum straight run of pipework is under 40m. Spigot ends must be pulled the 5 to 10mm from the socket after full insertion.

## Suspended Graded Installation

Diameter	Support Spacing
50mm	2.2m
75mm	2.5m
110mm	2.8m
160mm	3.3m
200mm	3.0m
250mm	3.0m
315mm	3.0m

The distance between the suspended supports must be calculated on the basis of a permissible 1mm bending of the pipe. The bending for a single mounting is calculated for a water-filled pipe.

Spacing distances apply to continuous straight lengths. At joins in the suspended drainage, additional fixing points must be placed that either the branch or the through pipe is held directly under the sleeve (not on the socket part). Changes in direction shall be supported with suitable bracketing to prevent movement & the join separating.

If this is not possible, the span between fixing points must be reduced by half or, as an alternative, Joint Clamps can be installed for stability.

## Vertical Installation

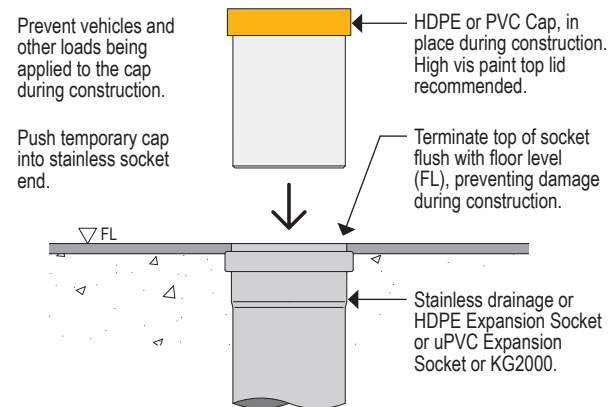
3.0m maximum gap between each support or designed to support water-filled pipe plus any expected loads.

Where larger inlets are connected, the pipe must be secured immediately below the inlet and under (not on) each socket.

Consideration for forces against change in directions for vertical drops must be provided to suit and securing any joins as part of the installation.

## Connecting at Floor Level

Protecting the drainage & socket from damage & debris.



## Fire Protection

Stainless drainage is a class A1 fire resistant product (highest rating) and certified as non-combustible (EN1124 parts 1 & 2).

Penetrations that require fire rating can be sealed between the opening and stainless pipe with a suitably rated mortar or insulation/mastic product that is compatible with stainless steel (eg low chloride). Fire collars are not required for stainless pipework. Consult standards for local requirements.

## Vacuum & Siphonic

Stainless drainage is suitable for vacuum (sewer) piping and siphonic (rainwater) installations. We recommended these systems are professionally designed - we have more information on request.

The material strength of stainless provides a high resistance to implosion and the rigid lengths are lightweight to install. We recommend Joint Clamps are used on each join and bracketing to resist the vibrations at 3m internals maximum or at a change in direction.

## Handling & Surface Finish

Stainless is resistant and durable but care must be given during transport and installation to not damage the shape or stainless surface.

**Storing:** Ensure stainless is kept suitably protected from contaminants, welding and/or grinding sparks, excessive weight or over stacked. Long lengths are recommended to be handled by more than one person.

**Mill Finish:** A dull surface finish, suitable for drainage however not suitable for exposed or aesthetic applications (such as downpipes as it shows fingerprints). For exposed installations, polishing the external surface is available on request.



## Installing Floor Gully & Channel

### Stainless Drain Bowls & Channel Bases

Both these systems are installed with the body/base fixed into position permanently with the accessories including grates, filter basket and foul air trap (FAT) fitted into the body/base afterwards.

These instructions are based on common installation situations for our products. If conditions, requirements or situations vary, contact AusPress for advice before installing. Other elements, including structural, are to be designed and specified by suitably qualified others and shown here for illustration purposes only.

### 1. Preparation

If to be installed in a recess, it should have a minimum 50mm gap on all edges (eg the cutout is 100mm wider overall than the channel) and 50mm deeper than the outer dimensions.

Remember to allow for the anchor tags and levelling angles in sizing the cutout hole size.

