

**POTVRDA O TIPNOM ODOBRENJU SUSTAVA ZA OBRADU
BALASTNIH VODA**
TYPE APPROVAL CERTIFICATE OF BALLAST WATER MANAGEMENT SYSTEM



REPUBLIKA HRVATSKA

REPUBLIC OF CROATIA

Izdana u ime Vlade REPUBLIKE HRVATSKE od HRVATSKOG REGISTRA BRODOVA

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Potvrđuje se da je ovaj sustav za obradu balastnih voda pregledan i ispitan u skladu sa zahtjevima specifikacija sadržanih u Kodeksu za odobrenje sustava za obradu balastnih voda (Rezolucija MEPC.300(72)). Ova Potvrda vrijedi samo za ovaj sustav za obradu balastnih voda.

This is to certify that the ballast water management system listed below has been examined and tested in accordance with the requirements of the specifications contained in the Code for Approval of Ballast Water Management Systems (Resolution MEPC.300(72)). This certificate is valid only for the ballast water management system referred to below.

Naziv sustava za obradu balastnih voda: **ERMA FIRST BWTS FIT**

Name of ballast water management system:

Sustav za obradu balastnih voda proizveden od: ERMA FIRST ESK Engineering Solutions S.A.
Ballast water management system manufactured by: Schisto Industrial Park (VIPAS), Block 13
Keratsiniou – Skaramagas Ave.
18863 Perama GREECE

Oznaka tipa i modela, uključujući:

Under type and model designation and incorporating:

ERMA FIRST BWTS FIT 75-3000 – sustav za obradu balastnih voda koji koristi filtraciju i elektrolitičku dezinfekciju, te sredstvo za neutralizaciju.

ERMA FIRST BWTS FIT 75-3000 – ballast water treatment system using filtration and electrolytic disinfection with a neutralizing medium.

Vidi Tablicu 1 - Popis odobrenih BWTS

See Table 1 - List of certified BWTS

Prema nacrtu opreme/sklopnom nacrtu br.: 1922-G-01

To equipment / assembly drawing No.:

datum 18.02.2021.

date

Ostala oprema proizvedena od:

Other equipment manufactured by:

Filter

Proizvođač/Manufacturer: Filtersafe Automatic Screen Filtration

Tip/Type: BS-serija/series

Kapacitet/Capacity: 25 do/to 3740 m³/h

Veličina mrežice/Mesh size: 40 µm

Proračunski tlak/Design pressure: 10 bar

Najveća radna temperatura/Maximum working temperature: 50°C

Najmanji ulazni tlak pri ispiranju/Minimum inlet pressure during filter's flushing: 1,6 bar

Filter

Proizvođač/Manufacturer: Filtrex S.r.l.

Tip/Type: ACB-serija/series

Kapacitet/Capacity: 25 do/to 3000 m³/h

Veličina mrežice/Mesh size: 40 µm

Proračunski tlak/Design pressure: 10 bar

Najveća radna temperatura/Maximum working temperature: 55°C

Najmanji ulazni tlak pri ispiranju/Minimum inlet pressure during filter's flushing: 1,5 bar

Filter

Proizvođač/*Manufacturer*: HYDAC Process Technology GmbH

Tip/*Type*: RF-serija/*series*

Kapacitet/*Capacity*: 52 do/to 3000 m³/h; 130 do/to 3500 m³/h (Δ -mrežica/*mesh*)

Veličina mrežice/*Mesh size*: 40 μ m

Proračunski tlak/*Design pressure*: 6 bar

Najveća radna temperatura/*Maximum working temperature*: 55°C

Najmanji ulazni tlak pri ispiranju/*Minimum inlet pressure during filter's flushing*: 1,5 bar

Elektro-klorinacijska jedinica/*Electro-chlorination unit*

Proizvođač/*Manufacturer*: ERMA FIRST ESK

Tip/*Type*: ECF100; ECF250; ECF500; ECF750; ECF1000

ECF100Ex; ECF250Ex; ECF500Ex; ECF750Ex; ECF1000Ex

Najmanja i najveća radna temperatura/*Minimum and maximum operating temperature*: -2°C i/and 55°C

Proračunski tlak/*Design pressure*: 6 bar

Najmanji radni salinitet/*Minimum operating salinity*: 0,9 PSU

Prema nacrtu opreme/sklopnom nacrtu br.: —

To equipment / assembly drawing No.:

datum

date

Nazivni kapacitet obrade: 90 - 3740 m³/h
Treatment rated capacity:

Ova Potvrda o tipnom odobrenju izdana je na osnovu odobrenja LR u ime Republike Grčke, Potvrda br.: LR21290950TA
This Type Approval Certificate is issued based on approval by LR on behalf of Hellenic Republic, Certificate No.: LR21290950TA

Kopija ove Potvrde o tipnom odobrenju mora se nalaziti na brodu opremljenom ovim sustavom za obradu balastnih voda, za pregled na brodu. Ako je Potvrda o tipnom odobrenju izdana na osnovu odobrenja od druge Uprave, potrebno je navesti tu Potvrdu o tipnom odobrenju.
A copy of this Type Approval Certificate shall be carried onboard a ship fitted with this ballast water management system, for inspection onboard the ship. If the Type Approval Certificate is issued based on approval by another Administration, reference to that Type Approval Certificate shall be made.

