DNV·GL

Certificate No:
TAS000006T

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Brakes

with type designation(s)
TS 200, TS 320, TS 500, TS 800, TS 1250, TS 2000

Issued to
PINTSCH BUBENZER GmbH
Kirchen (Sieg) Rheinland-Pfalz, Germany

is found to comply with
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances

Application :

Electromagnetic Quad-Disc Spring-Set Brake series "Twin Safe"

This Certificate is valid until **2022-12-14**.

Issued at **Høvik** on **2017-12-15**
DNV GL local station: **Essen** for **DNV GL**

Approval Engineer: **Chi Wan Bang**

Aldo Matteucci
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.

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Product description

Brake series TWIN SAFE with the following characteristics:

Equipment designation:	Twin Safe 200
Maximum braking torque:	2000 Nm
Number of springs:	18
Elastic force per spring:	552,6 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Equipment designation:	Twin Safe 320
Maximum braking torque:	3200 Nm
Number of springs:	15
Elastic force per spring:	976,2 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Equipment designation:	Twin Safe 500
Maximum braking torque:	5000 Nm
Number of springs:	19
Elastic force per spring:	1008,9 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Equipment designation:	Twin Safe 800
Maximum braking torque:	8000 Nm
Number of springs:	26
Elastic force per spring:	1008,9 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Equipment designation:	Twin Safe 1250
Maximum braking torque:	12600 Nm
Number of springs:	38
Elastic force per spring:	987,6 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Equipment designation:	Twin Safe 2000
Maximum braking torque:	20000 Nm
Number of springs:	59
Elastic force per spring:	950,0 N
Friction coefficient:	0,38
Number of friction surfaces:	4

Application/Limitation

- All materials in load carrying parts are to be delivered with minimum 3.1 certificates (EN 10204:2004) documenting mechanical properties and chemical composition in accordance with the approval documentation and shall comply with Sec.3. Note that the impact properties for all torque transmitting parts shall be in accordance with the standard based on design temperature for each installation.
- Above mentioned brake torque is the maximum torque the brake exerts. Allowable torque for the brake is the maximum torque divided by 1,8 or dynamic factor if this is above 1,8 (refer to the standard Sec.5 [5.2.3.5].

- The friction coefficient has not been evaluated, the value has been provided by the manufacturer.

Type Approval documentation

Tests carried out

Brake torque capacity tests carried out 22.03.2016 and 11.12.2017.

If a DNVGL product certificate is required, each brake shall be tested and witnessed by a DNVGL surveyor according to Sec.14 from the above-mentioned standard.

Marking of product

The brakes shall be marked according to Sec.14 from the standard.

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.

END OF CERTIFICATE