

Welcome to Cleaning up our Waters

In today's world where we are encouraged to consider our eco-footprint, the responsible management of black water waste from leisure vessels has never been more topical. If you want to know more about how you could help the marine environment by installing a holding tank in your boat, then please read this leaflet.

'Cleaning up our Waters' has been produced with input from leading experts to guide and assist boat owners considering fitting a holding tank to their boat. It answers key questions and provides basic information about holding tank installation, operation and routine maintenance procedures, to help you gain the fullest benefit of a holding tank system. Finally it offers details on where to go for further advice and purchase.



What is a holding tank?

A holding tank - also known as a marine sanitation device or MSD, is a simple and effective method of containing black water (sewage) discharged from a vessel's on-board toilets. Holding tanks can store sewage waste for discharge overboard in non-sensitive waters or for later pump-out at shoreside facilities. When installed, used and maintained correctly, a holding tank will not interfere with your boating pleasure and goes some way to protecting our delicate marine ecosystem.

For smaller boats, where a toilet is rarely used, owners may prefer the option of purchasing a portable toilet and discharge ashore into the regular sewage system.

Why do I need to fit a holding tank?

Quite simply, holding tanks protect the marine environment by limiting the discharge into the sea of polluting 'black water'. Increasing numbers of countries are introducing legislation to limit discharge, so anyone planning to cruise away from their home waters should seriously consider fitting one. There is no doubt that in years to come there will be more restrictions, not less.

Although within the overall picture of pollution, the leisure boater is a minor contributor of the volume that enters the waters, his activities have more direct impact due to the very nature of the polluting.

For example, when leisure boaters discharge in areas close to the coast, the black water harms the marine environment - particularly in more sensitive areas where there are shellfish beds and coral reefs.

Discharging black water into marinas or areas where other boaters congregate is also harmful to people swimming nearby.





How harmful is human sewage?

Poorly or untreated sewage released into the sea introduces pathogens that damage aquatic life or transmit disease from one human to another. In areas where there is little flushing of the waters, marinas for example, the micro-organisms will have a more intense, damaging effect.

Who wants to swim in an area of sea where boat users may have directly discharged untreated sewage? Those in the water are at risk from bacteria which can enter the human body through cuts or ingestion.

In addition, sewage in seawater increases the nutrient level of the water, which in turn speeds up a process known as eutrophication – excessive growth of marine plant life. The result of eutrophication is that the volume of dissolved oxygen within the water – a vital component for the survival of aquatic invertebrates and fish – decreases.

Contamination from untreated sewage can also cause coral loss. While coral is living and able to regenerate, more serious contamination may result in reefs being unable to recuperate.

How does a holding tank work?

There will be no difference in the operation of a vessel's toilets when connected to an on-board holding tank. Black water from the toilets is stored within the holding tank until it can be discharged shoreside or at sea (strictly in accordance with local regulations).

As water and waste are flushed into the tank, air is expelled externally via a through-hull vent fitting. Holding tanks should be fitted with a monitoring system that alerts the owner of the tank's capacity and will report 'empty', 'low', 'mid' and 'full' readings. Once the tank is full, toilet operation can be automatically shut down to avoid mishaps.

The holding tank features two discharge outlets – one for connection to dockside pump-out hose and a second to discharge via seacock and through-hull fitting.



Dockside discharge

Depending on local legislation, marinas may offer permanent pumps at the dockside. Alternatively there may be portable pumps or pump-out boats that come alongside vessels to remove the holding tank contents. In established No-Discharge Zones, facilities are much more widespread with mobile pump-out boats becoming more popular.

Normally, an 80 to 100 litre holding tank (suitable for a typical weekend cruiser) will take roughly five to eight minutes to empty.



B Tank monitors

Tank monitor systems can provide 4 indicator light signals – 'empty', 'low', 'mid' and 'full'. A relay can also be fitted to shut down electric toilet operation when the tank is full.



C Discharge pump control

Permits operation of overboard discharge pump in unrestricted waters. Switch turns pump on and shuts pump off automatically when tank is empty.



D Vent filter

Vent filter media absorbs heavier-than-air gases that accumulate in holding tank and prevents them escaping via the through-hull vent fitting.



F G Vent line, sanitation hoses & fittings

An important part of the system; hoses are available in 2 grades of odour barrier capabilities.