If connecting to metric drainage such as ACO Pipe®, Blucher® EuroPipe or KG2000®, the outlet spigot will push into a socket end connection. For HDPE and PVC, use an expansion socket; for cast iron use an 'Ensign' joining socket. Standard outlet dimensions are 110mm and 160mm outside diameter (OD).

### 2. Installing

Points are illustrated in the adjacent diagrams.

- 1) Ensure drainage piping is set up at correct height to suit depth of floor drain chosen (refer to technical information for measurements).
- 2) Position the support brackets for threaded rod or the supplied support legs to suitably support the drain bowl or channel base from moving.
- 3) Ensure appropriate moisture barriers are used to prevent corrosion as best practice construction, such as under each support leg stand for suspended slabs.
- 4) Place the drain bowl or channel into position and align with the levelling supports.

Long channels with bolted flanges will require this to be completed in sections and with multiple people to prevent the channel from torquing.

- 5) Adjust each of the supports to adjust & level the drain bowl or channel to the correct height. Threaded rod is recommended to be secured with a second nut, one each side of the tag.
- 6) Tie anchor tags to steel reinforcement. This will help prevent movement or floating during concreting and earth the drain bowl or channel.
- 7) Confirm the drain bowl is at correct height and is level.
- 8) Install 10mm thick x 20mm deep styrene foam to outside perimeter of the top of the drain bowl or channel edge.
- 9) Protect the opening with plywood or similar to ensure concrete and other foreign matter does not enter during construction.

10) Concrete footing is poured.

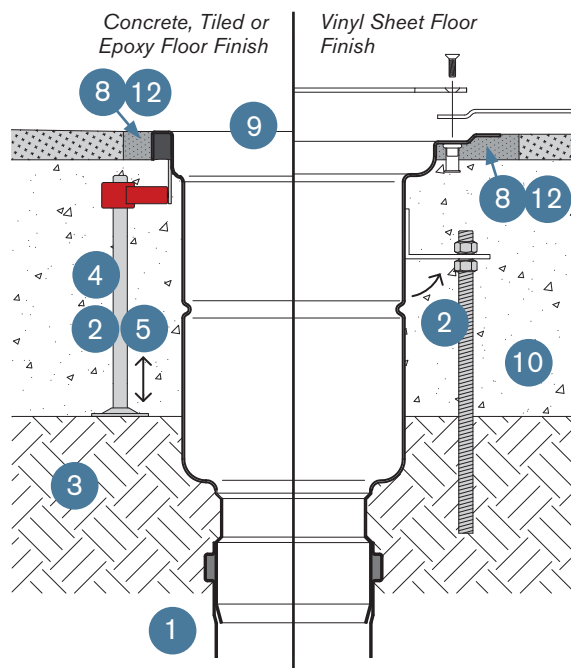
11) After concrete is set, and before final floor finish is applied (eg epoxy coating), remove the styrene foam from around outside perimeter.

12) Fill the gap made by the foam with an approved polyurethane sealant (such as Sikaflex-11FC) as per manufacturer's instructions and ensuring the product installation procedures are adhered to.

Two common methods are used to secure & level the drain bowl or channel when installing are shown below.

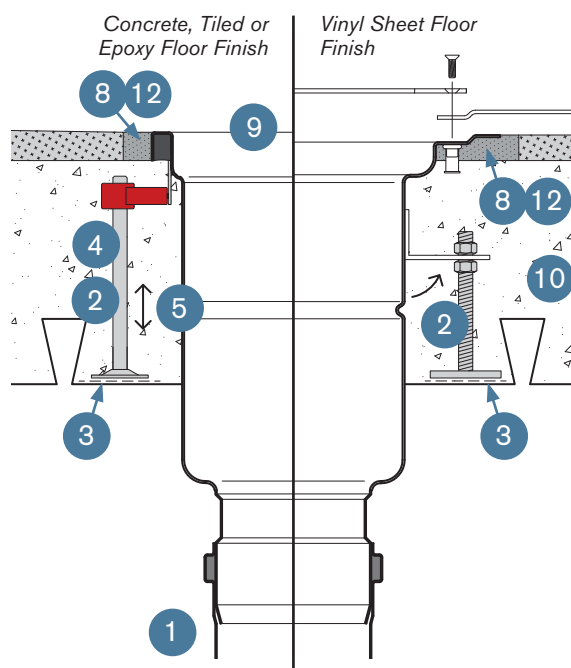
### Method A – In Ground

Use the easy adjust support legs or threaded rod.



