Oily water separator

Type tested acc. to IMO-Res. MEPC 107 (49)

Max. 4.5 ppm under test conditions
### Water Treatment

**Type** | **A** | **B** | **C** | **D** | **E** | **F** | **a** | **b** | **c** | **d** | **e** | **Weight dry** | **Weight wet** | **Capacity m³/h**
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
EB 0.25 | 1350 | 1200 | 600 | 700 | 900 | DN 25 | DN 20 | R 3/4" | R 3/4" | R 3/4" | 500 | 620 | 0.25
EB 0.50 | 1350 | 1200 | 600 | 750 | 900 | DN 25 | DN 20 | R 3/4" | R 3/4" | R 3/4" | 550 | 670 | 0.50
EB 1.0 | 1350 | 1500 | 600 | 750 | 900 | DN 25 | DN 20 | R 3/4" | R 3/4" | R 3/4" | 600 | 720 | 1.0
EB 2.5 | 1350 | 1900 | 920 | 1100 | 750 | DN 40 | DN 25 | DN 25 | R 3/4" | R 3/4" | 800 | 1300 | 2.5
EB 5.0 | 1600 | 1950 | 1250 | 1250 | 800 | DN 50 | DN 32 | DN 35 | DN 32 | R 3/4" | 1000 | 2000 | 5.0

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**Ocean Clean**

Water Treatment

made by Ocean Clean GmbH

Wehrmannsdamm 11 - D-27245 Kirchdorf - GERMANY

Tel. +49 (0) 42 73 / 96 28 70 - Fax +49 (0) 42 73 / 96 28 71

www.ocean-clean.de - info@ocean-clean.de

---
Make Oceans clean with "Ocean Clean®"

Bilge Water separator approved to IMO-Res. MEPC 107 (49).

The “Ocean Clean EB” series from 0,25 to 5,0 m³/h capacity is designed on the background of 30 years of experience of oil-water separation of its designer Dieter van Züren. The “Ocean Clean” system fulfills the test specification of a.m. IMO-Resolution more than required. The maximum oil content in the effluent water is less than 5 ppm. The “Ocean Clean EB” is a 3-stage oil-water-emulsion separating system.

The first stage is a gravity coarse separation stage, able to separate the input of up to 100% oil, without stops for flushing intervals. The oil water separation is forced by a special inlet, producing a hydrocyclone effect.

The second stage is a coalescence stage, separating finest oil droplets from the water. The coalescer is made of oil-and acid resistant Polyether-foam, self cleaned by automatic backflushing. Its life time is 3-5 years. The separated oil is detected by conductive measuring method and drained by automatic operated drain valves.

There are no moving parts inside the 1 and 2. stage

The third stage is an emulsion breaking stage by means of special infused filter membranes with hydrophobic surface, a.e. water can flow through it, but every oil particles of an emulsion are retained. The de-oiled and emulsion-free water is, after passing a 15 ppm alarm (to be adjusted to 5 ppm) discharged to overboard. The life time of the filter membranes is approx. 2 years.

Because of the systems pump is pressing the bilge water through it, there are no restrictions regarding the suction head. For a suction head of above 6 mtr., the pump may be installed apart from the separator on a lower position.

The “Ocean Clean EB” bilge water separator in standard is delivered ready to plug on, with all internal piping and wiring.
System description

The "Ocean Clean" oily water separator system is a 3-stage, combined gravity, cross-fluked membrane-filter system, manual or automatic operated. Maintenance and changing parts are reduced to a minimum.

The oily water from bilge or bilge water collecting tank is led via the transfer pump into the 1st stage, the coarse separation stage. The inlet pipe is prepared like a hydrocyclone which brings the inlet mixture into rotation. The lighter medium oil is moving to the centre of the tank, where it is easily detected by the conductive sensing electrode. The sensing electrode N 1.1 is measuring the electric resistance of oil and water between its sensors A and B. Water is a good electric leader whilst the electric resistance of oil is \( \infty \). That means, if the sensors A and B (C is only mass) are surrounded by oil, no electric flow can be between them. This signal is taken by the sensing relais N1, operating the necessary steps in the switch box to operate the necessary valves and pump operations.

The outlet of the oil drain valves V1 and V2 is specially designed as a self-sensor-cleaning-device. If the oil drain valves are open, the oil and at the end some water passes the sensor with high velocity, cleaning the sensor automatically from clogged oil residues.