H Dockside discharge fitting

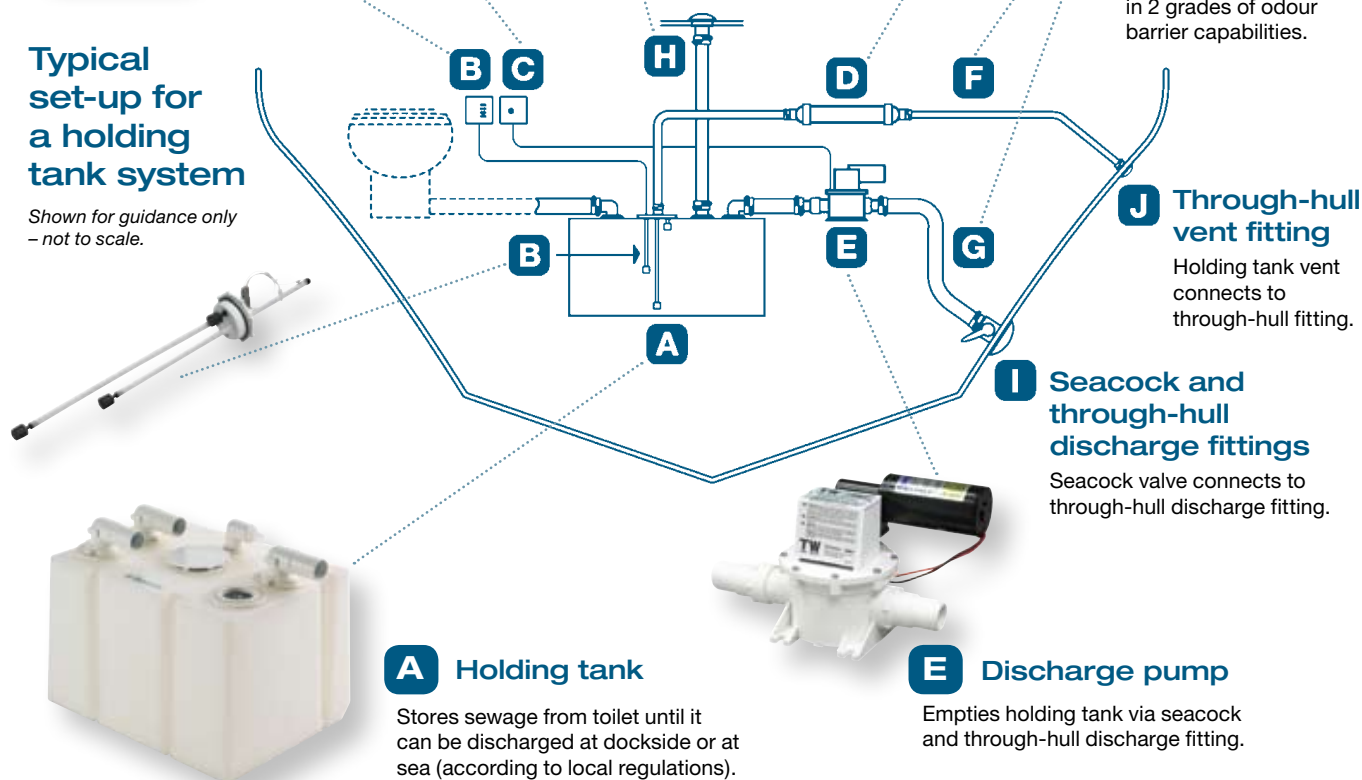
Connects to dockside pump-out hose.

J Through-hull vent fitting

Holding tank vent connects to through-hull fitting.

Typical set-up for a holding tank system

Shown for guidance only – not to scale.



A Holding tank

Stores sewage from toilet until it can be discharged at dockside or at sea (according to local regulations).

E Discharge pump

Empties holding tank via seacock and through-hull discharge fitting.

Helpful pump-out hints

- Inexpensive plastic or latex gloves should be used. Do not dispose of gloves overboard.
- Completely unroll the suction hose and lay it with the straightest possible runs to help increase flow.
- Continually flood the pump-out connection with fresh water during pump-out if you cannot make an airtight connection.
- Store hose and attachments after every use. Leave area in clean condition for next user.
- Always wash hands with hot water and soap when finished.
- Clean and disinfect surfaces with typical bathroom cleaner.

Discharge at sea

A holding tank should never be emptied when the tank is in ecologically sensitive waters, such as near swimming areas, inside marinas or close to shellfish waters. The best practice is to be at least five kilometres or more offshore in coastal waters to discharge untreated effluent from a holding tank.

Discharge at sea in unrestricted waters is achieved via the overboard discharge pump.

