

**Disclaimer**

This sheet is intended for designers, specifiers and other members of construction project teams wishing to reuse this building material or product. It is part of a collection of sheets aimed at bringing together the available information to date that is likely to facilitate the reuse of building materials and products.

This sheet has been produced by Rotor vzw/asbl within the framework of the Interreg FCRBE project - Facilitating the Circulation of Reclaimed Building Elements, supported by the entire project partnership. Sources of information include the experience of reclamation dealers and involved project partners, lessons learned from exemplary projects, available technical documentation, etc.

The sheets have been produced between 2019 and 2021. As the reclamation sector is evolving, some information, notably regarding pricing and availability, may change over the time. When the text refers to European standards, it is up to the project team to refer, if necessary, to their national implementations and local specificities.

It is important to note that the information presented here is not exhaustive or intended to replace the expertise of professionals. Specific questions are always project related and should be treated as such.

The complete collection of sheets (including the introductory sheet) is freely available from different reference websites (a.o. opalis.eu, nweurope.eu/fcrbe, futureuse.co.uk).

Non-exhaustive directories of dealers in reclaimed building materials are available on www.opalis.eu and www.salvoweb.com.

Interreg FCRBE partnership: Bellastock (FR), the Belgian Building Research Institute / BBRI (BE), Brussels Environment (BE), the Scientific and Technical Center of Building / CSTB (FR), Confederation of Construction (BE), Rotor (BE), Salvo (UK) and University of Brighton (UK).

The information contained in this document does not necessarily reflect the position of all the FCRBE project partners nor that of the funding authorities.

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Product description

Urinals are frequently found in sanitary facilities in public buildings (more rarely in homes). Compared to traditional toilet cubicles, they allow space saving and faster use, as well as some water saving. The most common models are enamelled sanitary ceramics, vitrified porcelain, stainless steel or synthetic materials.

Urinals come in many shapes and models. This sheet focuses mainly on suspended urinals of relatively recent origin (from the middle of the 20th century). It does not explicitly address older types of urinals, such as older urinal stalls, also available in the antique materials market. The sheet also does not cover very recent models of urinals, such as urinals without water or with a cartridge system, which, to our knowledge, are still infrequent on the reclamation market.

We can categorise the types of urinals covered by this sheet according to their rinsing methods:

- **Vacuum-flush urinals.** The bowl is surrounded by a rim which ensures complete rinsing. A specific siphon ensures drainage. These models generally have a higher water consumption (0.5 l/s) and pipes with a larger diameter.
- **Flushing urinals.** The bowl is partially rinsed using a diffuser specific to each model. The drain is equipped with a classic siphon. The water consumption is generally lower (0.15 l/s) and the supply and discharge pipes are of a narrower diameter.

In addition to the toilet bowl, the proper functioning of a urinal also depends on all its accessories: the water supply (direct flow or with a tank), the supply device (visible, integrated or recessed, mechanical or automatic, synchronised or not with other urinals, etc.), the outlet grid or plug (independent or not of the bowl), the siphon (visible or built-in) or the supply and drainage piping. Depending on their condition, these parts can be reused (possibly after cleaning or repair). If necessary, they can be replaced.

Deposits of material and the visibly worn character of a urinal also have an influence on the appreciation by future users. Fortunately, cleaning procedures often make it possible to give this equipment a second life.

More broadly, urinals have great advantages when reused. The maintenance possibilities and the durability of ceramic elements explain their stable presence on the reclamation market. In addition, the installation of urinals is governed by national and European standards relating, among other things, to the dimensions of the water connection and drainage, water consumption and installation procedures. However, these have changed little over the past 20 years. Therefore, it can be assumed that urinal systems installed less than 20 years ago will broadly meet current requirements. Older equipment can also meet them. In all cases, it is necessary to ensure this and, if necessary, to provide for the necessary adaptations.

