

Sanitaryware & Fittings



The Bathroom Academy
in partnership with
Strategic Professionals

Sanitaryware & Fittings

Generic Industry Guide

Welcome to the Sanitaryware and Fittings Generic Industry Guide one in a series of Industry Guides which are available free of charge from the Bathroom Academy Web Site.

We have aimed to make the contents of the Guides both informative and relevant and hope you will consider them a valuable aid to your continuing professional development and that of your colleagues, within the Bathroom Industry.

Each Guide has been written by experts and contains the same five elements:

- Right choice of product for end user needs
- Generic industry design
- Generic industry installation
- Frequently asked questions
- Generic industry terminology

The Sanitaryware & Fittings Generic Industry Guide looks at the vast range of Sanitaryware & Fittings that are available and offers essential information which will allow the Retailer, Merchant and Installer to provide items best suited to the end user needs, whilst the customer's major considerations will be cost, functionality, durability and aesthetics. It is also essential to consider a number of important additional factors; available space, storage requirements and the materials used to manufacture the furniture and its' suitability and compatibility with the bathing and/or showering suite within the bathroom.

Other guides in the series are:

- Baths
- Bathroom Furniture
- Brassware
- Domestic Water Systems
- Shower Controls
- Shower Enclosures
- Shower Trays
- Thermostatic Mixing Valves
- Wetrooms

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Introduction

What is Sanitaryware?

Sanitaryware is the generic term used to describe items which traditionally were made from pottery. i.e. WCs, Washbasins and Bidets installed within a bathroom or washroom.

Manufacturers select the most appropriate material from a range of available materials to meet the intended usage of each product.

Materials Used To Manufacture Sanitaryware

- Vitreous China
- Fireclay
- Fine Fireclay
- Porcelain Enamelled Steel
- Acrylic
- Acrylic/Resin
- Stone Resin
- Stainless Steel
- High Impact Plastic

Vitreous China is the most common material used for the manufacture of Sanitaryware;

- WCs
- Wash basins (wall hung, pedestal and hand rinse)
- Bidets
- Urinal bowls

Vitreous China

Vitreous china is made from a mixture of fired white clays and finely ground minerals.

The traditional method used to mould sanitaryware was to pour a finely sieved mixture of water, clays and minerals ('slip') into Plaster of Paris moulds which form the shape of the appliance. More modern pressure casting methods are commonly used today where multiple resin moulds are filled under pressure on a production line. This reduces labour time and speeds production.

Traditionally absorbency of the plaster extracted water from the 'slip' in the mould. With pressure casting, it is the high pressure applied which 'forces' the water out. When the clay is dry enough to be self-supporting, the mould is removed. Final trimming (fettling) is carried out while the piece is still soft. Exposed surfaces are then coated with an impervious acid and alkali resistant non-crazing vitreous glaze which today is usually white.

The clay piece is fired at around 1200C in a kiln where considerable shrinkage will take place. The finished piece of sanitaryware is approximately 13% smaller when it comes out of the kiln.



Fireclay

Fireclay is an older technology traditionally used when very heavy duty ware is required. The clay body incorporates 'grog' and is of a sufficient strength that it can be used to manufacture heavier items such as shower trays, sinks, slab urinals, hospital sanitaryware, medical sinks and heavy duty WCs and basins.

Fireclay is widely used for very large sanitaryware pieces. It is also used to make Belfast type sinks which are very popular in domestic kitchens. Fireclay is solid cast as opposed to hollow cast as is the case with vitreous china. It is moulded in the traditional way i.e. in plaster moulds then coated with vitreous glaze to improve the surface, to produce a material that is strong and resistant to heavy usage after firing. The vitreous ceramic glaze is guaranteed against crazing.

Fine Fireclay

Modern fine fireclay is a blend of refined refractory 'ball clays' and 'grog'. 'Ball clays' are found naturally in the UK in Devon and Dorset. 'Grog' is the term given to ball clays which have been previously 'fired' and ground to a fine particle size, and then added to the pottery recipe.

The body of the fine fireclay is naturally buff coloured. Since this is unacceptable in a modern bathroom the body is coated with a white ceramic undercoat called 'engobe' which, in turn is coated with two coats of white glaze. The glaze is tough and vitreous.

After firing at around 1200°C the resultant product has a comparatively thick body of sufficient strength to withstand constant rough treatment but unlike vitreous china it is porous.

Fine fireclay products include traditional kitchen sinks, cleaners' sinks and slab urinals and hairdressers' basins.

Ceramic sanitaryware is extremely robust and naturally resistant. Well manufactured sanitaryware will be:

- Stain proof
- Burn Proof
- Rot proof
- Rust proof
- Fade proof
- Scratch resistant
- Slip resistant
- Hygienic

Porcelain Enamelled Steel

Only special alloy steels with low carbon content suitable for enamelling are used. The shells are pressed then sprayed with a special enamel ground coat to ensure good chemical bonding with the metal and subsequent finish coat.

The product is then fired through a furnace at temperatures of 850°C to produce a glass hard permanent lustrous life time finish with good chemical and scratch resistant properties.

Acrylic

Acrylic baths, bath panels, shower trays, shower tray panels and washbasins which are manufactured in this material are warm to the touch, shapely and targeted at the domestic market. They will not rust or corrode but can be damaged by cigarette burns and some chemicals.

Acrylic sheet with an original thickness usually between 3mm to 10mm is heated until it becomes soft. The sheet is then placed over an aluminium mould, in the shape of the final product, and the air below extracted. The pliable acrylic is sucked into the shape of the mould and the product is formed. This is called 'vacuum forming'.

