PHCP SELF-INSTRUCTION PROGRAM

BOOK #12

- ***RESIDENTIAL LAVATORIES AND SINKS***
- ***RESIDENTIAL BATHTUBS AND SHOWERS***

Residential Lavatories and Sinks

Revised Edition

Series Two Unit 3

PHCP Self Instruction Program

222 Merchandise Mart Plaza Suite 1360
Chicago, Illinois 60654

CONTENTS

For a complete list of topics covered, see the index.

UNIT OBJECTIVES

The information in this Manual has been selected to give you an overview of residential lavatories and sinks. It includes definitions of common industry terms, descriptions of the lavatories and sinks you will most often sell, and information on their parts and how they work.

Some of the products reviewed in this Unit may not be a part of your company's current inventory. Other products which may be stocked by your company may not be discussed in this Unit. Always refer to manufacturers' liturature and recommendations on the products your company sells if unsure about a particular product.

To do your job well, it is important that you learn the details about specific items stocked by your company. The most complete and accurate information can be found in manufacturers' catalogs and materials. Be certain to spend time studying those materials.

When completing this Unit, you will be able to

- recognize and use basic terms related to lavatories and sinks
- discuss the specifications for different types of lavatories and sinks
- understand how to read manufacturers' rough-ins for their products and identify the specifications important for each type of lavatory or sink

THESE MATERIALS SHOULD NOT BE USED TO PLAN ACTUAL INSTALLATIONS OR TO INSTALL LAVATORIES OR SINKS

DISCLAIMER

Although the information contained in this Unit is believed to be accurate, the ASA Education Foundation and the American Supply Association disclaim any and all warranties, expressed or implied, regarding both the accuracy of that information and its application.

STEPS FOR COMPLETING THIS UNIT

1. If your company has purchased the videotape for use with this Series, view the video before you start Unit One.

2. Use the answer mask/book mark to cover the printed answers in the left hand column. Read the information in each Frame carefully.

3. Keeping the answer covered, write your response to the Frame question in the empty column at the right of each page.

4. Move the answer mask to check your response with the answer in the left column.

   - If your response is reasonably close to the printed answer, go on to the next Frame.

   - If your response differs from the answer given, review the material in the Frame to see why the printed answer is considered the best answer for the question.

   - If after reviewing the material in the Frame you still believe that your response is better than the printed answer, circle the printed answer. If you agree that the printed answer is best, mark an "X" through your response.

   - If after several attempts, you cannot understand the Frame or the answer to the Frame question, ask someone in your company for help.

   - If you still feel confused, contact the Foundation, and we will try to find a product knowledge expert to assist you.

5. Answer the questions in the Review at the end of each section. Check your responses with the answers given at the back of the book. Reread the Frames indicated for answers you missed.

6. When you've completed all Frames, prepare for the Unit Quiz by going over the Review pages and the definitions in the Glossary.

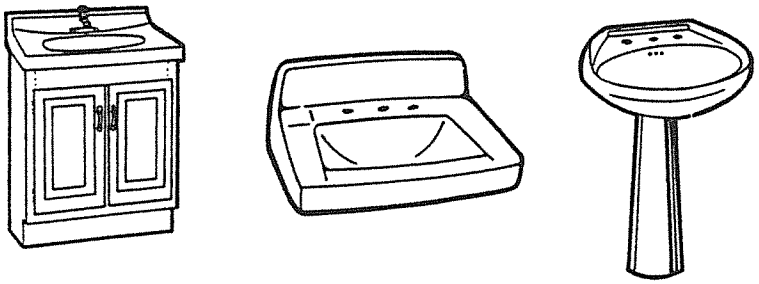
7. Take the Unit Quiz at the end of the Manual.

8. Send the whole book, with the completed Quiz, to the ASA Education Foundation for grading. You and your immediate supervisor will be notified about your completion of the Unit.

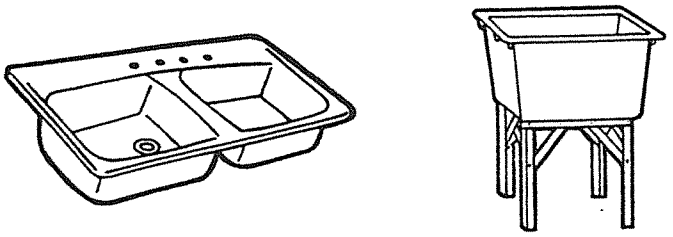
When you have completed all Units in Series Two, contact the ASA Education Foundation to make arrangements to take the Series Two Exam. You will receive a Certificate of Completion for Series Two when you have successfully completed all Units and the Series Two Exam.

In previous units you have learned that we classify plumbing fixtures in three basic types: sanitary fixtures, lavatories and sinks, and bathtubs and showers. This unit covers one of these basic types -- lavatories and sinks.

Lavatories and sinks are similar, but are also two distinctly different categories of plumbing fixtures. We use both lavatories and sinks to wash, but to wash different things.



LAVATORIES



SINKS

Sanitary, lavatories and sinks, bathtubs and showers

What are the three basic types of plumbing fixtures?

2

Lavatory is the industry term for the bathroom fixture used for personal washing, such as washing hands, face, or teeth. Lavatory is commonly abbreviated as LAV. Non-industry people call the lavatory the bathroom sink or wash basin.

Lavatory comes from the word "lave" which means to wash and was first used in 1375.

A fixture used for personal washing

What is a lavatory?

3

Sink is the fixture which is used to wash other things such as dishes and cloths, and is also used for food preparation. Sink comes from the word sinck. In 1566, sinck was used to describe a receptacle connected to a drain but, we don't know if the old sincks were connected to supply lines as they are today.

In this Unit when we refer to a sink, we are talking about a wash receptacle which is connected to a water supply line and to a Drain, Waste, and Vent system (DWV).

How the plumbing fixture will be used is the easiest way to tell the difference between a lavatory and a sink. We use a lavatory for personal washing such as face, hands, or teeth. Other things such as dishes, cooking utensils or cloths are washed in a sink.

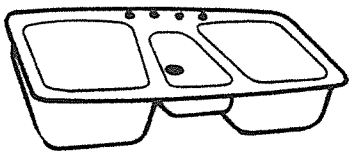
A fixture used to wash dishes, cloths, and for food preparation

What is a sink?

Wherever there is a water closet (toilet), a lavatory is usually close by. Residential bathrooms and public restrooms will have lavatories. Also, areas where frequent hand washing occurs, such as doctors' and dentists' examining rooms may have lavatories and sinks.

Sinks are sold for both residential and non-residential use. However, Some types of sinks are more common to a particular market sector. This Unit will cover those sinks and lavatories which are specified for residential installations.

The kitchen sink is used for food preparation and dish washing. Kitchen sinks are generally sold in the residential market sector.



KITCHEN SINK

Near a water closet

Where will you usually find a lavatory?

The most common materials used to make lavatories and sinks are

- ceramics such as vitreous china or fire clay
- enameled cast iron
- enameled steel
- stainless steel
- cultured marble
- solid surface materials such as plastics or molded stone
- enameled metals with reaction injection molding

Stainless steel is the most common material used for kitchen sinks.

Ceramics, enameled cast iron, enameled steel, stainless steel, cultured marble, and solid surface materials

What are the most common materials used in making lavatories and sinks?

6

Lavatories and sinks may be made from either of two types of ceramic, vitreous china or fire clay. Vitreous china and fire clay are both substances which are made of varying amounts of clay and water. The mixture is cast into the shape of the fixture, coated with a liquid glaze, and then fired under very high temperatures. Vitreous china is considered to be the superior material of the two because of its denser, less absorbent makeup. Fire clay has a less-dense wall.

In both vitreous china and fire clay, the glasslike glaze produces a hard, scratch and stain resistant surface.

Why is vitreous china considered superior to fire clay?

Because of its denser, less absorbent makeup

7

Enameled cast iron and enameled steel lavatories and sinks are produced through a different manufacturing process than those made of ceramics.

To make enameled cast iron, the iron is first cast into the shape of the fixture. Then, the cast iron is fired "red hot", and dusted with a thick coat of glass powder. The coated cast iron is then fired again to fuse the glass. The enamel is really fused glass.

The thick dusting and fusing process produces a thick coat of finished enamel. This thick enamel coat gives the fixture a deep color.

The advantages of enameled cast iron are

- a deep color
- long life
- a high gloss finish, and
- the thickness and weight of cast iron keeps sounds like running water or garbage disposal grinding to a minimum.

What is enamel?

Fused glass

8

The process for making fixtures from enameled steel begins with stamping steel into the shape of the fixture. Stamping is also called "drawing" because the steel is actually stretched to form the desired shape.

Enameled steel has two coats of fused glass. A base, or first coat, is sprayed or painted on the drawn steel and then fired to fuse the glass. Enameled steel is fired at lower temperatures than is enameled cast iron.

The fixture is then sprayed with a second coat of fused glass and fired again. This process provides a thinner coat of enamel than is produced when manufacturing enameled cast iron. So, fixtures of enameled steel have less color depth, and are more likely to chip than do those made of enameled cast iron.

Thinner coat of enamel

Why would a fixture made of enameled steel have less depth in color and be more likely to chip than one made of enameled cast iron?

9

Many kitchen sinks sold today are made of stainless steel. Stainless steel is a material made by combining steel with other metals or elements and is different from carbon steel. Unit 5 of Series One discusses stainless steel in detail.

While there are several alloy combinations, the most common combinations used for making sinks are those containing nickel and chromium.

The two basic categories of stainless steel used in manufacturing sinks are those in the 300 Series and the 400 Series of stainless steels. The 300 Series stainless steels are those which contain nickel and chromium and are used most often for stainless steel sinks. The 400 Series of stainless steels contain only chromium and are less expensive than 300 Series stainless steels.

In addition to the Series of stainless steel a sink is made from, other differences in stainless steel sinks may be found in

- the gauge of the metal
- the depth of the bowl
- whether the finish is hand rubbed or machine polished, and
- the degree of sound deadening.

300 Series

Which series of stainless steels contains nickel and chromium and is used most often in making stainless steel sinks?

10

Cultured marble is made by combining ground marble with a chemical bonding agent. Gel coat is sprayed onto a mold, then the marble (in a liquid form) is poured into the mold on top of the gel coat and is allowed to set.

Although the gel coating is relatively strong, it is not as resistant to heat and scratches as the fired glazes used for ceramics, enameled cast iron or enameled steel. For this reason you will most often find cultured marble used to make lavatories.

How is cultured marble made?

Ground marble combined with a chemical bonding agent is poured into a gel coated mold

11

Most recently, lavatories and sinks have been manufactured made of solid surface materials such as plastics and molded stone or varied combinations of materials.

Plastics used in these fixtures may be vacuum formed or reinforced plastic. Molded stone is ground stone held together by a plastic bonding agent.

Manufacturers each have their own unique combinations of materials that are grouped together and are classified as "solid surface materials." Most have their own registered trade name for their product. Some of the common names today are Asterite, Avonite, Fountainhead, and Corian.

It is important that you stay up to date on changes in the manufacturing process and materials used by the manufacturers your company deals with most often. These manufacturers can provide you with up-to-date information on their products made with solid surface materials.

What is molded stone?

Ground stone held together with a plastic bonding agent

12

Many new products are now on the market. In addition to those made with molded stone or combination plastics, you will find lavatories and sinks made from enameled metals with a polyester foam composite on the underside of these fixtures using materials like plastic and fiberglass. This process is referred to as reaction injection molding.

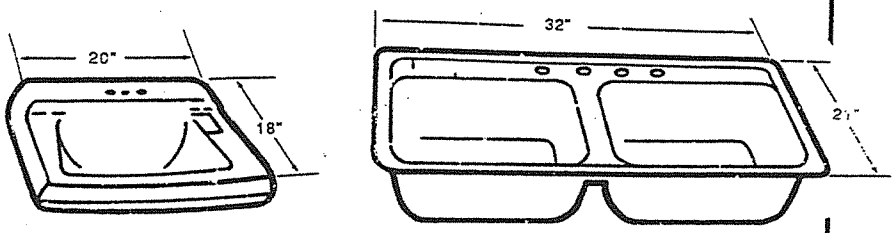
This process bonds materials to the underside of a metal fixture to produce a fixture which will have the same thickness as one made of cast iron with half the weight. The objective of using this method is to produce a steel fixture which has the same benefits as those provided by cast iron.

To produce a fixture of steel which has the same benefits as one made of cast iron

What is the objective of reaction injection molding?

13

Lavatories and sinks are available in many designs and sizes. However, you will find most lavatories have one basin and are usually smaller than sinks.



LAVATORY SINK

In addition to being larger in most cases than lavatories, sinks may also have more than one basin. The sink basin, or basins are often referred to as compartments or bowls. The sink pictured above has two compartments. In manufacturers' literature, it is referred to as a double bowl sink.

One

Generally, how many compartments are available in a lavatory?

14

Other differences between lavatories and sinks relate to the fittings used with each type of plumbing fixture. Lavatories and sinks have common pipe, fittings, and valves needed for connection to the water supply system which include

- a supply stop
- supply tube
- faucet(s)
- a stopper
- a drain, and
- a trap.

These items may differ in size and appearance, but the function provided by each remains the same.

A supply stop turns water coming in from the supply line on or off. This is necessary when servicing or replacing all or a part of the fixture. Supply tube carries the water from the supply stop to the faucet. A faucet is the valve which is used to control the water flow into the basin. A stopper covers the fixture's drain opening to keep water in the basin. The drain is the connection to the DWV system which allows dirty water to leave the basin. And, the trap provides a water seal to prevent sewer gas from escaping up through the fixture.

What pipe, fittings, and valves are common to all lavatories and sinks?

Supply stops, supply tube, faucets, stoppers, drains, and traps

15

We have noted that there are some pipe, fittings, and valves which may be different when comparing lavatories and sinks. For example, lavatories generally use 3/8" supply connections while sinks use 1/2" supply connections.

Local codes may specify a size other than those stated as most common. Check local codes in the areas serviced by your company regarding specifications for supply connection size.

What size supply connection is generally specified for lavatories?

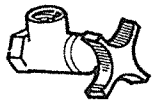
3/8"

16

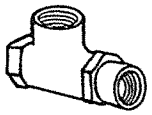
The pipe, fittings, and valves used for residential and non-residential installations may differ.

Most supply stop connections for lavatories and sinks are angle stops which have a handle to manually control the water flow on or off. Residential installations typically are made using an angle stop. However, a straight stop may be used for certain residential installations.

Loose key stops have no handle and require a key to shut off the water flow. A loose key stop is most commonly used in non-residential installations to prevent unauthorized operation. You will learn more about this type of connection in the Unit covering commerical fixtures in this Series.



ANGLE STOP CONNECTION



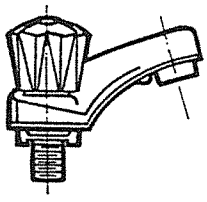
LOOSE KEY STOP CONNECTION

angle stop

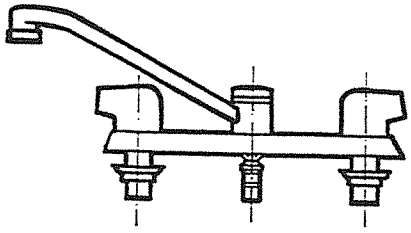
What type of supply stop connection is generally used for residential installations?

17

The type of faucet used for lavatories and for sinks differ as well. Most lavatory faucets have shorter spouts. Sink faucets generally have a longer and higher swivel spout.



LAVATORY FAUCET



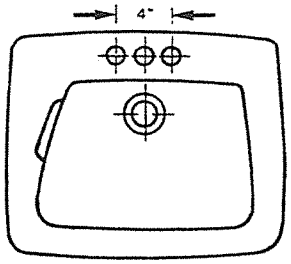
SINK FAUCET

A sink

Where would you most likely find a swivel spout type faucet?

18

Most lavatories have faucet mounting holes that measure 4" center to center, which is commonly abbreviated 4"cc. Typically, there are more 4"cc lavatories sold. There is also a middle hole which is for a pop-up waste control rod.



Lavatories also come with 8"cc mounting holes and as single hole drillings.

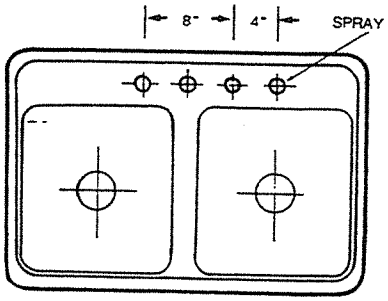
Knowing the common distance for lavatory faucet mounting holes can help you to better identify a fixture.

Lavatory

What type of fixture is most likely to have holes which have been drilled for a 4"cc faucet?

19

Kitchen sinks generally have supply mounting holes that measure 8" center to center (8"cc). Your company will most likely sell more 8"cc kitchen faucets than any other size.

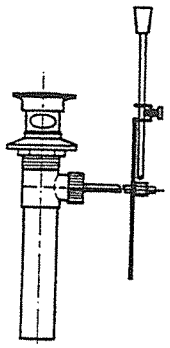


Kitchen sinks are also available with single hole drillings, or with 3, 4, or 5 drillings. Some plastic fixtures will have "knock out" drillings which are punched through at the time of installation.

8"cc

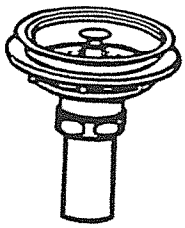
What size faucet mounting is your company most likely to sell for kitchen sinks?

A drain stopper can be any of three general types: a pop-up, a plug, or a strainer. Most residential lavatories use a pop-up drain (commonly called a P.O. plug) which is a type which allows you to open and close the drain without getting your hands wet. The pop-up drain uses a mechanism called a lift rod to control the opening and closing of the drain.



POP-UP DRAIN

Most sinks use a strainer basket stopper combination which allows the drain to be totally closed off and also allows the drain to remain open. The strainer also protects the drain by keeping anything other than liquid from going down the drain.



STRAINER BASKET STOPPER COMBINATION

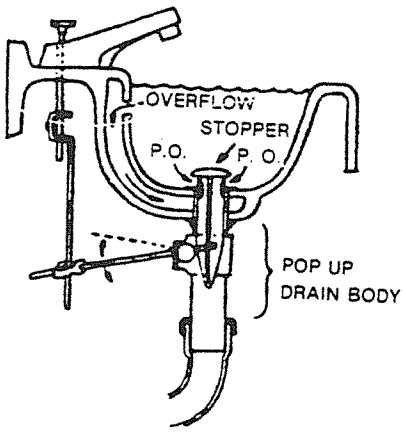
Pop-up drain

What type of drain stopper are you likely to find on a residential lavatory?

21

Another difference between the drain styles for lavatories and sinks is that lavatories have overflows and sinks do not.

An overflow is a passageway built into the design of the lavatory which allows excess water to flow out of the basin so that it will not spill over the rim. The water can flow down the built-in channel and through an opening in the body of the pop-up (P.O. plug) when the drain is closed.



What is the function of an overflow on a lavatory?

Allows excess water to flow out of the basin so it does not spill over the rim

22

A drain connects the plumbing fixture to the DWV system. In most cases, lavatories use a 1 1/4" tailpiece connection. Most sinks use a 1 1/2" connection to the drain to accommodate the larger volume of liquid to be drained. Some commercial sinks have a drain connection larger than 1 1/2".

Why do sinks generally use a larger connection to the drain than is required for lavatories?

To accommodate for the larger volume of liquid to be drained

	The trap seals the fixture from sewer gas in the DWV system. Each fixture has a separate trap. All local codes require that all fixtures have a trap. You may stock and sell S-traps or P-traps for lavatories and kitchen sinks.
S-traps or P-traps	**What types of traps may be used for lavatories and kitchen sinks?**

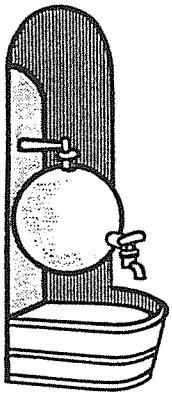
Overview of Lavatories and Sinks — Review

DIRECTIONS: For each of the items listed below, indicate whether it is more common to a lavatory or to a sink by writing LAVATORY or SINK in the blank.

1. _____ 1/2" supply stop connection
2. _____ 4"cc faucet mounting
3. _____ pop-up drain
4. _____ 1 1/2" tailpiece connection
5. _____ 3/8" supply stop connection
6. _____ overflow
7. _____ 1 1/4" drain connection
8. _____ 8"cc faucet mount
9. _____ single basin
10. _____ multiple bowls
11. _____ used for washing dishes
12. _____ used for washing hands

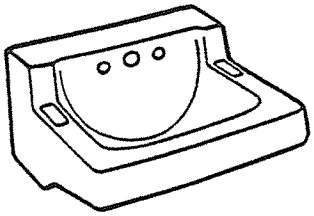
Check your responses with the answers given on page 56.

