

Appendix 1

Technology review of urine diversion components

Worldwide listing of suppliers for waterless urinals

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Important note:

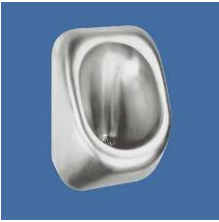
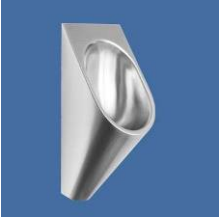



The tables of suppliers for waterless urinals provided here are *not complete listings* but give only an indication of available products. If you spot errors or omissions, please contact us at ecosan@giz.de. All information is provided to the best of our knowledge. In the brackets below each listing the date for provision of the information/last update of information is given. Please be aware that not all information is from 2011. An entry in this list does not imply a recommendation by GIZ. Costs are indicative only.

Additional photos are available in our photo collection on the internet (look for the sets on waterless urinals, or use keywords urinal, "waterless urinal"):
<http://www.flickr.com/photos/gtzecosan/collections>

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Table 1. Suppliers of waterless urinals with flat rubber tube or silicon curtain (ESS) for odour control.




Manufacturer	Waterless urinal model name and photo ¹	Materials, indicative costs ² and other information
<p>Austria: Franke Washroom Systems Franke Ges.mbH.</p> <p>Contact: Christian Marte christian.marte@franke.com E: franke.ws@franke.com I: www.franke-ws.com</p> <p>(updated in 2009)</p>	<p>Franke model "Campus" CMPX532WF (model 1)</p>  <p>CMPX538WF (model 2)</p> 	<p>Information for both model types:</p> <ul style="list-style-type: none"> • Material: High-grade stainless steel 18/10, surface satin finished • With flat rubber tube ("membrane stench barrier") with a sieve above • Indicative cost (reference cost for Germany): model 1 (being sold since 2002): EUR 851, model 2 (being sold since 2007): EUR 573 • Units sold: numbers not disclosed by supplier • Worldwide via agents and distributors
<p>Germany: Berger-Biotechnik GmbH Contact: Wolfgang Berger Hamburg, E: info@berger-biotechnik.de I: www.berger-biotechnik.de</p> <p>(updated in 2011)</p>	<p>Urinus dry urinal</p> 	<ul style="list-style-type: none"> • Material: (awaiting information) • Indicative cost: EUR: 160 (with smell stop, details missing) and EUR 100 (without smell stop) • Units sold: 20 (sales just started) • Countries sold: (awaiting information)
<p>Germany: Keramag</p> <p>Contact: Ronald Herkt Tel: +49- 3491-886052 E: info@keramag.de Ronald.Herkt@Keramag.de I: www.pro.keramag.com www.keramag.de www.varicor.de</p> <p>(updated in 2011)</p>	<p>Centaurus</p> 	<ul style="list-style-type: none"> • Material: Ceramics • Indicative cost: EUR 610 per urinal; EUR 19 per flat rubber tube (for replacement) • Units sold: 40,000 until end of 2010 • Countries sold in: mainly Central Europe (Germany, Austria, Benelux, France); also some business in Asia and Ghana (pilot project at Valley View university in Accra funded by Germany's federal ministry BMBF)
<p>(as above)</p> <p>(updated in 2011)</p>	<p>Urinal Renova Nr. 1 plan</p> 	<ul style="list-style-type: none"> • Material: Ceramics • Indicative cost: EUR 470 per urinal, EUR 19 per flat rubber tube (for replacement) • Units sold: 2,000 until end of 2010 • Countries sold: mainly in Central Europe (as above)

¹ More photos are available in the GIZ-ecosan photo collection, see beginning of document for website link.

² Costs are without freight, for single units bought by individuals. Costs tend to be lower when higher number of units are ordered, and are also lower for traders compared to individuals placing orders.