### Method B – Suspended Slab

Use the easy adjust support legs or threaded rod.



### 3. Installing Grates and Accessories

We recommend installing the grates and accessories as part of commissioning to prevent damage or loss of items during construction.

Remove any protective covering only if no damage can occur to the drain bowl or channel before use.

Fit the grate and accessories within the drain bowl as supplied. If a removable Foul Air Trap (FAT) is supplied, fit the rubber seal over the drain bowl bump first, then fit the FAT to the seal. The filter basket must be positioned above the removable Foul Air Trap (FAT) within the drain bowl.

Confirm the grating fitted is suitable for the traffic load and application prior to use.

Prevent construction traffic, scissor lifts, forklifts, vehicles or heavy loads from driving over an unprotected floor gully or channel.

### 4. Bolted Flange Connections

Channels manufactured with bolted connections are supplied with the fixings and a Viton rubber gasket to assemble and join the channel sections together. Tighten bolts evenly and ensure the gasket is not over or under compressed.

### 5. Special Installation Notes

Site materials can contaminate and damage the surfaces. Ensure the drain bowl and channel are clear of debris and cleaned in the approved method to avoid damage.

It is recommended that channels greater than 2.5m in length or irregular shapes be handled and installed with multiple people. This is to prevent the channel from accidental twisting and being damaged.

### 6. Flow Rates

Depending on the accessories installed and the drain bowl selected, the flow rates are expected based on 'clean' continuous flow of water, without solids. Flows with solids or contaminated water will experience lesser values.

Use the component with the lowest flow rate value when making flow calculations. Accessories such as Filter Baskets, Secondary Strainers and Silt Baskets will restrict the flow further, whether clean or otherwise.

## Corrosion Resistance

### Resistance Against Corrosion

316 stainless steel is resistant to corrosion when it is exposed to clean atmosphere (ambient air). The probability of corrosion is increased by contact with corrosion-promoting construction materials or by installation in corrosive atmospheres such as coastal areas or chemical production facilities.

We offer technical advice and have access to metallurgist specialists for water quality & purity testing for specialised applications or projects with specific needs.

### External Surface Protection

High ground water, external conditions such as coastal environments and contaminated soils can all effect the external surface of stainless steel drainage.

In areas where a risk of damaging effects exists, installation of stainless without protection should be avoided.

If there is the risk of corrosive substances (eg. Unsuitably high chloride content waters, plaster, building materials containing chloride, specialised concrete, high ground water levels, nitrite or ammonium) acting on the drainage over prolonged periods, surface-mounting or suitable corrosion protection is recommended.

Protection against external corrosion must meet the following requirements:

- Waterproof.
- Non-porous.
- Resistant to heat and ageing.
- Undamaged.

Refer to Tech Note TN.07, TN.04 & TN.11 for more information.

### Potable Water

Corrosion-resistant steels do not react with potable water due to their protective chromium oxide layer. This makes stainless steel corrosion-resistant to potable water.

Local corrosion effects such as pitting or crevice corrosion can occur in water with unduly high chloride content. This can occur from excessive chlorous disinfectant use or naturally occurring such as in bore water. Therefore, the duration of application and concentration for use must be strictly observed.

The content of water-soluble chloride ions at ambient temperature in potable water and water which is similar to potable water should not exceed 250 mg/l (250 ppm).

Corrosion resistance decreases as the temperature increases. Therefore, AusPress must be notified of maximum media temperature and media contents (eg water analysis) to enable a suitability recommendation.



### Treated Water

All water treatment methods such as ion exchange or reverse osmosis can be used with grade 316 stainless steel. No additional measures to protect against corrosion are necessary.