For a closer look at lavatories we will begin with the lavabo shown below. The lavabo was one of the first vessels used for washing hands. It consisted of a washbasin and a tank with a spigot and was fastened to a wall.



LAVABO

Today, the word lavatory refers to the fixture used for personal washing. Lavatory may refer to a basin such as the one illustrated on left, below. Or, a lavatory may be a complete unit such as the lavatory shown on the right in the illustration below.

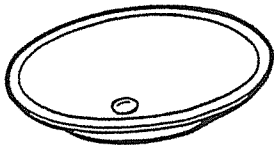


Fixture used for personal washing

What is a lavatory?

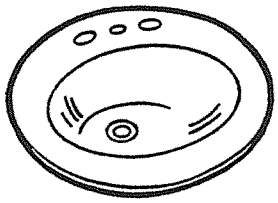
There are many different types of lavatories. Generally, lavatory basins may or may not be punched with faucet mounting holes. The basin becomes a lavatory when a rim, counter, and faucet are added.

One distinctive difference is that between an under-counter lavatory and a self-rimming lavatory. The under-counter lavatory is one that mounts underneath the counter and the faucet is mounted through the counter top.



UNDER-COUNTER MOUNT

The self-rimming lavatory is one that is mounted on top of the counter top and the faucet drillings for mounting the faucet is part of the lavatory basin.



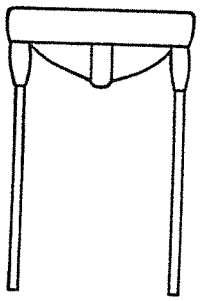
SELF-RIMMING MOUNT

On the top of the counter top

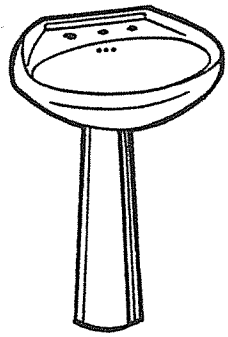
How is a self-rimming lavatory mounted?

Lavatories come in a selection of designs, shapes, and styles. One way in which they are classified into groups is based upon how they are installed or mounted.

There are leg supported or pedestal supported lavatories, like the lavatories shown below.

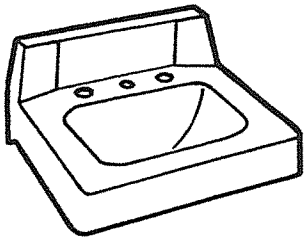


LEG SUPPORTED

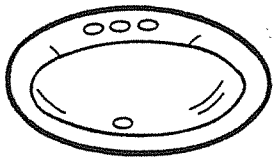


PEDESTAL SUPPORTED

Lavatories may also be wall mounted or designed for installation with a counter.

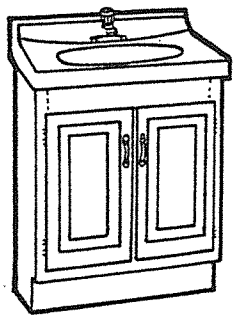


WALL MOUNT



COUNTER MOUNT

Still another type of lavatory design is a cabinet or vanity top mount.



VANITY TOP MOUNT

By how they are installed or mounted

How are lavatories classified?

27

Wall mounted lavatories are most commonly specified for multi-family and commercial markets. The wall mounted design makes it easy to clean the floor area under the fixture which promotes a more sanitary condition in public places. Wall mounted lavatories are most often made of vitreous china, although a few are made of enameled cast iron.

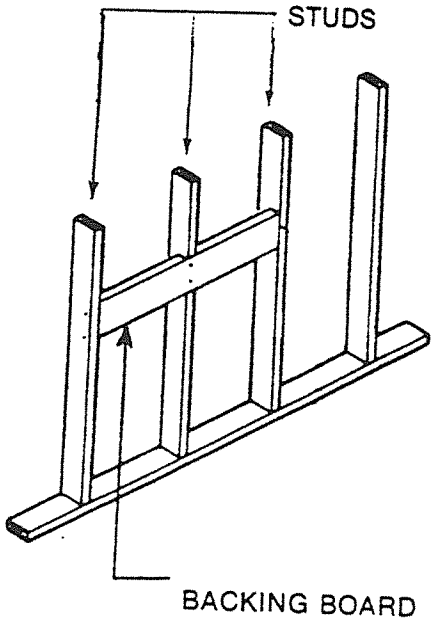
For more information on wall mounted lavatories refer to Unit 7 of this Series.

Multi-family and commercial markets

Which markets are wall mounted lavatories most commonly specified for?

28

Wall hung and pedestal supported lavatories require a backing board which is concealed behind the finished wall to help support the fixture.



The backing board is mounted flush with the wall studs. When the fixture is installed, the support stress is placed on the studs instead of the finished wall.

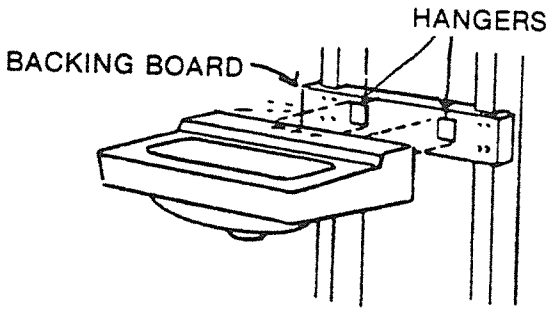
To help support the fixture

What is the purpose of a backing board?

If the lavatory is not mounted in a vanity or counter it will need additional support. There are four ways to support wall hung or pedestal lavatories:

- wall hangers
- leg supports
- arm carriers
- brackets

The most common method in residential installations is to use one or two wall hangers as is illustrated below.



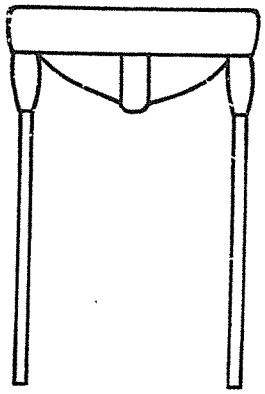
The wall hanger is screwed into a concealed backing board. The lavatory is then wedged onto the hanger and kept in place by long screws. The screws are inserted through holes in the lower back of the lavatory and then through the backing board.

Arm carriers are used for commerical applications. For more information on arm carriers see Unit 7 of this Series on commercial fixtures.

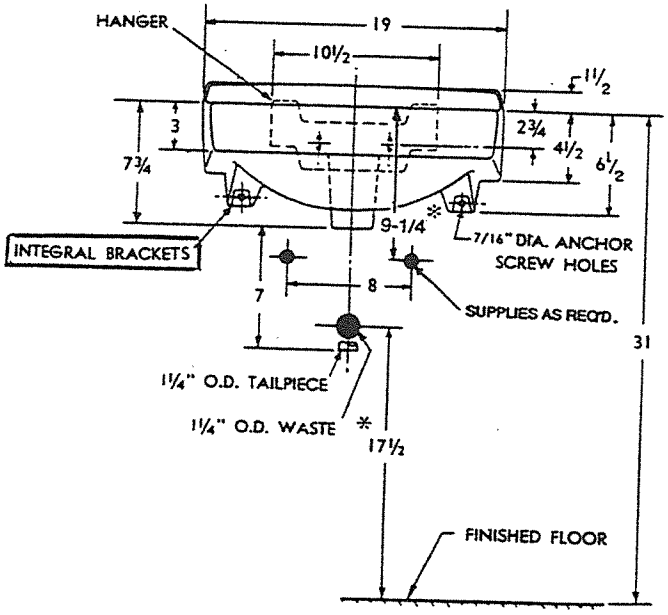
Using wall hangers

What is the most common method of supporting a wall hung lavatory for a residential installation?

A few residential installations may specify the use of metal legs and brackets. The leg support lavatory may have towel bars on each side of the lavatory.



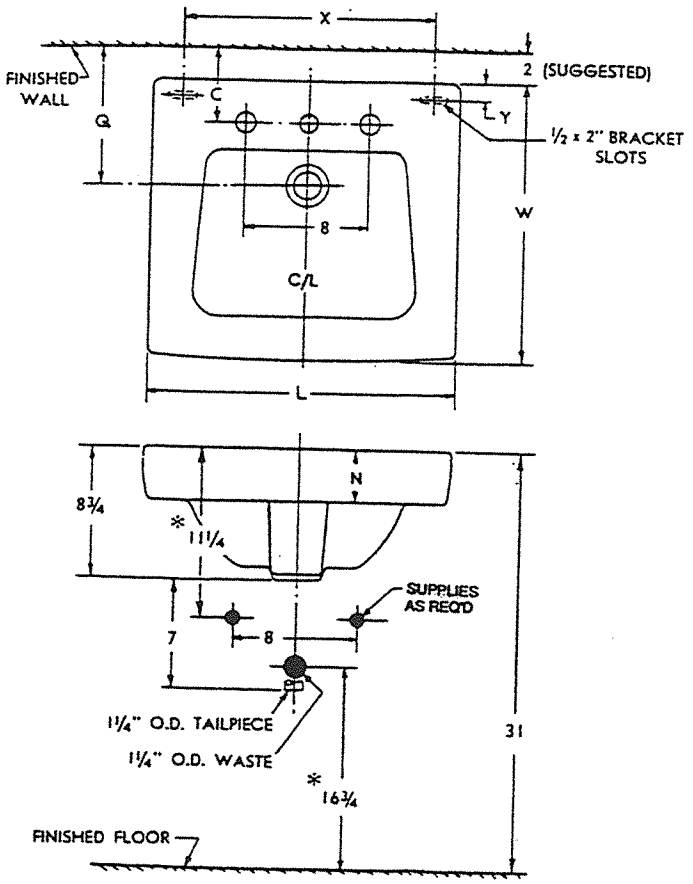
Brackets secure the back of the lavatory to the wall to help keep the lavatory in place.



Brackets

What type of support is used in conjunction with metal legs?

Square or rectangular lavatories are specified by using length and width to determine the size. You can see these two dimensions on the lavatory shown below.



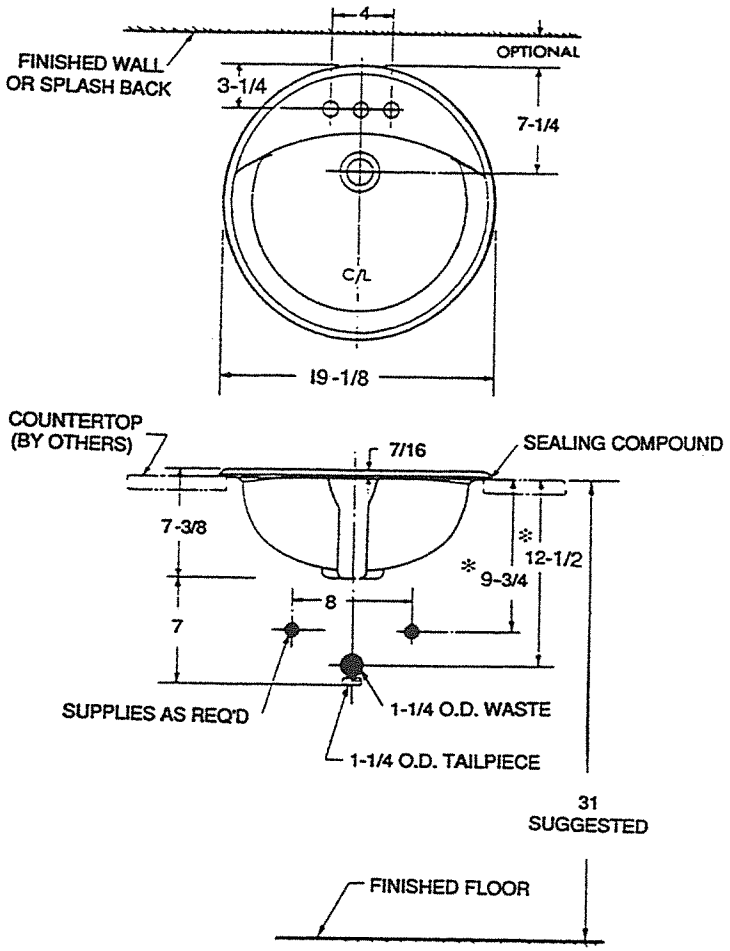
CAT. No.	L	W	Q	C	N	X	Y
0123	20	18	8-3/4	4-3/4	3-3/8	16	1-1/8
0156	24	20	9-1/4	5	3-3/4	18-1/2	1-1/2

Length is measured side to side. Width is the measurement of the distance from the front of the lavatory to the back of the lavatory. The manufacturers' chart will give you the measurements that correlate with the catalogue number. This lavatory is available in 20" x 18" size or 24" x 20" size. Lavatories are always specified with the length first and then the width.

Length = 20"
Width = 18"

What are the length and width measurements for the lavatory shown as #0123?

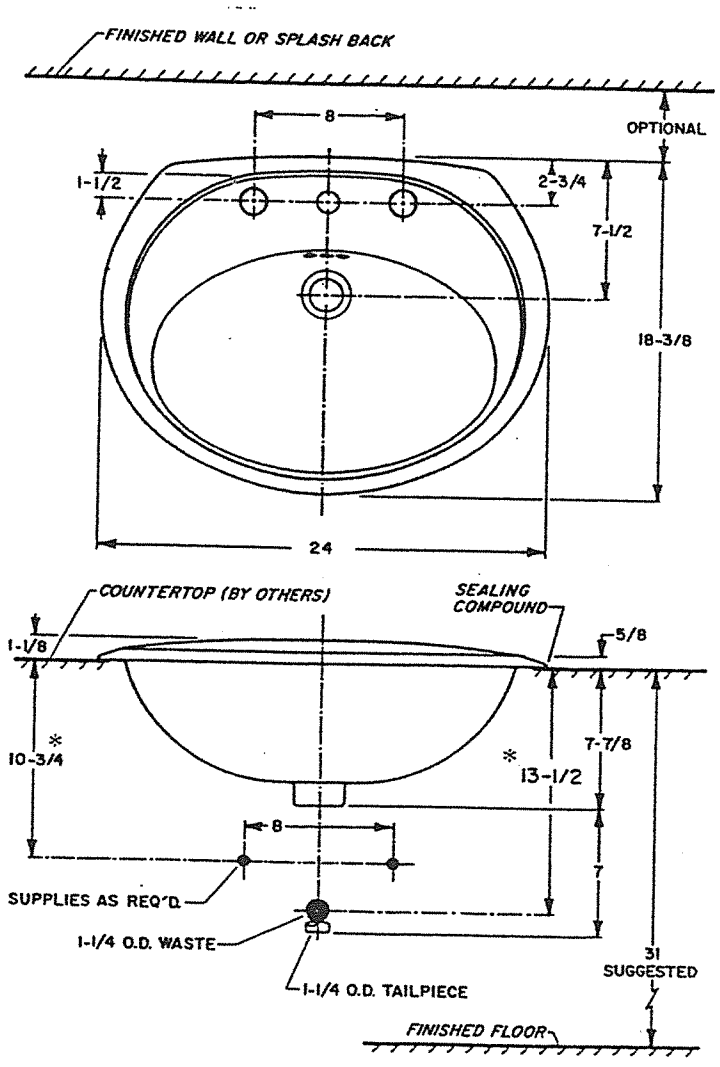
Round lavatories are specified by diameter. As you might recall, the diameter is the length of a straight line which divides a circle into two equal parts. This lavatory measures 19 1/8" in diameter.



By diameter

How is the size for a round lavatory specified?

Oval lavatories are specified by length and width measurements. The length is measured from side to side. The width is measured from front to back. Remember that lavatories are specified with the length first, and then the width.

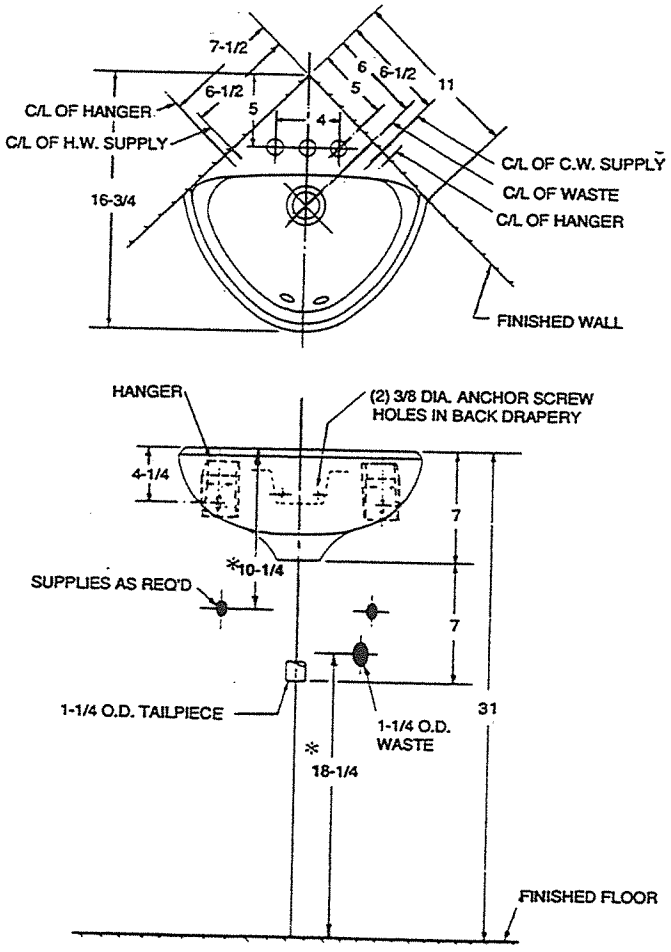


You must also specify color and whether it has a 4" or 8" faucet drilling.

Length = 24"
Width = 18 3/8"

What are length and width specifications for this lavatory?

A lavatory may also be shaped like the one illustrated below. This lavatory is designed to fit into a corner. A corner lavatory is used when space is limited.

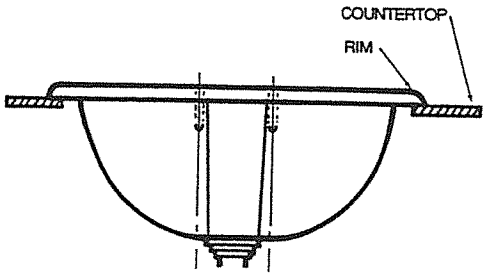


When space is limited

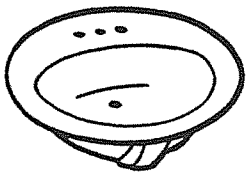
When might a corner lavatory be used?

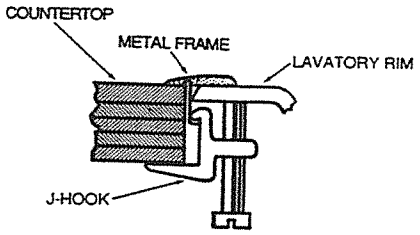
Another common lavatory is designed so that it will fit the cut-out in a counter top. This "drop-in" design is available in two rim styles: self-rimming and metal rim.

The most common is a self-rimming lavatory which has an integral (built-in) rim. The integral rim is molded as part of the basin itself. When a self-rimming lavatory is installed, the integral rim will overlap the cutout in the counter top and will hold the basin in place.



The metal rim lavatory uses special "J" hooks which hold the basin in place.

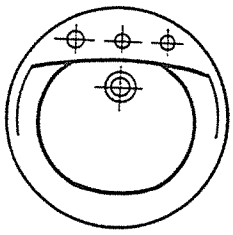




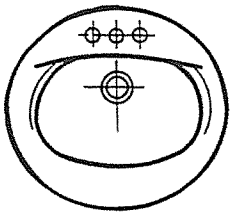
Self-rimming and metal rim styles

What are the two common rim styles found in a lavatory basin which will be mounted in a counter-top?

Self-rimming lavatories come in various shapes. The most common shapes are round and oval. Once again round lavatories are specified by diameter, while oval lavatories are specified by both length and width.



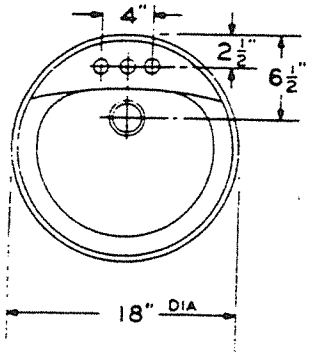
ROUND



OVAL

The same dimensions are used to specify metal rim round or oval lavatories as are used to specify self-rimming types. Most manufacturers make metal rim lavatory basins interchangeable with self-rimming styles. But, sizes for metal rims are generally one inch less in each dimension. The metal frame will add one inch when it is installed.

The diameter for the metal rim lavatory below measures 18". Since the metal frame will add one inch when it is installed, the diameter will become 19" when installed.