During valve V1 is open for oil drain, valve V3 is closed.

If there is no oil at the sensor N1.1 of the 1st stage, valve V1 is closed. The mixture is entering from below and streams through the coalescence insert from below to the top, forming big oil bubbles from a summary of small droplets.

Separated oil is detected by sensor N2.1 and drained by valve V2.

Whilst oil draining phase of 2nd stage, valve V 3 is closed. The pump stops automatically. Valve V 4 opens for back flushing with sea- or freshwater from hydrofor-system. The pressure of the back flushing water is regulated by the pressure regulating valve V 5 to be adjusted to 2 bar. After the oil is drained and the sensor is surrounded by water again, the unit switches over to normal operation condition.

After passing the 1st and 2nd stage, the remaining deoiled water passes the EM-columns and after this the polishing columns, which are switched in series. The clean water - free of oil and emulsions - passes valve V 6 - to the overboard discharge.

Between the last polishing column and valve V 6 there is a by-pass pipe to the 15 ppm-alarm and back to bilge/bilge tank. The 15 ppm-alarm is continuously detecting the oil content. As soon as this is increasing to more than 15 ppm the valve V 6 switches over, overboard discharge is stopped and the water flows back to bilge/bilge tank.
CERTIFICATE OF TYPE APPROVAL

This is to certify that

Lloyd’s Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd’s Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer: Ocean Clean GmbH

Address: Wehrmannsdamm 11
          D-27245 Kirchdorf
          Germany

Type: Oil Filtering Equipment (Pollution Prevention) (Part 4)

Description: Oily Water Separator - Type: “Ocean Clean 0.25 EB”

Specified Standard: IMO Resolution MEPC.107(49)

The attached Design Appraisal Document forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue: 22 February 2005

Certificate No.: SAS P050009

Sheet No.: 1 of 6

Expiry date: 21 February

Signed: S. James

Name: Surveyor to Lloyd’s Register EMEA

A Member of the Lloyd’s Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd’s Register of any modification or changes to the equipment in order to obtain a valid Certificate.

*Lloyd’s Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the ‘Lloyd’s Register Group’. The Lloyd’s Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or工作经验 provided, unless that person has signed a contract with the relevant Lloyd’s Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.*
EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

LLOYDS REGISTER VERIFICATION LIMITED (LRV), specified as a “notified body” under the terms of The Merchant Shipping (Marine Equipment) Regulations S.I. 1999 No. 1957, did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Marine-pollution prevention requirements of Marine Equipment Directive (MED) 96/98/EC as modified by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer
Ocean Clean GmbH

Address
Wehrmännedamm 11
D-27245 Kirchdorf
Germany

Annex A1 Item
(A.1/2.1)

Product Type
OIL-FILTERING EQUIPMENT (FOR AN OIL CONTENT OF THE EFFLUENT NOT EXCEEDING 15 P.P.M.)

Product Description
Oilly Water Separator “Ocean Clean 0.25 EB”

Specified Standard
MEPC Resolution MEPC.107(49)

The attached Design Appraisal Document (schedule) forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue
22 February 2005

Expiration date
21 February 2010

Certificate No.
MED 0550056

Sheet No
1 of 6

Name
S. James

For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Note:

This certificate is not valid for equipment the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Subject to compliance with the conditions in the attached Design Appraisal Document (schedule), which forms part of this certificate, and those of Articles 10.1(i) and 11 of the Directive, the Manufacturer is allowed to affix the “Mark of Conformity” to the Product described herein.

yy Last two digits of year mark affixed.

This certificate is issued under the authority of the MCA.

0038/yy

Lloyd's Register Verification is the business name of Lloyd's Register Verification Limited, a member of the Lloyd's Register Group. Registration number 4929226.

