

**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

*Issued under the authority of the Government of the REPUBLIC OF CROATIA by the CROATIAN REGISTER OF SHIPPING*

Br. / No.

02-002388/024377

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**

*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 50-3000 – sustav za obradu balastnih voda koji koristi prethodnu filtraciju, ciklonsku separaciju i elektrolitičku dezinfekciju, te sredstvo za neutralizaciju.

*ERMA FIRST BWTS 50-3000 – ballast water treatment system using pre-filtration, cyclonic separation 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.:** 1-110-CERT-50-3000 PFD Rev.01

*To equipment / assembly drawing No.:*

1-120-CERT-50-3000 PID Rev.01

**datum** 13.10.2015.

*date*

**Ostala oprema proizvedena od-:**

*Other equipment manufactured by-:*

**Filter DN100 – DN500**

Veličina mrežice/*Mesh size:* 200 µm

Proračunski tlak/*Design pressure:* 6 bar

Najveća radna temperatura/*Maximum working temperature:* 60°C

**Ciklonski separator/*Cyclonic separator***

Proizvođač/*Manufacturer:* ERMA FIRST ESK

Tip/*Type:* BS60 i/and BS120

Kapacitet/*Capacity:* BS60 (60 m<sup>3</sup>/h); BS120 (120 m<sup>3</sup>/h)

Veličina separacije/*Separation rate:* 20 µm

Proračunski tlak/*Design pressure:* 5 bar

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

**Elektro-klorinacijska jedinica**/*Electro-chlorination unit*

Proizvođač/*Manufacturer:* ERMA FIRST ESK

Tip/*Type:* EC50; EC100; EC250; EC500; EC750; EC1000

Najmanja i najveća radna temperatura/*Minimum and maximum operating temperature:* 5°C i/and 45°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: 50 - 3000 m<sup>3</sup>/h

*Treatment rated capacity:*

**Ova Potvrda o tipnom odobrenju izdana je na osnovu odobrenja od Republike Grčke, Potvrda br.: 4245.9/01/15.**

*This Type Approval Certificate is issued based on approval by Hellenic Republic, Certificate No.: 4245.9/01/15.*

**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.*

<b>Model</b>	<b>Nazivni kapacitet obrade</b> <i>Treatment rated capacity (m<sup>3</sup>/h)</i>	<b>Pre-filter</b> <b>(DN)</b>	<b>Ciklonski separator</b> <i>Cyclonic separator</i>	<b>Elektro-klorinacijska jedinica</b> <i>Electro-chlorination unit</i>
BWTS 50	45 – 60	100	1x BS60	1x EC50
BWTS 100	90 – 120	100	1x BS120	1x EC100
BWTS 200	180 – 240	150	2x BS120	1x EC250 ili/or 2x EC100
BWTS 300	270 – 360	150	3x BS120	1x EC500 ili/or 3x EC100
BWTS 400	360 – 480	200	4x BS120	1x EC500 ili/or 4x EC100
BWTS 500	450 – 600	200	5x BS120	1x EC500
BWTS 600	540 – 720	250	6x BS120	1x EC500
BWTS 700	630 – 840	250	7x BS120	1x EC500+ 1x EC250 ili/or 1x EC750
BWTS 800	720 – 960	250	8x BS120	2x EC500
BWTS 900	810 – 1080	300	9x BS120	2x EC500 ili/or 1x EC1000
BWTS 1000	900 – 1200	300	10x BS120	1x EC1000 ili/or 2x EC500
BWTS 1100	990 – 1320	300	11x BS120	1x EC1000 ili/or 2x EC500
BWTS 1200	1080 – 1440	350	12x BS120	1x EC1000 ili/or 2x EC500
BWTS 1300	1170 – 1560	350	13x BS120	1x EC1000+ 1x EC500 ili/or 3x EC500
BWTS 1400	1260 – 1680	350	14x BS120	1x EC1000+ 1x EC500 ili/or 3x EC500
BWTS 1500	1350 – 1800	350	15x BS120	1x EC1000+ 1x EC500 ili/or 3x EC500
BWTS 1600	1440 – 1920	350	16x BS120	2x EC1000 ili/or 3x EC500
BWTS 1700	1530 – 2040	400	17x BS120	2x EC1000 ili/or 3x EC500 + 1x EC250
BWTS 1800	1620 – 2160	400	18x BS120	2x EC1000 ili/or 4x EC500
BWTS 1900	1710 – 2280	400	19x BS120	2x EC1000 ili/or 4x EC500
BWTS 2000	1800 – 2400	400	20x BS120	2x EC1000 ili/or 4x EC500
BWTS 2100	1890 – 2520	400	21x BS120	2x EC1000 ili/or 4x EC500
BWTS 2200	1980 – 2640	450	22x BS120	2x EC1000 ili/or 4x EC500
BWTS 2300	2070 – 2760	450	23x BS120	2x EC1000+ 1x EC500 ili/or 5x EC500
BWTS 2400	2160 – 2880	450	24x BS120	2x EC1000+ 1x EC500 ili/or 5x EC500
BWTS 2500	2250 – 3000	450	25x BS120	2x EC1000+ 1x EC500 ili/or 5x EC500
BWTS 2600	2340 – 3120	450	26x BS120	3x EC1000 ili/or 5x EC500
BWTS 2700	2430 – 3240	500	27x BS120	3x EC1000 ili/or 5x EC500
BWTS 2800	2520 – 3360	500	28x BS120	3x EC1000 ili/or 5x EC500
BWTS 2900	2610 – 3480	500	29x BS120	3x EC1000 ili/or 6x EC500
BWTS 3000	2700 – 3600	500	30x BS120	3x EC1000 ili/or 6x EC500

**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:* > 3°C  
Salinitet elektrolita pri dobavi/*Electrolyte feed salinity:* 0,9 PSU  
Vrijeme zadržavanja/*Hold time:* nije primjenjivo/*not applicable*

**Ostala ograničenja uključuju slijedeće:**  
*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

**Ova oprema je projektirana za rad u slijedećim uvjetima:\***  
*This equipment has been designed for operation in the following conditions:\**

Najveći radni tlak/*Maximum working pressure:* 5 bar  
Temperatura okoline/*Ambient temperature:* 0°C do/to 55°C

**Mjesto pečata**  
*Official stamp*

**Potpis**  
*Signed*

.....  
Marinko Popović, dipl.ing.

**Uprava**  
*Administration of*

.....  
Republika Hrvatska  
.....  
Republic of Croatia

**Izdana**  
*Issued this*

.....  
8. dana lipnja 2018.  
.....  
8<sup>th</sup> day of June 2018

**Valjana do**  
*Valid until this*

.....  
8. dana lipnja 2022.  
.....  
8<sup>th</sup> day of June 2022

\* Unesi projektna ograničenja sustava  
Insert system design limitations