It is important to select discharge pumps that can safely be run dry if the operator can't quickly access the control switch when the tank becomes empty.



Holding tanks – top tips from the experts

DIY enthusiasts will be able to fit holding tanks on their boats and complete kits with pre-cut holes and pre-installed fittings are available to make the job even simpler and the result more reliable. Dometic Marine produces comprehensive guides to installing holding tanks and here are a few 'top tips' from our experts.

Where do I fit it?

A holding tank should be positioned as low in the hull as possible. Sailing boats will typically have the holding tank higher up in the hull than powerboats to assist self drainage.

The holding tank must not be exposed to temperatures above 120°F (45°C) so don't place the tank near heat sources such as engine manifolds, water heaters, generators, etc.

Consider the total filled weight (effluent typically weighs 1.08 kg per litre) when selecting materials for installing the tank.

Install the largest capacity tank that will fit in the available space. To increase usable tank capacity, consider installing a VacuFlush toilet system that will greatly reduce the amount of water consumed per flush.

Holding tanks may require inspection and service from time to time, so install it where there is easy access to the tank inspection port, discharge pump and vent filter.

What should I look for in a reliable holding tank?

A well-designed holding tank should be robust and designed to eliminate leakage of fluids and odours. There are certain things that you should consider when selecting your holding tank.

- Wherever possible choose a holding tank that has pre-installed fittings as this will minimise the risk of leakage.
- Choose a unit with sturdy, thick walls to prevent odour leakage.
- Closely examine any discharge hoses and ensure that they have been designed to minimise clogging.
- Separate discharge outlets for dockside and overboard discharge reduce hose connections.
- Ensure the system features a vacuum relief valve (see following section).
- Ensure the unit meets ISO 8099 requirements.

What does a vacuum relief valve do?

A vacuum relief valve is designed to protect the holding tank and interconnecting hoses from excessive suction force by dockside pumps. Cases have been reported where a tank implodes or fittings have fractured due to very high vacuum pressures created by a dockside pump.

What warranty will the manufacturer offer?

Look for a warranty of at least five years.

Hoses and pipes

All interconnecting hoses and pipes should be sloped downward towards the tank to permit gravity drainage and prevent potential hose odour permeation, which can be caused in hose runs that retain sewage.

Eliminate all unnecessary runs that may retain trapped liquids so simplify the hose layout by removing unnecessary valves. Vent lines must be free of low points which can trap liquid and prevent the free flow of gases from, or air into, the holding tank.

If any part of the system must be run close to a heat source, use rigid pipe instead of hose.

Do not restrict the ability to remove the hose or pipe. Avoid binding corners and sharp bends. Do not use wire ties to secure the hose or pipe. Support flexible hose every 0.3 m (12 inches), and support rigid pipe every 1.5 m (5 feet).

Each hose connection should be secured with two hose clamps to prevent possibility of leak; these hose clamps should also be cross-mounted.

Use 100% stainless steel clamps and avoid clamps with nickel-plated screws as they are susceptible to corrosion (if the clamp screw is slightly magnetic, it may be either a lower grade of stainless steel or nickel-plated).

Do not over tighten clamps or they may cut into the hose.

An in-line maintenance valve must be installed in any piping runs which retain liquid and are connected to components that may require periodic servicing.

Discharge pump location

It's best to locate the pump above the top of the holding tank. Ideally the pump should be located horizontally (with motor on top) on floor, deck or shelf.

Increasing legislation

In the early 1970s, the USA acknowledged that recreational boats should take responsibility for their own waste water and introduced legislation stating that all US boats fitted with a toilet must be equipped with either a holding tank or a water treatment device.

Since the early 1990s they have campaigned for greater responsibility with both encouragement and implementation of No-Discharge policies that vary according to individual states.

Europe is catching up and many countries have passed legislation or made recommendations to protect the marine environment by requiring boats to install holding tanks. The EU is moving closer to establishing standardised regulations to protect boating and swimming water and has already taken action with three directives; the Water Framework Directive, the Bathing Water Directive and the Recreational Craft Directive.

The following legislation is in place in 2010:



France

Recreational boats, equipped with toilets, built after January 1 2008, which enter maritime or inland ports must be equipped with an installation that permits either the storage of toilet waste water or treatment of it.



Spain

All vessels built since May 2004 or later must have a holding tank installed.



The Netherlands

From January 2009 the discharge of all black water from any type of new or existing recreational craft from 2.4 to 24 meters is prohibited.

These regulations do not apply to racing yachts, boats built before 1950 and boats over 24 meters.