Registered office 71 Fenchurch Street, London EC3M 4BS, England

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the "Lloyd's Register Group". The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or otherwise provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.
a  = DN25 = Inlet from Bilge
b  = DN25 = Oil drain
c  = 3/4" = Overboard Discharge
d  = 3/4" = return to Bilge
 e  = 3/4" = Flushing

Verwendungsbereich
zul. Abwäch.  Oberfläche
Ser. Nr.       RAL 6011
Maßstab
Werkstoff
Maßstab
Modell- oder Gesenk- Nr.
Datum  Name

Benennung
Ocean clean 0.25 EB
oily water separator

Zeichnungsnr. 250-000-06
CERTIFICATE OF TYPE APPROVAL

This is to certify that

Lloyd’s Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd’s Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer: Ocean Clean GmbH

Address: Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Type: Oil Filtering Equipment (Pollution Prevention) (Part 4)

Description: Oily Water Separator - Type: "Ocean Clean 0.5 EB"

Specified Standard: IMO Resolution MEPC.107 (49)

The attached Design Appraisal Document forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue: 22 February 2005

Certificate No.: SAS P050008

Sheet No.: 1 of 6

Expiry date: 21 February 2010

Signed: S. James
Surveyor to Lloyd’s Register EMEA
A Member of the Lloyd’s Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd’s Register of any modification or changes to the equipment in order to obtain a valid Certificate.

*Lloyd’s Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd’s Register Group'. The Lloyd’s Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or otherwise provided, unless that person has signed a contract with the relevant Lloyd’s Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.*
EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that:

LLOYD'S REGISTER VERIFICATION LIMITED (LRV), specified as a "notified body" under the terms of The Merchant Shipping (Marine Equipment) Regulations S.I. 1999 No. 1937, did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Marine-pollution prevention requirements of Marine Equipment Directive (MED) 96/88/EC as modified by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer: Ocean Clean GmbH

Address: Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Annex A1 Item: (A.1/2.1)

Product Type: OIL-FILTERING EQUIPMENT (FOR AN OIL CONTENT OF THE EFFLUENT NOT EXCEEDING 15 P.P.M.)

Product Description: Oily Water Separator - Type: "Ocean Clean 0.5 EB"

Specified Standard: IMO Resolution MEPC.107 (49)

The attached Design Appraisal Document (schedule) forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue: 22 February 2005
Expiry date: 21 February 2010

Certificate No.: MED 055054
Sheet No.: 1 of 6

Signed:

Name: S. James
For and on behalf of Lloyd’s Register Verification
LRV EC Distinguishing No. 0038

Note:

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Subject to compliance with the conditions in the attached Design Appraisal Document (schedule), which forms part of this certificate, and those of Articles 10.1(i) and 11 of the Directive, the Manufacturer is allowed to affix the “Mark of Conformity” to the Product described herein.

yy Last two digits of year mark affixed.

This certificate is issued under the authority of the MCA.

"Lloyd's Register Verification is the business name of Lloyd’s Register Verification Limited, a member of the Lloyd’s Register Group.
Registration number 4929226.
Registered office 71 Fenchurch Street, London EC3M 4BS, England

0038/yy

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CERTIFICATE OF TYPE APPROVAL

This is to certify that Lloyd’s Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd’s Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer
Ocean Clean GmbH

Address
Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Type
Oil Filtering Equipment (Pollution Prevention) (Part 4)

Description
Oily Water Separator – Type: “Ocean Clean 1.0 EB”

Specified Standard
IMO Resolution MEPC.107(49)

The attached Design Appraisal Document forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue 22 February 2005
Expiry date 21 February 2010

Certificate No. SAS P050010
Signed
Sheet No 1 of 6
Name

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd’s Register of any modification or changes to the equipment in order to obtain a valid Certificate.

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EC TYPE EXAMINATION (MODULE B) CERTIFICATE

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LLOYD'S REGISTER VERIFICATION LIMITED (LRV), specified as a "notified body" under the terms of The Merchant Shipping (Marine Equipment) Regulations S.I. 1999 No. 1957, did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Marine-pollution prevention requirements of Marine Equipment Directive (MED) 96/88/EC as modified by Commission Directives 98/85/EC, 2001/59/EC, 2002/75/EC and 2002/84/EC subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer: Ocean Clean GmbH
Address: Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Annex A1 Item: (A.1/2.1)
Product Type: OIL-FILTERING EQUIPMENT (FOR AN OIL CONTENT OF THE EFFLUENT NOT EXCEEDING 15 P.P.M.)
Product Description: Oily Water Separator “Ocean Clean 1.0 EB”
Specified Standard: IMO Resolution MEPC.107(49)

The attached Design Appraisal Document (schedule) forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue: 22 February 2005
Expiry date: 21 February 2010
Certificate No.: MED 0550057
Sheet No.: 1 of 6

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

Subject to compliance with the conditions in the attached Design Appraisal Document (schedule), which forms part of this certificate, and those of Articles 10.1(f) and 11 of the Directive, the Manufacturer is allowed to affix the "Mark of Conformity" to the Product described herein. Last two digits of year mark affixed.