Acrylic sheet can be delicate and when used as a bath it needs to be strengthened. The back of the acrylic is covered with glass reinforced polyester (GRP). Then a timber baseboard and a wooden or steel top frame is applied. Finally the bath is drilled for the waste, overflow and grips and the packaged legset included prior to despatch to the customer.

Acrylic products are versatile and modern in design. They suit a variety of budgets and style preferences. Installation is relatively easy owing to their lighter weight.

Stainless Steel

A wide variety of products are available in stainless steel such as inset and wall hung washbasins, bucket sinks, WCs and urinals. Many stainless steel products are designed to withstand the rigours of prolonged use and possible vandalism but also are used to add different finishes to a building, which complement other materials in the installation. Ranges also include products for use in hospitals and care homes, where the hygienic properties of stainless steel in terms of ease of cleaning contributes to minimising the risk of cross contamination in medical installations.

Stainless steel products are manufactured by using hydraulic presses, folding, welding and polishing and are engineered to fine tolerances. Many products are made as standard catalogue items but stainless steel is a very versatile and flexible material and can be designed to provide custom made products that fit to the shape and dimensions of a room or layout. There is a wide variety of different polish finishes from matt to high polish which lends the products to be used in a variety of locations from commercial to domestic or 'designer' installations.

High Impact Plastic

WC seats and concealed cisterns are manufactured from high impact plastic. They are made using the latest injection moulding techniques.

High Impact Polymer Resin

WC pans, basins, urinals and accessories can now be manufactured from polymer resin. This provides a finish that looks like ceramic yet is exceptionally hard wearing. Polymer resin sanitaryware is dent proof, shatterproof, chemical resistant and ideal for use in applications where there is the potential for heavy usage.



Section 1

WCs (Water Closets)

Types and Designs

There are 2 types of WC:

- Washdown (box rim, open rim or rimless)
- Syphonic

Washdown

This is by far the most common type of WC installed in the UK.

The pan is cleared by careful distribution of the force and volume of the flush water. Washdown pans have a 50mm water seal and a convenient bowl shaped to provide efficient cleaning and minimise fouling.

WCs are normally 400mm high but different shapes are available to suit individual choice. If required special seats can be used to provide more height for disabled use. Alternatively, taller WCs are available for increased height and disabled use with appropriate seats. Lower height WCs are available for children's use.

Syphonic

This type of WC was once commonly installed in the UK and indeed can still be found in many older properties today. However, they are no longer sold as they do not work at low flushing volumes. In a syphonic WC the flushing operation creates suction to assist the clearance of the pan. A double trap syphonic WC is very quiet and efficient in operation.



Traps and Fittings

Traditionally WCs were manufactured with 'P' traps or 'S' traps formed as an integral part of the casting. From a cost and logistics viewpoint this was expensive so today nearly all WCs have a simple horizontal outlet and the connection to the drains is made by plastic connectors available in a number of configurations which replicate the 'P' and 'S' configurations.

A comprehensive range of WC designs are available which include;

- Close coupled
- Low level
- High level
- Back to wall / concealed cistern & trap
- Wall hung
- Squatting

Close Coupled

This type of WC is typically floor mounted with the cistern resting on an extended platform at the back of the WC pan. The cistern is fixed directly to the back of the WC pan using a washer to provide a water tight seal.



Low Level

The WC pan is floor mounted with the cistern fixed separately on the wall. A short flush pipe connects the cistern to the WC.



High Level

Similar to the low level arrangement but the cistern is mounted high on the wall with a longer flush pipe. The WC pan is floor mounted with the cistern fixed separately on the wall. A short flush pipe connects the cistern to the WC.

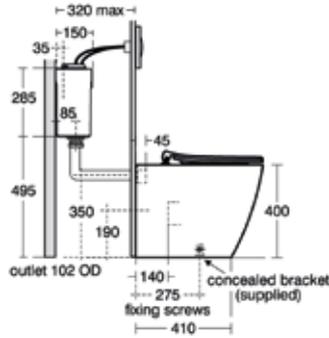
Note: High and low level cistern installation - it is important that the manufacturers' recommended dimensions are followed when determining the fixing height. If flush pipes are shortened the flush will be weakened and the pan contents may not be cleared effectively. For a low level installation the top of the cistern is usually set at 1000mm above the floor. High level installations usually have the underside of the cistern set at about 2000mm from the floor but in both cases, follow the manufacturers' recommendations. Rimless WCs normally require a restrictor washer to be fitted into the inlet of the WC prior to the fitting of the flush pipe, to prevent splashing occurring when the cistern is located at 2000mm.

WC Design Solutions

Interior designers are constantly looking for ways to make the bathroom look less cluttered, more stylish and easier to clean. British manufacturers always respond to the demands of their customers and have developed a range of products to satisfy the demand for stylish WCs. One such introduction is the back to wall close coupled WC. This WC is specifically designed to totally shroud the plumbing of the WC – particularly the soil pipe. The shroud, which is part of the overall shape of the WC, not an add on, allows the soil pipe in 'S' trap, 'P' trap, turned trap or bottom outlet positions.

Back to Wall/Concealed Cistern and Trap

The cistern and trap is concealed behind a false wall or within bathroom furniture with just the flushing mechanism showing. The WC is fitted back to the wall, commonly used in commercial applications (public toilets etc.) for easy cleaning but also used for neatness in domestic bathrooms.



Wall Mounted

The WC pan is mounted on brackets in the wall or installed on a mounting frame giving completely free floor space beneath. It enables easy floor cleaning in non-domestic application but is also used in domestic bathrooms to give a feeling of added space.



Squatting

The WC pan is mounted at floor level where the user "straddles" the unit. The design is more commonly associated with particular cultures worldwide.