Manufacturer	Waterless urinal model name and photo ¹	Materials, indicative costs ² and other information
<p>Mexico: Anfora</p> <p>Contact: Hans Kritzler E: cs0@anfora.com I: www.anfora.com</p> <p>(updated in 2011)</p>	<p>U2 Model</p> 	<ul style="list-style-type: none"> • Material: vitrified China in high quality ceramics • Unit costs: EUR 100-120 per waterfree urinal • Water free urinals do not include initial supplies (catridge or membrane) • Units sold: more than 200,000 since 1998 • Yearly output of sanitaryware factory is 400,000 pieces, with over 40,000 waterfree urinals and 20,000 dry latrines • Countries sold: USA, Canada, Mexico, Guatemala, El Salvador, Philippines • Factory does OEM outsourcing for Falcon waterfree, American standard, Sloan and Urimex.
<p>(as above)</p> <p>(updated in 2011)</p>	<p>Rienzi</p> 	<ul style="list-style-type: none"> • Material: high-temperature porcelain • Unit cost: EUR 30 per urinal • Units sold: 300,000 • Countries sold: Mexico, Canada, USA, Latin America
<p>(as above)</p> <p>(updated in 2011)</p>	<p>Sinaqua</p> 	<ul style="list-style-type: none"> • Material: high-temperature porcelain • Unit cost: EUR 90 per urinal • Units sold: 100,000 • Countries sold: Mexico, Canada, USA, Latin America
<p>Mexico: Industrias Makech S.A. Palenque 11, Col. Nalvarte, C.P. 03020, México, D.F. Tel: 54 40 42 78, 54 40 42 79, 54 40 43 19 E: gosamgo@yahoo.com.mx mexisan@gmail.com I: www.industriasmakech.com.mx</p> <p>(updated in 2011)</p>	<p>CL-3003</p> 	<ul style="list-style-type: none"> • Material: white ceramic • Odour stop system (OST) which does not use any liquid (details need to be clarified) • Unit cost: • Units sold: • Countries sold: Mexico
<p>Peru: Aguaecosan</p> <p>Contact: Juan Carlos Calisaya Tel: +51-990-320877 E: jcalizaya@aguaecosan.peru.com I: www.aguaecosanperu.com</p> <p>(updated in 2011)</p>		<ul style="list-style-type: none"> • Material: fiberglass. • Includes a sink with 2" drain • Includes a smell stop? • Indicative cost: EUR 19 (tax not included) • Unit sold: 732 • Countries sold: Peru

Manufacturer	Waterless urinal model name and photo ¹	Materials, indicative costs ² and other information
<p>Peru: Rotaria del Peru Contact: Ruth Mantila E: adm@rotaria.net or Heike Hoffman E: heike@rotaria.net I: www.rotaria.net</p> <p>(updated in 2011)</p>	<p>Rotaria- EcoUrinario</p> 	<ul style="list-style-type: none"> • Material: glass fibre (without smell stop) • Indicative costs: EUR 18 (depends on model and colour, without shipping) • without odour control (for domestic use only) • Number sold: 400 • Countries sold: Peru
<p>South Africa: Addicom (Pty) Ltd Contact: Peter Dahm E: sales@addicom.net I: www.addicom.co.za</p> <p>(updated in 2009)</p>	<p>SVR-M urinal (with Eco-Smellstop (ESS) for odour control)</p> 	<ul style="list-style-type: none"> • Material: Low density polyethylene urinal bowl (the bowl could easily be made locally in any developing country and in various materials) • Indicative cost: EUR 41 (for one urinal with ESS); cost of ESS itself: EUR 15 (to be added to urinal bowl above) – cannot easily be made locally but is small and light and can easily be imported • Units sold: 32,000 (until March 2009) ESS urinals sold by Addicom, Keller Invent & F Ernst) - Urinals sold since 2006 in South Africa alone: 3000 • Units of “stand-alone” ESS units sold: ~ 90,000 as they are being used to convert the 100,000 F Ernst AG waterless urinals on an ongoing basis. • Countries/regions sold in: Europe, Africa, Mexico and environs, Israel, India
<p>Switzerland: F. Ernst Ingenieur AG (company not existant anymore) Products are available via: Kemmler Baustoffe GmbH Contact: Andreas Mock System ERNST Deutschland Benzstrasse 19 D-70736 Fellbach, Germany Tel: 0711/51799801 Mob: 0171/6930211 E: mock@systems-ernst.me info@system.ernst.de I: www.system-ernst.de</p> <p>(updated in 2009; partially of 2011)</p>	<p>models 5000, 7000, 8000 (with EcoSmellstop (ESS) odour control since 2006)</p>  <p>Model 5000</p>	<ul style="list-style-type: none"> • Material: Mainly ceramics but also glass fibre • Pre-2006: with liquid sealant (approx. 100,000 units sold) • Since end 2006: with silicon curtain ESS system (converting to ESS presently at a rate of around 200 urinals per week) • Indicative cost: EUR 290 to 430 per urinal (dependent on number ordered) • Units sold: Number not disclosed by supplier • Countries sold in: worldwide
<p>Switzerland: Laufen Bathrooms AG Wahlenstrasse 46 CH-4242 Laufen Tel.: +41 61 765 72 53 Fax: +41 61 761 36 60 E: feedback@laufen.ch I: www.laufen.com</p> <p>(updated in 2009)</p>		<ul style="list-style-type: none"> • Lema with waterless urinal and without odour • The system includes siphon with a chemical sealing liquid • Siphon has a constructive evaporation protection