This certificate is issued under the authority of the MCA.

Lloyd's Register Verification is the business name of Lloyd's Register Verification Limited, a member of the Lloyd's Register Group.
Registered office: 71 Fenchurch Street, London EC3M 4BS, England

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a = DN25 = Inlet from Bilge
b = DN25 = Oil drain
c = 3/4" = Overboard Discharge
d = 3/4" = return to Bilge
e = 3/4" = Flushing
CERTIFICATE OF TYPE APPROVAL

This is to certify that

Lloyd’s Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd’s Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer
Ocean Clean GmbH

Address
Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Type
Oil Filtering Equipment (Pollution Prevention) (Part 4)

Description
Oily Water Separator – Type: “Ocean Clean 2.5 EB”

Specified Standard
IMO Resolution MEPC.107(49)

The attached Design Appraisal Document forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue
22 February 2005

Expiry date
21 February 2010

Certificate No.
SAS P050011

Signed

Sheet No
1 of 6

Name
S. James
Surveyor to Lloyd’s Register EMEA
A Member of the Lloyd’s Register Group

Note:

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EC TYPE EXAMINATION (MODULE B) CERTIFICATE

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Manufacturer: Ocean Clean GmbH
Address: Wehrmannsdamm 11
D-27245 Kirchdorf
Germany

Annex A1 Item: (A.1/2.1)
Product Type: OIL-FILTERING EQUIPMENT (FOR AN OIL CONTENT OF THE EFFLUENT NOT EXCEEDING 15 P.P.M.)
Product Description: Oily Water Separator "Ocean Clean 2.5 BB"
Specified Standard: IMO Resolution MEPC.107(49)

The attached Design Appraisal Document (schedule) forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue: 22 February 2005
Expiry date: 21 February 2010

Certificate No.: MED 0550058
Sheet No.: 1 of 6
Signed: S. James
Name: For and on behalf of Lloyd’s Register Verification
LRV EC Distinguishing No.: 0038

Note:

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.

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yy Last two digits of year mark affixed.
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0038/yy

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a = DN40 = Inlet from Bilge
b = DN25 = Oil drain
c = DN25 = Overboard Discharge
d = DN25 = return to Bilge
e = 3/4" = Flushing
CERTIFICATE OF TYPE APPROVAL

This is to certify that

Lloyd's Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd’s Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer
Ocean Clean GmbH

Address
Wehmannsdamm 11
D-27245 Kirchdorf
Germany

Type
Oil Filtering Equipment (Pollution Prevention) (Part 4)

Description
Oily Water Separator – Type: “Ocean Clean 5.0 EB”

Specified Standard
IMO Resolution MEPC.107(49)

The attached Design Appraisal Document forms part of this certificate.
This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue 22 February 2005
Expiry date 21 February 2010

Certificate No. SAS P050013
Signed

Sheet No 1 of 6
Name

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EC TYPE EXAMINATION (MODULE B) CERTIFICATE

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Manufacturer:  Ocean Clean GmbH
Address:  Wehmannsdamm 11
D-27245 Kirchdorf
Germany

Annex A1 Item:  (A.1/2.1)
Product Type:  OIL-FILTERING EQUIPMENT (FOR AN OIL CONTENT OF THE EFFLUENT NOT EXCEEDING 15 P.P.M.)
Product Description:  Oily Water Separator "Ocean Clean 5.0 EB"
Specified Standard:  IMO Resolution MEPC.107(49)

The attached Design Appraisal Document (schedule) forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue:  22 February 2005  Expiry date:  21 February 2010

Certificate No.:  MED 050060  Signed:  Lloyd's Register Verification
Sheet No.:  1 of 6  Name:  S. James

For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

Note:

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yy  Last two digits of year mark affixed.

This certificate is issued under the authority of the MCA.

"Lloyd's Register Verification is the business name of Lloyd's Register Verification Limited, a member of the Lloyd's Register Group. Registration number 492226. Registered office 71 Fenchurch Street, London EC3M 4BS, England"

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- a = DN50 = Inlet from Bilge
- b = DN32 = Oil drain
- c = DN32 = Overboard Discharge
- d = DN32 = Return to Bilge
- e = 3/4" = Flushing
BST - Biological Sewage Treatment
### Biological Sewage Treatment Plant "KD OceanClean"

The "KD OceanClean" is a new development of Ocean Clean GmbH considering the latest stand of biological treatment technology and based on long years of experience of its designers.