Fixing WC Pans

WC pans must be fixed to the floor by screws using the holes provided and any associated floor fixing kit, this applies whether on wooden or concrete floors. The joint between the pan and floor can be 'pointed' with a cement mortar or silicone sealant but WC pans must never be set onto a solid bed of concrete or the foot might split. Brass screws should be used to prevent rusting, care should be taken to align the screws with the angle of the fixing holes. Plastic connectors should be used to connect the horizontal outlet to the soil pipe. Many different designs are available to suit the majority of installations.

WC Bowl Rim Types

Water has to be delivered from the cistern and into the bowl of the WC in a pre-determined way to clear the sides of the bowl and sump. The Water Regulations specify the required performance of a WC suite.

Box Rim

The rim is formed as a curving tube with holes punched in the underside to deliver water into and around the sides of the bowl. The flush has reduced turbulence and aerosol effect and is the quietest in operation. Box rim WCs are particularly suitable for domestic and hotel bathrooms.

Open Rim

The rim is an inverted 'U' shape. Water is carried to the front of the bowl entirely by the rate of its flow. Bowl cleansing depends on the flow pattern designed into the WC bowl.

Rimless

The top of the bowl does not have a conventional rim but some water can be carried to the front of the bowl in a hidden rim. The majority of water is delivered into the back of the bowl with sufficient force to carry it around the sides of the bowl, in the form of two jets. The system provides the easiest of conditions for cleaning the top area of the bowl and is therefore particularly suitable for installations where soiling is likely to be a problem e.g. hospitals. Rimless designs are also particularly useful in prison installations.



Toilet Seats

Toilet seats are generally described by the way in which they fit to the WC and the way that they look. It is important to make sure that the style of seat chosen is compatible with the WC pan as they are not always interchangeable and need to be suitable for the proposed application.

Standard Seat/Cover

This is the simplest style of seat. The seat ring and the seat lid form what looks like, from the front a layered sandwich. (As illustrated in the picture of the close coupled WC on Page 6.)

Wrapover Style

In this case, the lid is designed so that the edges wrap over the seat ring. This hides the ring completely.

Soft Closing Mechanism

This type of seat is becoming increasingly popular and has a mechanism hidden in the seat hinges which slows down the movement of the seat as it closes. The seat will not close with a thud but will gently fall into place unaided. The soft closing mechanism gives an added feel of luxury to the bathroom.

Germ Resisting

Some toilet seats are specifically impregnated with a material which inhibits the growth of harmful bacteria.

Top Fix

In this situation the seat is fixed in position – through holes in the top of the WC – using bolts which can be adjusted from the top. There is no requirement to fasten the bolts from below

Bottom (conventional) Fix

Here the seat bolts are fastened from below.

In all cases it is essential that toilet seats are fitted correctly and in accordance with the manufacturer's instructions. All of the fittings provided with the seat (fixing bolts, nuts, washers etc.) should also be used in order to reduce movement of the seat once it has been installed. This improves safety and helps reduce the risk of breakage – helping to extend the life of the seat.

Section 2

WC Cisterns & Fittings

Cisterns

Cisterns are available in vitreous china and plastics. Both are available in high level, low level and close coupled types with various sizes and capacities being available dependent on the application required.

The market for concealed plastic cisterns has grown rapidly. Concealed plastic cisterns can be installed in fitted bathroom furniture and used behind partitions and walls.

Cistern Fittings

There are numerous types of fittings available including:

Float operated valves

These allow a WC cistern to refill after a flush has taken place. Two common types are:

- Float valves complying with BS1212-3: 1990 (see reference section for details). Normally referred to as 'Part 3' valves, these are the more traditional type of inlet valve, incorporating a ball float attached to a long arm. They are available in both side inlet and bottom inlet versions. Brass tails also help to eliminate cross threading when float valves are installed.
- Compact Float Valves complying with BS1212-4: 1991 (see reference section for details). Also available in side and bottom inlet versions, 'Part 4' valves have a much smaller float and a shorter float arm than their Part 3 counterparts.

Delayed action valves

The refill time of a cistern is dependent on the water pressure in the same way that flow rate is in a tap. The greater the pressure the greater the flow rate and in the case of an inlet valve, the sooner the shut off as the cistern fills quicker. The average refill time for a cistern is between 60 and 90 seconds which is generally more than adequate for the turnaround time in a cubicle in high usage areas. The delayed refill adds no more than approximately 4 seconds which is a minuscule addition to 60 or 90 seconds. They save water by only allowing cisterns to begin refilling once flushing has finished.

Flush valves are calibrated to deliver slightly less than 6L or 4L to compensate for the potential crossover of refill water entering the cistern before the valve has finished its flush cycle. The delayed fill inlet valve, usually only available as a bottom inlet type, are housed in a container officially known as a delayed fill chamber with a small hole drilled into the bottom of the container. When the cistern is in its inert state, the water level in the cistern will be above the chamber and therefore it will be submerged. When the cistern is flushed the water level naturally drops and it will correspondingly drop out of the container but at a slower rate. The inlet valve opening action is thus delayed by a small margin as the cup holds very little water, just enough for purpose, ensuring the flush valve has closed.

This simple solution ensures guaranteed consumption by preventing water entering the cistern until it has completely emptied, enabling a precise volume of water to be discharged independent of water pressure.



Silencing Devices

Some valves are supplied with silencing tubes that direct incoming water into the cistern below the water level. This reduces the noise caused by water splashing in from above, providing quiet refilling.

Flushing Devices

It is widely acknowledged that the flushing of toilets accounts for a significant proportion of the water used domestically. Indeed, research indicates that the toilet is responsible for around 30% of all water used in the home and an even greater share in non-domestic applications.

With just under 26 million homes in the UK and new home completions running at approximately 100,000 per year, the retrofit market (installing water-saving devices into existing installations) offers the greatest potential for saving water, particularly given the fact that the majority of homes still have single flush 9L or 7.5L cisterns installed.

