



Certificate no.:
TAM00001CH

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Shaft Coupling

with type designation(s)
JHC-HF-S, JHC-HF-S-UW, JHC-HF-F, JHC-S, JHC-S-UW, JHC-F

issued to
REGAL BELOIT SPAIN, S.A. (JAURE)
Zizurkil, Gipuzkoa, Spain

is found to comply with
DNV rules for classification – Ships
DNV rules for classification – High speed and light craft
DNV rules for classification – Yachts
DNV rules for classification – Naval vessels
DNV rules for classification – Inland navigation vessels

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2025-04-02**

This Certificate is valid until **2030-04-01**.

for **DNV**

DNV local unit: **Area NB/CMC Iberia**

Approval Engineer: **Olaf Richter**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2023-09

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Page 1 of 3

Product description

Shaft couplings for main propulsion and auxiliary machinery, mounted by hydraulic shrink-fit
Three-ring coupling: cylindrical joint at inner side of inner sleeve, conical joint between inner and outer sleeve

Coupling type	JHC-HF-S JHC-HF-S-UW	JHC-HF-F	JHC-S JHC-S-UW	JHC-F
Muff type coupling for connection of two cylindrical shaft ends	X		X	
Flanged coupling for connection of one cylindrical shaft end to a flange		X		X
High friction coating at inner side of inner sleeve allowing calculation with $\mu = 0.30$	Yes	Yes	No	No
Approved sizes as per catalogue	090 .. 1000	090 .. 1000	090 .. 700	090 .. 700

UW: For underwater application, S-type couplings may be delivered with additional watertight covers and protective tubes, made from stainless steel.

Application/Limitation

The required torque capacities T_{C1} , T_{C2} must be calculated according to DNV RU-SHIP Pt.4 Ch.4 Sec.1 [2.4.2].
In case of additional axial loads F_A , the required torque capacity T_{C1} must be increased to

$$TC1i = \sqrt{TC1^2 + \left(FA \frac{DS}{2}\right)^2}$$

The coupling design torque T_{Des} must be derived from the catalogue torque T_{Pmax} as follows:

$$TDes = TPmax * \frac{2.5}{S_F}$$

The coupling design torque must be equal or larger than all the required torque capacities T_{C1} , T_{C1i} , T_{C2} .

Where: T_{Des} [kNm] = coupling design torque
 T_{Pmax} [kNm] = torque capacity according to maker's catalogue
 T_{C1} , T_{C1i} , T_{C2} [kNm] = required torque capacities according to Rules
 F_A [kN] = axial force
 D_S [m] = shaft outer diameter
 S_F [-] = service factor as per below table:

Coupling type	JHC-HF-S JHC-HF-S-UW	JHC-HF-F	JHC-S JHC-S-UW	JHC-F
Service factor S_F	2.5	2.5	3.0	3.0

Type Approval documentation

Tests carried out

Testing of sample couplings with high friction coating, according to DNV-CP-0509 (2021-07).

Marking of product

Periodical assessment

For retention of the Type Approval, a DNV surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of

the certificate. The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued.

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

When a Type Approved product is manufactured at other companies, the Type Approval applicant takes the sole responsibility for the conformity of the product to the applicable requirements.

Other conditions

General:

- For each application with DNV class, a coupling assembly drawing is to be submitted to DNV. It shall show the main dimensions of the coupling, mass and inertia, and outer hub expansion during mounting.
- For applications for underwater installation (UW), the assembly drawing shall show the watertight protection.
- Applications with hollow shafts will be assessed regarding stresses within the shaft.
- Applications with ice class need to be submitted for detailed review based on DNV RU-SHIP Pt.6 Ch.6.
- Flange connection bolts are not covered by this approval.
- The workshop performing the application of the high friction coating must hold a valid DNV workshop approval.

Handling of coupling sizes / designs not listed in the approved catalogue:

- Intermediate coupling sizes: Couplings of same design as those listed in the catalogue, but of intermediate size, can be found by taking the nearest coupling sizes listed in the catalogue, and interpolation of dimensions and all other data. These can be regarded as covered by the approved catalogue.
- Other coupling designs: All other coupling designs not listed in the approved catalogue need to be submitted for detailed review. Friction factor $\mu = 0.30$ may be used where the approved high friction coating is applied.

END OF CERTIFICATE