#### The advantages
- It is fully made of acid resistant stainless steel!
- The biological treatment takes place in four stages.
- All in- and outlet flanges are situated at the forehead-sides so that the cover plate can be removed completely for inspection and cleaning without disconnecting any pipes.
- The incoming black water is grinded by a macerator-pump to prepare convenient conditions for excellent biological treatment.
- The aeration chamber is equipped with a submerged bio-bed having a surface of approx. 150 $m^2/m^3$, i.e. the bio-active bacteria have a much bigger settling surface that at conventional systems. Therefore the biological treatment process is much more effective. Also the bio-bed softens the movement from rough sea.
- It is type-tested acc. to IMO-Resolution MEPC. 2 (VI) Annex IV, and Helsinki Convention.
- Custom-built systems, for example sections for retro-fit, are possible.

<table>
<thead>
<tr>
<th>Machine Type</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Dry Weight</th>
<th>Wet Weight</th>
<th>max Pers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BST 20</td>
<td>1500 mm</td>
<td>690 mm</td>
<td>1250 mm</td>
<td>350 kgs</td>
<td>1300 kgs</td>
<td>20</td>
</tr>
<tr>
<td>BST 30</td>
<td>1500 mm</td>
<td>900 mm</td>
<td>1250 mm</td>
<td>370 kgs</td>
<td>1500 kgs</td>
<td>30</td>
</tr>
<tr>
<td>BST 50</td>
<td>1500 mm</td>
<td>1500 mm</td>
<td>1250 mm</td>
<td>450 kgs</td>
<td>2700 kgs</td>
<td>50</td>
</tr>
<tr>
<td>BST 100</td>
<td>2000 mm</td>
<td>1500 mm</td>
<td>1500 mm</td>
<td>850 kgs</td>
<td>5100 kgs</td>
<td>100</td>
</tr>
</tbody>
</table>

Other sizes on request - Andere Größen auf Anfrage lieferbar.

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### Biological Schiffs-Kläranlage "KD OceanClean"

Die „KD OceanClean“ ist eine neue Entwicklung der Ocean Clean GmbH und basiert auf den neuesten Erkenntnissen der Wasseraufbereitungstechnik gepaart mit langjähriger Erfahrung im Anlagenbau.

#### Die Vorteile
- Komplett aus säurefestem Edelstahl gefertigt. Der biologische Klärprozess findet in 4 Stufen statt.
- Das einlaufende Schwarzwasser wird durch eine Mazerator-pumpe fein zerhackt, um günstige Voraussetzungen für den biologischen Klärprozess zu schaffen.
- Die Belüftungskammer ist in einem „getauchten Bio-Bett“ mit einer biowirksamen Oberfläche von ca. 150 $m^2/m^3$ versehen, d.h. den biowirksamen Organismen steht eine weit größere Ansiedelfläche als bei herkömmlichen Anlagen zur Verfügung. Entsprechend besser ist auch der biologische Wirkungsgrad. Außerdem dämpft das Biobett die Schwallbewegungen bei Seegang.
- Die Anlage ist nach der IMO-Resolution MEPC. 2 (VI) Annex IV und Helsinki Konvention typgeprüft.
- Custom built-Anlagen in Segmentbauweise, z.B. für Nachrüstungen, sind jederzeit möglich.

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Ocean Clean GmbH
Wehrmannsdamm 11 · D-27245 Kirchdorf · GERMANY
Tel. + 49 (0) 42 73 / 96 28 70 · Fax + 49 (0) 42 73 / 96 28 71
www.oceanclean.de · info@oceanclean.de
Short Description

Make Oceans clean with “Ocean Clean®”

Biological Sewage Treatment Plant approved to IMO-Res. MEPC 2 (VI) Annex IV and Helsinki Convention.

The “KD-Oceanclean” series for gravity and vacuum toilet systems is designed to the latest state of aerated, “submerged fixed bed” biological treatment principle. It is a high efficient four chamber system.

The first chamber is the sewage collecting chamber. By aeration and mechanical grinding with a cutting pump the sewage is well mixed and prepared for homogenous overflow to the second chamber.