As a result, a number of devices have been used in recent years in an attempt to reduce the water used by WCs. These range from basic displacement devices such as bags and bricks, to the more technically advanced dual flush syphons and valves.

If bags or other displacement devices are dropped into an existing cistern. They affect every flush and can impair a cistern's ability to clear the contents of the WC pan. This can result in the user flushing the toilet several times, actually consuming more water in the process.

WC flushing devices include traditional lever operated syphons and outlet valves operated by push buttons, push plates or touch-free electronic sensors.

Water-Saving Flushing Syphons and Valves

Syphons have been used in the UK for over one hundred years and are operated by a lever. Syphons work using a syphonic action which once started, discharges the contents of the cistern into the WC pan, creating a flush. Syphons have very few moving parts and have no 'dynamic' seals beneath the waterline of a cistern and therefore cannot leak.



Water-saving flushing devices are now available to provide full and reduced flushing. Increases in new build and renovation has meant that single flush 9 litre cisterns are now commonly being replaced by dual-flush 6/4L, 5/3L and even 4/2.6L cisterns. They give the user the option of choosing a full flush for solids or a water-saving reduced flush for urine.

For further information about water efficiency go to:
<http://bathroom-association.org.uk/education/water-hog/>

Domestic and Commercial

Syphons have been successfully used in both domestic and commercial installations for very many years. Their durability and reliability makes them an ideal choice for commercial applications such as public houses, offices and service stations. Plumbers are very familiar with their repair or replacement.

Heavy Use

Heavy-duty metal levers should be fitted in public installations for added confidence. Syphons can be used with traditional high level WC cisterns - where they are activated by a chain pull rather than a lever.

Easy Flushing for the Elderly, Less Able or Young

Ergonomically designed levers can be used to provide easier flushing. These sometimes have an enlarged handle so that the lever can be depressed with a closed fist or elbow.

Concealed Applications

Extended lever kits enable syphons to be used in most concealed applications where the cistern is installed behind a partition wall. The longer spindle length of these lever kits can pass through the wall or partition and even the duct if the cistern is fixed to the rear wall (subject to dimensional constraints).



Push Button Flush Valves

Have been commonplace in North America and Europe for some time and were first permitted in the UK on the 1st January 2001.

To flush the WC the valve's seal or stopper is lifted, allowing water to cascade out of the cistern into the WC pan.

These valves can be operated by either manual or pneumatic push buttons. Touch-free electronic flushing is becoming increasingly popular in commercial applications.

Pressure Flushing Valves

These valves utilise the power of the mains water supply and can be used to flush urinals and WCs installed in commercial buildings, but not homes. Installation is only permitted provided there is adequate flow available at the appliance and specific backflow prevention devices are installed. The water supplier's advice should be sought.

Heavy Use

In those applications where there is the potential for abuse, steel button types should be considered.

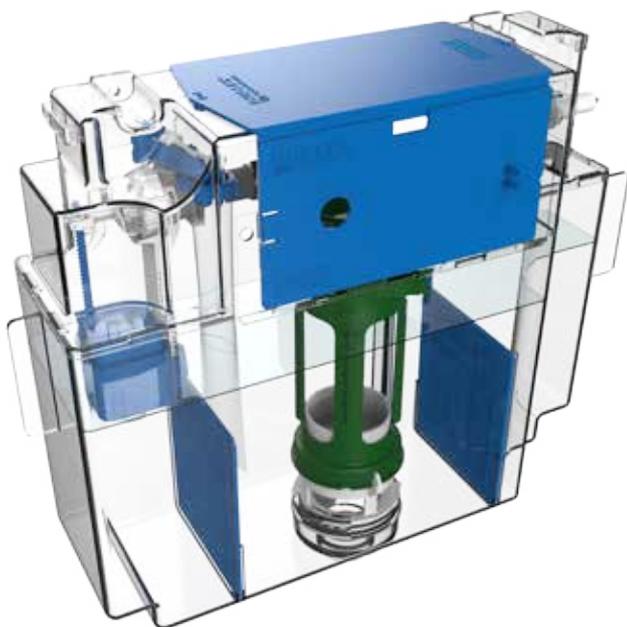
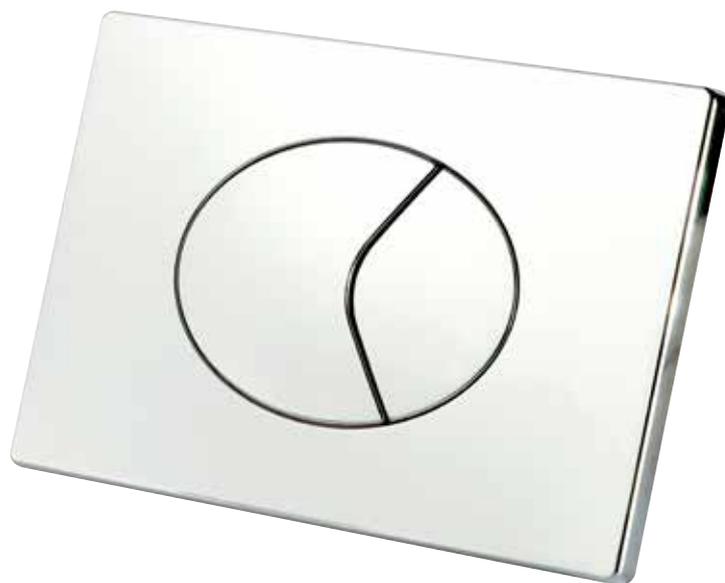
Electronically operated valves are becoming popular in the commercial sector. An electronic sensor installed next to the WC activates flushing when a hand is waved in front of it. The hygiene benefits associated with not having to touch a lever or push button, make electronic flushing particularly attractive in hospitals, motorway services and the like.

