

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings

with type designation(s)

MF-RS & MF-RL, RCH-S & RCH-L, RCH-E & RCD-E

Issued to

Young Nam Metal Co.,Ltd.

Gimhae-si, Gyeongsangnam-do, Republic of Korea

is found to comply with

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

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
MF-RS & MF-RL	-50°C to +220°C (see page 2)	4 to 20 bar (see page 2)	15A to 500A (see page 2)
RCH-S & RCH-L	-50°C to +220°C (see page 2)	3 to 14 bar (see page 2)	15A to 500A (see page 2)
RCH-E & RCD-E	-50°C to +220°C (see page 2)	3 to 11 bar (see page 2)	15A to 500A (see page 2)

Issued at **Høvik** on **2021-05-14**

This Certificate is valid until **2024-08-13**.

for **DNV**

DNV local station: **Gimhae Station**

Approval Engineer: **Maheshraja Venkatesan**

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Zeinab Sharifi

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

Six types of Slip-on joints - Slip type:

- Multi Flex Round Standard type (MF-RS) – approved fire-resistant type
- Multi Flex Round Long type (MF-RL) – approved fire-resistant type
- Repair Clamp Hinge Standard type (RCH-S)
- Repair Clamp Hinge Long type (RCH-L)
- Repair Clamp Hinge Elbow type (RCH-E)
- Repair Clamp Double Elbow type (RCD-E)

Material of construction:

Case : SUS 304, 316L
Rubber : EPDM, NBR, SILICONE, VITON
Bolt : SUS 304, 316L
Bar : SUS 304, 316L

Application/Limitation

Sizes	Maximum working Pressure (bar)			
	MF-RS and MF-RL	RCH-S and RCH-L	RCH-E	RCD-E
15A	20	14	11	-
20A	20	14	8	-
25A	20	14	8	-
32A	20	12	8	-
40A	20	12	8	-
50A	18	10	7	-
65A	18	10	7	-
80A	16	8	7	-
100A	16	8	7	-
125A	14	8	7	-
150A	14	8	7	-
200A	10	7	-	6
250A	10	7	-	6
300A	8	6	-	5
350A	8	6	-	5
400A	5	4	-	5
450A	5	4	-	4
500A	4	3	-	3

Design temperature range dependent on gasket material:

NBR: -30°C to +100°C
EPDM: -40°C to +100°C, not to be used for hydrocarbon applications.
SILICONE: -50°C to +190°C
VITON: -30°C to +220°C

The couplings are to be assembled and mounted according to the manufacturer's recommendations.

The coupling types MF-RS & MF-RL are considered as approved fire-resistant types whereas the types RCH-S, RCH-L, RCH-E & RCD-E are not fire tested and therefor shall not be used in applications where fire resistance is required.

The slip-on joints (Slip type) covered by this certificate are approved to be used in below Class II and III piping systems:

1) Flammable fluids (flash point $\leq 60^{\circ}\text{C}$) - Cargo oil lines ⁽¹⁾ - Crude oil washing lines ⁽¹⁾ - Vent lines ⁽⁵⁾ 2) Inert gas - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽¹⁾ ⁽⁶⁾ - Distributions lines ⁽¹⁾ 3) Flammable fluids (flash point $> 60^{\circ}\text{C}$) - Cargo oil lines ⁽¹⁾ - Fuel oil lines ⁽⁵⁾ ⁽⁶⁾ - Lubricating oil lines ⁽⁵⁾ ⁽⁶⁾ - Hydraulic oil ⁽⁵⁾ ⁽⁶⁾ - Thermal oil ⁽⁵⁾ ⁽⁶⁾ 4) Fresh water - Cooling water system ⁽⁴⁾ - Condensate return ⁽⁴⁾ - Non-essential system	5) Sea water - Bilge lines ⁽⁴⁾ - Water filled fire extinguishing systems, e.g. sprinkler systems ⁽⁵⁾ - Non water filled fire extinguishing systems, e.g. foam, drencher systems ⁽⁵⁾ - Fire main (not permanently filled) ⁽⁵⁾ - Ballast system ⁽⁴⁾ - Cooling water system ⁽⁴⁾ - Tank cleaning services - Non-essential systems 6) Sanitary/drains/scuppers - Deck drains (internal) ⁽³⁾ - Sanitary drains 7) Sounding/vent - Water tanks/dry spaces - Oil tanks (f.p. $> 60^{\circ}\text{C}$) ⁽⁵⁾ ⁽⁶⁾ 8) Miscellaneous - Service air (non-essential) - Brine - Steam ⁽²⁾
(1) Only in pump rooms and open decks - only approved fire-resistant types. (2) May be used for pipes on deck with a design pressure of 10 bar or less. (3) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships. (4) Inside machinery spaces of category A - only approved fire resistant types. (5) Approved fire-resistant types except in cases where such mechanical joints are installed on exposed open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines. (6) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.	

Type Approval documentation

Tests carried out

Burst pressure test, Fire test (only for MF-RS and RL types), Vacuum test, Tightness test

Marking of product

For traceability to this Type Approval each joint is to be marked with:

- Manufacturer's name or trademark
- Type designation
- Size
- Max. working pressure or pressure class



Job Id: **262.1-031668-1**
Certificate No: **TAP0000205**

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.