

SEWAGE EFFLUENT KIT MAX

Simplified Onboard Sewage Water Testing

martekTM
MARINE
Innovative Ship Solutions

Regulation and Legislation

MARPOL Annex IV

Sewage testing legislation was introduced as the discharge of raw sewage can create a health hazard, cause damage to the marine environment, while in coastal areas sewage can lead to oxygen depletion and obvious visual pollution.

MARPOL Annex IV is a set of regulations regarding the discharge of sewage into the sea from ships, regulations regarding the ships' equipment and **systems for the control of sewage discharge**, the provision of port reception facilities for sewage, and requirements for survey and certification (ISPPC – International Sewage Pollution Prevention Certificate).

MARPOL Annex IV, (resolution MEPC.115(51)), entered into force on 27th September 2008. It applies to ships on international voyages which are either 400gt and greater or less than 400gt when certified to carry more than 15 persons, which includes passengers and crew.

For vessels visiting countries that have ratified to MARPOL Annex IV will need to demonstrate compliance with the relevant International Sewage Pollution Prevention Certificate (ISPPC). A ISPPC is issued upon successful inspection and are valid for 5 years. **Non-compliance or failed inspections can result in vessel detention.**

As set out in Annex 22 Resolution MEPC.227(64) adopted on the 5th October 2012, sewage treatment plants installed prior to 1st January 2010, on ships other than passenger ships operating in MARPOL Annex IV special areas and intending to discharge treated effluent into the sea, should comply with resolution MEPC.2(VI) adopted on 3rd December 1976.

MEPC.2(VI): As set out in Annex 22 Resolution MEPC.227(64) adopted on the 5th October 2012, sewage treatment plants installed prior to 1st January 2016 and on or after 1st January 2010, on ships other than passenger ships operating in MARPOL Annex IV special areas and intending to discharge treated effluent into the sea, should comply with resolution MPEC.159(55) adopted on 13th October 2006.

MEPC.159(55): As set out in Annex 22 Resolution MEPC.227(64) adopted on the 5th October 2012, sewage treatment plants installed on or after 1st January 2016, on ships other than passenger ships, in all areas; and passenger ships outside MARPOL Annex IV special areas and intending to discharge treated effluent into the sea, should comply with resolution MPEC.159(55) adopted on 13th October 2006.

As set out in Annex 22 Resolution MEPC.227(64) adopted on the 5th October 2012, for new passenger ships when operating in a MARPOL Annex.

IV area and intending to discharge treated sewage effluent into the sea on or after 1st January 2016, and existing passenger ships on or after 1st January 2018, should comply with resolution MPEC.159(55) adopted on 13th October 2006 and the following additional effluent tests.

All applicable vessels will need to maintain the system in line with the effluent standards or risk detention. The Martek Marine Effluent Test Kit provides simple tests for Permanganate Value, Ph, Suspended Solids, Probable BOD, COD & TOC. The Kit provides all the necessary tests to **guarantee compliance for all commercial vessels.** Crews who carry out regular testing will be able to take corrective action which will keep efficiency high whilst keeping down-time to a minimum and reducing costs.

MEPC.2(VI):

Coliforms – up to 250 CFU/100ml

Total Suspended Solids (TSS) (onboard) – up to 100 mg/l

Biological Oxygen Demand (BOD) – up to 50 mg/l

MEPC.159(55):

Coliforms – up to 100 CFU/100ml

Total Suspended Solids (TSS) – up to 35 mg/l

Biological Oxygen Demand (BOD) – up to 25 mg/l

Chemical Oxygen Demand (COD) – up to 125 mg/l

pH – between 6.0 – 8.5

Chlorine (Free) – up to 0.5 mg/l

Martek Marine's Sewage Effluent Test Kit MAX

SEWAGE EFFLUENT TESTING MADE SIMPLE

This all in one portable water testing solution makes compliance with complex sewage discharge legislation easy.

The Sewage Effluent Test Kit is designed to provide you with simple test methods which are guaranteed to be the most economical you will find - or your money back.

The kit requires no formal training and is the only all in one solution to guarantee complete compliance with the MLC 2006 & MARPOL ANNEX IV onboard water testing legislation.

Our spares service means you only buy the full kit once and then replace what you use. This means you'll reduce waste whilst reducing costs.

DrinkSafe™ customers can purchase our standard kit to reduce doubling up on equipment such as the incubator.