Easy Flushing for the Elderly, Less Able or Young

Although most push buttons are simple to operate, touch free or extremely light touch flushing can be provided by electrically operated valves.

Concealed Applications

Some push button valves are used in both domestic and commercial concealed applications. Pneumatically operated valves are supplied with long air tubes enabling the push button to be installed in a wide range of positions, often up to a metre away from the cistern itself. Cable operated versions are also available for concealed use.



Section 3

Washbasins

Types of Washbasins

There are four basic forms of washbasin:

- **Wall Mounted**
Fixed to a wall using brackets for the support or bolted directly to the wall.
- **Pedestal**
Fixed to a wall but using a pedestal for the main support.
- **Countertop**
Fitted into a countertop by a flange on the ware either on, under or projecting from the countertop.
- **Vessel**
A bowl supported by a mounting surface.

Wall Mounted

Various types of brackets e.g. screw to wall, towel rail or concealed are available to support wall mounted basins. Whichever type is used, ensure the fixing method and the wall itself is of sufficient load-bearing strength. If doubt exists, a centre leg or pair of legs and bearers can be used.



Fixing Brackets

For normal use the correct fixing height is approximately 800mm from floor level to the front lip of the basin.

Once the brackets are correctly fitted the basin can be placed in position and checked for height and level. It is important to note that the manufacturing process of vitreous china is such that there will often be a slight distortion in basins. BS 3402: 1969 (2010) allows for up to 6mm on the level of fronts of washbasins (also on the straightness of pedestals) and up to 3mm on the back of washbasins which are attached to a wall.

Hand Rinse Basins

Hand rinse basins are essentially small versions of wall mounted washbasins. They are also available for corner fixing.



Because of their compact dimensions they utilise the space in restricted areas such as cloakrooms. Commonly they only have one tap hole, but two tap hole versions are available.

Because they are small and light, the support brackets are simple in design.

Pedestal

Pedestal washbasins tend to be larger with their additional weight being supported by the pedestal.

The pedestal has the added advantage of concealing the waste and supply pipes giving a neater appearance for bathroom/bedroom applications.



Semi – Pedestal Washbasins

This is an increasingly popular choice as they are aesthetically pleasing, make very effective use of limited space and enable easy cleaning.

Fixing

The supply and waste fittings should be assembled onto the basin as described in their individual instructions. To improve the joint between the basin and a pedestal, a thin layer of sealing compound should be applied to the top edge of the pedestal.

With the basin in position and on its supports check for level and alignment against the wall and adjust as necessary before tightening any fixing pins and removing any excess sealant.

Fixing Basins Back to Wall

Where the basin is moulded with screw holes, brass screws and soft washers should be used to secure the basin. Similarly use brass screws and soft washers to secure any pedestal to the floor. Brass screws should be used because the metal is relatively soft and will 'give' slightly as it is tightened. This makes cracking of the pottery less likely than if a harder steel screw is used.

Also, using corrosion resistant brass screws will mean that the ware can be removed easily in the future. Mark the wall through the holes with the basin temporarily in position. Take care to estimate the angle of the screw holes, do NOT drill straight into the wall but, as soon as the drill starts to bite, angle the drill so that it matches the angle of the holes. This helps prevent cracking caused by uneven pressure as screws are tightened. It is important not to over tighten screws.

Wastes and Traps

A trap must be attached directly to the waste outlet to prevent odours from the drains. The bottom of many traps are detachable for periodic cleaning. Alternatively, there may be a 'rodding eye'. Traps are commonly made from plastic because finish is not of paramount importance when out of sight. However chrome finished or similar, can be used where the trap is visible to enhance appearance and to aid cleaning.

Countertop

There are three types of countertop basin;

- **Countertop**
- **Semi countertop**
- **Under countertop**

Countertop

A full countertop basin is made with a flange that allows the basin to sit into an opening in the countertop. The joint should be made using a waterproof sealant.



Semi Countertop

In smaller rooms a semi countertop basin can be fitted. This will have its front portion projecting clear of the countertop. Small brackets supplied by the manufacturer are used to fix the basin to the countertop



Under Countertop

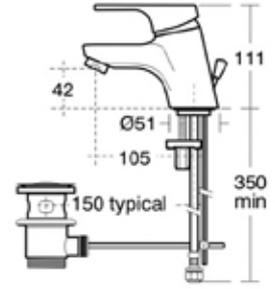
An under countertop basin has a lip around the top of the bowl. This is to allow the basin to be fitted beneath the countertop using fixing clips.



Tapholes

Basins are available with either a single tap hole – for a monobloc mixer tap, two tap holes for fitting hot and cold pillar taps, or three holes for fittings with an independent spout. Basins often incorporate an integral overflow for use with 11/4" slotted waste fitting. Plug and chain type waste fittings are readily available, alternatively, pop up waste fittings can be used for added luxury.

When fitting countertop basins take great care to cut the opening correctly using the template supplied by the manufacturer. Jig saw blades are available that cut on the down-stroke only, this will reduce any chipping of a melamine finish that can occur with normal blades that also cut on the up-stroke. Alternatively, to get a good finish stick adhesive tape on the surface, on the line of the cut before attaching the template to get a good finish. Once the opening is created the exposed edges MUST be thoroughly sealed to prevent water damaging the chipboard. Two coats of varnish can be used for this. Where an under countertop basin is to be fitted even more care is required to achieve a good finish. Once the opening has been cut, an edging strip of melamine will have to be applied using a waterproof adhesive onto the exposed edge and carefully trimmed with a sharp chisel and fine file to leave a neat finish.