The evolution of uses could however impact the demand for this equipment in the near future since increasingly more public buildings are now opting for gender-neutral toilets.



Suspended urinal with siphon-action, with rim, visible top feed and integrated waste.



Vacuum-flush suspended urinal without rim.



Suspended flushing urinal, diffuser and metal plug, visible supply and outlet. © backacia.com



Urinal stall



Collective installations can be supplemented with urinal separators, which are also suitable for reuse.



Product reclamation

Generally easy to dismantle, urinals are good candidates for reclamation, either on site or through professional channels of product resellers.

The potential for reuse depends mainly on the model, the quantities and the general condition of the lot. Sanitaryware coming from public facilities (school, offices, etc.) can prove to be interesting since they offer the possibility of constituting large batches of identical equipment.

→ **Potential assessment.** An "expert eye" generally makes it possible to estimate the potential for reclamation during an on-site visit or based on photos and technical information relating to the model, manufacturer, quantities, dimensions, etc. The focal points are among others:

- general condition: are the devices damaged (hairline fractures, fissures, cracks, scratches, etc.)? *A cracked device must not be reused.* Is the equipment clogged (limescale, mould)?
- condition of the accessories: does the rinsing device work? Is it cleanable or replaceable? What condition are the gaskets, siphon, etc. in?
- commercial interest, depending on the brand, model, quantity or even resale potential.
- logistical arrangements, in particular deadlines, handling and organisation of transport.

→ **Removal.** Careful disassembly should be aimed at ensuring the integrity of the fixture, equipment and accessories being considered for reclamation. If the fixture is still supplied with water, it is advisable to carry out a pre-cleaning. The water supply should then be shut off before disassembly. Some rinsing devices can be electrically powered (most often by cells or batteries, and sometimes directly through the mains). It is necessary to ensure that they are de-energized before dismantling.

The bowls are separated from the fixing supports and from the supply and drainage devices. There may be a sealant or a layer of sound insulation between the equipment and its support. Built-in flushing devices may prove more complicated when disassembling than exposed models.

If they are recovered, the functional accessories (rinsing and emptying device, support frames, etc.) must be correctly dismantled and listed. The lids can be held in place and secured with adhesive tape to prevent them from moving during transport. It is advisable to document the principle of fixing specific elements in order to facilitate their subsequent installation. Once dismantled, the urinals will be properly emptied, sorted by quality, colour and size and packaged in such a way as to avoid knocks and breakage.

Newer siphons (plastic or alloy) could theoretically be reclaimed after thorough cleaning. Alternatively, they can be replaced with compatible parts.

→ **Storage.** It is advisable to arrange the urinals so that their installation face rests on a flexible support, to avoid spillover from the pallets, and to provide dividers, strapping and possibly a wrapping film. Once cleaned and ready to be put back into operation, the elements should preferably be stored away from water and dust.

Technical surveys

If no technical documentation is available for the equipment, it may be useful to note certain indications before or during removal in order to facilitate re-installation: diameter of the supply and drainage pipes, flow rate and flush volume (sometimes noted on the equipment), reference numbers, etc.



Potential assessment.



Removal of urinals



Storage of urinals



→ *Treatments, maintenance and cleaning.* Recent reclaimed urinals are generally sold without any treatment other than superficial cleaning with soapy water or even bleach (prohibited on stainless steel urinals). A descaler or vinegar is sometimes used to remove the most visible scale.

→ Some professionals offer deep cleaning and disinfection of ceramic equipment in order to remove tough deposits (limescale, mortar, paint, putty, etc.). After removing the metal and synthetic accessories, the devices are soaked in a specific acid solution before being pressure washed and then rinsed. Because of its additional cost, this process is especially interesting for mid-range and high-end urinals.

→ If superficial knocks affect the enamel layer, it is possible to carry out spot repairs using a specific product. These repairs will however remain visible. Ready-to-use kits are readily available on the market.

