



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **M-12592**

This is to certify that the
Clutch and Friction Brake Coupling for Shaft

with type designation(s)
Series: 0-021-33.-, 0-021-007.-, 0-021-067.-, 0-002-83.-, 0-002-33.- and 0-002-88.-

Issued to
Ortlinghaus-Werke GmbH
WERMELSKIRCHEN, Germany

is found to comply with
Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft

Application
The clutches are approved for main propulsion (incl. ice class notations) and auxiliary purposes.

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-06-13**

DNV local station: **Essen CMC Western Germany**

Approval Engineer: **Øyvind Eriksen**

for **Det Norske Veritas AS**



Digitally Signed By: **Sollie, Terje**
Location: **DNV Høvik, Norway**
Signing Date: **13.06.2014** on behalf of

Oddvar Deinboll
Head of Section

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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

Oil pressure operated multidisc clutch.

Application/Limitation

The clutches are approved for main propulsion (incl. ice class notations) and auxiliary purposes, based on an oil operating pressure of 20 bar for the 0-021.33.- size 55 , 25 bar for the remaining sizes fo the 0-021.33.- serie and 24 bar for the 0-002-83.-, 0-002-33.- and 0-002-88.- series.

The clutches are approved with ball valve, bolts for emergency running or a combination.

Clutches with ball valve is designated –100 at the end of the drawing / type number, with emergency bolts –001 and with a combination –101.

Clutches with ball valves are approved for a higher RPM than without ball valves. Approved RPM is given in the tables in following pages.

General:

The permissible rated torque is found by dividing $T_{dyn}(M_s)$ by at least 1,3 and $T_{stat}(M_U)$ by at least 1,8, the minimum of these applies. Normally T_{stat} is not to exceed 2,5 times the rated torque. Special vibration conditions may require deviations of the a.m. limits.

Ice class notations:

If the ice class application factor $K_{Aice} > 1.4$, the torque capacities shall be increased by the ratio $K_{Aice}/1.4$. See the Rules Pt.4, Ch.4, Sec.3 B. Design

Type Approval documentation

Table 1 is valid for the 0-021-33.- serie.

Drawing/Type	Engagement torque $M_s(Nm)$	Static torque $M_U(Nm)$	Max RPM	
				*
0-021-339-55-000 333-55-000	7000	10500	3100	3200
0-021-333-55-151 0-021-333-55-153	7700 5900	11550 8750	2550	3200
0-021-339-59-000 333-59-000	11200	16800	2250	3070
0-021-339-63-000 333-63-000	16000	24000	2000	2725
0-021-339-66-000 333-66-000	22500	33750	1800	2450
0-021-339-72-000 333-72-000	32000	48000	1600	2095
0-021-339-75-000 333-75-000	45000	67500	1400	1930
0-021-339-78-000 333-78-000	63000	94500	1300	1710
0-021-339-79-000	90000	135000	1150	1560

333-79-000				
0-021-339-81-000	125000	187500	1000	1400
333-81-000				
0-021-339-85-000	180000	270000	900	1245
333-85-000				
0-021-339-89-000	250000	375000	800	1125
333-89-000				
0-021-339-91-000	315000	472500	750	1000
333-91-000				
0-021-339-94-000	450000	675000	700	885
333-94-000				
0-021-339-96-000	630000	945000	600	815
333-96-000				

* Max. RPM for clutch with ball valve.

Table 2 is valid for the 0-021-007 and 0-021-067 series.

Drawing/Type	Engagement torque Ms(Nm)	Static torque Mü(Nm)	Max RPM	
				*
0-021-067-47-155000	2000	3000	3900	-
0-021-007-55-169000	4000	6000	3100	-

Table 3 is valid for the 0-002-83.-, 0-002-33.- and 0-002-88.- series.

Drawing/Type	Engagement torque Ms(Nm)	Static torque Mü(Nm)	Max RPM	
0-002-839-47-000	3200	4800	3000	
833-47-000				
831-47-000				
0-002-837-47-151	4600	6900	3000	
0-002-839-55-000	5500	8250	2500	
833-55-000				
831-55-000				
				*
0-002-839-63-000	9000	13500	2200	2925
833-63-000				
831-63-000				
0-002-839-63-001	13000	19500	2200	2925
833-63-001				
831-63-001				
0-002-839-63-002	15600	23400	2400	2925
833-63-002				
831-63-002				

0-002-839-69-000	12000	18000	1800	2495
833-69-000				
831-69-000				
0-002-839-69-001	17000	25500	1800	2495
833-69-001				
831-69-001				
0-002-839-69-002	20500	30750	1800	2495
833-69-002				
831-69-002				
0-002-839-75-000	24000	36000	1500	2015
833-75-000				
831-75-000				
0-002-839-75-001	30000	45000	1500	2015
833-75-001				
831-75-001				
0-002-839-75-002	36000	54000	1500	2015
833-75-002				
831-75-002				
0-002-839-78-000	37000	55500	1200	1805
833-78-000				
831-78-000				
0-002-839-78-001	41000	61500	1200	1805
833-78-001				
831-78-001				
0-002-839-78-002	50000	75000	1200	1805
833-78-002				
831-78-002				
0-002-839-81-000	45000	67500	1000	1500
833-81-000				
831-81-000				
0-002-839-81-002	90000	135000	1000	1500
833-81-002				
831-81-002				
0-002-839-81-003	60000	90000	1000	1500
833-81-003				
831-81-003				
0-002-839-81-004	75000	112500	1000	1500
833-81-004				
831-81-004				
0-002-839-84-000	92000	138000	800	1320
833-84-000				
831-84-000				
0-002-839-84-001	102000	153000	800	1320
833-84-001				

831-84-001				
0-002-839-84-002	123000	184500	800	1320
833-84-002				
831-84-002				
0-002-839-87-000	140000	210000	750	1180
833-87-000				
831-87-000				
0-002-839-87-001	175000	262500	750	1180
833-87-001				
831-87-001				
0-002-839-87-002	210000	315000	750	1180
833-87-002				
831-87-002				
0-002-839-90-002	240000	360000	750	1060
833-90-002				
831-90-002				
0-002-839-90-003	300000	450000	700	1060
833-90-003				
831-90-003				

* Max. RPM for clutch with ball valve.

The type approval is also valid for designs deviating from the above mentioned types, provided no essential changes are made for the power transmitting parts.

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification

Periodical assessment

For retention of the Type Approval, a DNV surveyor shall perform a survey every second year and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

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. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

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.

Certificate No.: M-12592
File No.: 714.60
Job Id.: 262.1-016138-1

Other conditions

For single propulsion plants, the clutch is to be of such design that sufficient torque transmission can be arranged in event of loss of hydraulic or pneumatic pressure.

The connection of the clutch to adjacent parts is not included in the type approval.

The type approval is also valid for versions with tapered shrink fit between hub and shaft.

The parts "Träger" and "Gehäuse" are to be made of material quality C45 EN 10250-2 or better, e.g. forged steel according to EN 10250-3.

END OF CERTIFICATE