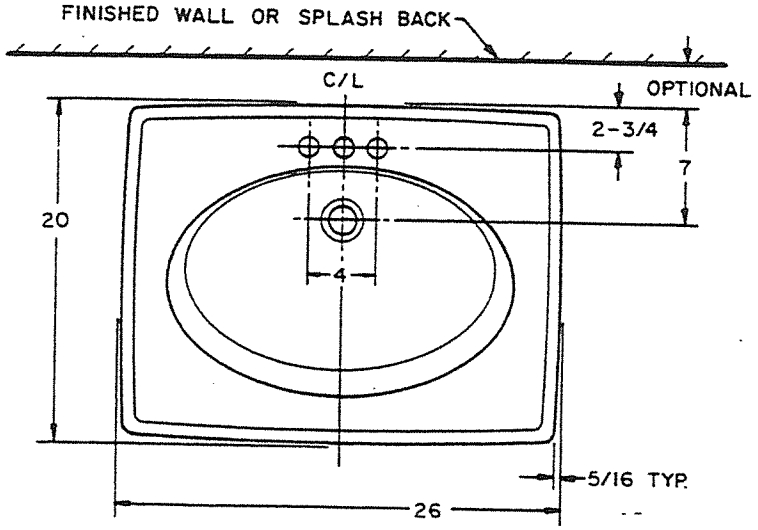
Because the metal rim will add one inch to the size when it is installed

Why is a 19" self-rimming lavatory and an 18" metal rim lavatory interchangeable?

37

Some manufacturers make metal rim lavatories with a rectangular shape. This rectangular lavatory is specified by length and width. Be aware that all manufacturers do not always include the metal rim when stating the dimensions of a lavatory.

One of the most common sizes for rectangular shaped lavatories is shown below.



26" x 20" (length first, then width)

What is the size for the lavatory shown above?

38

Another style of lavatory is the <u>under-counter</u> basin which is mounted underneath the counter top. Because the rim is actually concealed from view, this design may also be referred to as a "rimless style lavatory."

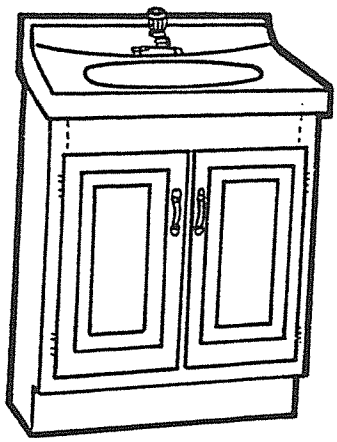
Although the under-counter basin resembles a lavatory which uses a metal rim, they are different. Generally, a metal rim lavatory has a glazed rim while the under-counter lavatory has an unglazed rim. The glaze is simply a continuation of the coating which is used on the basin. However, glazed rim lavatories are also used for under-counter installations.

Under-counter lavatory

What is another name for a "rimless" style lavatory?"

39

Lavatories which are made for the top of a cabinet or vanity are rectangular in shape to fit the cabinet. The basin itself may be oval or rectangular in shape. These lavatories are ordered by the overall size of the lavatory. Once again, rectangular lavatories are specified by the length and width dimensions.

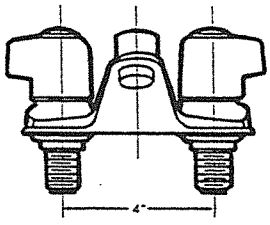


Length x Width

How would the lavatory shown above be specified?

40

Lavatories used for residential applications generally require either center set or combination faucets. As discussed in the previous section, most lavatories are punched with 4"center set (4"cc) faucet holes. This lavatory faucet is the most common type used.

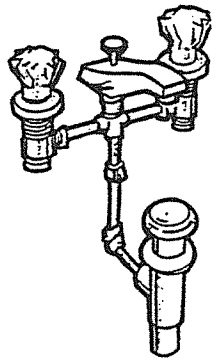


4"cc

What is the most common type of faucet used for a lavatory?

41

Some lavatories for residential installations need 8"cc combination faucets. The combination faucet is sometimes called the "widespread faucet". Instead of the hand controls and the spout being all one unit as is found with the typical 4"cc faucet, a combination faucet has hand controls and a spout which seem independent of one another once installed.

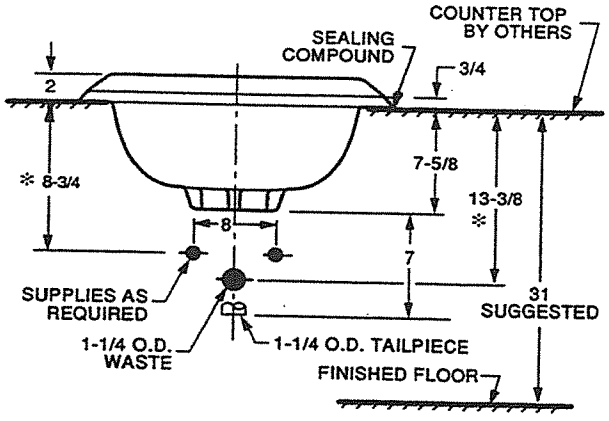


8"cc combination faucet

What type of faucet would be needed for a lavatory which has mounting holes that measure 8" on center?

42

Become familiar with the rough-ins provided by manufacturers for the lavatories sold by your company. Many manufacturers recommend lavatories be installed 31" from the finished floor. This measurement is determined by measuring the finished floor to the top of the lavatory rim.

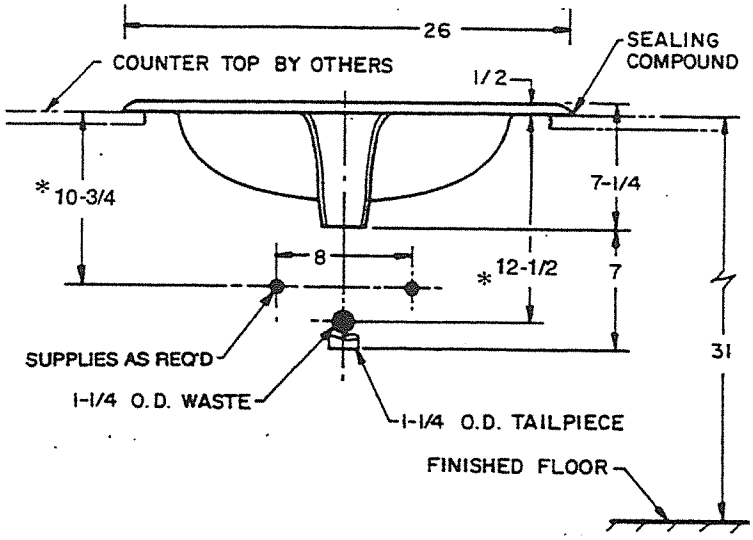


31"

What is the distance recommended by most manufacturers for lavatory installation from the finished floor to the top of the lavatory rim?

Another important rough-in dimension is the distance from the rim of the lavatory to the centerline of the trap outlet. In the rough-in below the distance of this connection is 12 1/2".

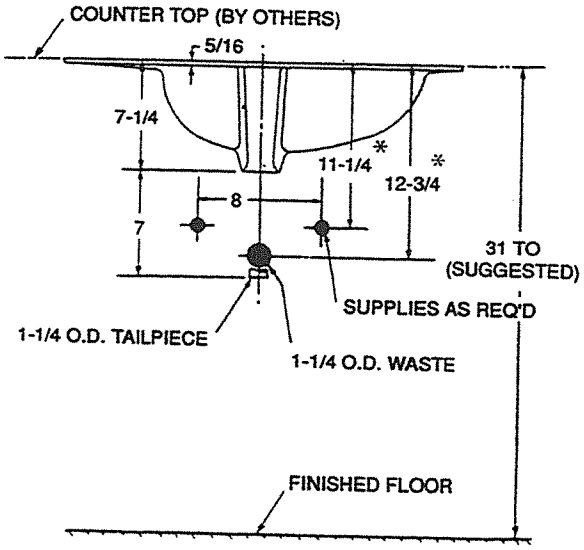
The distance from the rim of the lavatory to the supply connection is also important. In the rough-in below the distance for this connection is 10 3/4".



The distance for the centerline of the trap outlet will change with the type of drain used. The amount of change may vary with the depth of the bowl and depending upon the manufacturer of the lavatory.

11 1/4"

According to the rough-in provided below, what is the distance of the supply connection for this lavatory?



DIRECTIONS: In the space to the left, label each of the following statements "TRUE" or "FALSE."

_____ 1. A lavatory is a fixture used for washing dishes.

_____ 2. One way lavatories are classified is based on how they are installed.

_____ 3. The most common way to support a wall hung lavatory for a residential installation is to use brackets.

_____ 4. Lavatories are always specified by depth dimensions.

_____ 5. The size for a round lavatory is specified by diameter.

_____ 6. A 19" self-rimming lavatory and a 18" metal rim lavatory are interchangeable.

_____ 7. Wall hung and pedestal lavatories require a backing board for support.

_____ 8. Most manufacturers recommend lavatories be installed 31" from the finished floor.

_____ 9. A corner lavatory is specified by diameter.

_____ 10. A metal rim lavatory requires J hooks to hold the lavatory in place.

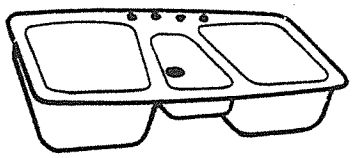
Compare your responses with the answers provided on page 56.

There are more types and shapes for sinks than any other type of plumbing fixture. We noted earlier that sinks may have a single bowl or multiple bowls (compartments).

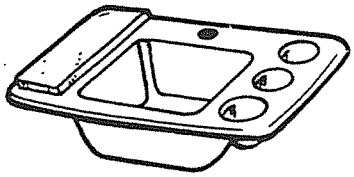
Sinks are classified into groups based upon how they are used. In this section we will look at the three basic groups of sinks used in residential installations:

- kitchen sinks
- bar sinks
- laundry sinks

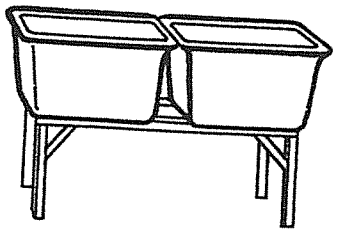
Examples of each of these types are illustrated below.



KITCHEN SINK



BAR SINK



LAUNDRY SINK

Kitchen, bar and laundry

What are the three types of sinks as classified by their use found in residential installations?

45

The kitchen sink was the first plumbing fixture common in the U.S. home. The sink was frequently used with a small hand pump called a pitcher pump, which eliminated the chore of carrying water into the kitchen and then carrying out the dirty waste water.

Today, the kitchen sink is used for many other tasks besides food preparation. In fact, it is the most frequently used plumbing fixture in the home.

Kitchen sink

What is the most frequently used plumbing fixture in the home today?

46

Kitchen sinks are made of stainless steel, enameled cast iron, enameled steel, or solid surface materials. The most common material for kitchen sinks is stainless steel. Most of the kitchen sinks you will sell are made of stainless steel.

Some light commercial applications will require kitchen sinks. But, your largest volume of sales in kitchen sinks will be in the residential market.

Stainless steel

What is the most common material used to make kitchen sinks?

47

Earlier, in the overview section of this Unit, we discussed stainless steel. Recall that the 300 Series stainless steels contain nickel and chromium; and the 400 Series of stainless steels are the straight chromium group and contain no nickel.

Stainless steel sinks are also specified by the gauge of the stainless steel. Gauge refers to the thickness of the metal. Most residential stainless steel sinks are made of 18, 20, or 22 gauge stainless steel. The number gets higher as the metal gets thinner.

22 gauge

Of 18, 20, and 22 gauge stainless steel, which number indicates the thinnest thickness of stainless steel?

48

Type 302 stainless steel is the most common type of stainless steel used for kitchen sinks and the gauge will vary.

For example, the specifications below were taken from a manufacturer's catalog. The stainless steel used is listed as Type 302 stainless steel which contains 18% chromium and 8% nickel. It also states that this particular sink is available in 18 or 20 gauge.

(SAMPLE SPECIFICATION)

SPECIFICATIONS

Fabricated of type 302, 18-8 stainless steel. Available in 18- or 20- gauge. All surfaces are polished. All bowls are thoroughly sound deadening. All sink bowls furnished less drain fittings are punched for 3 1/2" basket strainer.

The percentages of nickel & chromium in Type 302 stainless steel

What do the numbers 18-8 with Type 302 stainless steel indicate to you about this type of stainless steel?

49

The second most common material used for residential sinks are those with enameled finishes. Two kinds are on the market today: enameled cast iron sinks and enameled steel sinks.

Recall from Frame 7 that enameled cast iron sinks have the thickest coat of enamel. These sinks are the more expensive and are available in a variety of shapes, sizes, and colors.

Enameled steel sinks are less expensive than enameled cast iron and stainless steel sinks. These sinks have a thinner coat of enamel and the selection of sizes and shapes available are limited.

Of the two types of sinks with an enameled finish, which is the least expensive?

Enameled steel sinks

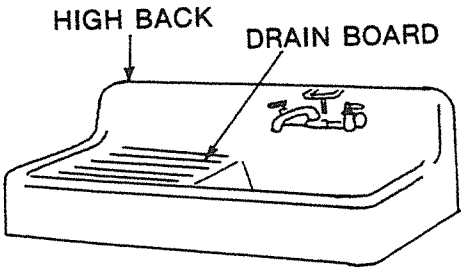
50

Sinks made of solid surface materials are relatively new in the marketplace. The materials used are typically acrylic or polyester based and the durability of most is excellent. Seams are chemically welded so that the sink and counter top appear to be seamless. The color and texture are consistent throughout the entire fixture which means that scratches and other surface damage can be easily sanded out.

Why can scratches or other surface damage be easily sanded out of a sink made of solid surface materials?

Because the color and texture are consistent throughout the entire fixture

Just like lavatories, we classify sinks according to the method of installation. An early model wall mounted sink is shown here.

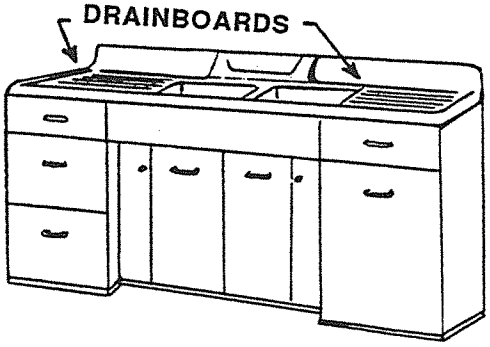


Hangers were used for support, just like a wall mounted lavatory. The high back was wedged onto the wall hangers. The high back served to protect the wall from splashing water.

To protect the wall from splashing water

What is the purpose for the high back on a wall mounted sink?

Later, cabinets were added to the bottom portion to give the sink design a more finished look. This design with a cabinet is often called a free standing model.



The sink shown above and in the previous frame have integral drainboards. The drainboard is sloped so dripping water from dishes flows into the sink basin instead of on the floor.

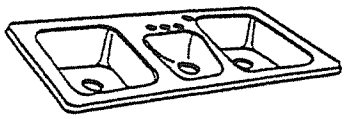
Free standing

What type of sink is shown in this frame?

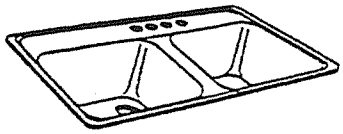
Today, most kitchen sinks are made for installation in a counter top. Rim styles for counter top kitchen sinks are:

- self-rimming
- separate mounting rim
- tile edge

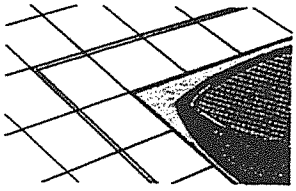
The self-rimming style, also referred to as the integral rim design, have an integral rim for mounting to a counter top. The rim actually sits on top of the counter top.



The separate mounting rim style, is often referred to as the external rim design or flat rim design, needs a metal frame to mount it to a counter top. This style is not used as often today.



The tile edge style is a sink used with ceramic tile counter tops. The tile is installed up to and around the sink forming the edge so, the tile and the sink edge are flush against one another.



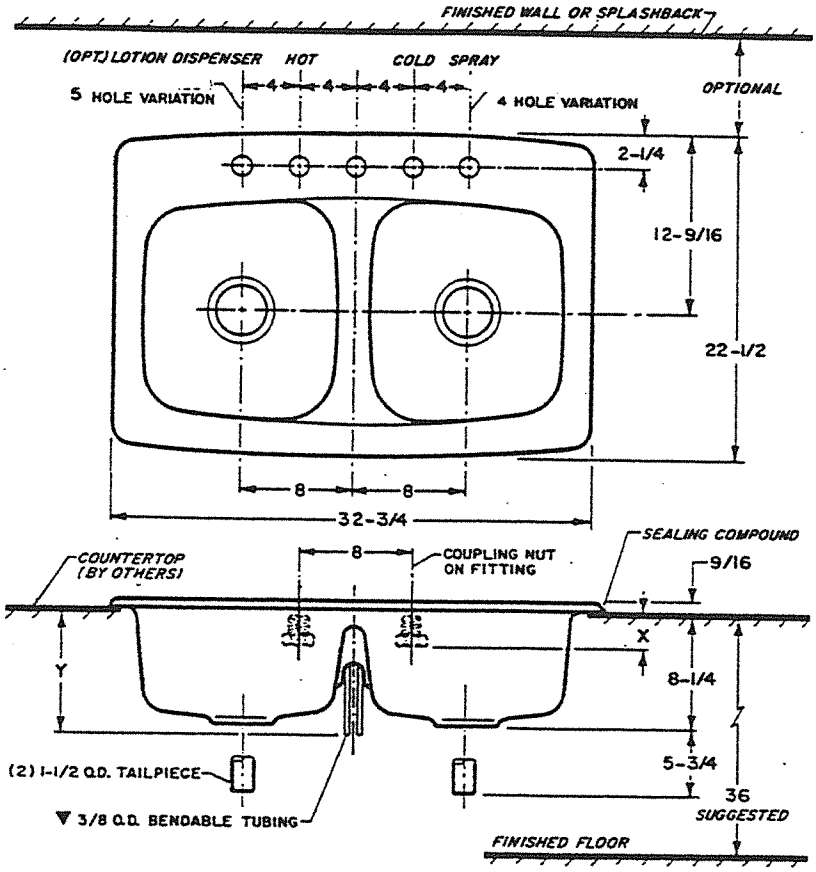
Most stainless steel sinks are self-rimming. Sinks with enameled finishes may have a flat rim, a tile edge, or be self-rimming.

Self-rimming, separate mounting, and tile edge

What are the three rim styles for counter top mounted kitchen sinks?

Kitchen sinks are specified by the outside dimensions, just like lavatories. Remember, the shape tells you which dimensions are used. Square and rectangular sinks are specified by length x width.

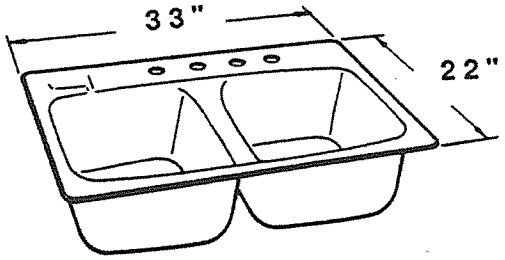
A common self-rimming kitchen sink is shown below.



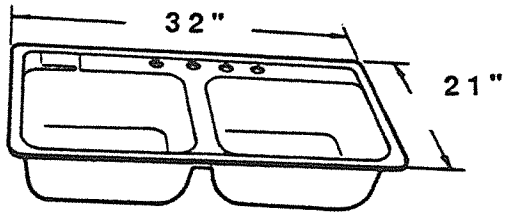
32 3/4" x 22 1/2"

What are the dimensions for the sink shown in the rough-in above?

A self-rimming kitchen sink is shown below. The dimensions would be stated as 33" x 22".



A separate mounting rim style sink is shown here. The size would be stated as 32" x 21".



In these two illustrations, notice that the length and width measurements differ by one inch. The metal frame needed to mount the second sink will add one inch to each dimension when installed.

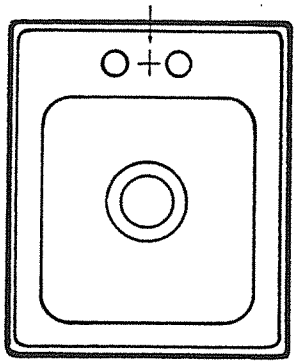
Manufacturers often make self-rimming sinks one inch larger than their flat rim sinks so that they will be interchangeable.

Why do manufacturers make self-rimming sinks an inch larger than separate mounting rim style sinks?

So that both types will be interchangeable when a metal rim is added to the flat rim style

Another type of sink you will sell for residential installations is the bar sink which is used for entertaining and preparing drinks.