Stainless steel is corrosion-resistant to treated water such as:

- Softened/decarbonised water.
- Fully desalinated water (deionised, demineralised, distilled and pure condensates).
- Ultrapure water with a conductivity of < 0.1 µS/cm.

### Chemical Suitability

Some chemicals are not suitable for stainless steel, diluted or otherwise. Please confirm suitability with the chemical manufacturer before use or contact AusPress for an assessment.

Complete a Project Info Sheet with the relevant MSDS and details from our website.

## Commissioning & Maintenance

Stainless products require little maintenance. In most environments, little or no maintenance is necessary. This would include wet areas and shower rooms with no washdown debris.

We recommend installing the grates and accessories as part of commissioning to prevent damage during construction.

Please ensure wash down waters or waste debris do not contain chemicals that are either high in chlorides or not suitable for stainless.

Care is to be taken to prevent scratching the stainless steel surface. Avoid any contact with, grinding and welding sparks, metal shavings, corrosive chemicals or any material or process which may cause failure during construction and also from future maintenance.

Ensure that all drains and accessories are properly "dry" cleaned to remove any foreign products from drain bowls etc, before initial wet clean. A visual inspection is recommended if any rust spots appear caused by these foreign products, please ensure these are removed using a scotch bright cleaning pad only, then thoroughly washed out with cold potable water. This process should also be followed after any maintenance once plant is commissioned.

In especially demanding environments, such as food processing, chemical industries and agriculture, it may be necessary to clean to avoid coating that could lead to corrosion later. Cleaning can be carried out with high-pressure cleaning or high pressure flushing equipment using potable water.

If installed in locations effected by coastal conditions, a regular cleaning regime must be implemented to remove external salts and contaminants from the stainless.

Generally, AS 3500.2 shall be followed, air or water methods can be used. The installation shall have all necessary brackets, clamps and secured appropriately before commencing in the test.

Limitations:

- max pressure of 50 kPa (in either method),
- ensure clean, preferably potable, water is used.
- air to be 'dry' with an oil content < 1 mg/3.
- test duration: 15 mins as per AS 3500.2.

Where there is heavy coating, plastic or brass tools can be used. With especially persistent coating, diluted citric acid can be used to loosen the deposit. This must be flushed with large quantities of cold potable water afterwards.

Cleaning of drains, including the emptying of filter basket, is to be performed at least once every shift and when required.

In cases of difficulty, users should consult us for technical advice.

### Disinfecting the System

This is carried out to meet more stringent hygiene requirements, and in the event of severe microbial contamination. Contact us for more information.

To protect the environment and simplify handling, the Australian Drinking Water Guidelines (ADWG) recommend the use of hydrogen peroxide, however chlorine can also be used to disinfect.

Before commissioning the system carefully follow the instructions for use, particularly in relation to the contact time, maximum solution concentration and subsequent flushing requirements.

**Note:** To reliably prevent corrosion damage, during disinfection do not exceed the maximum chlorine concentration and contact times as tabled below:

The Australian water regulations allow dosing with up to 1.2mg/l of free chlorine in the disinfectant solution, provided a limit of 0.3mg/l of free (active) chlorine is not exceeded in the drinking water.

Quantities can be increased to 6mg/l and 0.6mg/l respectively in exceptional circumstances for example, high or increased micro bacterial contamination.

### Flushing the System

In the case of stainless steel, the possibility of corrosion promoted by foreign matter such as dirt or swarf can be ruled out. It is therefore sufficient to simply flush the system with potable (drinking) water ensuring the content of water-soluble chloride ions is within approved AusPress limits.

When using any solution, ensure the system is flushed correctly and the manufactures instructions are followed in an accurate and safe manner at all times.

### Commissioning

Systems must be commissioned in accordance with the applicable standards and regulations.

The installation contractor must familiarise the user(s) with the system. This is to be documented with a hand-over and acceptance record.

The user must also be provided with the manufacturer's maintenance and operating instructions for all installed valves and equipment.