Tablica 1/ Table 1

Model	Nazivni kapacitet obrade <i>Treatment rated capacity (m³/h)</i>	Filter model HYDAC RF	Filter model FILTER SAFE FS	Filter model FILTREX FX	Elektro-klorinacijska jedinica <i>Electro-chlorination unit</i>
BWTS FIT 75	20 – 90	RF-14-10 RF-14-10 Δ-mesh	BS-031H/V BS-050H/V	ACB-906-100	1x ECF100
BWTS FIT 100	20 – 140	RF-14-10 RF-14-10 Δ-mesh	BS-031H/V BS-050H/V	ACB-910-150	1x ECF100
BWTS FIT 200	40 – 200	RF-14-15 RF-14-15 Δ-mesh	BS-061H/V-T BS-070H/V	ACB-935-200	1x ECF250
BWTS FIT 300	60 – 300	RF-14-20 RF-14-20 Δ-mesh	BS-101H/V BS-101H/V-T BS-100H/V BS-100H/V-T	ACB-945-200 ACB-935-200	1x ECF250
BWTS FIT 400	80 – 515	RF-14-25 RF-14-20 Δ-mesh RF-14-25 Δ-mesh	BS-151H/V BS-151H/V-T BS-150H/V BS-150H/V-T	ACB-955-250	1x ECF500
BWTS FIT 600	120 – 600	RF-14-25 RF-14-25 Δ-mesh	BS-201H/V BS-201H/V-T BS-200H/V BS-200H/V-T	ACB-985-300	1x ECF500
BWTS FIT 800	160 – 800	RF-14-30 RF-14-30 Δ-mesh	BS-300H/V BS-300H/V-T	ACB-999-350	1x ECF750
BWTS FIT 1000	200 – 1200	RF-14-35 RF-14-30 Δ-mesh RF-14-35 Δ-mesh	BS-300H/V-T BS-400H/V	ACB-999-350	1x ECF1000
BWTS FIT 1200	200 – 1250	RF-14-40 RF-14-35 Δ-mesh	BS-400H/V BS-400H/V-T	2xACB-985-300 1xACB-9100-400	1x ECF1000
BWTS FIT 1500	160 – 1600	RF-14-45 RF-14-40 Δ-mesh	BS-400H/V-T BS-603H/V	2xACB-985-300 1xACB-9100-400	2x ECF750 1x ECF1500
BWTS FIT 2000	200 – 2300	RF-14-50 RF-14-45 Δ-mesh RF-14-50 Δ-mesh	BS-603H/V-T BS-804H/V BS-804H/V-T	2xACB-999-350 1xACB-9120-500	2x ECF1000
BWTS FIT 2500	200 – 2500	RF-14-60 RF-14-50 Δ-mesh	BS-804H/V-T BS-1004H/V BS-1004H/V-T	3xACB-999-350 1xACB-9200-600	2x ECF1000
BWTS FIT 3000	200 – 3740	RF-14-60 RF-14-60 Δ-mesh	BS-1004H/V-T BS-1204H/V BS-1204H/V-T BS-1206H/V	3xACB-999-350 1xACB-9200-600	3x ECF1000 2x ECF1500

Više modela se može ugraditi u svrhu povećanja protoka./ *Multiple models can be used to provide higher flow rates.*

Granični radni uvjeti su opisani u ovom dokumentu (temperatura/salinitet):

Limiting operating conditions imposed are described in this document (temperature/salinity):

Temperatura elektrolita pri dobavi/*Electrolyte feed temperature*: > -2°C
Salinitet elektrolita pri dobavi/*Electrolyte feed salinity*: > 0,9 PSU
Vodljivost unutar reaktora/*Conductivity in reactor*: > 1050µS/cm (0,9 PSU pri/ at 3°C ili/ or 1,07 PSU pri/ at -2°C);

Vrijeme zadržavanja/*Hold time*: nije primjenjivo/*not applicable*

Ostala ograničenja uključuju sljedeće:

Other restrictions imposed include the following:

Sredstvo za neutralizaciju/*Neutralizing medium*:

Vodena otopina natrijevog hidrogensulfita/*Aqueous solution of sodium bisulfite (38% w/w)*

Ukupni ostatni oksidans/*Total residual oxidant*: 6 mg/l kao/ as Cl₂

Najveća dozvoljena količina aktivne tvari/*Maximum allowable dose of active substance*: 10 mg/l kao/ as Cl₂

Najveća dozvoljena koncentracija na ispustu/*Maximum allowable discharge concentration*: 0,1 mg/l kao/ as TRO

Vodik je nus-proizvod ERMA FIRST FIT postupka obrade. Opasnost od sakupljanja vodika i stvaranja moguće eksplozivne atmosfere se uzima u obzir kod svake ugradnje na brod putem ERMA FIRST teoretskog modela za proračun vodika prema projektnoj dokumentaciji br.975. Taj proračun je sastavni dio u dodatku svakog OMSM priručnika./

Hydrogen is a by-product of the ERMA FIRST FIT treatment process. The risk of hydrogen accumulation and formation of potential explosive atmosphere is addressed in every ship specific installation with the ERMA FIRST theoretical hydrogen calculation model as per Project No.975. These calculations are part of the appendix in every OMSM.

Ova oprema je projektirana za rad u sljedećim uvjetima:*

This equipment has been designed for operation in the following conditions:*

Najveći radni tlak/*Maximum working pressure*: 6 bar

Temperatura okoline/*Ambient temperature*: 0°C do/to 55°C

Mjesto pečata
Official stamp

Potpis
Signed

Uprava
Administration of

Izdana
Issued this

Valjana do
Valid until this

Marinko Popović, dipl.ing.

Republika Hrvatska

Republic of Croatia

dana rujna 2021.

day of September 2021

dana lipnja 2026.

day of June 2026

* Unesi projektna ograničenja sustava
Insert system design limitations