Countertop basins can also be fitted into other types of tops such as laminate covered, marble, slate, stone etc. Once the opening is ready apply a strip of waterproof sealant to the countertop surface and carefully fit the basin before clamping it in position using the clips provided.

Important Note

Whatever the style, size or design of the 'countertop' washbasin, you must carefully follow the manufacturers' fitting instructions and use only the template and brackets supplied.

It should be noted that whilst most countertops are designed for 'drop in' installation as per the template supplied, some designs may require and are supplied with fixing screws and clips.

Vessel

Historically, the oldest form of washbasin. The modern day equivalent is fitted with central drainage. Vessel basins are manufactured in a wide range of materials enabling more options in the design and fashion elements of the modern bathroom.



A vessel basin can be mounted on a variety of surfaces e.g. countertop, bathroom furniture or simple shelving. Their simple lines make them a popular choice for anyone aiming for a "minimalist" look to their bathroom. There are many shapes and sizes of vessel basin and it is essential to follow the manufacturer's installation instructions, as fitting instructions can vary.

Belfast Type Sinks

The 'Belfast' sink has become increasingly popular as a modern alternative to traditional washbasins. Its origin was as a simple, rugged commercial design used in schools and factories. Because of its basic design there are no tapholes in the ware so wall or deck mounted taps have to be used. It can be fitted in a variety of ways eg. on solid support legs or recessed into countertops.



Section 4

Bidets

The bidet has been described as a sit-on washbasin. It provides an easy and convenient means of ensuring personal cleansing, especially after using the WC. A secondary but important use of the bidet is as a footbath. They can be Floor Standing, Wall Mounted or of Back to Wall design.

Types of Bidet

Bidets are available in two types;

- **Ascending spray**
- **Over-rim supply**

Because of the risk of contamination of the water supply it is important that ascending spray bidets are correctly plumbed. Water Regulations permission is required from the local water undertaker before installation of this type of bidet proceeds. Ascending spray bidets are becoming less common – in favour of the over the rim type.

Over-rim supply bidets do not pose a contamination risk and the assembly of supply and waste fittings can be dealt with in a similar way to the washbasin.



Section 5

Maintenance

Vitreous china and fireclay items should be cleaned frequently using warm soapy water or mild detergent, (a little disinfectant may be added). Rinse with clean water then dry with a soft cloth. Prompt and thorough cleaning immediately after use will prevent tidemarks and the build-up of insoluble lime salts in hard water areas. For cleaning of other material types, reference should be made to manufacturers' instructions.

WC bowls should be cleaned regularly. Using a soft brush. Always clean under the rim. Flush after cleaning to remove any deposits of cleanser from the sump of the trap. Ensure that the frequency of flushing is in line with Water Regulations.



Section 6

Frequently Asked Questions

Is all Sanitaryware white?

All manufacturers make their products in a variety of colours and finishes to compliment any bathroom or washroom design. White is generally the most popular colour chosen today.

Is all Sanitaryware made from Vitreous China?

Not necessarily. Although WCs, washbasins and bidets have been traditionally made from VC other materials such as Plastics, Stainless Steel, Fireclay and Fine Fireclay are used.

What are the advantages of Vitreous China?

It is extremely durable and can be in service for many years without any deterioration in performance and appearance.

What are the advantages of plastic products?

They tend to be lighter, durable and hard wearing and can be moulded into precise shapes for specific applications (e.g. slimline concealed cisterns). They can be in service for many years without any deterioration in performance.

What are the advantages of wall mounted washbasins?

They do not take up floor space in confined areas where space may be a major consideration, helping to make a room appear larger.

Why do some washbasins have pedestals?

The larger the washbasin the more support it will require - a pedestal provides the extra support and also conceals the trap, waste and fittings.

I'm not sure if a washbasin I've seen will fit into the space I've got in my bathroom?

All manufacturers make their product in a variety of sizes and styles so there is always an ideal product available to suit your particular need.

When you fit a Countertop basin does the water damage the top?

No. All suitable countertops are impervious to water and provided the basin is fitted with a water tight seal, using the correct proprietary sealant, there should be no problems with damage or leakage of water.

I want to fit a 'Belfast' sink but there are no tap holes. What do I have to do?

You will need to fit wall mounted or deck mounted taps which are available from all manufacturers.

What is the difference between a low level and a close coupled WC?

They both work in exactly the same way but with a 'close coupled' the cistern is mounted and connected directly onto the back of the WC pan. A 'low level' has the cistern mounted separately on the wall with a flush pipe connecting into the back of the pan.

Why would you use a 'back to wall' WC?

A 'back to wall' WC has the cistern concealed behind a false wall which provides an easy to clean and very neat fitment, with only the cistern lever/push button visible from the front. A back to the wall WC can also be fitted into bathroom furniture.

Are toilet seats standard?

BS 1254: 1981 specifies requirements for toilet seats but not all of them comply. There is a type of seat available for every type of WC. They can be either wooden or plastic and are available in a huge variety of colours, finishes and shapes.



Are internal overflows mandatory?

No. Internal overflows are however generally provided in current manufacturers products. They are deemed acceptable by Water Regulations, and considered a no less effective device to external overflows.

Do lever operated syphons have internal overflows?

Yes, some syphons do provide internal overflow. If the water level in a cistern rises above the required level, it will reach the 'spillover' and cascade down the syphon downleg and into the WC pan. Not all syphons provide this feature though.

What are the flushing volumes for WCs?

UK WC flush volumes must not exceed 6L for new installations. There are many larger 7.5 and 9L flush volumes still in use though.



When installing low level cisterns, is there a guide as to how high the cistern should be fixed?

There is no mandatory height for the cistern. It really is dependent on the bathroom dimensions available such as the height of window sills and the maximum length of the flushbend provided with the cistern. It is a case of looking at the constraints of the particular application and taking a common sense approach - but the manufacturers' recommendations must be followed.