The materials most commonly used to make bar sinks for residential installations are stainless steel, enameled cast iron, and plastics. Commercial bar sinks are often made of stainless steel, but the gauge may be heavier than those made for residential applications.

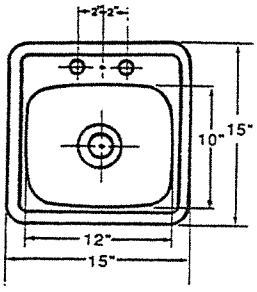


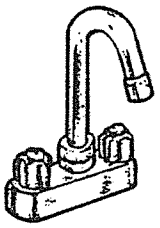
BAR SINK

Stainless steel, enameled cast iron, and plastics

What types of materials are most commonly used in making bar sinks?

A residential bar sink is typically smaller than a kitchen sink. The bar sink shown here is 15" x 15". There are a variety of bar sinks so you will need to become familiar with the specific bar sinks your company stocks and sells.





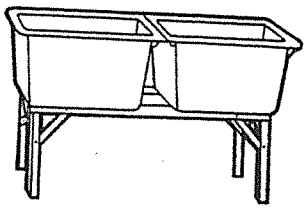
Bar sinks normally have a faucet with a gooseneck spout.

A faucet with a gooseneck spout

What type of faucet is generally specified for a bar sink?

58

Another type of sink specified for residential installations is a laundry tray. A laundry tray is a sink which is used for light clean-up work and to wash household items such as curtains. Laundry trays may also be used to drain water from washing machines. These sinks are larger than kitchen sinks.



LAUNDRY TRAY

What is a laundry tray used for?

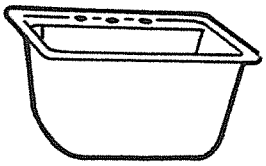
Light clean-up, and to drain water from the washing machine

59

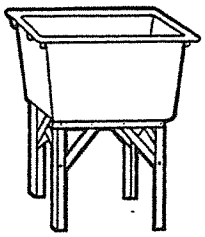
Laundry trays are made of stainless steel, enameled cast iron, molded stone, or plastic. You will find four basic designs of laundry trays which are based upon the method of installation.

Depending upon the material used to manufacture the laundry tray, it may be wall hung, counter top mounted, leg supported, or cabinet mounted.

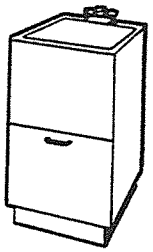
WALL HUNG MOUNT



COUNTER TOP MOUNT



LEG SUPPORTED MOUNT



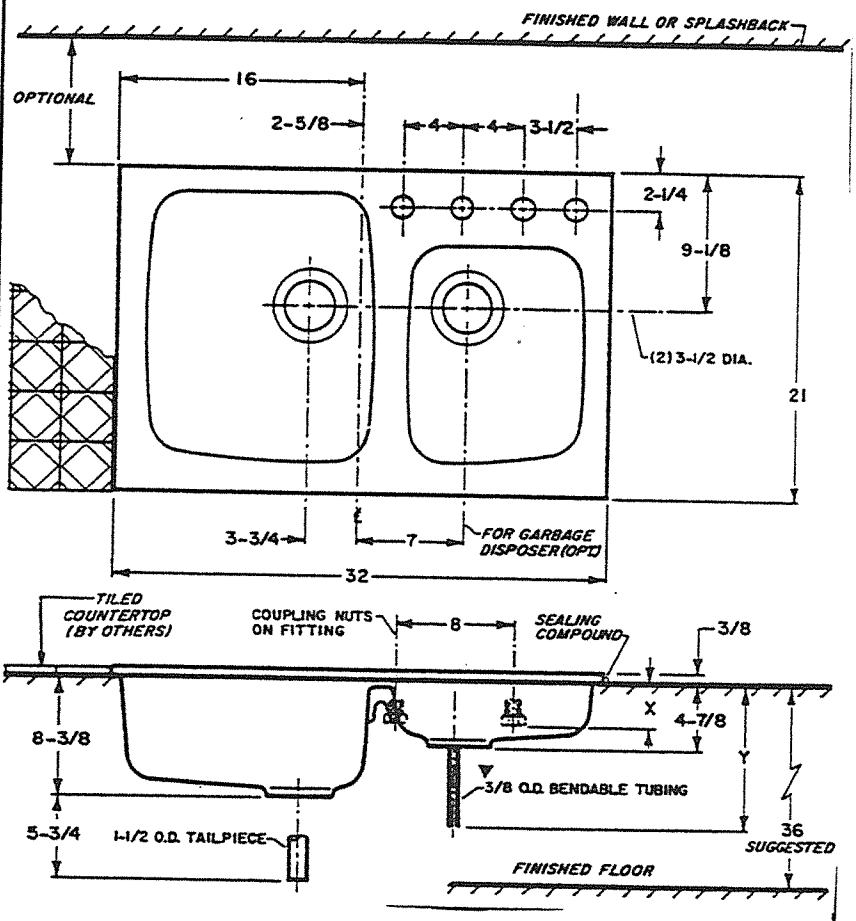
CABINET MOUNT

What are the four methods of mounting laundry trays?

Wall hung, counter top, leg supported, and cabinet mount

There is also a special laundry type sink which was originally designed for use in an apartment called a sink-tray combination. This allows laundry to be done in the kitchen area. This type of sink is also used as a work sink by gardeners. The two compartments in the sink are different sizes. The shallow bowl is the sink and the deep bowl is the tray. Either the sink or the tray can be located on the right or left hand side.

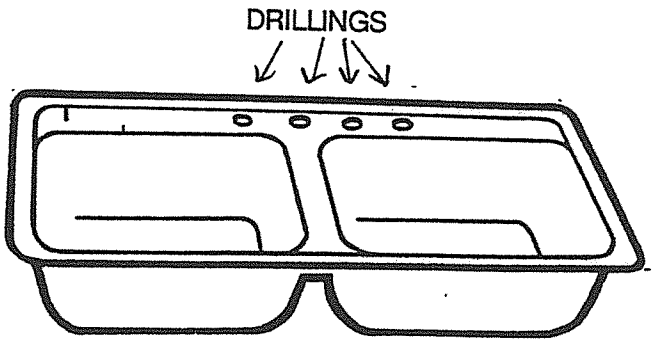
Below are the rough-ins for a sink-tray combination. The drawing shows a 32" x 21" right sided sink with a left sided tray. This is specified by listing the overall size first, then the location of the sink (either left or right), and then the location of the tray (either left or right).



The sink

When indicating the dimensions for a sink-tray combination, which side is stated first: the sink or the tray?

There are basically two ways to mount a sink faucet: through the counter top, or through the sink back or ledge. Many manufacturers refer to the mounting holes which are punched in the sink back or ledge as drillings.



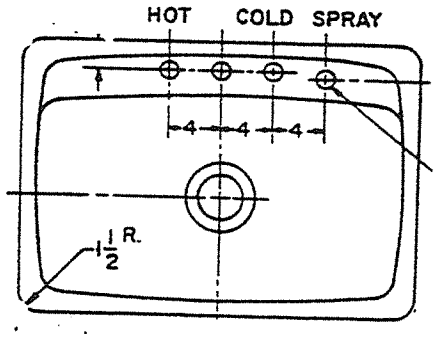
Until recently, kitchen sinks generally had three or four holes. Two of these holes are used for supply connections and one is used for the spout. The fourth hole on a kitchen sink with four drillings is used for a spray attachment.

Today, manufacturers offer kitchen sinks with one, three, four, or five drillings because of the wide variety of faucets and accessories, such as hot water dispensers and liquid soap dispensers, available.

To mount a faucet to the sink and/or sink accessories

What is the purpose of drillings in a sink?

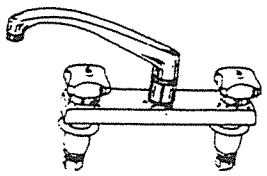
Your company will most likely stock more sinks with 3 hole drillings or 4 hole drillings than any other kind. Here is a sink with 4 hole drillings; the holes measure 4" apart. The hot and cold supply connection holes measure 8" center to center (8"cc). 8"cc supply connection holes are considered standard for sinks.



8"cc

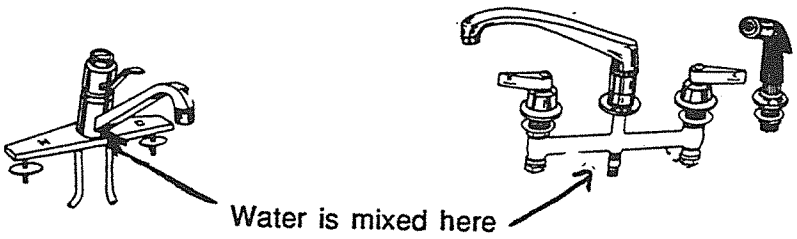
What size supply connection drilling is considered the standard size for sinks?

Faucets are ordered based upon the center to center distance of the supply holes. The deck faucet is used on kitchen sinks and is mounted through the sink ledge or through the counter top.



DECK FAUCET

Deck faucets may be top mounted or bottom mounted. The difference is in where the hot and cold water is mixed. Top mounted deck faucets mix the water above the rim of the sink. Bottom or under-mounted deck faucets mix the water below the rim of the sink.



TOP MOUNTED DECK FAUCET

BOTTOM MOUNTED DECK FAUCET

Above the rim of the sink

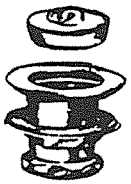
Where is the water mixed on a top mounted deck faucet?

Several different styles of drain stoppers or strainers are available for sinks.

The basket or crumb cup strainer is often used for kitchen sinks and bar sinks.

BASKET STRAINER

A strainer with a plug stopper is often used with laundry trays.

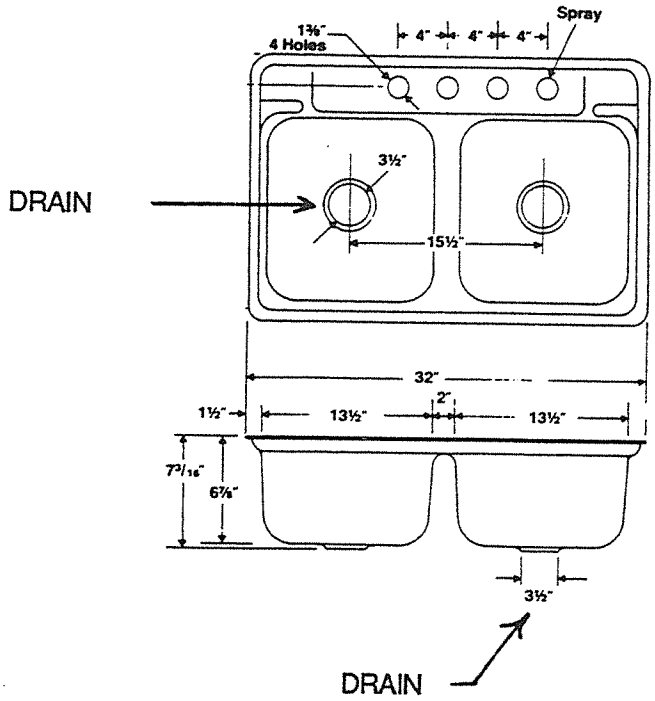


STRAINER WITH PLUG STOPPER

Basket or crumb cup strainer

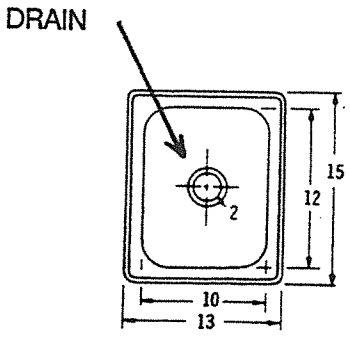
What type of strainer is most often used with a kitchen sink or bar sink?

Strainers come in different diameters to match the size of the sink drain. The sink shown below would use a 3 1/2" basket strainer.

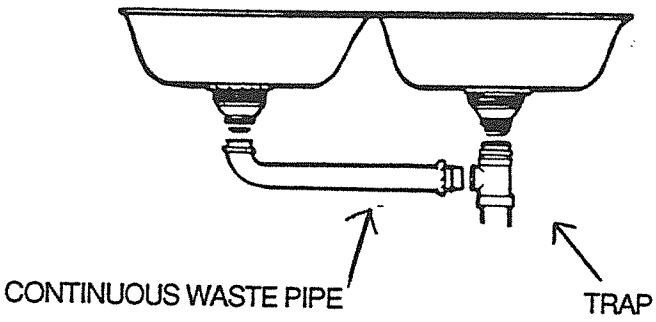


2" basket strainer

What size and type of strainer would the bar sink below use?



Waste or drain connections for a sink will depend upon the number of compartments it has. A continuous waste pipe which makes a single connection for multiple bowls is used with multiple compartment sinks. This reduces the number of traps used.



To make a single connection for sinks with multiple bowls

What is the purpose of using a continuous waste pipe?

DIRECTIONS: Match the terms listed on the left with the correct definition listed on the right.

1. _____ drillings
2. _____ bowl
3. _____ tile edge
4. _____ 18-8
5. _____ 20- gauge
6. _____ enameled cast iron
7. _____ drainboard
8. _____ continuous waste pipe
9. _____ sink-tray combination
10. _____ self-rimming
11. _____ basket strainer
12. _____ gooseneck
13. _____ enameled steel

A. drain connection to serve a sink with multiple bowls

B. most common strainer for a kitchen sink

C. style of counter top mounted sink which has an integral (built-in) rim

D. holes which are punched for a faucet

E. long neck spout often used with a bar sink

F. material which has been sprayed with a thin coat of fused glass

G. sink which allows laundry to be done in the kichen area

H. amounts of chromium and nickel in Type 302 stainless steel

I. portion of the sink which is integral to allow excess water to flow back into the bowl instead of onto the floor

J. material which has a thick coat of fused glass

K. compartment of a sink

L. style of counter top mounted sink in which the sink edge and the ceramic tile are flush against one another

M. common metal thickness used in making residential stainless steel sinks

Compare your responses with the answers given on page 57.

REVIEW ANSWERS

Overview of Lavatories and Sinks, page 21

1.	SINK	*See Frame 15*
2.	LAVATORY	*See Frame 18*
3.	LAVATORY	*See Frames 20-21*
4.	SINK	*See Frame 22*
5.	LAVATORY	*See Frame 15*
6.	LAVATORY	*See Frame 21*
7.	LAVATORY	*See Frame 22*
8.	SINK	*See Frame 19*
9.	LAVATORY	*See Frame 13*
10.	SINK	*See Frame 13*
11.	SINK	*See Frame 4*
12.	LAVATORY	*See Frame 2*

Residential Lavatories, page 38

1.	FALSE	*See Frame 24*
2.	TRUE	*See Frame 26*
3.	FALSE	*See Frame 29*
4.	FALSE	*See Frames 31, 32, 33*
5.	TRUE	*See Frame 32*
6.	TRUE	*See Frame 36*
7.	TRUE	*See Frame 28*
8.	TRUE	*See Frame 42*
9.	FALSE	*See Frame 34*
10.	TRUE	*See Frame 35*

Residential Sinks, page 55

1.	D	*See Frame 61*
2.	K	*See Frame 44*
3.	L	*See Frame 53*
4.	H	*See Frame 48*
5.	M	*See Frame 47*
6.	J	*See Frame 49*
7.	I	*See Frame 52*
8.	A	*See Frame 66*
9.	G	*See Frame 60*
10.	C	*See Frame 53*
11.	B	*See Frame 64*
12.	E	*See Frame 57*
13.	F	*See Frames 8, 49*

GLOSSARY

bar sink type of sink which is used for entertaining and making drinks; typically smaller than a kitchen sink

basin portion of a lavatory which holds water

basket strainer type of drain strainer used for kitchen sinks *(also called crumb cup strainer)*

bottom mount faucet type of faucet which mixes the hot and cold water below the rim of the sink

bowl part of the sink that holds water; when a sink has multiple bowls, the bowls are referred to as compartments

ceramic mixture of clay and water that has been cast into the shape of a fixture, coated with a liquid glaze, and then fired under very high temperatures. Vitreous china and fire clay are two types of ceramic used to make sinks and lavatories

combination faucet type of faucet used for residential lavatories where mounting holes measure 8" center to center *(also called widespread faucet)*

compartments see BOWLS

continuous waste pipe drain connection used with multiple bowl sinks

crumb cup strainer see BASKET STRAINER

cultured marble material used in manufacturing lavatories which is made of ground marble mixed with a chemical bonding agent

deck faucet type of faucet which is mounted through the ledge of the sink or counter top; most often used with kitchen sinks

drain fixture connection to the DWV system

drillings mounting holes which are punched in the ledge of a sink or lavatory for mounting a faucet

enamel fused (melted together) glass

enameled cast iron material used in manufacturing lavatories and sinks; iron which is dusted with a thick coat of glass powder and is fired at high temperatures

enameled steel material used in manufacturing lavatories and sinks; steel that is coated with a thin coat of fused glass

external rim see FLAT RIM

flat rim style of sink that requires an additional metal frame for installation *(also called external rim)*

free standing an early model kitchen sink which was the first type to be mounted with a cabinet to give the sink a more finished look

gauge refers to the thickness of stainless steel; the higher the gauge the thinner the metal

integral back lavatory or sink which has the back of the fixture molded as part of the fixture

Integral rim see SELF RIMMING

kitchen sink fixture used for food preparation and dish washing which is generally used in residential markets

laundry tray sink used for light clean up work and to drain water from a washing machine; larger than a kitchen sink and used primarily in residential markets

lavabo one of the earliest vessels used for washing hands

loose key stop type of supply stop used to turn off the water supply which requires a key to operate

metal rim lavatory or sink which requires a separate metal rim when installed

molded stone material used in the manufacture of lavatories which consists of ground stone held together by a plastic bonding agent

open grid strainer type of strainer used with a P.O. plug to prevent the drain from being totally open when plug is not being used

plug stopper type of drain stopper most commonly used with laundry trays

pop-up drain type of drain stopper that uses a lift rod allowing the drain to be open and closed without getting hands wet *(also called a P.O. plug)*

reaction injection molding process which bonds materials to the underside of steel fixtures to produce a fixture that is made of steel which has the durability of cast iron

self-rimming style of sink or lavatory which has an integral rim for mounting to a counter top

sink fixture used to wash things such as dishes and cloths, and is also used for food preparation

sink tray combination sink with one shallow bowl and one deep bowl; often used as a work sink for a gardener

solid surface materials a material, or combination of several materials, used in manufacturing lavatories and sinks which is generally made up of plastics or molded stone

stainless steel material used in manufacturing lavatories and sinks; type of steel which contains varying amounts of chromium and nickel to make it corrosion resistant

stopper fitting that covers the drain opening of a fixture to control the water flow through the drain

strainer basket stopper combination drain stopper which allows the drain to be totally closed off or remain open but protected by "straining" out anything other than liquids; most common type of drain stopper used on residential kitchen sinks; see BASKET STRAINER

supply stop a valve which controls the water coming into a fixture from the water supply system

supply tube carries water from the supply stop into the faucet of the fixture

tile edge style of sink in which the tiled counter forms the edge or rim of the sink

top mounted faucet type of faucet in which the hot and cold water is mixed above the rim of the sink

trap fitting used to provide a water seal preventing sewer gas from escaping up through the fixture

under counter lavatory basin style which is mounted underneath the counter top

under mount faucet see BOTTOM MOUNT FAUCET

INDEX

Residential Bathtubs and Showers

Revised Edition

Series Two Unit 4

PHCP Self Instruction Program

222 Merchandise Mart Plaza Suite 1360
Chicago, Illinois 60654

CONTENTS

For a complete list of topics covered, see the index.

UNIT OBJECTIVES

The information in this Manual has been selected to give you an overview of common types of bathing fixtures. It includes definitions of common industry terms, descriptions of the major types of bathing fixtures and information on the supply and DWV fitting most commonly specified for the installation of these fixtures.

Some of the products reviewed in this Unit may not be a part of your company's current inventory. Other products which may be stocked by your company may not be discussed in this Unit. Always refer to manufacturers' literature and recommendations on the products your company sells if unsure about a particular product.

To do your job well, it is important that you learn the details about specific items stocked by your company. The most complete and accurate information can be found in manufacturers' catalogs and materials. Be certain to spend time studying these materials.

When completing this Unit, you will be able to

- recognize and use basic terms related to common bathing fixtures
- discuss the specifications for different types of common bathing fixtures
- understand which bathtub, shower, and bath-shower combination designs are best for a given installation or application

THESE MATERIALS SHOULD NOT BE USED TO PLAN ACTUAL INSTALLATIONS OR TO INSTALL BATHING FIXTURES OR REQUIRED FITTINGS.