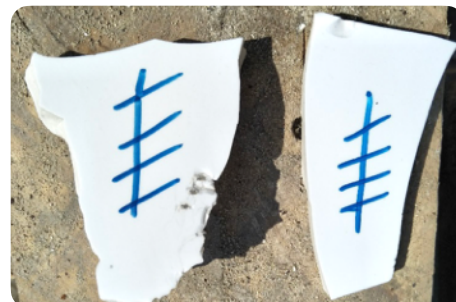
→ In all cases, it is advisable not to use abrasive products or metal objects to remove dirt, as this risks damaging the surface layer.

→ *Transport and delivery.* Necessary precautions must be taken during transport and delivery in order to limit knocks and scratches (dividers, corner protectors, strapping of pallets, etc.).

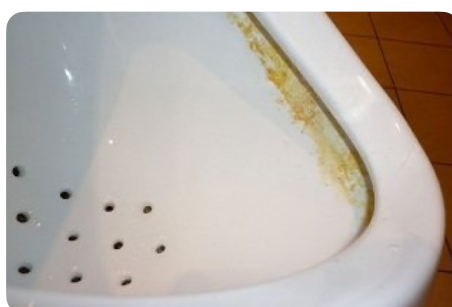
It is advisable to involve specialised professionals to ensure the smooth running of these operations.

Checking the condition of the glaze

It is possible to test the condition of the glaze layer using an alcohol marker: if it is easily erased, the glaze is still in good condition, otherwise the glaze has probably become "porous".



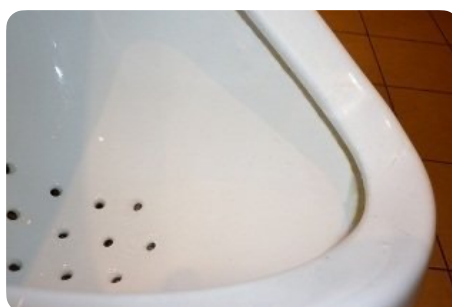
"Porous" glaze vs glaze in good condition



Traces of scale on the rim, before cleaning



Dirty drainage device



Traces of scale on the rim, after cleaning



Partially cleaned drainage device



Applications and installation

In principle, the re-use of reclaimed urinals does not differ in any way from that of new urinals. It must meet the same requirements of use, in particular - depending on the case - with regard to the properties and condition of the support (floor or wall), the installation height, the installation and grouting products and techniques, connections and plumbing, flushing volume, flushing trigger system, waterproofing, taps, wastewater disposal, accessibility for people with reduced mobility or children, the frequency of use, water consumption, specific maintenance measures, safety against vandalism, sound insulation, etc. In all cases, reference should be made to the European and national standards relating to the product (in particular EN 13407), to the rules of practice in force and to the installation standards.

To facilitate the integration of reclaimed elements, the specifier takes care to formulate his expectations with regard to the following characteristics.

→ *Types and dimensions* of equipment. For example, flushing device (visible, integrated or recessed), with or without rim, etc. Leaving some latitude on the dimensions generally makes it easier to find a batch on the reclaimed market.

→ *Condition and degree of wear accepted*. It is important that urinals do not have any major cracks or breaks that could damage their seal. Depending on the case, however, it is possible to accept traces of surface wear, light traces of limescale or minor stains.

→ *Flushing volume*. Some contexts require specific performance in this regard. It will be necessary to verify that the flushing volumes of the urinals are reasonable and comply with the environmental standards in force. The current standard is to provide a maximum flushing volume of 5 litres of water per use. In fact, this quantity varies significantly from one system to another and some low-flow urinals allow only one litre of water to be used per flush. The rinsing volume must ensure good cleaning while preventing clogging of the sewer system (see specific standards). In some cases, it is possible to replace the flushing mechanism of older equipment which no longer meets these requirements. It is however a question of ensuring the feasibility and the appropriateness of such an op-

eration - in particular by taking into account the diameter and the slope of the downstream pipes. Where applicable, this involves precisely describing the expected operations in the specifications.