The second chamber is the actual aerating and bio-process chamber. The grinded sewage mass has to pass through the honeycomb structure of the “submerged fixed bed” (1m³ has a surface of 150 m²) and gets simultaneously aerated from below via air membranes. They inject smallest air bubbles which infuse the sewage mass with oxygen from the air, which is produced by an air blower. By injection of oxygen the aerobic-process starts.

Bacteria (which are found in any kind of sewage organic) start -stimulated by the oxygen injection- the organic degradation to carbon dioxide and water. The “submerged fixed bed” also called “bio reactor” becomes a layer of bio-mass, the so called “bio-lawn”.

The fully digested, odours, biological solids and dead cells fall down to the settling chamber and are led back by an automatic air ejector to the first chamber and come into the treatment process again.

From time to time the sludge has to be discharged to the sea on areas, where it is allowed. From the second chamber, the treated water flows to the third chamber - the settling chamber. Suspended sludge settles down and is also led back by an air ejector to the first stage again. The cleaned water now flows to the fourth, the disinfection and discharge chamber. Disinfectant is injected from a container, via a dosing pump to sterilize the water. After a certain settling time the sterilized water is automatically discharged overboard.

The “KD-Oceanclean” sewage treatment is made of acid resistant stainless steel, fully equipped with:
Macerating pump, air blower, disinfection pump, disinfectant, discharge pump, air lifter and solenoid valves for fully automatic operation.

Different from the most other sewage treatment plants the overflow from one chamber to the next, happens not via pipes (which may clog) but via weirs over the whole width of the chamber to guarantee a constant flow of the mass.
INSTALLATION DIAGRAM
for OCEANCLEAN-Sewage Treatment-Plant
with gravity toilet system

Legende
1 Macerator Pump
   emergency discharge pump
   optional
2 Discharge Pump

Ocean Clean
INSTALLATION DIAGRAM
for separated pipe system
for OCEANCLEAN-Sewage Treatment-Plant
with gravity toilet system

Legende
1 Macerator Pump
emergency discharge pump
optional
2 Discharge Pump
TYPENPRÜFUNGSZEUGNIS
für Abwasser-Aufbereitungsanlagen
Certificate of Type Test for Sewage Treatment Plants

Ausgestellt im Namen der Regierung
der BUNDESREPUBLIK DEUTSCHLAND
durch die SEE-BERUFSGENOSSENSCHAFT

Issued under the authority of the
FEDERAL REPUBLIC OF GERMANY
by See-Berufsgenossenschaft

Hiermit wird bescheinigt, daß ein Muster der Abwasser-Aufbereitungsanlage
This is to certify that a specimen of Sewage Treatment Plant

Typ: KD-OCEAN CLEAN-20

Auszug des Flüssigkeitsdurchsatz:
Having a designed hydraulic loading of:
Durchsatz an organischem Stoffen:
organic loading of:
Auslegung gemäß Zeichnungs Nr.:
and of the design shown on Drawings Nos.:
Hergestellt durch:
macht also:
es war unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in IMO-
entschedung MEPC.2 (VI), um die Anforderungen an den Betrieb gemäß Regel 3 (1) (a) (i) der Anlage IV des Interna-
tionalen Übereinkommens zur Verhütung der Meeresverschmutzung durch Schiffe, MARPOL 73/78, zu erfüllen, erprobt

been examined and tested in accordance with the requirements of the specification contained in International Maritime
Organization Resolution MEPC.2 (VI) to meet the operational requirements referred to in Regulation 3 (1) (a) (i) of Annex IV of the
International Convention for the Prevention of Pollution from Ships, MARPOL 73/78.

Die Erprobungen der Anlage wurden durchgeführt
The tests on the equipment were carried out
an Land bei: Kläranlage Kirchdorf

und abgeschlossen am: 25.11.2003

Bei der Erprobung wurde ein Ableitung festgestellt, der nach der analytischen Untersuchung folgende Werte nicht
überschritten hat:

250 Coli-Bakterien pro 100 Milliliter MPN
250 faecal coliform per 100 milliliter MPN, (Most Probable Number)

☐ 50 Milligramm pro Liter als geometrisches Mittel der gesamten Schwimm- und Schwebstoffe*)
50 milligrams per litre geometric mean of total Suspended Solids*)

☐ 100 Milligramm pro Liter als geometrisches Mittel der gesamten Schwimm- und Schwebstoffe der Proben. Dieser
Wert läßt den Anteil an Schwimm- und Schwebstoffen im umgebenden Wasser, das für Spülzwecke verwendet
wurde, unberücksichtigt.*