DISCLAIMER

Although the information contained in this Unit is believed to be accurate, the ASA Education Foundation and the American Supply Association disclaim any and all warranties, expressed or implied, regarding both the accuracy of that information and its application.

STEPS FOR COMPLETING THIS UNIT

1. If your company has purchased the videotape for use with this Series, view the video before you start Unit One.

2. Use the answer mask/book mark to cover the printed answers in the left hand column. Read the information in each Frame carefully.

3. Keeping the answer covered, write your response to the Frame question in the empty column at the right of each page.

4. Move the answer mask to check your response with the answer in the left column.

   - If your response is reasonably close to the printed answer, go on to the next Frame.

   - If your response differs from the answer given, review the material in the Frame to see why the printed answer is considered the best answer for the question.

   - If after reviewing the material in the Frame you still believe that your response is better than the printed answer, circle the printed answer. If you agree that the printed answer is best, mark an "X" through your response.

   - If after several attempts, you cannot understand the Frame or the answer to the Frame question, ask someone in your company for help.

   - If you still feel confused, contact the Foundation, and we will try to find a product knowledge expert to assist you.

5. Answer the questions in the Review at the end of each section. Check your responses with the answers given at the back of the book. Reread the Frames indicated for answers you have missed.

6. When you've completed all Frames, prepare for the Unit Quiz by going over the Review pages and the definitions in the Glossary.

7. Take the Unit Quiz at the end of the Manual.

8. Send the whole book, with the completed Quiz, to the ASA Education Foundation for grading. You and your immediate supervisor will be notified about your completion of the Unit.

When you have completed all Units in Series Two, contact the ASA Education Foundation to make arrangements to take the Series Two Exam. You will receive a Certificate of Completion for Series Two when you have successfully completed all Units and the Series Two Exam.

Overview of Bathing Fixtures

1

In previous units we discussed sanitary fixtures such as water closets, urinals, and bidets; and lavatories and sinks. In this unit we will focus on bathing fixtures. Bathing fixtures are those fixtures which are used for soaking and washing your entire body all at once. These products make up the third basic group of plumbing fixtures.

Soaking and washing the entire body all at once

What are bathing fixtures used for?

2

Bathing fixtures can be divided into four basic groups:

- bathtubs
- showers
- bathtubs with wall surrounds
- specialty fixtures (such as hot tubs and spas)

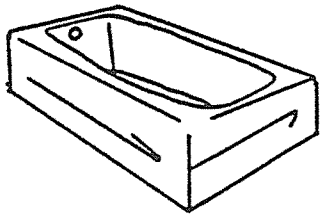
In general, bathtubs have a bathing well, but no walls. Showers have walls, but no bathing wells. Tubs with wall surrounds have both a bathing well and shower walls. The various types of specialty fixtures such as hot tubs and spas will be discussed separately in Unit 5.

Bathtubs, showers, bathtubs with wall surrounds, and specialty bathing fixtures

What are the four basic groups of bathing fixtures?

3

The most common bathing fixture is the bathtub. A bathtub has been so named because the word "bath" means to immerse oneself in a pool of water.



BATHTUB

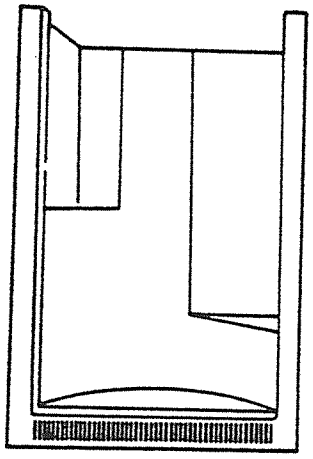
The bather sits in the bathing well, or hollowed out portion of the tub. The size and shape of the bathing well will vary based upon the bathtub design.

Bathtub

What is the most common type of bathing fixture?

4

Another type of bathing fixture is the shower. A shower is an enclosure in which you stand to wash your body using a spray of water. The word shower is an abbreviation of shower-bath, meaning that water is sprayed over the body.



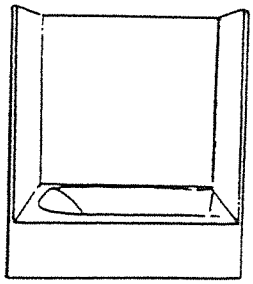
SHOWER

Shower-bath, meaning that the water is sprayed over the body

Where does the word "shower" come from?

5

Another bathing fixture, the bathtub with wall surrounds is a combination bathtub and shower. The wall surrounds protect the walls around the tub from splashing water.



BATHTUB WITH WALL SURROUNDS

The showerhead can be added to an existing tub and then wall surrounds added, or a tub with wall surrounds can be purchased as a single unit.

This fixture provides the convenience of bathing in either a standing or sitting position.

A combination bath tub and shower

What is a tub with wall surrounds?

6

Like all plumbing fixtures, bathing fixtures are connected to the water supply system and the Drain, Waste, and Vent system.

As discussed in previous units, the water supply system is the system of pipe which brings clean water into the fixture. The DWV (Drain, Waste, and Vent) system is the system of pipe which takes dirty water and waste out of the building.

Bathtubs and showers have drains which lead to the DWV system to dispose of the used water.

Water supply system

Which system of pipe brings clean water into a fixture?

7

One significant difference between bathtubs and showers and other plumbing fixtures is that most bathtubs and showers must be installed during the roughing-in stage.

The roughing-in stage refers to laying the supply and DWV pipe. Most bathing fixtures are then installed before the floors and walls are finished.

Even during remodeling installations, the wall area surrounding the bathing fixture must be re-finished after the fixture is installed.

When are bathing fixtures usually installed?

Before the walls and floors are finished

8

Since the walls and the floors are finished after the fixture is installed, it is important to order the correct bathing fixture for each installation. An incorrect order will stop completion of the bathroom. Time and money is wasted by having to return the wrong fixture, re-order another, and wait for the right fixture to be delivered.

To prevent incorrect orders and help serve your customers better, you should know the types of materials bathing fixtures come in; styles and design features from which to choose; and rough-in dimensions for each particular fixture.

What happens when an incorrect bathing fixture is ordered?

It will stop completion of the bathroom

9

There have been dramatic changes in bathing fixtures over the past twenty years. A significant change is in the materials being used, today. Plastics and other solid surface materials are being used in addition to cast iron and steel for bath fixtures.

In the past, enameled cast iron was the most common material used for tubs. Enameled cast iron is an alloy of iron, carbon and silicon cast in a mold. A baked-on porcelain finish is then applied to give the fixture a "glasslike" appearance. The end result is a product which is extremely durable with less susceptibility to damage than other materials.

There are many advantages to cast iron tubs besides durability. Tubs which are made from enameled cast iron require little maintenance due to its chip resistant surface, and are more efficient in maintaining hot water temperatures for a longer period of time.

The main disadvantage of a cast iron tub is weight, which may be up to five hundred pounds. This weight makes installation cumbersome and sometimes requires additional floor reinforcement under the tub. The combined material and handling costs tend to make cast iron tubs very expensive.

Its heavy weight

What is the main disadvantage of an enameled cast iron tub?

10

Enameled steel is manufactured by stamping out the shape of the fixture and applying a coat of fused enamel. Tubs made from enameled steel have a tendency to be noisier than cast iron due to their finish. Soundproofing is possible by using an undercoating on the surface of the tub.

Bathtubs made of enameled steel are less expensive to manufacture than those made of cast iron.

Enameled steel

Which type of fixture is less expensive to manufacture; enameled cast iron or enameled steel?

11

Plastic fixtures are manufactured by several different processes. It is important to refer to each individual manufacturers' literature to determine which method is used.

Plastics, when used to manufacture bathing fixtures, have several benefits. Fixtures made of plastic are lightweight for easy installation. Plastic fixtures are easily repaired and are often less expensive to produce than those of enameled cast iron.

What are the benefits of plastics for bathing fixtures?

Plastic is light weight, easily repaired, and less expensive than cast iron

12

When reading manufacturer specifications on plastic bathing fixtures, it is important to know the types of materials being used. The two types of plastic materials most commonly listed are fiberglass reinforced plastic and acrylics. Fiberglass reinforced plastic actually refers to the manufacturing process of plastic using a combination of materials, while acrylic is truly a type of plastic.

Which term refers to the manufacturing process of plastic?

Fiberglass reinforced plastic

13

Fiberglass reinforced plastic, also called FRP, is a process in which fixtures are manufactured without the use of heat. This is different from those which are manufactured of cast iron or steel. In this process, a gel coat is sprayed thinly to a male mold. The gel coat will eventually become the outside surface of the finished fixture. This initial layer is then reinforced by the application of a mixture of polyester resin and fiberglass strands. After cooling at room temperature, the product is then removed from the mold and trimmed.

Reinforcement

In the FRP manufacturing process, what is fiberglass actually used for?

14

Acrylic plastic fixtures are manufactured by a process called vacuum forming. The vacuum forming process differs from FRP because heat is used in the making of the fixture. In this type of manufacturing, heat is used to make the acrylic pliable. When this happens, a vacuum in the female part of the mold pulls the material into the desired form. After cooling, the fixture is reinforced and trimmed in the same manner as an FRP fixture.

Vacuum forming

What is the process by which acrylic fixtures are manufactured?

15

Plastic fixtures have many advantages besides their relatively low cost. They are lightweight with a bathtub averaging 60-70 lbs, easy to install, and easy to clean. Plastic fixtures are warm to the touch and are available in a wide variety of shapes and colors.

Unfortunately, plastic fixtures also have numerous disadvantages. They are subject to stress cracking. The surfaces of fixtures are easily scratched, so therefore require the use of a non-abrasive cleanser. Also, unlike metal fixtures, plastic fixtures do not retain hot temperatures very well.

Since bathing fixtures made of plastics are relatively new on the market, manufacturers are constantly working to improve their products to eliminate the disadvantages. Often manufacturers provide repair kits to remove scratches from plastic fixtures. Check with your manufacturer to see if such kits are available for the products your company stocks and sells.

What are the disadvantages of plastic fixtures?

Easily scratched, subject to stress cracking, require non-abrasive cleansers, do not retain heat well

16

Besides metals and plastics, some bathing fixtures may be made of wood. These fixtures are specifically for decorative purposes, rather than practical use. Teak and cypress are the most popular woods used in this way.

Wooden fixtures, though beautiful, have many shortcomings. Because of their porous surfaces, these fixtures can be very difficult to maintain. Unlike metal and plastic, wood is not stain resistant, nor can abrasive cleansers be used on their surfaces. Another problem is the frequency of leaking joints. Although proper maintenance can decrease the likelihood of problems, wood fixtures require more work on the part of the owner.

What two woods are most commonly used for wooden fixtures?

Teak and cypress

17

Just as fixtures are made from various materials, so are they used in different ways. Bathing fixture applications include residential, commercial and institutional. The largest market for bathing fixtures is residential.

Several factors determine what type of bathing fixture will be used for an installation, and how the fixture will be installed. The type of fixture your customer chooses for an application will depend upon the specific application as well as space, cost of available fixtures, and plumbing considerations for the installation. Whether the installation is new or remodeling will also be a determining factor.

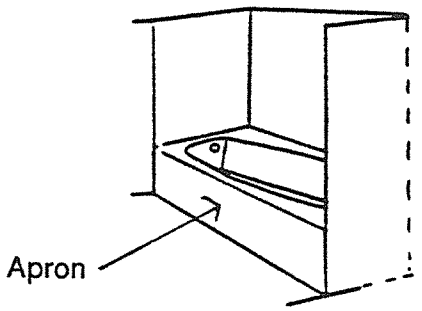
Residential

What is the largest market for bathing fixtures?

18

Bathing fixtures are classified based on the type of installation necessary for each. Each type of bathing fixture varies in design and size to coordinate with specific room measurements and the shapes of the spaces needed for installation.

One general type of bathtub, which has been named based upon the method of installation, is a recess tub. A recess tub is a bathtub designed to fit in a cavity, or indentation in a bathroom. This kind of fixture has only one finished side, which is called an apron.



RECESS TUB

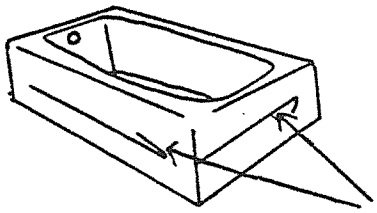
Recess bathtubs only need one finished side because the recess walls surround the tub.

An apron

What is the finished side of a recess type bathtub called?

19

Another type of bathtub is the corner tub which is installed in a corner where two walls adjoin each other. For this reason, the tub has two aprons.



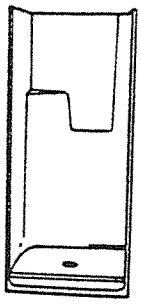
CORNER TUB

Where two walls join

Where is a corner tub installed?

20

Showers are also classified based upon installation. One example, a shower cove or shower stall, is generally made of a single piece of plastic. All three shower walls must be supported by wall studs.



SHOWER STALL

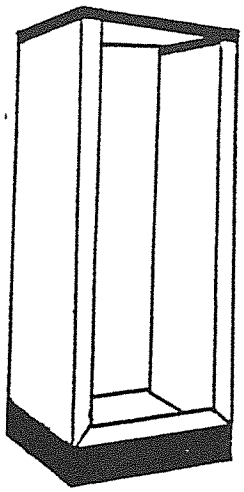
A shower cove

What is another name for a shower stall?

21

A shower which can stand alone without wall supports, is called a free standing shower. This bathing fixture looks like a cabinet, and though it is free standing, is often placed against a room wall.

Free standing shower cabinets are most often made from enameled steel. The shower floor, called the base or receptor, can be made of cement, terrazzo, plastic, enameled steel or painted steel.



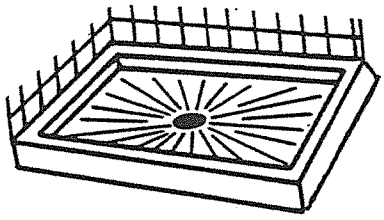
FREE STANDING SHOWER

Free standing shower

What type of shower can stand alone and needs no wall support?

22

Corner showers, like corner bathtubs, are installed where two room walls adjoin. The upper portion may be tiled in with plastic or ceramic tile, or a prefabricated stall can be used. The base can be made of many different materials including stone, plastic, tile or even wood. However, acrylic with reinforced fiberglass is most often used.



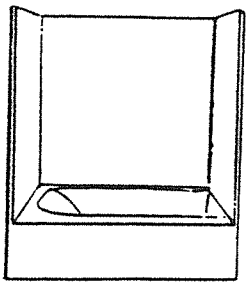
CORNER SHOWER

Where two room walls join

Where is a corner shower installed?

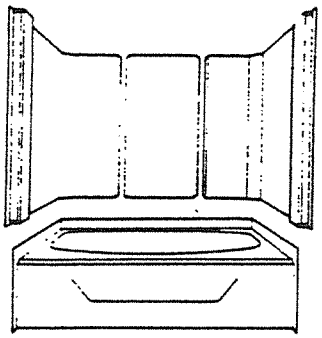
Tub and wall surrounds may be classified as one-piece structures, or multi-piece structures.

One-piece structure styles are generally only used in new construction. Their size makes it impractical for remodeling installations because they are too big to fit through doorways in a constructed building.



ONE PIECE TUB WITH WALL SURROUNDS

Multi-piece structure styles are used for new construction or remodeling. The separate pieces make it easier to move and fit the structure.



MULTI-PIECE TUB WITH WALL SURROUNDS

Both one-piece and multi-piece tubs with wall surrounds require stud support on all three shower walls.

One-piece style

Which style of tub with wall surround is generally only used for new construction because of its size?

Overview of Bathing Fixtures — Review

DIRECTIONS: Fill in the blanks with the word or words which best complete each statement.

1. The three major types of bathing fixtures are _____, _____, and _____.

2. The most common plastics used in manufacturing bathing fixtures are _____ and _____.

3. Bathing fixtures are connected to the _____ system, and to the _____ system.

4. Corner showers and corner bathtubs are installed _____.

5. The most common bathing fixture is a _____.

Check your responses with the answers given on page 64.

Bathtubs

24

Now that we have reviewed bathing fixtures in general based upon the types classified by installation method, let's look more specifically at bathtubs.

There are three basic styles of bathtubs classified based on the method of installation:

- recess tubs
- corner tubs
- sunken tubs

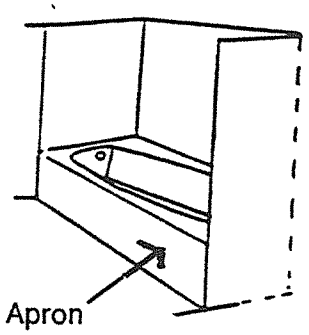
The style also will tell you how many aprons the tub has.

Recess, corner and sunken

What are the three basic styles of bathtub?

25

The most common of the three styles of bathtub is the recess tub. As overviewed in Frame 18, a recess tub has only one finished apron, or side, which is located on the front face. Room walls surround the three un-aproned sides of the tub.

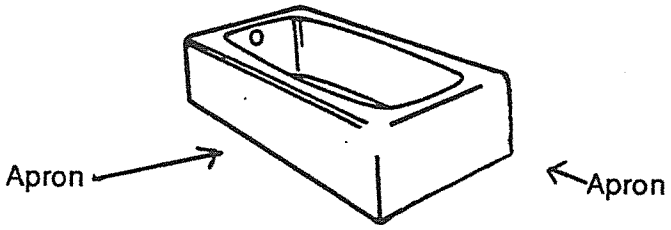


RECESS TUB

The recess tub

Which tub style is the most common, based upon the installation method?

A second style of tub is the corner tub. As its name implies, the corner tub is located in a corner where two walls adjoin. This type of tub has two aprons; one located on the front face, and the other on the tub end opposite of the drain.

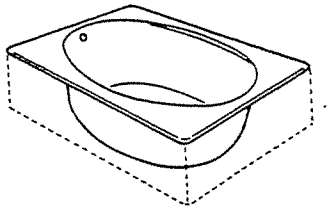


CORNER TUB

Two

How many aprons does a corner tub have?

The third style of basic tub is the sunken tub. A sunken tub is installed either in the floor or on a raised platform. Unlike the other tubs, the sunken tub has no aprons.



SUNKEN TUB

It has no aprons

How does the sunken tub differ from the recess or corner tubs?

28

Wall supports are necessary when installing a recess bathtub or corner bathtub to keep the tub in place and prevent it from pulling away from the wall. Because tubs are made from different materials, such as plastic, cast iron and enameled steel, the installation method will vary. Each manufacturer provides instruction sheets for installing their products.

While the installation method may differ slightly from manufacturer to manufacturer, there are two basic ways to support the bathtub. One way is by using wood supports and the other is through the use of a nailing flange.

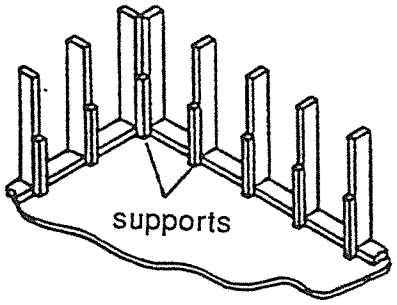
The material of the tub

What determines the type of support method used when installing a recess or corner tub?

29

Recess and corner tubs made of enameled cast iron and enameled steel require the use of wood support. Wood supports are supports that are nailed to wall studs where the tub will be placed, following the manufacturer's instructions.

When installed, the un-aproned side and ends of the tub will rest on the wood supports.

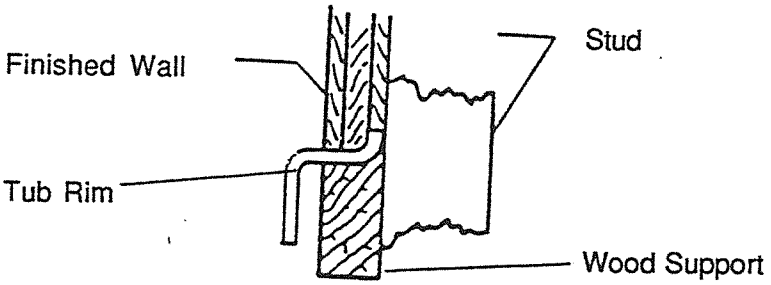


Recess or corner tubs made of enameled cast iron or enameled steel

What type of bathtubs require wood supports?

30

When a tub is installed with wood supports, the rim edge on all un-aproned sides is raised slightly. The finished wall actually covers the raised edge. This prevents water from getting behind the wall and rotting the wood studs and supports.

