Certificate No:
TAP00002S9

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

with type designation(s)
Z Serial, Type ZDRO

Issued to
Zhejiang Yongsheng Technology Co., Ltd
Hangzhou, **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 :

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

Type:	Temperature range:	Max. working press.:	Sizes:
Z Serial, Type ZDRO	-29°C ~ 150°C	150 Class ~ 600 Class	150 DN ~ 250DN
	-29°C ~ 150°C	150 Class ~ 300 Class	15 DN ~ 125 DN

Issued at **Hamburg** on **2023-07-31**
This Certificate is valid until **2028-07-30**.
DNV local unit: **Shanghai**

for **DNV**

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

Sven Klinger
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.

Product description

Ball valve Z Serial, type ZDRO designed for installation in piping systems for different services conditions.

Design and manufacture of ball valve: GB/T 12237, API 608

Structural length of the ball valve: GB/T 12221, ASME B16.10

End size: HG/T20592, ASME B16.5

Pressure-Temperature ratings: GB/T12224, ASME B 16.34

Test Standard: GB/T13927, API 598

Sizes: DN150 ~ DN 250 => Pressure rating: PN 1.6 ~ 6.4 MPa

Sizes: DN 15 ~ DN 125 => Pressure rating: PN 1.6 ~ 2.5 MPa

Flow direction: two way

Design Temperature range: -29°C~150°C

Sealing Type: soft seal

For Z serial ball valve DN 150~250, PN 16-64

Non-metallic materials name	Material
Packing	PTFE
Spiral wound gasket	Flexible graphite
Sliding bearing	SS+PTFE
O-Ring seal	FKM

For Z serial ball valve DN 15~125, PN 16-25

Non-metallic materials name	Material
Packing	PTFE
Spiral wound gasket	304+Flexible graphite
O-Ring seal	FKM

Materials:

Valve part	Material type	Standard
Body	Cast steel	ASTM A 216 WCB
Bonnet	Cast steel	ASTM A 216 WCB
Ball	Stainless steel	ASTM A182 F304
Stem	Stainless steel	17-4PH
Seat support ring	Stainless steel	ASTM A276 F304, A182 F304

Note: The materials to be used in piping system shall be suitable for the medium and service for which the intended service.

Application

Ball valve Z Serial, type ZDRO may be used for applications in piping systems of DNV pipe class I, II and III. Operating media may include non-flammable gases, water, air, oil[1].

Note [1]:
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

Ball valves may not be used for ship’s LNG and gas (methane) systems, sea water systems and flowing media specified as dangerous and toxic fluids.

Type Approval documentation
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	Type of Product Certificate (PC) / Issued by
DN > 100 mm / PN > 16 bar	Product Certificate (PC) / DNV
DN ≤ 100 mm / PN ≤ 16 bar	Product Declaration (PD) / Manufacturer
Ship side valves DN > 100 mm regardless of pressure rating	Product Certificate (PC) / DNV

Material certificates (valve bodies)
In accordance with DNV Rules Pt.4 Ch.6 – Piping systems, Section 2 – Table 3

Tests carried out

The ball valves Z serial type ZDRO have been tested in accordance with the following standards:

Test standard: GB/T600-2008 GB/T12237-2017 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.

Marking of product

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

Manufacturers name	永盛科技 YSMETER ZHEJIANG YONGSHENG TECHNOLOGY CO., LTD		
Tag no.		Model	
Nominal Diameter DN (mm)		Nominal Pressure PN (MPa)	
Rate Kv		Flow Characteristic	
Leakage Class		Rotation Angle (°)	
Input Signal (mA)		Body Material	
Output Signal (mA)		Plug Material	
Working Temperature (°C)		Seat Material	
		MFR No.	
		MRF Date	

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to DNV-CP-0338, Sec.4.

The certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com

END OF CERTIFICATE