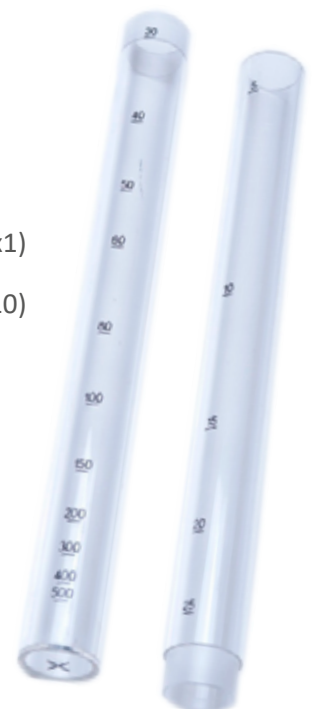
WHY THE MARTEK MARINE KIT?

- The ONLY combined portable Sewage Effluent and Potable Water Test Kit
- Guaranteed to be the MOST cost effective solution on the market
- ONLY replace what you use - you'll never need to buy a full kit again
- NO formal training required



KIT CONTENTS

- Hard carry case
- Acidifying SE tablets (x300)
- Permanganate Value tablets (x300)
- Universal pH tablets (x100)
- Sterile sample containers (100ml, x3)
- Plastic test tubes (10ml, x2)
- Turbidity tube (13 inches)
- Test tube brush (12cm)
- Thermometer (x1)
- DPD free Chlorine (x500)
- PH Comparator disk 0-5mg (x1)
- Bacterial plates (pack of 4, x10)
- Incubator (x1)
- Coliform tests (x25)
- Disposable gloves (x100)
- Goggles (x1)
- Crushing rods (pack of 10)



Sewage Effluent Test Kits - Comparison Table

Key Features	Maker					
	Martek (MAX) £615	Martek £435	Kittiwake £383	DTK Water £261.53	Lovibond £301.35	TrekTrak £765
Total tests in kit	965	965	152	4	225	32
Cost per test - approx	£0.64	£0.45	£2.52	£65.38	£1.33	£23.90
Guaranteed to meet all commercial rules/legislation & class/flag state requirements?	YES	YES	NO	NO	NO	NO
Free Chlorine DPD 1	500	500	100	0	100	1
pH	100	100	2	1	100	1
Coliforms	25	25	25	0	25	30
Total Plate Count / HPC	40	40	25	0	0	0
Permanganate Value	300	300	0	3	0	0
BOD	YES	YES	YES	YES	YES	YES
COD	YES	YES	YES	YES	YES	YES
TOC	YES	YES	YES	YES	YES	YES
Turbidity Tube	1	1	1	1	1	1
Includes Incubator	YES	NO	NO	NO	NO	YES
3 Year Guarantee on Incubator	YES	NO	-	-	-	-
Included Thermometer	YES	YES	NO	YES	NO	NO
Disposable Gloves	100	100	200	0	0	0
Uses messy Thio-bags	NO	NO	YES	NO	NO	YES

Simple Testing

PERMANGANATE VALUE (PV)

The Permanganate Value test is used for indicating the general quality of final effluents as to its acceptability for discharge. You simply fill your sample containers and add Acidifying SE tablets. After a short 30 minute wait you read the result from the following table.

Containers Pink	PV	Grading
All Three	PV of 0-10	Excellent
Two	PV of 10-20	Satisfactory
One	PV of 20-30	Dubious
None	PV of over 30	Unsatisfactory

TURBIDITY AND SUSPENDED SOLIDS

The Turbidity test is designed to give a measure of the suspended solids content of the final effluent. It is also useful in following the day to day variation in the quality of sewage and effluent.

The Turbidity test uses a specially calibrated plastic tube. This provides the simplest possible method of performing this important test. Test kit SP 304 includes a tube graduated at 30 to 500 turbidity units.

The Royal Commission Standards for Effluents recommend that the suspended solids content of sewage effluent should not be more than 30 mg/l.

BOD, COD AND TOC

It is possible to derive an indication of the Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Organic Carbon (TOC) from the result of the Permanganate Value test.

To convert the Permanganate Value (PV) for domestic sewage and effluent to probable BOD, COD and TOC values multiply by the following factors:

	Sewage	Effluent
Probable BOD	PV x 5	PV x 1.5
Probable COD	PV x 10	PV x 7
Probable TOC	PV x 3	PV x 2

The probable BOD can be calculated from the result of the turbidity test using the following formula :

$$\text{Probable BOD} = \frac{\text{Turbidity}}{2} + 5$$

The Royal Commission Standard for Effluents recommends a BOD value of not more than 20 mg/l.