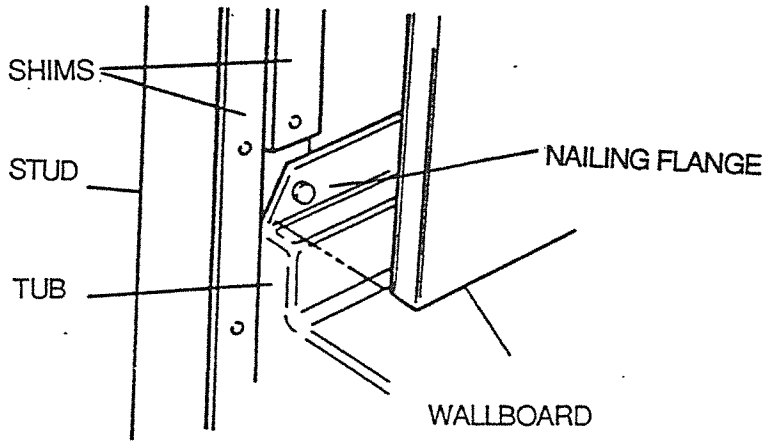


To prevent water from getting behind the wall and rotting the wood

Why does the finished wall cover the raised edge on a bathtub that is installed with wood supports?

31

A nailing flange is a 1" to 1 1/2" vertical extension of the tub rim on all un-aproned sides. When the tub is set in place, the flange may be nailed directly to the wall studs.
Most plastic bathtubs and some enameled steel tubs require the support of a nailing flange.



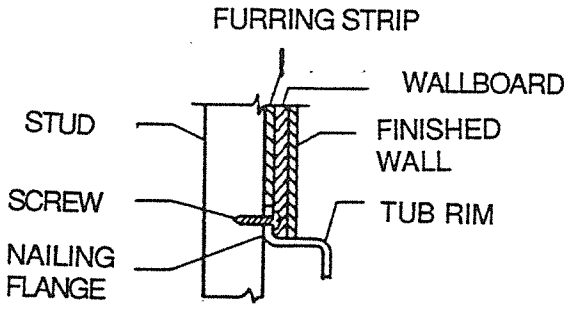
Some plastic bathtubs may require additional support. Check manufacturers' literature for support requirements of their plastic fixtures.

Tubs made of plastic and some enameled steel

What types of tubs require a nailing flange?

32

Below is a closer view of the nailing flange. This flange has been screwed to the wall stud. The finished wall covers the flange down to the tub rim. This prevents water from getting behind the tub and rotting the supports or wallboard.



How does the finished wall cover the flange?

It covers the flange down to the tub rim

33

Unlike the recess or corner bathtubs, sunken tubs are not attached to walls, and therefore do not require wood supports or a nailing flange.

Sunken tubs may be installed below the floor with cement or plaster reinforcement underneath. They may also be installed in a platform above the floor. Platforms are available in a variety of materials, styles, and colors. Check your manufacturers' literature for specific information on sunken tub supports.

Where is a sunken bathtub usually installed?

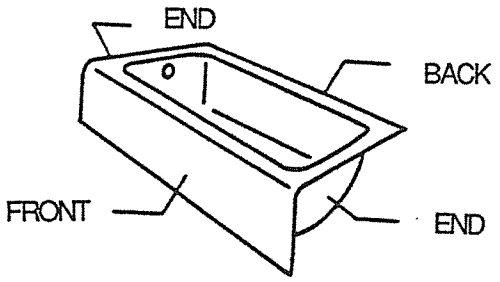
In the floor, or on a raised platform

34

Bathtubs are specified by size. The size refers to the overall dimensions of the tub. Three dimensions are used when stating tub size:

- length
- width
- height

Length is measured from one end of the tub to the other. Width is determined by measuring from the front face of the tub to the back. Height is measured from the bottom of the apron to the rim.



When reading manufacturer's literature, size dimensions will be listed as length by width by height, or "L x W x H".

By measuring from the bottom of the apron to the top of the tub rim

How is height dimension determined on a bathtub?

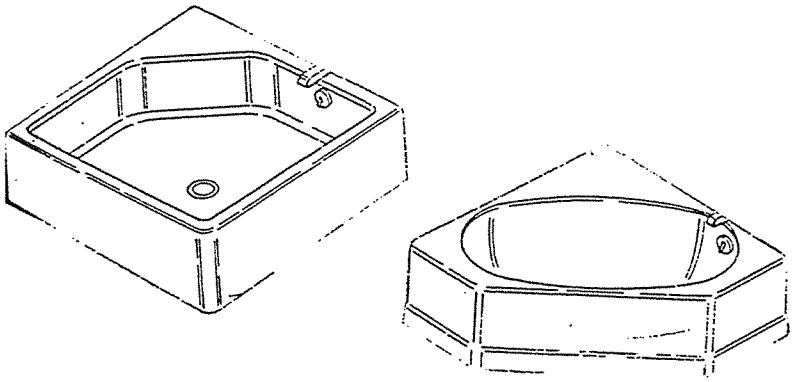
35

Tub length is often stated in feet. The most common length for standard tubs is 5' long and account for the vast majority of sales. Five foot tubs generally have a width of 30 to 32 inches, and a height of 14 to 16 inches.

Width = 30"-32"

What are the width dimensions of a 5' standard tub?

Today, many manufacturers are producing oversized tubs for their customers. Tubs measuring 6 feet long are not uncommon. Along with size, the shape of tubs has changed from the more common rectangular style to ovals, corner tubs and unusual shapes. This provides larger dimensions in width and height. Some tubs are even large enough to accommodate two bathers at once. In most cases, these larger tubs are a sunken installation.



Manufacturers' information will specify dimensions in inches, by length, width and height. Information is also provided on the method of installation needed for each specific tub.

72"Lx36"Wx18"H

What would be the dimensions for a tub 6 feet in length, 3 feet wide and 1 1/2 feet high?

When reading the manufacturer's literature on bathtubs, you will find additional information besides size dimensions. Typical information listed includes:

- the weight of the fixture (both empty and with water)
- the tub's water capacity in gallons
- colors in which the fixture is available
- floor loading

Floor loading is the weight of the water, occupants and tub itself expressed in pounds per square foot.

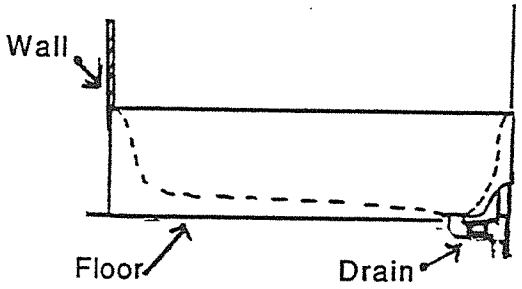
The weight of the fixture, occupants and water in pounds per square foot.

What is floor loading?

38

Manufacturers may also provide the dimensions of the bathing well. Bathing well dimensions are informative, but not used in ordering.

The bathing well is always smaller than the tub size. The dotted line in the illustration below shows where the bathing well is.



The bottom of the bathing well slopes downward toward the drain. Manufacturers always make the bathing well bottom to slope toward the drain so that water in the tub will naturally drain out.

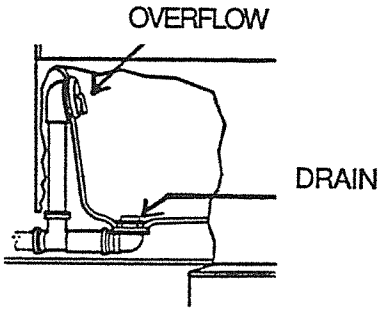
So the water will naturally drain out

Why does the bathing well slope downward toward the drain?

39

Along with the dimensions of a bathtub, it is important to know how different tubs work and the type of plumbing used to make them work efficiently.

One major part of the tub is the overflow. Bathtubs have two holes: one for the drain, and the other for the overflow. The overflow is an opening that allows excess water to drain preventing spillage over the fixture rim. The drain is an opening which is used to empty the water from the tub.

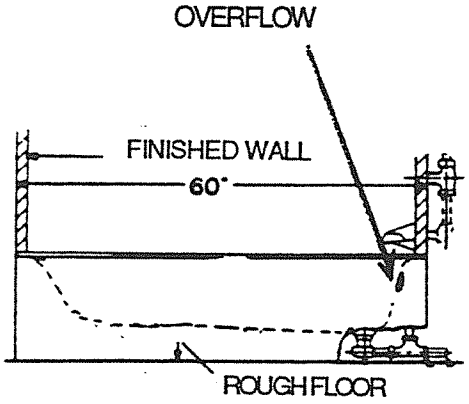


To allow excess water to drain out preventing spillage over the rim

What is the purpose of the overflow?

Tubs are made with different outlet locations to match the location of the DWV pipe. The connection of fixtures to the DWV and the supply systems are always made taking the shortest route. It would be impractical to make these connections by running pipe under the full length of the tub.

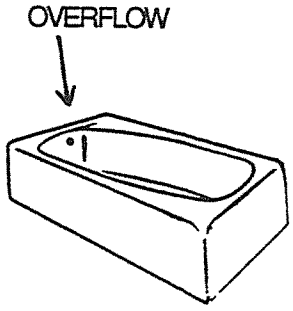
Bathtubs are ordered with right or left drain outlets. The bath tub specification below requires a right outlet.



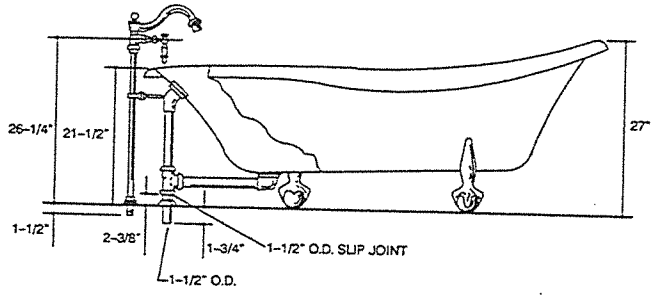
The drain outlet is always on the same end as the overflow hole. When the tub is installed, the outlet will be on your right hand side as you face the tub.

A left-hand outlet

What kind of outlet is shown on the tub below?



The tub drain connection is usually made below the floor. You will also find tubs which make drain connections above the floor. An above the floor drain connection is shown below.



This style of drain connection is used when the room floor is made of concrete or in remodeling applications when changing the rough plumbing would be impractical.

When the floor is made of concrete or in some remodeling applications

When is it necessary to use above the floor drain connections?

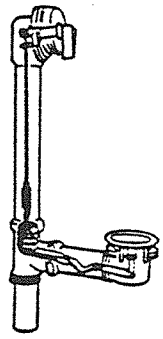
There are three types of tub waste and overflow fittings that are used in tub installations based upon how they seal the tub drain to keep water in the fixture. The three drain fittings used with bathtubs are

- the pop-up type
- the chain and stopper type
- the plunger (or trip lever) type

Pop-up, chain & stopper, plunger or trip lever

What are the three types of tub waste and overflow fittings used when installing a bathtub?

The pop-up drain fitting has a lever at the overflow that controls a metal stopper which opens or closes the tub drain.



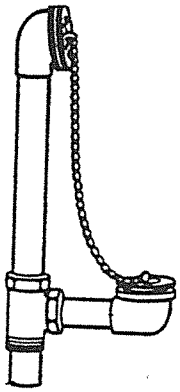
POP-UP DRAIN FITTING

Also available are waste and overflow fittings where the pop-up is directly operated. These fittings only require a touch with your toe to open or close the drain.

The pop-up

What is the most common tub waste and overflow fitting used?

Another type of waste and overflow fitting is the chain and stopper. With a chain and stopper, a rubber stopper or plug fits the tub drain outlet to make the seal. This type of fitting is more commonly found in older installations.



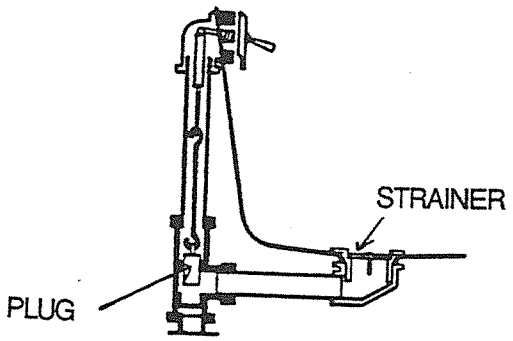
CHAIN AND STOPPER DRAIN FITTING

A rubber stopper or plug

What seals the drain of a chain and stopper drain fitting?

45

The third type of waste and overflow fitting is the plunger or trip lever design. With this fitting, the lever at the overflow controls a plug or plunger in the tee to open or close the drain. The plug is hollow to seal the branch of the tee without closing the run from the overflow. A strainer covers the tub drain outlet.



PLUNGER OR TRIP LEVER DRAIN FITTING

Plunger or trip lever type

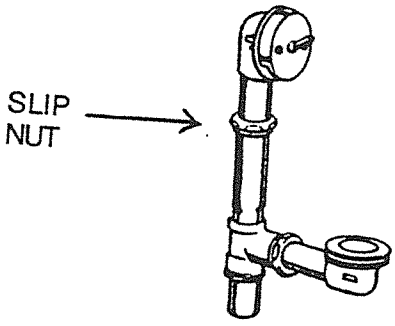
What type of drain fitting uses a plug or plunger inside the tee to open or close the drain?

46

These drain fittings are ordered to match the tub height and the drain size. Tub waste and overflow fittings come in standard sizes to match standard tub heights.

The size of the fitting drain must match the size of the tub drain outlet. You will most often find waste and overflow fittings with a 1 1/2" or a 2" drain.

Some adjustable drain fittings are also available which have a slip nut to match less common or custom tub heights. An example of a adjustable drain fitting is shown below.



ADJUSTABLE WASTE AND OVERFLOW FITTING

Tub height and size of drain outlet

What two dimensions are needed when ordering tub waste and overflow fittings?

47

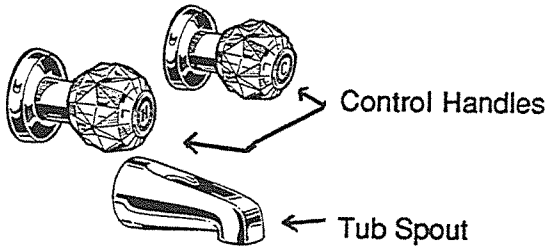
In most cases, the drain fittings ordered for bathtub waste and overflow are for standard tubs. Standard tubs generally have a 1 1/2" drain outlet. Tubs which hold larger quantities of water will usually require a 2" drain outlet. Again, the size of the fitting drain must match the size of the tub drain outlet.

1 1/2" fitting drain

What size waste and overflow fitting is needed for standard size 5' tub?

48

Along with the waste and overflow fittings, there are supply fittings used on tubs. The supply fittings for a tub consist of the supply valve control handles and the tub spout. This fitting assembly may also be called a tub filler.



Tub filler

What is another name for tub supply fittings?

49

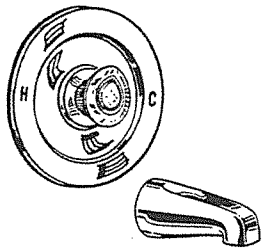
The tub spout is always mounted over the tub rim. This is done to allow for an air gap between the spout outlet and the tub rim. The air gap prevents back siphonage of contaminated water keeping it from entering the supply system. An air gap of 2" or more is recommended between the tub spout and rim.

To prevent back siphonage

What is the purpose of an air gap on a mounted over-the-rim spout?

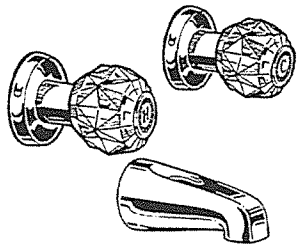
Bath valves may be deck or wall-mounted. They are available as single-control or two-valve fittings. The number tells you how many handles there are on the valve.

On a single-control model, one handle controls both the hot and cold water flows.



SINGLE CONTROL

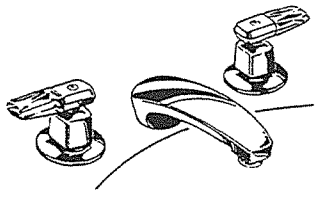
In a two-valve model, one valve controls the hot water and the other controls the cold water.



TWO VALVE CONTROL

A two-valve

What type of bathtub supply fitting model is shown below?



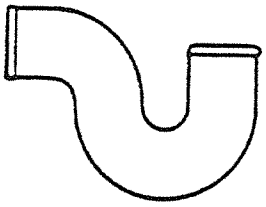
Bath and shower valves may come with special safety features. Some products may have special safety stops which reduce the risk of accidental scalding.

These valves may also be pressure balanced. Pressure balancing valves adjust the mix of hot and cold water in response to changes in relative supply inlet pressure.

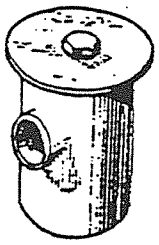
Safety stops and pressure balancing

What are two safety features for tub and shower valves?

As with all plumbing fixtures, a tub requires a trap to seal off sewer gas from the DWV system. The trap is connected to the waste and overflow tailpiece. You will find two types of traps commonly used on the bath drain; the p-trap, or drum trap.



P-TRAP



DRUM TRAP

Local codes may dictate which type of trap to be used.

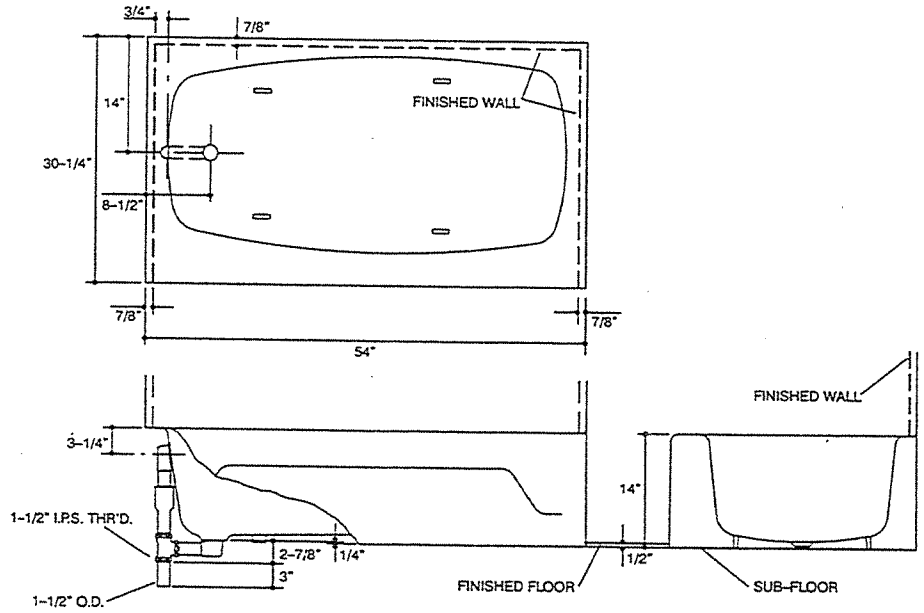
An advantage of the drum trap is that an opening is available to clean it out in case the drain line becomes clogged.

It can be cleaned out if clogged

What is the advantage of the drum trap?

The location of the supply and DWV connections on a bathtub are determined by refering to the fixture rough-in drawings. In remodeling installations, these specifications may be used to select the right tub for the plumbing system which is already installed.

Below is an example of one manufacturer's rough-in for a recess bathtub.



Whether your customer is purchasing for new construction or for a remodeling installation, the rough-ins provided by manufacturers on the tubs you sell will provide necessary information.

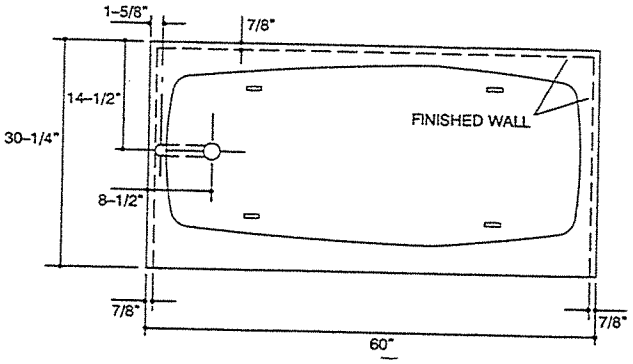
Take time to become familiar with rough-ins provided by manufacturers on the products your company stocks and sells.

Manufacturers' rough-ins

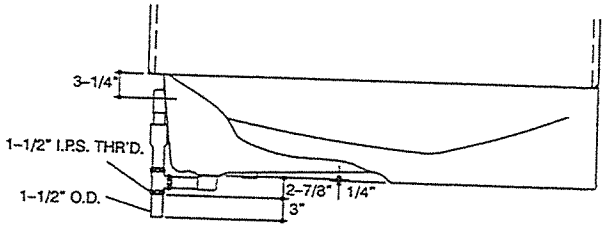
Where will you find information on the location of the drain connection for a bathtub?

Generally, bathtub rough-ins provided by manufacturers will show three different views of the fixture: a top view, a side view, and an end view.