Manufacturer	Waterless urinal model name and photo ¹	Materials, indicative costs ² and other information
		
<p>Switzerland: Urimat Schweiz AG Contact: Marcel Näpflin E: info@urimat.com marcel.naepflin@urimat.com I: www.urimat.com</p> <p>(updated in 2011)</p>	<p>Urimat ceramic</p> 	<ul style="list-style-type: none"> • Material: ceramic/ vitreous China • Weight: 14-21 kg • Unit cost: from EUR 400 • Units sold: not disclosed by supplier • Countries sold: more than 40 countries (Europe, Asia, Australia, Africa, North America, South America) • It uses MB active trap which collects the urine and channels it into the waste pipe without flushing while at the same time sealing in any odour (check for details).
<p>(as above)</p> <p>(updated in 2011)</p>	<p>Urimat ceramic compact</p> 	<ul style="list-style-type: none"> • Material: ceramic/ vitreous China • Weight: 14-21 kg • Unit cost: from EUR 400 • Units sold: not disclosed by supplier • Countries sold: more than 40 countries (Europe, Asia, Australia, Africa, North America, South America) • It uses MB active trap which collects the urine and channels it into the waste pipe without flushing while at the same time sealing in any odour (check for details).

Additional notes:

Waterless urinals in China:

2 companies found so far with English website: <http://www.sunming-jj.com> and http://www.zcsm.net/En_textingNewsInfo.asp?id=22

Table 2. Suppliers of waterless urinals with sealant liquid (blocking fluid) for odour control.

Manufacturer	Waterless urinal model name and photo ³	Materials, indicative costs ⁴ and other information
<p>Austria: Hellbrok GmbH</p> <p>Contact:</p> <p>Lukas Hell</p> <p>Tel: +43 523465859</p> <p>Fax +43-523465859-80</p> <p>E: office@hellbrok.com</p> <p>I: www.hellbrok.com</p> <p>www.urinale.at</p>	<p>MINIMAX</p> 	<ul style="list-style-type: none"> • Material: fibre reinforced synthetics • Unit cost: EUR 350 per urinal (and EUR 33 per replacement trap) • Countries sold in: Austria, Germany, Netherlands, Belgium, France, Spain, Turkey, Switzerland, Hungary, Slovenien, United Kingdom, Ireland, Italy, Australia, Romania, Bosnia, Kosovo, Serbia, India.
<p>(updated in 2011)</p> <p>(as above)</p> <p>(updated in 2011)</p>	<p>ULTRAPLUS</p> 	<ul style="list-style-type: none"> • Material: made of mineral casting (inner basin) and fiber glass reinforced plastic (hand lay-up laminate) • Indicative unit cost: EUR 399 per urinal (and EUR 33 per replacement trap) • The system includes cartridge which combines a reliable liquid siphon with state of the art membrane technology • Countries sold in: as above
<p>(as above)</p> <p>(updated in 2011)</p>	<p>CERATUR</p> 	<ul style="list-style-type: none"> • Material: sanitary ware, (mainly white colour) • Indicative cost: EUR 299 (models are delivered with cartridge HBI, installation frame and manual EUR 33) cartridge removal tool EUR 2,50 • The system includes cartridge which combines a reliable liquid siphon with state of the art membrane technology • Countries sold: as above
<p>Denmark: Uridan</p> <p>Contact:</p> <p>Karsten Leimstoll</p> <p>Uridan, Germany</p> <p>E: uridan@uridan.com</p> <p>leimstoll@uridan.de</p> <p>I: http://www.uridan.com</p> <p>(updated in 2009)</p>	<p>KH-6-W</p> 	<ul style="list-style-type: none"> • Material: GFK (glassfibre reinforced plastic) or ceramic • Sealant liquid: 0.3 L per urinal; has to be exchanged after approx. 15,000 uses (typically after one year). Cost: EUR 20 per 0.3 L. • Unit cost: EUR 600 • Units sold: In Germany alone during 2004-2009 approx. 6,000 pieces in particular at schools, public buildings, restaurants (figures from head office in Denmark were not disclosed) • Countries sold in: worldwide (currently especially in Australia)