100 milligrams per litre geometric mean of total Suspended Solids above the ambient water used for flushing purposes *)

50 Milligramm pro Liter als geometrisches Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen (BSB5)
50 milligrams per litre geometric mean of the 5 day Biochemical Oxygen Demand (BOD5)

*) Zutreffende tecken mark with a cross where applicable

Zulassungs-Nr.: 340162
Certificate-No.
Die Regel- und Überwachungseinrichtungen wurden unter Stoß- und Schwingungsbeanspruchungen geprüft.
The control and sensor equipment were tested for shock and vibration.

Die Verwaltung bescheinigt, daß die Anlage
The Administration is satisfied that the equipment

(i) so ausgelegt wurde, daß das geometrische Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen (BSB5)
50 Milligramm pro Liter nicht überschreitet und
has been designed so that the geometric mean of the 5 day Biochemical Oxygen Demand (BOD5) does not exceed 50 milliseconds per litre; and

(ii) bei Neigungen bis zu 22.5° arbeiten kann.
can operate under conditions of heel of up to at least 22.5°.

Einzelheiten der Erprobungen und der einzelnen Ergebnisse werden im Anhang aufgezeigt.
Details of the tests and the results obtained are shown on the Appendix to this certificate.

A plate or durable label containing data of the manufacturer’s name, type and serial numbers, hydraulic loading and date of manufacture is to be fixed on each unit.

Eine Kopie dieses Zeugnisses muß jederzeit auf jedem Schiff mitgeführt werden, das mit der oben beschriebenen Anlage ausgerüstet ist.
A copy of this certificate shall at all times be carried on board of any vessel equipped with the above described unit.

This certificate of type test is valid until

Dieses Typenprüfungszeugnis bleibt über das vorstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt.

A revocation of the equipment installed aboard the ship can follow, but is not limited to, if the equipment is not maintained and or is not in good working order and or the equipment can not be modified within an appropriate time frame due to future regulatory standards.

Ausgestellt in: Hamburg am: 11.03.2005
Issued at: on: 

See-Berufsgenossenschaft
Schiffsicherheitsabteilung

Die Abwasser-Aufbereitungsanlage mit der Serien-Nummer ..................................................................................................... entspricht dem geprüften Typ.
The sewage treatment plant with the serial number ..................................................................................................... complies with the tested type.
Typenprüfungszeugnis
für Abwasser-Aufbereitungsanlagen
Certificate of Type Test for Sewage Treatment Plants

Ausgestellt im Namen der Regierung
der Bundesrepublik Deutschland
durch die See-Berufsgenossenschaft

Issued under the authority of the
FEDERAL REPUBLIC OF GERMANY
by See-Berufsgenossenschaft

Hiermit wird bescheinigt, daß ein Muster der Abwasser-Aufbereitungsanlage
This is to certify that a specimen of Sewage Treatment Plant:

Typ: KD-OCEANCLEAN-25

Ausgelegter Flüssigkeitsdurchsatz: 4,5 m³/Tag
having a design hydraulic loading of:

Durchsatz an organischen Stoffen: 3,91 kg/Tag biochemischer Sauerstoffbedarf (BSB)
organic loading of: kg per day Biochemical Oxygen Demand (BOD)

Auslegung gemäß Zeichnungen Nr.: 11-19-0345
and of the design shown on Drawings Nos.

Hergestellt durch: Ocean Clean GmbH, Wehrmannsdamm 11, 27245 Kirchdorf, Germany
manufactured by:

einer Prüfung unterzogen und gemäß den Anforderungen der technischen Beschreibung, enthalten in IMO-Entscheidung MEPC.2 (VI), um die Anforderungen an den Betrieb gemäß Regel 3 (1) (a) (i) der Anlage IV des internationalen Übereinkommens zur Verhütung der Meeresverschmutzung durch Schiffe, MARPOL 73/78, zu erfüllen, erprobt wurde.

has been examined and tested in accordance with the requirements of the specification contained in International Maritime Organization Resolution MEPC.2 (VI) to meet the operational requirements referred to in Regulation 3 (1) (a) (i) of Annex IV of the International Convention for the Prevention of Pollution from Ships, MARPOL 73/78.