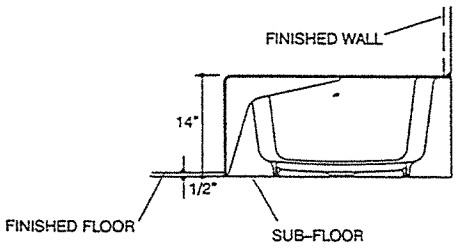
The top view indicates the length and width of the tub.



A side view shows the location of the rough pipe for the DWV system.



An end view provides the height of the tub and sometimes will also show the location and size of the supply connections.



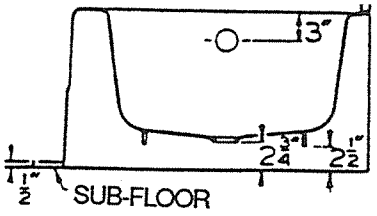
Length and width of the tub

What information is provided in a top view rough-in specification for a bathtub?

As previously mentioned, some bathtubs may require above the floor drain installations.

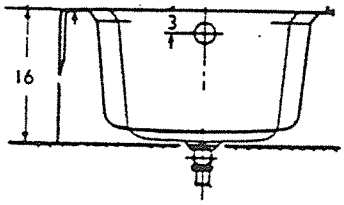
With most tubs requiring above the floor drains, the drain connection measures 2 1/2" or more. Remember that this measurement is larger than the standard below the floor drain measurement of 1 1/2" or less.

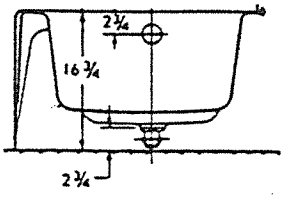
In this rough-in, the drain connection measures 2 3/4".



The bathtub on the right

Below are rough-ins for two common recess tubs. Does the bathtub on the right or left have an above the floor drain?

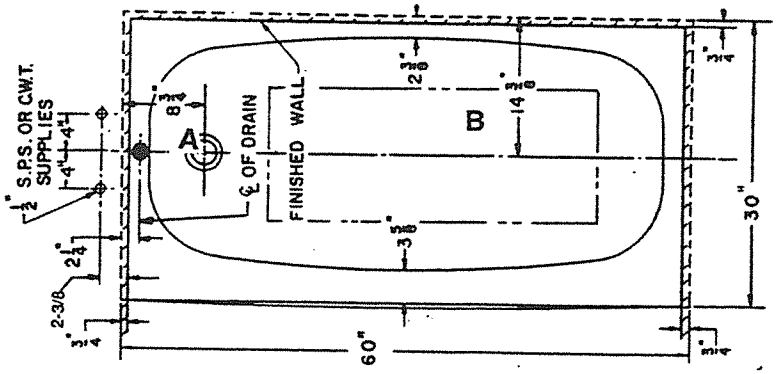




The location of the tub drain outlet is specified by two dimensions. These dimensions are always measured the same whether a standard below the floor drain is used or an above the floor drain is used.

The first dimension measures the distance from the end of the tub on the supply fitting wall to the centerline of the tub drain. This dimension is shown as "A" in the illustration below.

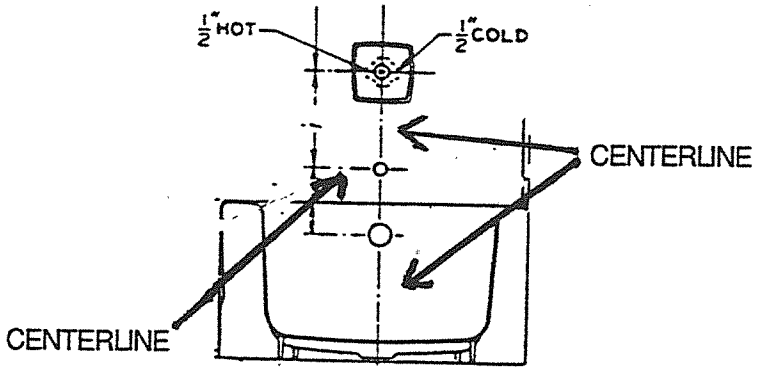
The second dimension measures the distance from the edge of the tub opposite the aproned face to the centerline of the drain outlet. This dimension is shown as "B" below.



A = 8 3/4"
B =14 3/8"

Give the rough-in dimensions for the tub drain outlet location shown above.

Reading fixture rough-ins may be confusing. Manufacturers often use symbols to identify centerline dimensions from other fixture dimensions. The two most commonly used symbols to indicate centerlines are the ℄ symbol or by using dot-dash lines (. __ . __ .). The use of dot-dash lines is illustrated below.



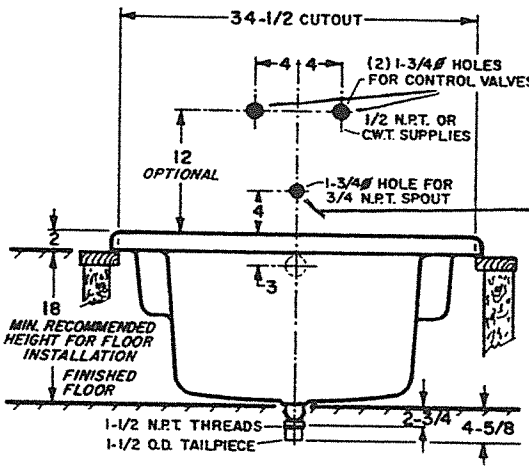
℄ . . __ . __ .

Draw the two centerline symbols which are most commonly used by manufacturers in rough-ins.

Manufacturers will also provide rough-in specifications for the supply fitting connections. These dimensions indicate the placement and size of the hot and cold water supply and the tub spout mounting holes.

The connection of the hot and cold water supply is measured from the tub rim to the centerline of the mounting holes. In the illustration below this specification measures 12".

The connection of the tub spout is measured from the top of the tub rim to the centerline of the hole for the tub spout. In this illustration the tub spout connection measures 4".



Hot & Cold supply connection

Tub Spout connection

Most standard bathtubs have 8" centerset (8cc) hot and cold supply drillings (mounting holes).

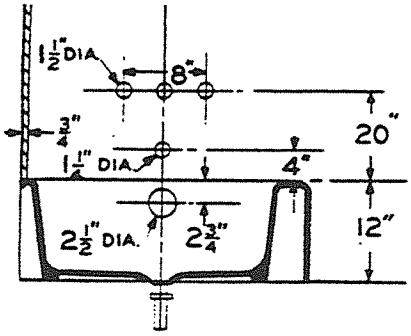
Placement and size of the hot and cold supply connections and tub spout

What do the dimensions for the supply fitting connections indicate?

Each manufacturer recommends a standard distance for the location of the hot and cold supply connections from the floor. This distance will differ depending upon each particular tub. You can determine this specification by adding the tub height to the distance from the tub rim to the supply connection centerline.

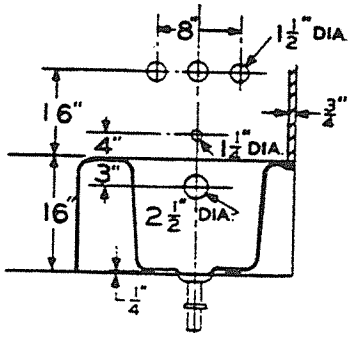
In the fixture illustrated in the rough-in shown below, the manufacturer recommends a standard distance of 32" from the floor for the water supply connection. The tub height is 12" and the distance from the tub rim to the centerline of the supply connection is 20". By adding the two dimensions together you will determine a total of 32" from the floor to the centerline of the supply connections.

12" + 20" = 32"



16" + 16" = 32" (tub height = 16" tub rim to supply connection = 16")

What is the recommended distance from the finished floor for the supply connections for the bathtub illustrated below?



While all bathtubs require standard valves and fittings such as faucets, tub fillers, and drain mechanisms, some tubs are available with accessories and special features. Attractive side moldings, grab bars, non-skid textures, and built-in back supports are some examples. Other types might include special tub filler spouts, hand held showers, or even seats built into the tub.

While some of these features are used for a user's special needs such as medical or safety requirements, other features or accessories are designed for luxury or convenience.

Name two tub accessories or special features.

Side moldings, grab bars, non-skid textures, built in back supports seats, special filler spouts

DIRECTIONS: In the space to the left, label each of the following statements "TRUE" or "FALSE."

_____ 1. A standard bathtub is 72" long.

_____ 2. A standard corner tub has two aprons.

_____ 3. Bathing well dimensions are a required specification when ordering a bathtub.

_____ 4. An oversized tub normally uses a 1 1/2" drain.

_____ 5. Bathtub rough-ins usually show three different views of the fixture.

_____ 6. Supply fittings for a tub include the supply valve control handles and a tub filler.

_____ 7. Plastic bathtubs use wood supports for installation.

_____ 8. An above the floor drain connection is used when the floor is made of concrete.

Compare your responses with the answers provided on page 64.

Showers

61

There are three types of shower designs characterized based upon the method of installation needed. These include:

- recess showers
- corner showers
- free standing showers

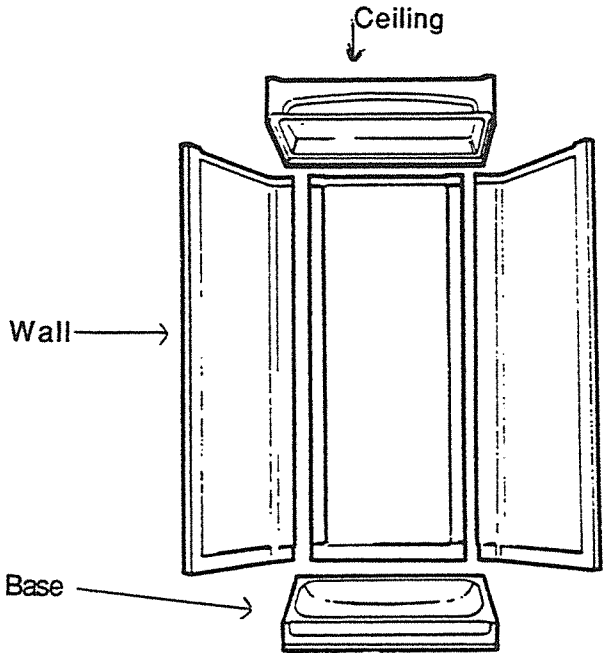
Like bathtubs, shower designs are made to accommodate the available space in bathrooms.

Corner, recess and free standing

What are the three types of shower designs based upon the method of installation needed?

62

Like the recess bathtub, the recess shower is installed into an indentation in the bathroom wall. This style of shower may be made as one piece or of multi-piece construction. Some designs are available with a matching shower ceiling.

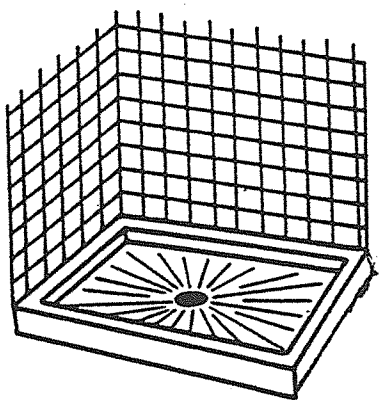


RECESS SHOWER

Can be one piece or multiple pieces

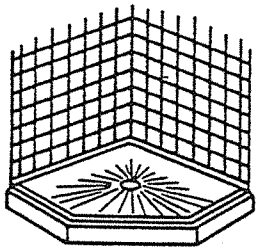
How many pieces make up a recess shower?

A corner shower is constructed where two walls adjoin. This type of shower is built on site at the time of installation. The walls may be surfaced with ceramic tile or a waterproof plastic.



CORNER SHOWER

A neo shower is a type of corner shower. It has five sides instead of four. This allows the shower to fit in a corner using minimal floor space.



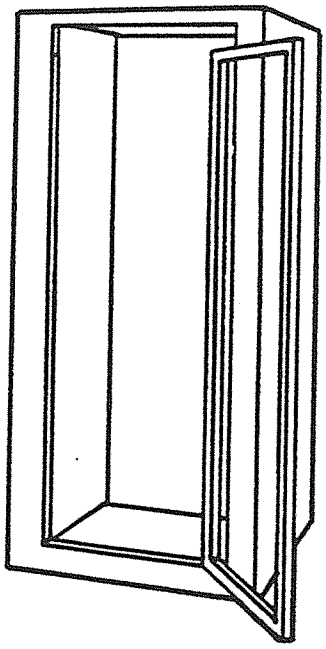
NEO SHOWER

A pan, or base of the shower is common in both the corner and free standing showers. Typically, only the pan will be ordered for a corner shower installation.

Where two walls adjoin

Where is a corner shower installed?

The third style of shower is the free standing type. A free standing shower stands upright without the support of walls. Unlike the other showers, the free standing style can be installed after a room has been completed because it does not require any wall support.



FREE STANDING SHOWER

The free standing, like the corner shower, also has a pan, or base. This base, or shower floor, may be made of concrete, terrazzo, plastic or formed metal.

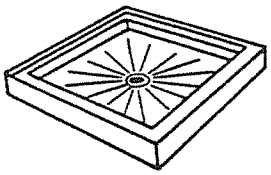
What makes the free standing shower different from other showers?

It can be installed after the room has been completed because it needs no wall support

There are three shapes for shower bases:

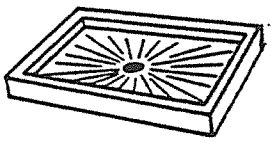
- square
- rectangular
- neo

A square base is one where all sides are equal in size. Square bases range from 30-36 inches square.



SQUARE SHOWER BASE

A rectangular base is one where the length is greater than the width. Rectangular bases are most often found in sizes 36x42" and 36x54". The extra space allows room for a bench to sit on.



RECTANGULAR SHOWER BASE

A neo shower base has five sides. The five sides allow the base to fit the shape of a corner using minimal floor space.

NEO SHOWER BASE

What are the three shapes of shower bases?

Square, rectangular, and neo

66

Plastic showers, such as the recess shower or corner shower, require the same type of support as plastic bathtubs. When installed, a vertical extension of the shower wall, or nail flange, is screwed or nailed to the wall studs.

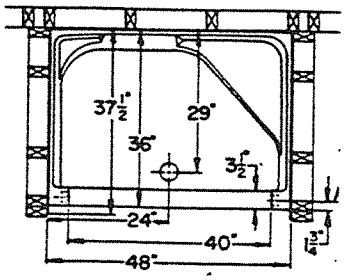
Free standing showers, when made of plastic, do not require nail flanges since they do not need wall support.

Nailed or screwed to the wall with a nailing flange

How is a plastic shower attached to a wall?

67

Showers are often specified by size. The size generally refers to the length, or distance from side to side. The shower below would be specified as a 48" length.



Other dimensions may include the width and height. Width is measured from front face to back. Height is measured from bottom to top.

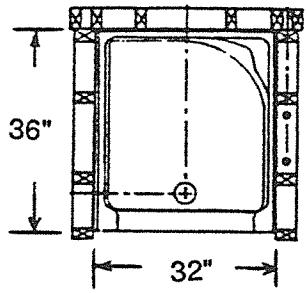
Also, the nailing flange on plastic showers may or may not be included in the size dimensions. Check each manufacturer's literature closely to note if the nailing flange has been included in specifications.

Width = 37 1/2"

What is the dimension for the width of the shower illustrated above?

In some cases the length and width are given for the size specification of a shower. The first dimension given is the length (the side to side) measurement. The second dimension is the width (the front to back) measurement.

The shower illustrated here is specified as 32" x 36".



These are the same dimensions as the base or pan.

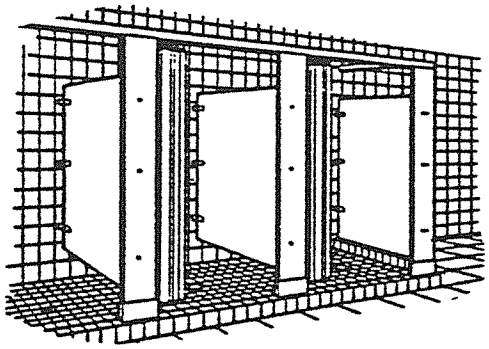
Length (side to side)

When given the length and width of a shower, which measurement is stated first?

The showers described so far are for individuals and generally found in residential installations. Commercial applications may be both for individual or group use. These types of showers are called group showers, and are most commonly found in schools, health clubs, institutions or other large non-residential facilities with large bathrooms.

These showers are constructed on-site. Wall dividers, like those illustrated below, may be added for privacy.

Commercial fixtures and faucets are covered in detail in Unit 7 of this Series.



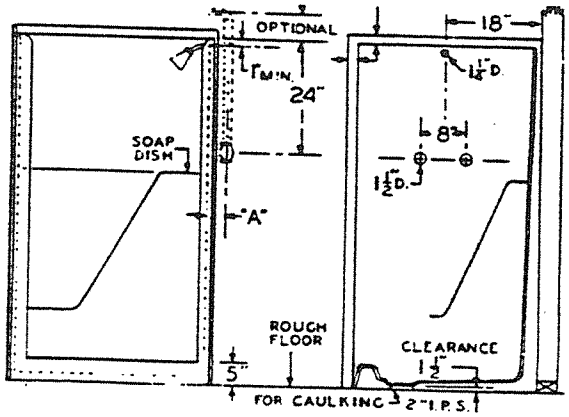
A group shower

What type of shower is most likely used in an institutional application?

It is important to remember that plumbing lines to a shower stall are brought into the stall before the walls are finished.

Unlike bathtubs or sinks, shower stalls or modules are generally not drilled for supply fitting mounting holes. These drillings are made at the time of installation. The supply fittings are generally mounted on the left or right side wall.

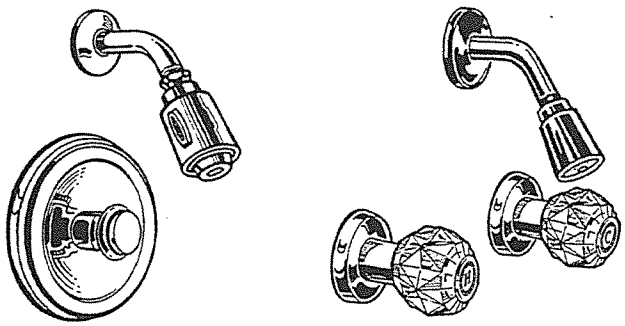
As with bathtubs, manufacturers often recommend the location of the supply fittings. In the illustration here, the manufacturer recommends that the showerhead should be located 18" from the back wall.



At installation

When are supply fitting mounting holes for showers usually made?

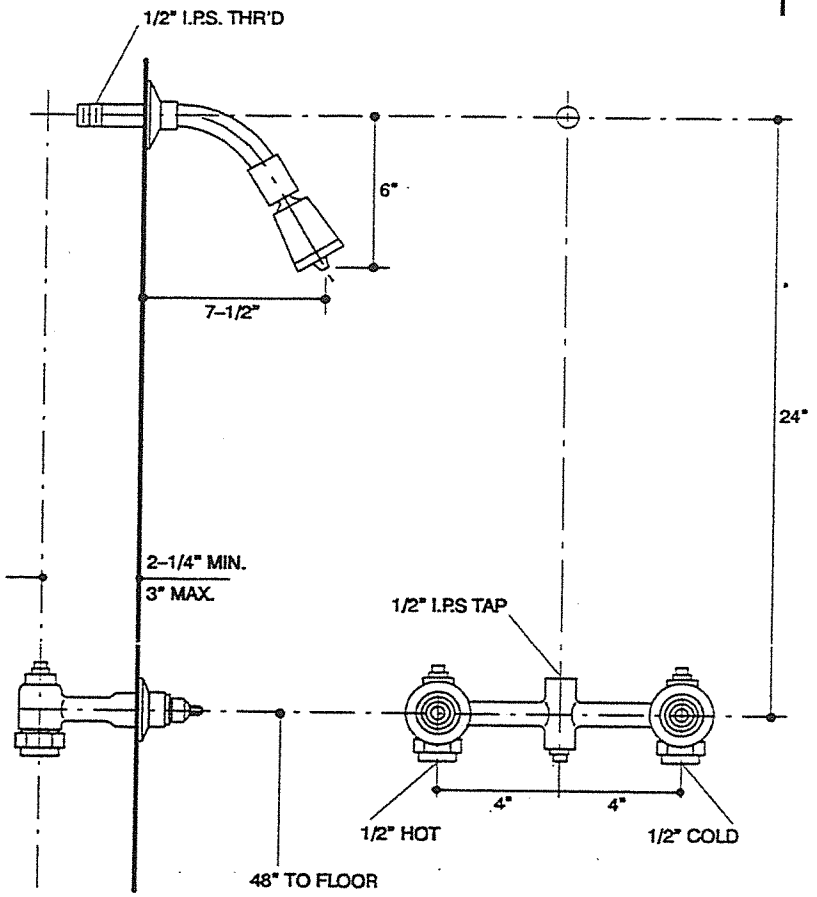
Like bathtubs, showers also have certain supply fittings. The supply fittings for a shower include the showerhead, and the control valves. Showers may use a single control valve, or a two valve faucet assembly.