USA

Since 1980 all boats in US waters with a permanent toilet must be equipped with a Marine Sanitation Device. Waters of special concern (drinking water, shellfish beds and others) can be designated a No Discharge Zone, where treatment devices of any type can not be used.



UK

Direct discharge of sewage into inland waters is prohibited. Codes of Best Practice are strongly encouraged.

The Baltic

The Helsinki Convention for the protection of the Baltic Sea (HELCOM) recommends the installation of toilet retention systems (holding tanks) on all ships. The recommendation must be taken up by national authorities. Finland has had a No Discharge law since 2006 and Sweden is shortly to follow.

Dometic Marine* has sold over 300,000 holding tank systems for boats since the early 1970s, when boats were required to stop discharging sewage into the Great Lakes of the USA.

Dometic holding tanks are designed to be odour- and trouble-free for the life of the boat and are covered by a five-year warranty. Each component of the Dometic holding tank system is proven in thousands of installations in meeting that design goal.

Dometic is dedicated to a healthy marine environment. We promote the growing use of holding tanks and pump-out stations to keep marinas clean and compliant with coming requirements. Our role in this commitment is to provide on-board sanitation equipment that is trouble-free and reliable.

*and its predecessor companies.

Global sales contacts

Dometic Sanitation

13128 State Rt. 226
Big Prairie, OH 44611 USA
Phone: 330 496 3211
Fax: 330 496 3220

Dometic Marine Headquarters

2000 N Andrews Avenue
Pompano Beach, Florida 33069
Phone: 1 954-973-2477
Fax: 1 954-979-4414

Argentina

Trimer S.A.
Del Arca 55, B1646 AA
San Fernando
PCIA. De Buenos Aires
Tel: 5411 4580 0444
Fax: 5411 4580 0440
Email: trimer@trimer.com.ar

Australia

Seabreeze Industries
A.B.N 62 067 341 888
PO Box 553, Oxenford Qld 4210
Tel: 07 5580 6371
Fax: 07 5580 6372
Email: colin@seabreezeindustries.com.au

Austria

See Germany

Brazil

Lestada Comércio, Importação e Exportação Ltda.
Engenho D'Água, n.º 1330 box 28
Jacarepaguá, Rio de Janeiro,
RJ 22765-240
Tel: +55 21 2427-6618
Email: skuplik@lestada.com.br

Belgium

See The Netherlands

Canada

Transat Marine
70 Ellis Drive Unit 1
Barrie Ontario L4N 8Z3
Tel: 705-721-0143
Fax: 705-721-0747
Email: josborn@transatmarine.com

Western Marine Company

1494 Powell Street
Vancouver, BC V5L 5B5
Tel: 604-253-7721 / 1-800-663-0600
Fax: 604-253-2656 / 1-800-663-6790
Email: sales@westernmarine.com

Caribbean

Environmental Marine
111 S.W. 23rd Street, Suite A
Fort Lauderdale, FL 33315
Tel: 954-522-2626 / 1-800-522-2656
Fax: 954-522-5152
Email: info@environmentalmarine.com

China

Tripower Corporation
3 Tuas Avenue 18A, Singapore 638852
Tel: 65 6861 1188
Fax: 65 6861 4263
Email: support@tritex.com.sg

Cyprus

TutiMare Trading Ltd.
37 Promachon Eleftherias
4103 Limmasol
Tel: 00 3575 431313
Fax: 00 3575 431300
Email: info@tutimare.com

Denmark

See Scandinavia

Finland

Nautikulma Oy
Lantinen Pitkakatu 33
20100 Turku
Tel: 358 2 250 3444
Fax: 358 2 251 8470
Email: nautikulma@kolumbus.fi

France

Kent Marine
3 Rue De La Dutee,
B.P. 207, 44815 Saint Herblain Cedex
Tel: 33 2 4092 1584
Fax: 33 2 4092 1316
Email: tech2@kent-marine.com

Germany

Ocean Marine
Handelsges MBH,
Pinkertweg 10
22113 Hamburg
Tel: 49 0 40 219 1042
Fax: 49 0 40 219 1114
Email: info@ocean-marine.de

Greece

Amaltheia
13 Papaflessa Str.
143 43 N. Halkidona, Athens
Tel: 30 210 25 88 985
Fax: 30 210 25 88 986
Email: amalmar@otenet.gr

Hong Kong

Alan Reid
2/F, 6E, Wong Chuk Wan,
Sai Kung
Tel: 852 2719 5982
Fax: 852 2792 6567
Email: ascenteng@netvigator.com