³ More photos are available in the GIZ-ecosan photo collection, see beginning of document for website link.

⁴ Costs are without freight, for single units bought by individuals. Costs tend to be lower when higher number of units are ordered, and are also lower for traders compared to individuals placing orders.

Manufacturer	Waterless urinal model name and photo ³	Materials, indicative costs ⁴ and other information
<p>Switzerland: Laufen Bathrooms AG Wahlenstrasse 46 CH-4242 Laufen Tel.: +41 61 765 72 53 Fax: +41 61 761 36 60 E: feedback@laufen.ch I: www.laufen.com</p> <p>(updated in 2009)</p>		<ul style="list-style-type: none"> • Lema with waterless urinal and without odour • The system includes siphon with a chemical sealing liquid • Siphon has a constructive evaporation protection
<p>USA: Falcon Waterfree Technologies Contact: Randall Goble E: info@falconwaterfree.com rgoble@falconwaterfree.com I: http://www.falconwaterfree.com/</p> <p>(updated in 2009)</p>	<p>Lava</p> 	<ul style="list-style-type: none"> • Material: vitreous china or stainless steel. • Indicative cost: EUR 430-655 per urinal, includes installation and initial supplies (30% discount without installation). • Replacement cartridges are EUR 30 each and good for an average of 7,000 uses. • Units sold: More than 150,000 since 2000. • Countries sold in: 35 countries in Europe (UK, France, Italy, Spain, Portugal, Germany, Czech Republic, Slovakia, Serbia, Croatia, Bulgaria, Romania, Denmark, Sweden, Norway, Cyprus, Greece, Latvia, Slovenia, Poland and Turkey), Asia, Australia, South Pacific, Africa/Middle East South Africa and the Americas.
<p>USA: Waterless Co. Contact: Klaus Reichardt E: sales@waterless.com I: www.waterless.com</p> <p>Further contact: In Germany: Waterless GmbH Contact in Europe: E: info@noflush.eu I: www.noflush.de</p> <p>(updated in 2011)</p>	<p>Waterless No-Flush™ Standard</p> 	<ul style="list-style-type: none"> • Material: ceramic and high performance composites (fiberglass) • Unit cost: urinals range from EUR 146 – 364 (10 different models) • EcoTrap insert costs EUR 6.75 and lasts about 8,000 to 10,000 uses. • Units sold: approx. 100,000 (during 1991 to current) • Countries sold in: USA, Germany, Ireland, UK, Canada, Mexico, Japan, Malaysia, Singapore, Australia, New Zealand, France, South Africa, Guatemala, Costa Rica, Brazil, Colombia, Jamaica, Virgin islands, Puerto Rico, Spain, Dubai UAE. Argentina, Uruguay, El Salvador, Ecuador, Peru, Thailand
<p>(as above)</p> <p>(updated in 2011)</p>	<p>Baja 2104</p> 	<ul style="list-style-type: none"> • Material: vitreous China (wall hanged with two interior ceramic drain) • Indicative cost: EUR 140,8 • Ecotrap insert cost: EUR 6,75 (urinal uses blue seal) • Units sold: not disclosed • Countries sold: : USA, Germany, Ireland, UK, Canada, Mexico, Japan, Malaysia, Singapore, Australia, New Zealand, France, South Africa, Guatemala, Costa Rica, Brazil, Colombia, Jamaica, Virgin islands, Puerto Rico, Spain, Dubai UAE, Argentina, Uruguay, El Salvador, Ecuador, Peru, Thailand