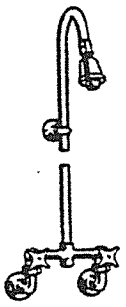
Showerhead and control valves

What supply fittings are used when installing a shower?

When the supply fittings like those in Frame 71 are used, the supply line is concealed behind the finished wall. You can see the connection in the illustration below.



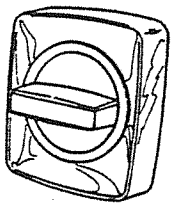
Or, shower valves which have an exposed showerhead riser may be used. In this case the supply pipe may or may not be concealed behind the wall or escutheon plate. This is most often used in commercial installations.



A shower valve with an exposed showerhead riser

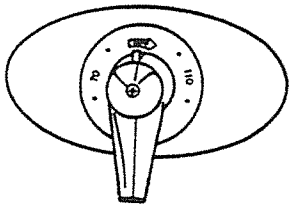
What type of showerhead valve may not have a concealed supply line mounting?

When choosing a shower valve, there are a variety available to choose from. Pressure balancing valves can be used, which provide automatic adjustments to sudden variations in water pressure.



PRESSURE BALANCING VALVE

Another style of valve are thermostatic controlled valves, which provide control of the temperature of the water. A few specialized valves provide both thermostatic and pressure control.



THERMOSTATIC CONTROL VALVE

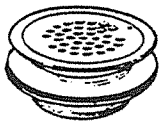
Some states require non-scald thermostatically controlled or pressure balanced valves for safety reasons. Check your local codes to determine if this applies to your area.

Pressure balancing valves

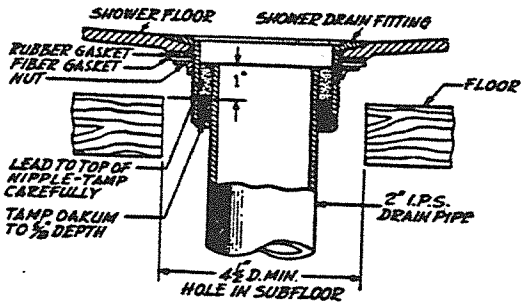
Which shower valves control against sudden changes in pressure?

While shower valves bring water into the shower, drains discard it. The drain for a shower may or may not be installed in the shower floor when the unit is shipped from the manufacturer.

The drain is typically a strainer type design to be used with a 2" drain connection. Unlike tub drains, the shower drain cannot be closed. This is why shower stalls do not have an overflow.



SHOWER DRAIN



ROUGH IN FOR SHOWER WITH A 2" DRAIN CONNECTION

Because the drain cannot be closed

Why doesn't a shower come with an overflow?

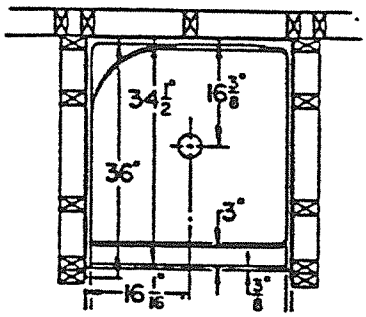
Shower stalls have a trap at the drain outlet under the finished floor. There is not enough room to make the rough drain connection for an above the floor installation.

Under the floor

Where is the trap located on a shower stall?

The location of the drain is specified by the distance from the shower drain centerline to the back wall, and from the centerline to the side or supply fitting wall.

In the illustration here, the drain location is 16 3/8" and 16 1/16".



Distance from shower drain centerlines to back wall and to side or supply fitting wall

How is a shower drain location determined on rough-in specifications?

Just like bathtubs, showers are available with a variety of accessories. Shower heads can be designed with special massagers, or can be removed and hand held. Some showers may contain a bench, soap racks or shelving.

To enclose the shower, a curtain or door can be used. Doors are usually made of shatterproof glass or plexiglass.

Curtain or door

Name the two types of enclosures used on a shower stall.

DIRECTIONS: In the space provided on the left, write the word or words for the term described in each of the following statements.

_____ 1. Support used to nail or screw a fixture to the wall studs.

_____ 2. Type of control valves used for showers which provide temperature control.

_____ 3. Neo shower.

_____ 4. Type of shower often found in non-residential installations such as schools, health clubs or institutions.

_____ 5. Type of drain used with a shower.

_____ 6. A shower which is installed into an indentation in a bathroom wall.

_____ 7. Type of shower which does not require the use of a nailing flange for support.

_____ 8. Type of control valves which provide automatic adjustment to sudden changes in water pressure.

Compare your responses with the answers given on page 64.

Bath-Shower Combinations 78

The previous two sections have focused on bathtubs and showers as independent units. This next section introduces the bath-shower combination.

An existing bathtub can be converted into a bath-shower combination by waterproofing the walls, adding a rod and shower curtain or a tub enclosure, and changing the fittings. The recess tub is the easiest type of bathtub to adapt to a bath-shower combination.

Recess tub

Which type of bathtub is easiest to adapt to a bath-shower combination?

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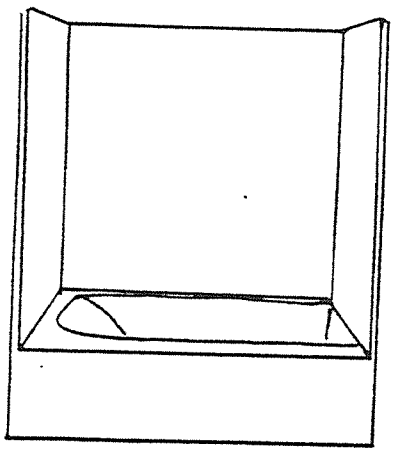
When converting a bathtub into a bath-shower combination it is necessary to waterproof the walls around the tub. This can be done in two ways; by adding ceramic tile to the walls or by installing wall surrounds. Wall surrounds are prefabricated walls made from plastic that are installed around a tub.

Adding ceramic tile or wall surrounds

What are the two ways to waterproof the walls around a tub?

Tub and wall surrounds are combination bath-showers. Tub and wall surrounds are bathtubs that come with prefabricated walls. Tub and wall surrounds are available in one-piece or multi-piece units for installation.

One-piece tub and wall surrounds are usually used in new construction installations. The reason for this is because the one-piece design is so large it may not fit through existing doorways or openings available in remodeling installations.



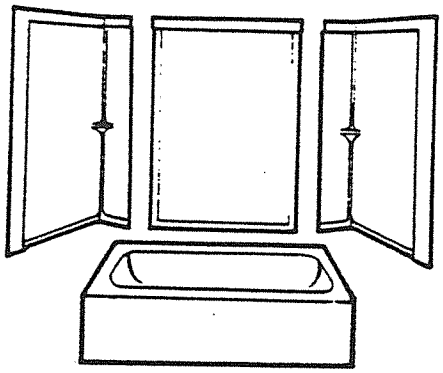
ONE PIECE TUB AND WALL SURROUND

An advantage of the one-piece tub and wall surround is the seamless design which prevents water or moisture from getting behind the walls.

New construction

What type of installations are one-piece tub and wall surrounds typically used for?

The other type of tub and wall surrounds is the multi-piece. This type of surround is usually used for remodeling installations. The multi-piece design is constructed to be easily shipped and moved in pieces. The pieces are then assembled on the job site.



MULTI-PIECE TUB AND WALL SURROUND

A disadvantage of the multi-piece tub and wall surround is the need to use caulk at all the seams. These seams require more maintenance on the part of the owner.

Seams must be caulked and require more maintenance

What is the disadvantage of a multi-piece tub and wall surround?

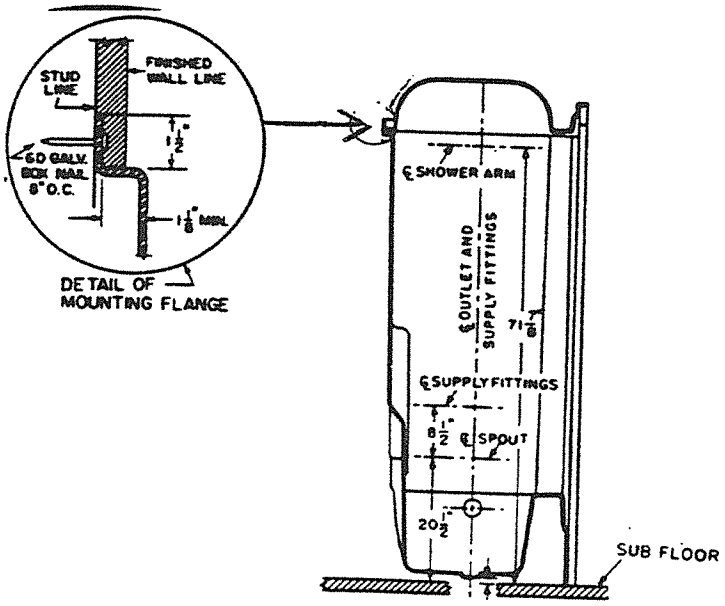
Most tub and wall surround units are made of fiberglass reinforced plastic (FRP), or shaped through vacuum forming (acrylic).

As with other plastic bathing fixtures, the tub with wall surrounds uses a nailing flange as a means of support.

FRP and vacuum forming

What are the two processes used in manufacturing tub and wall surrounds?

Illustrated below is a one-piece tub and wall surround. The model shown has a ceiling dome. It has a 1 1/2" nailing flange around all three sides of the shower ceiling. The flange is nailed or screwed to the wall studs for support.



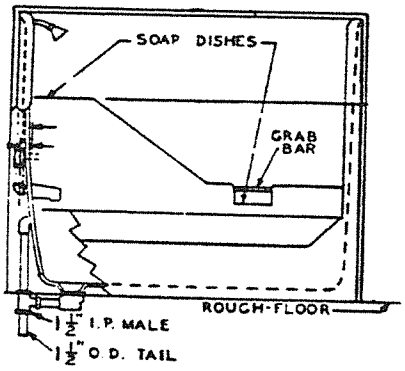
Secure the fixture to wall studs for support

What is the purpose of the nailing flange?

Just like bathtubs, tub and wall units are available with different outlet locations to match the rough plumbing; either right or left.

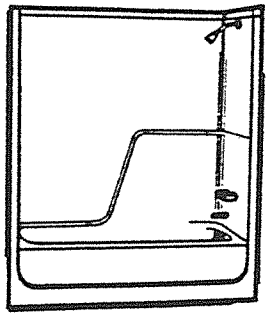
The units also come in standard drain installations; either below the floor or above the floor drains.

Pictured here is a standard below the floor drain installation with a left outlet location.



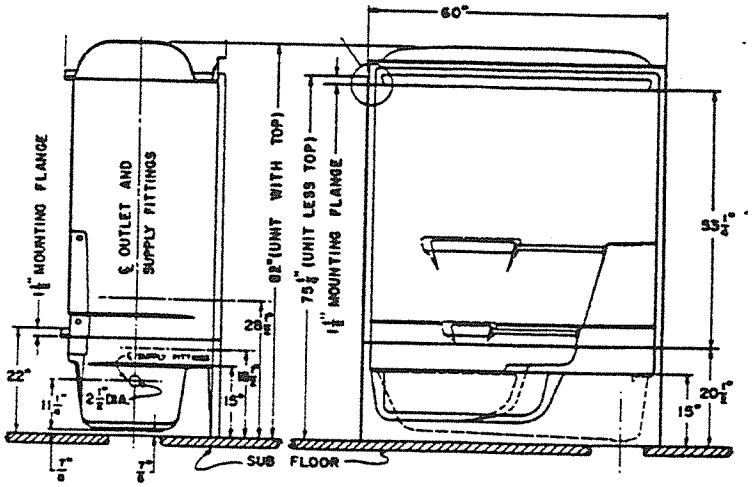
Right outlet

Which type of outlet is shown below?



Tub and wall units are made to fit a recess. Most of these units are 5 feet long. The width can vary from 28 to 35 inches. The height of the tub face apron may range from 14" to 20".

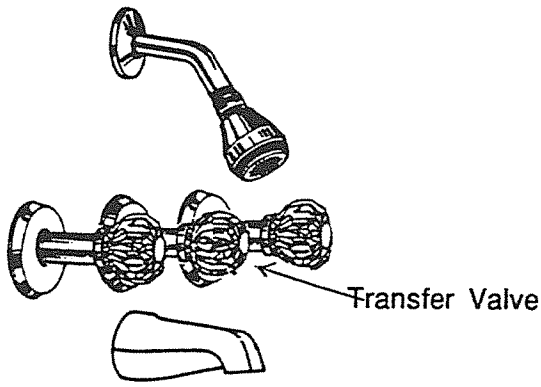
The size dimensions for the tub and wall surround shown here are very close to a standard tub.



Standard length: 5 feet

How long are most tub and wall surround units?

Tub and wall units use the same type of supply fittings as those found on bathtubs. A three valve fitting is illustrated below.



The middle valve is the transfer valve, which is called the diverter. This extra valve is necessary to transfer (or divert) the water flow either to the showerhead or to the tub spout.

Transfers the water flow to either the showerhead or tub spout

What is the purpose of a transfer valve?

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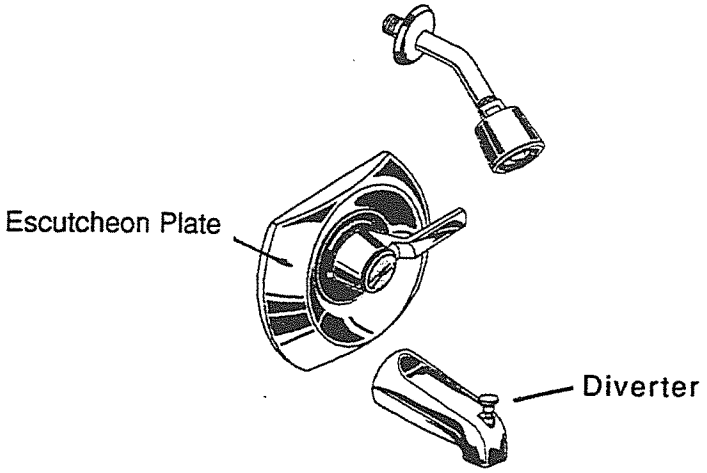
Two-valve and single-control fittings also have a diverter to transfer the waterflow from the tub spout to the shower head. The diverter may be located on a escutcheon plate, or may be a small lever on the tub filler.



On the escutcheon, or tub filler

Where is the diverter located on two-valve or or single control valves?

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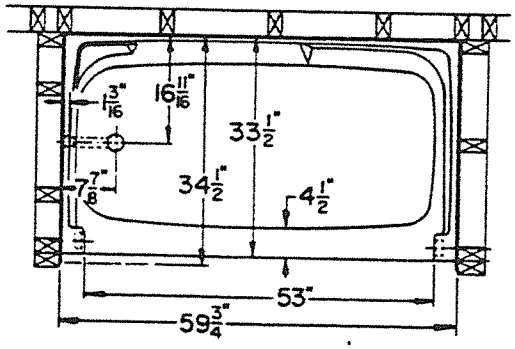
Most tub and shower units only have mounting holes for the waste and overflow fittings, just like tubs. The supply fitting mounting holes are made at installation.

The location of the drain is indicated by the distance from the drain centerline to the supply fitting or end wall, and from the centerline of the drain to the back wall.



7 7/8" and 16 11/16"

What are the two dimensions which indicate the location of the drain outlet specified in the rough-in shown above?

Bath-Shower Combinations — Review

DIRECTIONS: Write the answer to each of the following questions in the space provided.

1. How can an existing recess bathtub be converted into a bath-shower combination?

2. Which type of tub and wall surrounds is used most often for new construction installations?

3. Why do multi-piece tub and wall surrounds require more maintenance for the owner?

4. What material is most often used in manufacturing tub and wall surrounds?

5. Why do tub and wall surrounds come with either right or left outlet locations?

6. What is the purpose of the transfer valve?

Compare your responses with the answers given on page 65.

REVIEW ANSWERS

Overview of Bathing Fixtures, page 20

1.	Bathtubs, showers, and bathtubs with wall surrounds	*See Frame 2*
2.	Fiberglass reinforced plastic and acrylics	*See Frame 12*
3.	Water supply, DWV	*See Frame 6*
4.	Where two walls join	*See Frames 19 & 22*
5.	Bathtub	*See Frame 3*

Bathtubs, page 43

1.	FALSE	*See Frame 35*
2.	TRUE	*See Frame 26*
3.	FALSE	*See Frame 38*
4.	FALSE	*See Frame 47*
5.	TRUE	*See Frame 54*
6.	TRUE	*See Frame 48*
7.	FALSE	*See Frames 29-31*
8.	TRUE	*See Frame 41*

Showers, page 55

1.	Nailing flange	*See Frame 66*
2.	Thermostatic controlled valves	*See Frame 73*
3.	Corner shower	*See Frame 63*
4.	Group showers	*See Frame 69*
5.	Strainer	*See Frame 74*
6.	Recess shower	*See Frame 62*
7.	Free standing shower	*See Frame 64*
8.	Pressure balancing valves	*See Frame 73*

Bath-Shower Combinations, page 63

1. By waterproofing walls, adding a curtain and rod or enclosure, and changing the fittings *See Frame 78*

2. One-piece tub and wall surrounds *See Frame 80*

3. Because the seams require caulking to prevent water from getting behind the walls *See Frame 81*

4. Plastic *See Frame 82*

5. To match the rough-in plumbing *See Frame 84*

6. It control the water flow to either the showerhead or to the tub spout *See Frame 86*

GLOSSARY

acrylic type of plastic manufactured by the vacuum forming process

apron the finished side of a bathtub

bath to immerse oneself in a pool of water

bathing fixture fixtures which are used for washing and soaking the entire body all at once such as a bathtub, shower, or a bath-shower combination

bathing well the hollowed out portion of the bathtub where the bather sits to take a bath

chain and stopper drain fitting with a rubber stopper or plug that seals the drain opening

corner shower shower which is installed where two walls join

corner tub tub which is installed where two walls join

diverter fitting which transfers the flow of water from the tub spout to the shower head

drain opening which is used to empty the water from the tub

drain, waste, and vent system (DWV) connection of pipe, fittings, and valves used to take solid, liquid, and gas waste out of a building. Also called the sanitary system.

drum trap type of trap commonly used on bath fixtures which contains a clean out

enameled cast iron material used in manufacturing fixtures; an alloy or iron, carbon and silicon cast in a mold with a baked on porcelain finish

enameled steel material used in manufacturing fixtures made by stamping steel into the shape of the fixture and then applying a coat of fused enamel

fiberglass reinforced plastic (FRP) manufacturing process used for bathing fixtures

Floor loading weight of the water, bathtub, and occupants together expressed in pounds per square foot

FRP abbreviation for fiberglass reinforced plastic; process in which fixtures are manufactured without the use of heat

free standing shower shower which can stand alone without wall supports

group shower large shower used in non-residential applications

neo shower type of corner shower which has five sides to minimize the space needed

nailing flange 1" to 1 1/2" vertical extension of the tub rim on all un-aproned sides used to attach the tub to the wall

overflow hole in a tub which allows excess water to drain preventing spillage over the fixture rim

P-trap type of trap commonly used on bath fixtures

pan base of a shower

plunger type of drain fitting which uses a plug or plunger in the tee to open or close the drain *(also called a trip lever)*

pop-up drain fitting with a lever at the overflow that controls a metal stopper which opens or closes the tub drain

pressure balancing valves valves which adjust the mix of hot and cold water in response to changes in relative supply inlet pressure

recess shower shower installed into the indentation in the bathroom

recess tub bathtub having one apron made to fit an indentation in the bathroom

rough-in dimensions of pipe concealed behind walls or under floors

roughing-in stage laying the supply and DWV pipe

safety stops feature on bath or shower valves that reduces the risk of accidental scalding

shower enclosure in which you stand to wash your body using a spray of water

shower cove (or stall) shower generally made of a single piece of plastic

sunken tub tub installed either in the floor or on a raised platform

thermostatic controlled valves valves which provide control of the temperature of water

transfer valve valve which transfers the water flow either to the showerhead or to the tub spout

trip lever drain fitting that uses a plug or plunger in the tee to open or close the drain. *(also called a plunger)*

tub filler supply fittings for a tub which consist of valve control handles and a spout

tub with wall surrounds combination bathtub and shower

vacuum forming acrylic fixture manufacturing process where by a vacuum in the female part of the mold pulls the material into the desired form

wall surrounds prefabricated walls made from plastic installed around a tub

water supply system system of pipe which brings clean water into a fixture

wood supports supports nailed to wall studs where a tub will be placed