



TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00001XR
Revision No:
2

This is to certify:

That the **Butterfly Valves**

with type designation(s)
TEB-150, TEB-300, TEB-600

Issued to

Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.
Suzhou City, China

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV class programme DNV-CP-0186 – Type approval – Valves

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Temperature range: see certificate
Max. working press.: **Class 600 (PN 100 [bar])**
Sizes: see certificate

Issued at **Hamburg** on **2022-08-01**

for **DNV**

This Certificate is valid until **2025-08-24**.

DNV local station: **Shanghai**

Approval Engineer: **Ana Cristina Do Carmo Insfran**

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Olaf Drews
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.

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: 2021-03

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Product description

<u>Butterfly valve type:</u>	TEB-150, TEB-300 and TEB-600 for installations in piping systems.
<u>Valve design:</u>	Double Flange-, Wafer- and Lug-Type, API 609-2016 type B
<u>Nominal Pressure:</u>	Class 150 (PN 20 bar), Class 300 (PN 50 bar), Class 600 (PN 100 bar)
<u>Flange connections:</u>	ASME B16.5 and ASME B16.47 of Class 150, ASME B16.5 of Class 300 and Class 600
<u>Face to Face:</u>	API 609
<u>Testing Standard:</u>	API 598

Butterfly valve nominal sizes:

Class 150: DN 100 to DN 1200 (NPS 4 to NPS 48)
 Class 300: DN 100 to DN 600 (NPS 4 to NPS 24)
 Class 600: DN 100 to DN 450 (NPS 4 to NPS 18)

Pressure and temperature ratings: ASME B16.34

Design temperature: Depending on seat materials

Seat design type	Temperature range [°C]
STL	-46° to 425°
SS + flexible graphite	-46° to 425°

Butterfly valves may be equipped with manual, pneumatic or electric actuator hydraulic¹

Note 1:

Actuators, remote operating control devices and additional mountings are not included in this type approval.

Materials:

Valve	Material type	ASTM Standard
Body	Stainless Steel	CF8, CF8M, CF3, CF3M ASTM 351
	Carbon Steel	WCB ASTM A216
	Duplex	F304, F304L, F316, F316L ASTM A182
Disc	Stainless steel	CF8, CF8M, CF3, CF3M ASTM 351
	Carbon Steel	WCB ASTM A216
Shaft	Stainless Steel	630 ASTM 564 FXM-19 ASTM A182
	Alloys	INCONEL 750, INCONEL 718
Seal	STL	
	STL + Flexible graphite	

Application

Butterfly valves of type TEB-150, TEB-300 and TEB-600 are approved for the following operation media:

Operating media may:

Flammable fluids: cargo oil, crude oil washing, vent, cargo oil lines, fuel oil, lubrication oil, hydraulic oil, thermal oil²

Inert gas: inert gas, water seal effluent lines, scrubber effluent lines, main lines, distribution lines

Sea water: bilge lines, fire main and water spray, foam, sprinkler, ballast, cooling water, tank cleaning, non-essential

Fresh water: cooling water, condensate return, non-essential

Miscellaneous: starting /control air, service air (non-essential), brine, CO₂, steam, sanitary.

Note 2:

Fuel oil, lubrication oil, hydraulic oil and thermal oil are in this context regarded as "Flammable liquids".

See DNV Rules, Pt. 4 Ch. 1, Section 3 – Design principles

Limitation

Butterfly valves may not be used for flammable gases and applications with flowing media specified as dangerous and toxic fluids.

Body material of copper and copper alloys are subjected to requirements according to DNV Rules Pt.2, Ch.2 – Metallic Materials, Section 10 and 11 and to operating temperatures limits specified in DNV Rules Pt.4, Ch. 6 – Piping Systems, Section 2 – Materials.

Valves fabricated of copper and copper alloy shall not be used for media having temperature above the following limits:

- Copper and aluminum brass: 200°C
- Copper Nickel: 300°C

Tests carried out

The butterfly valves have been tested in accordance with the following standards:

Test standard: API 598 DNV Pt.4 Ch.6 DNV CP 0186		Purpose
Title	Test reference	
Hydrostatic Pressure Test	Valve Body	To confirm the pressure containing capability of the shell against internal pressure Test pressure = 1,5 times the design pressure No leakage is permitted.
Hydrostatic/Pneumatic Seat tightness	Valve seat	To confirm the capability of the seats to comply with the specified leakage rate At the manufacture In the direction(s) for which the valve is designed No visible leakage.
Functional test	Valve assembly	Function test of completed assembled valve.

Type Approval documentation

Type Approval Application dated on 2019-09-09
 Inspection testing Outline dated on 2020-08-01
 Type Approval Assessment Report dated on 2020-08-10
 Prototype testing report of butterfly valves dated 2020-07-16
 Drawings No.: 1021001001-A; 1021001002-A; 1021001003-A

Certification

Application in machinery and piping systems

Valves intended to be installed in piping system listed in DNV Rules Pt.4, Ch.6 – Section 1

shall be certified according to DNV Rules Pt.4 Ch.6 – Piping systems, Section 9

Valve nominal size / Pressure rating

DN > 100 mm / PN > 16 bar

DN ≤ 100 mm / PN ≤ 16 bar

Ship side valves DN > 100 mm
 regardless of pressure rating

Type of Product Certificate (PC) / Issued by

VL Certificate / DNV

W Works Certificate / Manufacturer

VL Certificate / DNV

Material certificates (valve bodies)

In accordance with DNV Rules Pt.4 Ch.6 – Piping systems, Section 2 – Table

Place of Manufacture

Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.

No. 988, Yuexiu Rd., Lili Town, Wujiang Zone, Suzhou City, Jiangsu Province, China

Marking of product

For traceability to this type approval the products are to be marked in particular with:

- Manufacturer's brand
- Valve type designation
- Serial no.
- Lot no.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment as per DNV-CP-0338, Sec.4 to verify that the conditions for the Type Approval are complied with.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.

End of certificate