Manufacturer	Waterless urinal model name and photo ³	Materials, indicative costs ⁴ and other information
(as above) (updated in 2011)	Anza 2005 	<ul style="list-style-type: none"> • Material: high performance composite (HPC) • Indicative cost: EUR 197,1 • Ecotrap insert cost: 6,75 (urinal uses seal) • Units sold: considered confidential • Countries sold: USA, Germany, Ireland, UK, Canada, Mexico, Japan, Malaysia, Singapore, Australia, New Zealand, France, South Africa, Guatemala, Costa Rica, Brazil, Colombia, Jamaica, Virgin islands, Puerto Rico, Spain, Dubai UAE, Argentina, Uruguay, El Salvador, Ecuador, Peru, Thailand • Urinal comes with Ecotrap inserts and is wall mounted.



Table 3. Suppliers of waterless urinals with hydrostatic float barrier.

Manufacturer	Waterless urinal model name and photo ⁵	Materials, indicative costs ⁶ and other information
<p>Switzerland: Urimat Schweiz AG Contact: Marcel Näpflin E: marcel.naepflin@urimat.com info@urimat.com I: www.urimat.com</p> <p>(updated in 2009)</p>	<p>Eco</p> 	<ul style="list-style-type: none"> • Material: polycarbonate (unbreakable) • Light weight: 4.3 kg • Unit cost: from EUR 400 per urinal, EUR 14 per replacement trap • CO₂ neutral production, fully recyclable • Units sold: numbers not disclosed by supplier • Countries sold in: more than 40 countries (Europe, Asia, Australia, Africa, North America, South America)
<p>(as above)</p> <p>(updated in 2009)</p>	<p>compactplus</p> 	<p>Same information as for model above, but:</p> <ul style="list-style-type: none"> • Integrated communication pannel without electricity (for what used?) • Light weight 3.6 kg

⁵ More photos are available in the GIZ-ecosan photo collection, see beginning of document for website link.

⁶ Costs are without freight, for single units bought by individuals. Costs tend to be lower when higher number of units are ordered, and are also lower for traders compared to individuals placing orders.

Table 4. Other basic waterless urinals.

Manufacturer	Waterless urinal model name and photo ⁷	Materials, indicative costs ⁸ and other information
<p>... self-built (updated in 2009)</p>	<p>"Eco-Lily"⁹</p> 	<ul style="list-style-type: none"> • Material: 20 L plastic jerrican (or similar container) • A table tennis ball, is placed in a plastic funnel and acts as an "odour lock" (floats up during urination) • Alternatives to the ball is to mount a hose on the funnel and let the hose extend down to almost the bottom of the container, or to initially pour a small amount of cooking oil into the container, creating a sealant layer on the urine. • EUR 3 or less
<p>South Africa: EnviroSan Sanitation Solutions Contact: Jacques Rust Marketing and Sales Manager P.O. Box 1769 New Germany, 3620 South Africa Tel: (+27) 31 700 1866 Mobile: (+27) 82 787 2112 Fax: (+27) 31 700 1867 E: jacquesru1@gmail.com info@envirosan.co.za I: www.envirosan.co.za (updated in 2011)</p>		<ul style="list-style-type: none"> • Material: plastic • Installed in the Durban type UDD toilets, of which some 1500 - 2000 are built every month. • Odor seal is simply the lid on top (and odor seal in the collection tank, in the form of the inlet pipe going down below the liquid surface (i.e. it should end close to the bottom) and/or a layer of oil on top of the urine in the collection tank) • intended just for small one toilet systems in a warm country (just one toilet and maybe one urinal but in the same room (therefore same air pressure))¹⁰. • Unit cost: EUR 7 • Units sold: approx 50,000 small men urinal

⁷ More photos are available in the GIZ-ecosan photo collection, see beginning of document for website link.

⁸ Costs are without freight, for single units bought by individuals. Costs tend to be lower when higher number of units are ordered, and are also lower for traders compared to individuals placing orders.

⁹ Name coined by NGO SUDEA in Ethiopia.

¹⁰ Source: Hakan Jönsson, SEI, 5 May 2009



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