Die Erprobungen der Anlage wurden durchgeführt
The tests on the equipment were carried out

an Land bei: Kläranlage Kirchdorf
at: 
av Bord von: 
on board at: 

und abgeschlossen am: 25.11.2003
and completed on: 

Bei der Erprobung wurde ein Abfluß festgestellt, der nach der analytischen Untersuchung folgende Werte nicht überschritten hat:
The equipment was tested and produced an effluent which, on analysis, did not exceed:

250 Coli-Bakterien pro 100 Millilitern MPN
250 fecal coliform per 100 millilitres MPN, (Most Probable Number)

50 Milligramm pro Liter als geometrisches Mittel der gesamten Schwimm- und Schwebstoffe*)
50 milligrams per litre geometric mean of total Suspended Solids*)

100 Milligramm pro Liter als geometrisches Mittel der gesamten Schwimm- und Schwebstoffe der Proben. Dieser Wert läßt den Anteil an Schwimm- und Schwebstoffen im umgebenden Wasser, das für Spillzwecke verwendet wurde, unberücksichtigt.*
100 milligrams per litre geometric mean of total Suspended Solids above the ambient water used for flushing purposes *)

50 Milligramm pro Liter als geometrisches Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen (BSB, netto)
50 milligrams per litre geometric mean of the 5 day Biochemical Oxygen Demand (BODs)

*) Zustreßfendes andeuten mark with a cross where applicable

Zulassungs-Nr.: 340.163
Certificate-No.
Die Regel- und Überwachungseinrichtungen wurden unter Stoß- und Schwingungsbeanspruchungen geprüft. The control and sensor equipment were tested for shock and vibration.

Die Verwaltung bescheinigt, daß die Anlage The Administration is satisfied that the equipment

(i) so ausgelegt wurde, daß das geometrische Mittel des Biochemischen Sauerstoffbedarfs nach fünf Tagen (BSB5) 50 Milligramm pro Liter nicht überschreitet and has been designed so that the geometric mean of the 5 day Biochemical Oxygen Demand (BO135) does not exceed 50 milligrams per litre; and

(ii) bei Neigungen bis zu 22,5° arbeiten kann can operate under conditions of heel of up to at least 22.5°.

Einzelheiten der Erprobungen und der einzelnen Ergebnisse werden im Anhang aufgeführt. Details of the tests and the results obtained are shown on the Appendix to this certificate.

Ein Schild oder ein haltbarer Aufkleber muß an jeder Anlage angebracht sein mit Angaben über den Hersteller, Typ und die Seriennummern, den Flüssigkeitsdurchsatz und das Herstellungsdatum. A plate or durable label containing data of the manufacturer's name, type and serial numbers, hydraulic loading and date manufacture is to be fitted on each unit.

Eine Kopie dieses Zeugnisses muß jederzeit auf jedem Schiff mitgeführt werden, das mit der oben beschriebenen Anlage ausgerüstet ist. A copy of this certificate shall at all times be carried on board of any vessel equipped with the above described unit.

This certificate of type test is valid until

Dieses Typenprüfungszeugnis bleibt über das vorstehende Datum hinaus in Kraft, sofern kein Widerruf erfolgt. Ein Widerruf für auf einem Schiff eingebaute Einrichtungen kann z.B. erfolgen, wenn diese nicht gefahren und/oder nicht gewartet und/oder nicht funktionsbereit sind und/oder nicht innerhalb einer angemessenen Frist an zukünftige Bestimmungen angepasst werden können. This certificate of type test is in force beyond the above mentioned date unless it is revoked. A revocation of the equipment installed aboard the ship can follow, but is not limited to, if the equipment is not maintained and or is not in good working order and or the equipment can not be modified within an appropriate time frame, due to future regulatory standards.

Das Typenprüfungszeugnis für Type KD 25 wird aufgrund der Erprobung von Type KD 20 gemäß IMO-Entschließung MEPC.2 (VI) Anhang B 2.7 ausgestellt. The certificate of type test of type KD 25 will be issued based on the test of type KD 20 according to IMO Resolution MEPC.2 (VI) annex B 2.7.

Ausgestellt in: Hamburg

am: 11.03.2005

on: 

Sec-Berufsgenossenschaft
Schiffssicherheitsabteilung

Die Abwasser-Aufbereitungsanlage mit der Serien-Nummer entspricht dem geprüften Typ. The sewage treatment plant with the serial number complies with the tested type.