Is there a standard outlet size for syphons and flush valves?

Yes as a general rule, syphons tend to have a standard (1 1/2") BSP outlet and flush valves a standard (2") BSP outlet. However, some products are available with adaptors.

When fitting WCs into a new build application, is it necessary to flush the pipework through before finally completing the installation?

New pipework should always be flushed through. Many new cisterns contain compact 'Part 4' type inlet valves that are fitted with a filter. If pipework is not flushed through properly, debris can clog the filter and prevent the valve from operating efficiently. This can lead to slow filling of the cistern.

How do I determine which size syphon to fit into a cistern?

Simply measure internally from the cistern bottom to the 'invert' on the existing syphon (the point at which water travelling up the syphon body will spill down the downleg).

What type of inlet valve is most suitable for narrow, portrait style cisterns?

'Part 4' inlet valves are perfect as, unlike the more traditional 'Part 3' models, they do not come with long float arms and large round floats. They are far more compact in size and will fit into smaller sized cisterns.

In dual-flush installations, what proportion of the full flush should the reduced flush represent?

The reduced flush volume should be no greater than two thirds of the full flush volume. Therefore in a new 6L application, the reduced flush volume should not exceed 4L.

Can a syphon be used in concealed cisterns fitted behind thick block walling?

Yes. Concealed lever kits are readily available to fit a wide range of concealed applications from 12mm thick partitions up to concrete block walls where the cistern might be fixed to the rear wall or a duct. In this situation, the lever kit has to be long enough to fit through the concrete block front wall and the duct in order to reach the cistern.

Does a bidet have to be installed in a bathroom with a toilet?

Not necessarily. A bidet can be fitted on its own but they tend to be more commonly fitted alongside a WC.

Can a squatting pan be fitted in any bathroom?

Theoretically yes, but the trap and bowl is largely beneath the top surface of the floor so if they are installed on a solid floor, the floor will have to be dug out to accommodate. If fitted to a boarded floor there needs to be enough depth beneath the boards for the bowl and trap.

Section 7

Industry Terminology

Acrylic

Plastic material used for vacuum forming baths, washbasins, shower trays, shower tray panels and bath panels.

Ascending Spray

The water outlet found in the bowl of some bidets.

Back to Wall WC

A WC with integral sides to conceal the trap. Usually used with a cistern hidden behind the wall, panelling or fitted furniture.

Ball Float

The float used to operate a particular type of float-operated valve which in turn controls the flow of water into a cistern.

Belfast Type Sink

A simple rectangular Fine Fireclay sink with a waste outlet hole and overflow.

Bidet

A bidet is essentially a low height washbasin, designed for washing the genito-urinary area without the need for bathing or showering.

Bottle Trap

Compact trap containing a water seal to prevent foul air from drains entering a room.

Cistern

A container housing the flushing mechanism and flushing water for a WC.

Closed Coupled WC

So called because the WC cistern is mounted directly onto the top plate of a WC pan.

Concealed Bracket

A bracket which is obscured from view used for attaching a wall hung washbasin to the wall.

Concealed Cistern

A cistern which is fitted behind a (false) wall so that only the operating mechanism can be seen.

Countertop Basin (Full)

A washbasin fitted into a worktop surface from above.

Countertop Basin (Semi)

A basin which fits part way into the countertop, leaving the front of the basin projecting beyond the countertop.

Countertop Basin (Under countertop)

A basin which is fixed beneath the countertop and is held in position with the aid of clips and/or brackets.

Dual Flushing Cistern

A flushing cistern that provides discharges of two different volumes, the selection being made by the user.

Equilibrium Float Valve

A compact type of float valve operated by a small float and the incoming pressure of water supplied.

Fireclay

A ceramic product used for larger sanitaryware items.

Flushing Cistern

Cistern fitted with a device operated automatically or by the user that discharges water to cleanse a WC pan, urinal or slop hopper.

Flush Valve (Drop type)

A device for flushing WC cisterns. Valves are operated by a push button or electronic sensor. Flushing takes place when the seal over the outlet hole is lifted, allowing the water in a cistern to be evacuated down the flush bend into a WC pan.

Glaze

A glass coating applied to Vitreous China or Fireclay, fired in a kiln during the manufacturing process to give a hard wearing non-porous coating.

Handrinse Basin

Basin that has an overall width of 500mm or less.

High Impact Polymer Resin

A new sanitaryware material that produces a high gloss finish that is dent proof, shatter proof and chemical resistant.

High Level WC

The WC cistern is mounted on the wall usually above head height, connected to the WC pan by a long flush pipe.

Horizontal Outlet (H.O.)

The outlet comes straight out horizontally at the back of a WC.

Inlet Socket

A recessed hole in a WC pan for the connection of a flush pipe.

Low Level WC

The cistern is fixed on the wall immediately above and behind the WC bowl and is connected to it by a short flush pipe.

Overflow (Cistern)

A pipe or device in a cistern, which provides a warning of inlet valve failure.

Overflow (Basin)

In washbasins there is usually an overflow beneath the highest level of the bowl which drains into the waste outlet pipe, by-passing the outlet closing mechanism.

Over Rim

Description of the supply arrangement to a bidet without an ascending spray (or vessel type washbasin) where the taps supply water to the bowl from a flat deck at the rear, 'over the rim' of the bidet.



Flush Pipe

A pipe which connects low or high level cisterns to a WC pan.

Float Valves

Inlet valve found inside a cistern which control the in-flow of water often using a ball type float.

Pedestal Washbasin

A washbasin, screw fixed to the wall, but primarily supported by a column fixed to the floor which is also used to conceal the supply and waste pipework.