→ *Accessories*. Clearly specify in the specifications all the elements which, if applicable, must be provided by the company to replace or adapt existing toilet systems. Among the parts likely to be delivered as new, there are: support frame, control fittings, flushing mechanism, connection sleeve, air barrier or siphon, push button, seals, lid, etc. For each accessory, compatibility with the existing system must be ensured. This step is facilitated when the technical documentation is available. Certain accessories are sometimes available from professional reclamation dealers. For the most recent models, professional plumbing suppliers are usually able to offer compatible accessories.

Most of the reclaimed building products are sold as is. The conditions of sale may however contain specific guarantees specific to the product. Some suppliers are able to indicate the origin of the product and/or provide documentation on the purchased product (*for more information, see the Introduction Sheet*). When the equipment is recent enough, it is usually possible to find the manufacturer's technical documentation using the make and model number.

Design tip!

To increase the chances of meeting the offer available on the reclamation market, the specifier can choose to accept several different lots and distribute them in an organised manner throughout the building. For example, provide a homogeneous batch per sanitary fixture block.



Crackling or crazing is the phenomenon responsible for the appearance of a set of hairline cracks in the glaze. These can lead to the penetration of liquids inside the fissure, causing the appearance of lasting stains and causing the development of pathogens. It is therefore advisable to discard equipment with this defect.



Chiro Itterbeek (BE) © Rotor



Characteristics and fitness for use

A large number of harmonised European standards and national standards establish performance requirements relating to the various constituent parts of urinal systems (toilet bowl, flushing valves, emptying devices, support frame, etc.). Here we focus on **recent (~ 20 years) suspended urinals**, drawing on the characteristics established by the harmonised European standard EN 13407 (*Wall urinals in glazed sanitary ceramic or stainless steel*). Although itemised for new products, its content may prove useful in considering the reclamation of urinal systems.

Characteristics	Comments
Dimensional characteristics	In the case of recent equipment (~ 20 years), it can be assumed that, in most cases, the connection dimensions comply with standard EN 80 (<i>Wall urinals - Connection dimensions</i>).
Flushing characteristic - Headroom	<p>Urinals are generally defined according to their operating mode (siphon action or flushing, with or without a rim, with or without a specific siphon). Reference should be made to the original technical documents or to the technical information noted during removal in order to ensure the compatibility of all the components.</p> <p><i>Example 1:</i> depending on the model, flushing urinals generally require a flushing volume of between 0.5 and 5 L for a flow rate of ≤ 0.2 l/s. The inlet and outlet pipes can be smaller in diameter - but must take into account the risk of scaling. For increased efficiency and a similar flushing volume, siphon urinals require a flow rate of approximately 0.5 l/s and larger diameter pipes.</p> <p><i>Example 2:</i> the water seal is a hydraulic plug which remains in the siphon after rinsing in order to prevent the rise of odours from the pipes. The height of the water seal must not be less than 50 mm for siphon urinals and 75 mm for flushing urinals. If necessary, the siphon can be replaced.</p> <p>In all cases, wall-mounted urinals must operate with flushing and draining devices similar to those specified by the manufacturer. Most professional sanitaryware dealers are able to verify the suitability of equipment.</p>
Flushing characteristic - Bowl flushing	<p>Flushing should be effective on the interior walls of the urinal bowl. A visual inspection under installation conditions makes it possible to assess this performance (using fine sawdust for example). Note that flushing urinals generally flush over just a part of the surface (depending on the orientation and the level of fouling of the diffuser) while urinals with siphon action with rim must normally ensure the bowl is completely flushed (higher water consumption).</p> <p>Flushing must not cause any splashing to the outside of the bowl. It must allow the evacuation of residues (smaller in diameter than the drain holes) without overflowing out of the bowl. The good quality of the flushing can be ensured by testing with small plastic beads or coloured liquids in a working bowl.</p> <p>Furthermore, it can be assumed that if the flushing of the bowl of a reclaimed urinal was not satisfactory during its period of use, the bowl would show visible signs of wear. A visual inspection then makes it possible to judge this performance.</p>
Water absorption	<p>Reclaimed sanitary ceramic urinals must not absorb water. The presence of cracks, chips, sharp internal angles or signs of crazing in areas of the glaze that are in contact with water, negatively influence this performance.</p> <p>This characteristic can be assessed by visual inspection of the functional surfaces of the bowls, using an appropriate light source. Some imperfections can be repaired. Water absorption can also be determined by the test method described in EN 13407+A1 for glazed ceramic urinals.</p> <p>Experience shows that stainless steel urinals meet these requirements.</p>
Chemical resistance	The surface of urinals must be resistant to common chemicals and cleaning products. Experience shows that bowls made of sanitary ceramic and stainless steel meet this requirement. Note that bleach (and chlorine products in general) is not recommended for cleaning stainless steel equipment.



