



Marine &amp; Offshore

Certificate number: 04012/F0 BV

File number: ACM 129/2205/001

Product code: 1320I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*  
**Vestas aircoil A/S**  
 Lem - DENMARK

*for the type of product*  
**TUBE HEAT EXCHANGERS**  
 GENERIC TYPE: I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XII  
 MIXED GAS PRODUCTS TYPE - MG : I, II, III, IV, V, VI, VII, VIII

### Requirements:

Bureau Veritas Rules for the Classification of Steel Ships

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 03 May 2023**

**For Bureau Veritas Marine & Offshore,**  
 At BV FREDERICIA, on 03 May 2018,  
 Jesper Jensen



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## THE SCHEDULE OF APPROVAL

### **1. PRODUCT DESCRIPTION:**

HEAT EXCHANGERS Generic TYPE: **I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII**

HEAT EXCHANGERS Mixed Gas Products TYPE MG : **I, II, III, IV, V, VI, VII, VIII**

- Main category: Charge air cooler – pressurized air side

<b>Type I</b>	<b>Type II</b>
One or more water stages	One or more water stages
Fixed tube plate in both ends of cooler	Floating tube plate(s) in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side cover	Side cover
Tie-bars*	Tie-bars*
Water boxes	Water boxes
Gaskets / O-rings*	Gaskets / O-rings*
	O-ring for air side sealing*

- Main category: Cooler insert – non-pressurized air side

<b>Type III</b>	<b>Type IV</b>
One or more water stages	One or more water stages
One tube plate in both ends of cooler	More than one tube plate in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side plates	Side plates
Tie-bars*	Tie-bars*
Water boxes	Water boxes
Gaskets / O-rings*	Gaskets / O-rings*
O-ring for air side sealing*	O-ring for air side sealing*

- Main category: Cooler block – non-pressurized air side

<b>Type V</b>	<b>Type VI</b>
One or more water stages	One or more water stages
One tube plate in both ends of cooler	More than one tube plate in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side plates	Side plates
Tie-bars*	Tie-bars*

\*Depending on specific design

- Main category: Generator cooler insert – non-pressurised air side (p<0,1bar-g)

<b>Type VII</b>	<b>Type VIII</b>
One or more water stages	One or more water stages
One tube plate in both ends of cooler (single walled tube design)	More than one tube plate in one end of cooler (double walled tube design)
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side plates	Side plates
Tie-bars*	Tie-bars*
Water boxes	Water boxes
Gaskets/ O-rings	Gaskets / O-rings

\*Depending on specific design

- Main category: EGR cooler (Exhaust Gas Recycling)

<b>Type IX pressurised air side</b>	<b>Type X – insert, non-pressurised air side</b>
One or more water stages	One or more water stages
Fixed tube plate in both ends of cooler	Floating tube plate(s) in one end of cooler
Cooler elements (tubes and fins) Support plates* 1 Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings	Cooler elements (tubes and fins) Baffle plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings

\*Depending on specific design

- Main category: Oil cooler

<b>Type XI pressurised oil side</b>	<b>Type XII insert, non-pressurised oil side</b>
One or more water stages	One or more water stages
Floating tube plate(s) in one end of cooler	Floating tube plate(s) in one end of cooler
Cooler elements (tubes and fins) Baffle plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings	Cooler elements (tubes and fins) Baffle plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings

\*Depending on specific design

- Main category: Compressor cooler

<b>Type XIII PED CAT: SEP-III</b>
One or more water stages
Fixed tube plate in both ends of cooler
Cooler elements (tubes and fins) Support plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings

\*Depending on specific design

### **Mixed Gas Products**

- Main category: Oil cooler

<b>Type MG-I P # 0,5 bar(g)</b>	<b>Type MG-II 0,5 &lt; P # 1,0 bar(g)</b>
One or more water stages	One or more water stages
Fixed tube plate in both ends of cooler	Floating tube plate(s) in one end of cooler
Cooler elements (tubes and fins) Baffle plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings	Cooler elements (tubes and fins) Support plates* Tube plates Side covers Water boxes Tie-bars* Gaskets / O-rings

\*Depending on specific design

- Main category: Charge air cooler for mixed air/gas – pressurised air side

Type MG-III	Type MG-IV
One or more water stages	One or more water stages
Fixed tube plate in both ends of cooler	Floating tube plate(s) in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side cover	Side cover
Tie-bars*	Tie-bars*
Water boxes	Water boxes
Gaskets / O-rings *	Gaskets / O-rings*
	O-ring for air side sealing*

\*Depending on specific design

- Main category: Cooler insert for mixed air/gas – non-pressurised air side

Type MG-V	Type MG-VI
One or more water stages	One or more water stages
One tube plate in both ends of cooler	More than one tube plate in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side plates	Side plates
Tie-bars*	Tie-bars*
Water boxes	Water boxes
Gaskets / O-rings*	Gaskets / O-rings*
O-ring for air side sealing*	O-ring for air side sealing*

\*Depending on specific design

- Main category: Cooler block for mixed air/gas – non-pressurised air side

Type MG-VII	Type MG-VIII
One or more water stages	One or more water stages
One tube plate in both ends of cooler	More than one tube plate in one end of cooler
Cooler elements (tubes and fins)	Cooler elements (tubes and fins)
Support plates*	Support plates*
Tube plates	Tube plates
Side plates	Side plates
Tie-bars*	Tie-bars*

\*Depending on specific design

## **2. DOCUMENTS AND DRAWINGS:**

Technical file Va-GTA-R12.01 Dated 12.11.21

## **3. TEST REPORTS:**

NA

## **4. APPLICATION / LIMITATION:**

4.1 - May be used for the following services, but not limited to:

- Design Working Pressure: Water side: 20 barg ; Air side: 10 barg
- Media: Oil / Steam ; Treated water / Treated water or Oil.

4.2 - Flanges Types according fluids and services shall be compliant with the Rules (see Pt C, Ch 1, Sec 10).

4.3 - The nature of materials, joints included, is to be selected according to the nature of the fluid to be conveyed.

4.4 - Heat exchangers and the connected pipes are to be insulated according to the Rules (see Pt C, Ch 1, Sec 1, § 3-7.1).

## **5. PRODUCTION SURVEY REQUIREMENTS:**

5.1 - The **Heat Exchangers** are to be supplied by **Vestas Aircoil A/S** in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 - BV product certificate is required.

5.4 - Each steam generator is to be hydraulic pressure tested at 1.5 times the design pressure.

5.5 - **Vestas Aircoil A/S** has declared to Bureau Veritas that the type of products described in this certificate are manufactured at the following production sites:

**Vestas aircoil Cooling Technologies (Suzhou) Co.  
No. 666 Jian Lin Road, Export Processing  
Zone Sub-Industrial Park, Building 8  
215151 Suzhou New District, P.R. CHINA**

**SC VP INDUSTRIES ROMANIA Srl.  
Aeroportului Street n°6  
Parc Industrial Ghimbav  
Hala 1  
DJ103C,Ghimbav,  
ROMANIA**

**6. MARKING OF PRODUCT:**

Each heat exchanger should be marked with:

- Manufacturer's name or logo
- Type designation
- Maximum working pressure
- Test pressure
- Maximum working temperature
- BUREAU VERITAS' marks

**7. OTHERS:**

7.1 - It is **Vestas Aircoil A/S**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

7.2 - This certificate supersedes the Type Approval Certificate N° 04012/E1 BV issued on 27 Otc. 2015 by the Society.

**\*\*\* END OF CERTIFICATE \*\*\***