Simple Testing

PH TEST

The pH test is carried out using a Universal pH test tablet in conjunction with a comparator colour wheel. The test covers the pH range 4 to 10.

The expected pH range for raw sewage is 6 to 8.5, and the pH of final effluents should also fall within the 6 to 8.5 pH range unless other consent limits are specified.

FREE CHLORINE

The Free Chlorine test is carried out by taking a sample of your sewage effluent, adding a crushed DPD 1 tablet and comparing the sample effluent against the chlorine comparator disc. The corresponding number on the disc is what you record.

BACTERIA PLATE TEST

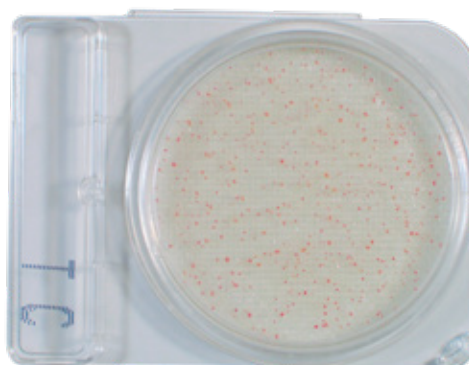
A Bacteria Plate Test simply involves taking a small 1ml sample of effluents and placing it onto the bacterial plate. You incubate the sample at 35°C for 48 hours and simply count the number of red colonies on the plates surface. You are looking for a result less than 100/250 CFU/ml depending on the vessel.

COLIFORMS

The coliform test is carried out by taking a sample of your sewage effluent and adding Sodium Thiosulphate and reductant. Once thoroughly shaken, you incubate the sample for 24 hours at 35°C. You then check for a colour change in the effluent sample, a change to blue/green indicates a presence of coliforms. Log result as present or absent.

TEMPERATURE

A check should be maintained on the temperature of effluent discharges and these should always be close to ambient temperatures. Sewage Effluent Test Kit SP 304 contains a 0 to 50°C thermometer complete in a brass protecting case



DrinkSafe[™] - Potable Water Testing

Sewage Effluent Test Kit - Add On

To meet MLC 2006 requirements you need to ensure you are regularly testing your potable water. If you are already using the Martek Marine DrinkSafe[™] Kit you can upgrade your kit to include the Sewage Effluent Kit. Doing this will mean your crew will be used to these simple methods of testing reduce your price as some kit items are the same. ***If you purchase both DrinkSafe[™] and The Sewage Effluent Add-on your cost per test will reduce from £0.72 to £0.41.***

The ILO Maritime Labour Convention (MLC 2006)

Since August 2013 under the **MLC 2006 legislation** all seagoing vessels are now required to do regular comprehensive documented testing of your ships' drinking water supplies. This legislation was then **amended in (MSN1848)** which requires you to complete potable water inspections **no less than weekly** and recorded in an onboard log book.

Developed using feedback from a survey of 8000 marine decision makers, DrinkSafe[™] is guaranteed to be the easiest kit to use, includes more tests than all other kits, and DrinkSafe[™] MAX is guaranteed to meet all legislation and Class/Flag state requirements in a single kit. Easy!

What The Rules Say You Must Do

MLC 2006 defines you must perform "frequent documented inspections"

ILO Convention 78 - "Physically check quality of water at random using different outlets."

World Health Organization Guidelines - "Source water is monitored at the port to ensure that water is safe. The ship's master is responsible for operational monitoring: quality of source water: disinfectant residuals and pH (e.g., daily); microbial quality of treated water, particularly after maintenance or repairs.

Important ICS Advice

The International Chamber of Shipping (ICS) has issued the following urgent advice to shipowners "Regardless of the progress which may or may not have been made by a vessel's flag state, ships are required to meet the standards in the Convention. ICS recommends you prepare a Declaration of Maritime Labour Compliance (DMLC) Part II for all your ships, which will serve as evidence that YOUR ship meets MLC standards. To issue a DMLC you must of course have provided potable water test kits for your ships.

What You'll Gain From The DrinkSafe[™] Kit

Your DrinkSafe[™] kit will provide you with the best value on the market with the lowest cost per test!

GUARANTEED!

Your DrinkSafe[™] MAX kit will allow you to easily meet all Flag State, MLC and WHO regulations and guidelines! **GUARANTEED!**

You will receive the easiest and quickest test kit on the market - **GUARANTEED!** There is no instruments to calibrate, no glass ampoules to break, no messy thio-bags and no sample dilution pots!





SEWAGE EFFLUENT KIT MAX

GET IN TOUCH TODAY FOR YOUR QUOTE

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