Characteristics	Comments
Load resistance	This characteristic determines the solidity of suspended urinals during use. This installation condition can be tested by fitting the urinal to a smooth vertical surface and applying a static load to it (for example: 100 kg load in the middle of the rim for 1 hour). The urinal should not crack, come loose from the wall or show any permanent deformation. Note that this performance is dependent on the properties of the support and the fasteners used.
Reliability of the flushing device (tap)	Particular specifications are applicable to the flush valve (inlet pressure, hydraulic characteristics, watertightness, inlet flow, materials, operating endurance, electrical and acoustic characteristics, etc.). These parameters can be difficult to check on reclaimed equipment. The main consequences of a valve failure are wasted water (flush that flows or is triggered unexpectedly) and poor flushing efficiency (flow or volume too low). These failures can, depending on the case, be partially assessed on the equipment in operation (before removal, for example). If necessary, the taps can be replaced.
Hazardous substances	The equipment must be free from hazardous substances. To our knowledge, no hazardous material is likely to be present in reclaimed urinal equipment, except in the cells and batteries of automatic flushing devices.

Availability

Urinals are a very common product in the reclamation market. However, availability depends on the quantities required. As an example:

Frequent	Batch of 1 piece
Occasional	Batch of 2 to 20 identical pieces
Rare	Batch of > 20 identical pieces

Indicative prices (Excl. tax)

Random sampling of the reclamation market in Western Europe (Belgium, France, Great Britain and the Netherlands) made it possible to extract some indicative prices. These vary depending on the models, materials and original manufacturer. Some prices:

- Supply: 15 to 150 € /item
- Urinal separator: 40 to 150 € /item
- Removal cost: around 35 to 50 € /item
- Specific cleaning service: 10 to 20 € /item

However, the replacement of missing or defective parts should also be budgeted for.

Even taking into account these operations specific to reclamation logic, urinal equipment is generally competitive with new products, in particular for mid-range and high-end models.

Find specialised businesses



salvoweb.com

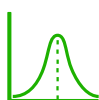
opalis.eu

Embodied carbon (Cradle to gate - production A1-A3)

	kg CO ₂ eq./PU
INIES database (FR) – Generic data *	50,1
Geberit - Individual declaration **	42,6

*Indicative value for PU (Product Unit) = standard range ceramic urinal (vitreous porcelain) with a reference lifespan of 20 years. Push button, drain, siphon and gaskets included.

** Indicative value for PU (Product Unit) = standard range ceramic urinal (vitreous porcelain) with a reference lifespan of 20- 25 years. Push button, drain, siphon and seals excluded.



According to the sources, reusing a standard range suspended urinal prevents the equivalent production of ~ 42,6 to ~ 50,1 kg of CO₂ related to the manufacture of new equipment (production phase only). By way of comparison, this corresponds to the emissions caused by a small diesel car during a trip of ~ 250 to ~ 300 km.