Italy

Ecosan
Via Della Liberazione N. 67/7
20068 Peschiera Borromed,
Milano
Tel: 39-2-51650151
Fax: 39-2-55300397
Email: ecosan@ecosan.it

Japan

Gunji Corporation
1-9-12 Ebie, Fukushima-ku,
Osaka 553 0001
Tel: 81 66 451 5615
Email: tsubura@gunji.co.jp

Luxembourg

See The Netherlands

Mexico

Svendens Marine
1851 Clement Avenue
Alameda, CA 94501
Phone: 1-800-824-2391
510-521-8454
Fax: 510-522-0870
Email: info@svendensmarine.com

The Netherlands

Auerhaan B.V.
P.O. Box 22, 8200 AA, Lelystad,
Platinastraat 21, 8211 AR, Lelystad
Tel: 31 0 320 286171
Fax: 31 0 320 286170
Email: accessoires@auerhaan.nl

Netherlands Antilles

Budget Marine
25B Waterfront Road, Cole Bay,
Philipsburg, St. Maarten
Tel: 599 5 43134
Fax: 599 5 44409
Email: sales@budgetmarine.com

New Zealand

Lighthouse Marine Equipment Ltd.
3C Henry Rose Place
Albany Auckland 0632
Tel: +6494482761
Fax: +6494482764
Email: info@lhmarine.co.nz

Norway

See Scandinavia

Puerto Rico

See Caribbean

Scandinavia

Dometic Scandinavia AB
Gustaf Melins gata 7,
21 31 Västra Frölunda, Sweden
Tel: +46(0)317341110
Fax: +46(0)317341111
Email: info@waeco.se

Singapore

Tripower Corporation
3, Tuas Avenue 18A, Singapore 638852
Tel: 65 6861 1188
Fax: 65 6861 4263
Email: jason@tritex.com.sg

South Africa

Central Boating
Roggebaai 8012 PO Box 7281
Tel: 27 21 424 8026
Fax: 27 21 424 2564
Email: sales@centralboating.co.za

Spain, Balearic & Canaries

Dahlberg Sociedad Anonima
Passamaners, 8 Nave 12
Poligono Son Rossinyol
07009 Palma de Mallorca
Tel: 34 971 774751
Fax: 34 971 771458
Email: rosa@dahlberg-sa.com

Sweden

See Scandinavia

Switzerland

See Germany

Taiwan

Mercury Marine Supply Ltd.
No. 15 Chongshan Street
Siaogang District, Kaohsiung,
812 Taiwan
Tel: 886 07 8133233-5
Fax: 886 (07) 8133236
Email: mms46654@ms16.hinet.net

Thailand

Octopus Electrical Service Co. Ltd.
20/15 Moo 2, Thepkasattri Rd,
Koh Kaew, Muang Phuket 83200
Tel/Fax: 66 76 273379
Email: mick@octopusasia.com

Turkey

Marina Deniz Araclari
Fener Kalamis CAD. No: 75
Fenerbahce 81030, Istanbul
Tel: 90 0 216 338 1441
90 0 216 336 9788
Fax: 90 0 216 337 44 92
Email: marinadeniz@marinadeniz.com.tr

United Arab Emirates

HFL Mantech
PO Box 20695, Dubai U.A.E.
United Arab Emirates
Tel: 971 02-6656260
Fax: 971 02-6661247
Email: mge@emirates.net.ae

United Kingdom

Lee Sanitation
Fenny Compton, Wharf Road,
Warwickshire CV47 2FE
Tel: 44 (0) 1295 770000
Fax: 44 (0) 1295 770022
Email: sales@leesan.com

Venezuela

Oceanika Yachts C.A.
Centro Comercial Ciudad Tamanaco
Primera Etapa de la Piramides Invertida
Torre "E", Piso 5. Oficina 528
Urbanizacion Chuao,
Caracas
Tel: +58 (414) 959 3160
Fax: +58 (414) 959 3154
Email: miguel_duran@oceanikayachts.com

DEALER

Dometic Marine has over 40 years experience in supplying and fitting a huge range of holding tanks to vessels all over the world. The company has a global network of skilled and professional dealers and engineers ready to offer assistance and advice.

Please note: This guide has been designed to be informative and helpful but should not be considered a definitive guide. Further advice should be sought prior to purchase and installation of a holding tank. August 2010.

 **Dometic**
GROUP

For your nearest Dometic Sales Company or SeaLand expert visit www.dometic.com