P Trap connector

Used to convert the horizontal outlet from a WC pan to a soil pipe with a 14 degree fall.

Push button

The visible, manually activated, flush mechanism fitted to a cistern equipped with a flush drop valve.

Semi-pedestal basin

Basin fitted with a pedestal to conceal supply pipes and waste pipes but the pedestal stops short of the floor.

Standing overflow

Vertical pipe in a cistern that passes through its base and is connected to a warning pipe.

S Trap connector

Used to convert the horizontal outlet from a WC pan into a vertical connection. The S trap connector can also be turned to left or right to give a turned P trap.

Syphon

Device used for flushing WC cisterns. Syphons are operated by a lever and provide a flush by means of syphonic action. Syphons are fail safe and cannot leak.

Syphonic Flushing System

Water flows into the bowl and at the same time a device lowers air pressure in the trapage. Atmospheric pressure creates a syphonic action drawing waste material through the trap into the drainage system.

Squatting Pan

A WC which is mounted into the floor with only the top portion visible, the user 'straddles' by placing their feet either side of the bowl.

Trap

Pipe fitting or part of a sanitary appliance that retains liquid to prevent the passage of foul air.

Vessel Basin

A design which has the appearance of a simple bowl, all of which is visible and supplied by wall or deck mounted taps.

WC

Water Closet which is the generic term used for all types of pan.

Wall Mounted WC

A WC supported clear of the floor by brackets or by a wall frame.

Warning Pipe

Overflow pipe that has its outlet in a conspicuous position so that discharge can be seen.

Washdown Flushing System

Water cascades into the sump of the bowl and forces waste material through the trap into the drainage system.

Waste Pipe

A pipe which takes waste water from a WC or other sanitary appliances into the drainage system.

Section 8

References

BSI British Standards

BSI British Standards' publications give recommendations on a wide range of building and construction matters including materials, testing, health and safety, access and regulations. They are essential reference for architects, developers, building owners, site managers, building contractors, structural engineers, materials specifiers and other interested parties. www.bsigroup.com

BS 6465-4:2010

Code of practice for the provision of public toilets.

BS EN 14124:2004

Inlet valves for flushing cisterns with internal overflow.

BS EN 200:2008

General specification for single taps and mixer taps (nominal size 1/2") PN10. Minimum flow pressure of 0.05MPa (0.5 bar).

BS 1212-3:1990

Specification for diaphragm type float operated valves (plastic bodied) for cold water services only (excluding floats).

BS 1212- 4: 1991

Specification for compact type float operated valves for WC Flushing cisterns (including floats).

BS 2456:1990

Specification for plastic floats for float operated valves for cold water services.

BS 1254: 1981 (2012)

Specification for WC seats (plastics).

BS 3402:1969 (2010)

Quality of Vitreous China sanitaryware.

BS 5627:1984

Specification for plastic connectors for use with horizontal outlet Vitreous China WC pans.

BS 6465-1:2006+A1:2009

Code of practice for the design of sanitary facilities and scales of provision of sanitary and associated appliances.

BS 6465 Part - 2: 1996

Code of Practice for space requirements for sanitary appliances.

BS 6465-3:2006

Code of practice for the selection, installation and maintenance of sanitary and associated appliances.

BS 1188:1974

Specification for ceramic washbasins and pedestals.

BS EN 31:2011+A1:2014

Washbasins. Connecting Dimensions.

BS 5506-3:1977

Specification for washbasins, 1 or 3 tapholes. Materials, quality, design and construction.

BS EN 33:2011

WC pans and WC suites. Connecting dimensions.

BS EN 35- 2014

Pedestal and wall hung bidets with over-rim supply. Connecting dimensions.

BS 5505-3:1977

Specification for bidets. Vitreous china bidets over-rim supply only. Quality, workmanship and functional dimensions other than connecting dimensions.

BS EN 14528:2007

Bidets. Functional requirements and test methods.

BS EN 997:2012

WC pans and WC suites with integral trap.

BS EN 14055:2010

WC and urinal flushing cisterns.

BS EN 14688:2006

Washbasin. Functional requirements and test methods.

Water Supply (Water Fittings) Regulations 1999

The Water Fittings Regulations 1999 (or Byelaws 2000 in Scotland) are national requirements for the design, installation and maintenance of plumbing systems, water fittings and water-using appliances. Their purpose is to prevent misuse, waste, undue consumption or erroneous measurement of water and contamination of drinking water.

www.legislation.gov.uk/ukksi/1999/1148/contents/made

Note: References to water regulations apply to England and Wales. Data may vary for Scotland and Northern Ireland – please check for specific regulations applicable.

BEAMA

BEAMA is concerned with TMVs and promotes the safe provision of hot water at point of use. www.beama.org.uk

<http://wtl.defra.gov.uk/product-search-landing.asp>

This link provides guidance for manufacturers and suppliers wishing to register their products for inclusion on the Water Technology List.

Building Regulations

Communities and Local Government are responsible for building regulations, which exist to ensure the health and safety of people in and around buildings, and the energy efficiency of buildings. The regulations apply to most new buildings and many alterations of existing buildings in England and Wales, whether domestic, commercial or industrial. General public users and professional users can access building regulations guidance, including the Approved Documents and associated guidance from the Planning Portal at: www.planningportal.gov.uk/buildingregulations/approveddocuments

Waterwise

Waterwise is a UK NGO (non-governmental organization) focused on decreasing water consumption in the UK by 2010 and building the evidence base for large scale water efficiency. They are the leading authority on water efficiency in the UK. Waterwise have produced a number of product brochures covering a wide range of water efficient products suitable for the bathroom, enabling the consumer to easily identify and incorporate water efficient products into the bathroom design. www.waterwise.org.uk

