

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible Hoses of Metallic Material with permanently fitted couplings

with type designation(s)
ZCR 25, ZCR 10

Issued to

Shanghai Yongxin Corrugate Pipe Co., Ltd.
Shanghai, China

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

DNV GL class programme DNVGL-CP-0184 – Type approval – Flexible hoses with permanently fitted couplings

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
ZCR 25	-20°C up to 200°C	25 bar	DN 20 - DN 65
ZCR 10	-20°C up to 200°C	10 bar	DN 20 - DN 200

Issued at **Hamburg** on **2020-03-30**

This Certificate is valid until **2025-03-29**.

DNV GL local station: **Shanghai**

for **DNV GL**

Approval Engineer: **Andrii Pishchanskyi**

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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.



Job Id: **262.1-029882-1**
Certificate No: **TAP0000220**

Product description

Types ZCR 25 and ZCR 10 are corrugated metal hoses with one layer of braid and welded end fittings ready for installation. The hose assemblies consist of the following components:

Component	Material
Corrugated hose	SUS304 ¹⁾ (stainless steel)
Braiding	
Ferrule	
Welding ring	
Nipple	
Flange	Q235B (non alloy steel)

Footnote

- 1) The stainless-steel grade is not considered suitable for use in:
- Piping systems (e.g. seawater cooling or wet exhaust gas) with flowing and stagnant seawater;
 - Seawater atmosphere, i.e. unprotected area subject to seawater spray or green water, e.g. open deck.

Hose end fittings

The type approval certificate includes flange end fittings:

- Plate flange for welding;
- Plate flange with weld-on collar plate;

as per CB/T 4196-2011, GB/T 2501-2010, GB/T 9112~9124-2010, DIN 2576 and EN 1092-1.

Limitation on pipe connection part of hose end fittings

For the pipe connection part of the hose end fittings limitations depending on pipe class, media and temperature may have to be observed. In particular, application of plate flange with weld-on collar plate is limited as per DNVGL-RU-SHIP Pt.4, Ch.6, Sec.9, 5.1.2 for flange type F.

Pressure reduction factor shall be used for high service temperature according to ISO 10380 as follows:

Temperature [°C]	20	50	100	150	200
Pressure reduction factor [/]	1	0.88	0.73	0.66	0.6

Manufacturing locations

The following hose and hose assembly manufacturer are approved

Manufacturer's name	Changshu Yongxin Corrugate Pipe Co.,Ltd
Address	Sicun Road, Zhaoshi Village, Meili Town, Changshu City, Jiangsu Province, China

Responsibility

The company Shanghai Yongxin Corrugate Pipe Co., Ltd. in Shanghai takes the responsibility that both design and production of the hose assemblies are in compliance with the DNV GL Rules and Class Programme listed on page 1 of this certificate

Application/Limitation

The metallic hose assemblies of types ZCR 25 and ZCR 10 are type approved for application according to their suitability in classes I, II and III of the following piping systems:

1. Fuel, lubricating, hydraulic and thermal oil;
2. Fresh water cooling;
3. Compressed air;
4. Refrigeration;
5. Class III steam.

Flexible metal hose assemblies are not approved for use in systems where they may be subjected to high pressure pulsation or vibration.

Selection of materials

In addition, it shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature etc. and installation area of the piping system. In particular, the resistance to corrosion, erosion, oxidation and other deterioration during projected service life are to be considered. Refer to DNVGL-RU-SHIP Pt.4, Ch.6, Sec.2.

A combination of a flange made of carbon steel with stainless steel nipple is not approved for seawater systems.

It is the manufacturer's responsibility to ensure that the materials applied in specific piping systems are suitable for the intended service conditions.

Material certificate

An appropriate material certificate of the bellow and flange materials depending on class of piping system is to be provided. Refer to:

- DNVGL-RU-SHIP Pt.4, Ch.6, Sec.1 – Table 1 Pipe classes
- DNVGL-RU-SHIP Pt.4, Ch.6, Sec.2 – Table 3 Material certificates
- DNVGL-RU-SHIP Pt.2, Ch.1, Sec.2 - Approval of manufacturers (AoM)

Installation

Hose assemblies shall be:

- Limited to a quantity and length necessary to provide for relative movement between fixed and flexibly mounted items of machinery / equipment or systems (ref. to MSC.1/Circ.1321);
- Fitted in places where they are always accessible;
- As short in length as practicable, but, in general, shall not exceed 1.5m in length. Exceptions are subject to case by case approval.

Means shall be provided to isolate flexible hoses used in systems for fuel oil, lubricating oil, seawater cooling and compressed air as per DNVGL-RU-SHIP Pt.4, Ch.6, Sec.9, 4.2.3.

Hose assemblies shall not be used in piping systems subject to high pressure pulsation or vibration load.

For the installation of the hose assemblies the manufacturer's instructions "No. YBJ-HTA" is to be observed.

Production testing

Each hose is to be hydraulically pressure tested to 1.5 times the maximum working pressure before installation/delivery and delivered with:

- Product test report (PTR) as per DNVGL-RU-SHIP Pt.4, Ch.6, Sec.9, 4.1.7;
- Material certificate (MC) of metal sheet and hose end fittings as per DNVGL-RU-SHIP Pt.4, Ch.6, Sec.2, 1.8.1.

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Type Approval documentation

Tests carried out

1. Burst test;
2. Pliability test;
3. Fatigue test.

Marking of product

For traceability to this type approval the hose ferrules are to be marked as follows:

Marking scope	Example
Product name	Metallic Hose
Date of manufacture	201404
Product No.	ZCR25-1
Nominal diameter	DN 20
Maximum allowable pressure (PS)	2.5 MPa
Maximum allowable temperature (TS)	200 °C

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 Type Approval are complied with. Refer to DNVGL-CP-0338, Sec.4. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>.