

TYPE APPROVAL CERTIFICATE

This is to certify:
That the Pipe Couplings

with type designation(s)
GR-S, GR-L

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:
GR-S	-50°C to +220°C (see page 2)	5 to 20 bar (see page 2)	15A to 350A
GR-L	-50°C to +220°C (see page 2)	5 to 20 bar (see page 2)	15A to 300A

Issued at **Høvik** on **2021-05-14**

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

DNV local station: **Gimhae Station**

Approval Engineer: **Maheshraja Venkatesan**



for **DNV**
Digitally Signed By: Ragavendhra Rao, Vishnumurthi
Location: DNV Høvik, Norway
on behalf of

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

Slip-on joints (Grip type) in two standard (GR-S) and long (GR-L) types.

Material of construction:

Case :	SUS304,316L
Rubber :	EPDM, NBR, SILICONE, VITON
Bolt :	SUS304,316L
Ring :	SUS301/304

Application/Limitation

The slip-on joints (Grip type) are approved as fire resistant couplings and are allowed for Class II and III below piping systems:

<p>1) Flammable fluids (flash point ≤ 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Crude oil washing lines ⁽¹⁾ - Vent lines <p>2) Inert gas</p> <ul style="list-style-type: none"> - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽¹⁾ - Distributions lines ⁽¹⁾ <p>3) Flammable fluids (flash point > 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Fuel oil lines - Lubricating oil lines - Hydraulic oil - Thermal oil <p>4) Fresh water</p> <ul style="list-style-type: none"> - Cooling water system - Condensate return - Non-essential system 	<p>5) Sea water</p> <ul style="list-style-type: none"> - Bilge lines - Water filled fire extinguishing systems, e.g. sprinkler systems - Non water filled fire extinguishing systems, e.g. foam, drencher systems - Fire main (not permanently filled) - Ballast system - Cooling water system - Tank cleaning services - Non-essential systems <p>6) Sanitary/drains/scuppers</p> <ul style="list-style-type: none"> - Deck drains (internal) ⁽²⁾ - Sanitary drains <p>7) Sounding/vent</p> <ul style="list-style-type: none"> - Water tanks/dry spaces - Oil tanks (f.p. > 60°C) <p>8) Miscellaneous</p> <ul style="list-style-type: none"> - Service air (non-essential) - Brine - Steam
<p>(1) Only in pump rooms and open decks (2) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.</p>	

Sizes	Maximum working Pressure	
	GR-S	GR-L
15A, 20A, 25A, 32A, 40A	20 bar	20 bar
50A, 65A	18 bar	18 bar
80A, 100A	16 bar	16 bar
125A, 150A	12 bar	12 bar
200A, 250A	7 bar	7 bar
300A	5 bar	5 bar
350A	5 bar	-

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.

Type Approval documentation

Drawing numbers: YG-0002-0, YG-0002-1, and YG-0002-2 dated 2019-05-21

Report numbers: YNQ-19TGL015, YNQ-19TGL150, YNQ-19TGL300, YNQ-19TGS015, YNQ-19TGS200, YNQ-19TGS350 dated 2019-10-11; GNTP-V19-023, GNTP-V19-024, GNTP-V19-025 and GNTP-V19-026 dated 2019-09-24

Test reports KOMERI-07T179,180,181,182,183,184

Pull-out test report SE-080220-001 dated 2002-02-20

Gasket datasheets:

- General purpose Silicone elastomer dated April 20, 2020
- Document no. 2003250001 - Data sheet for NBR dated 2020.03.25
- Data sheet – Black Viton Rubber
- Document no. 2004130001 - Data sheet for EPDM dated 2020.04.13

Tests carried out

Burst pressure test, Vibration/Impulse test, Fire test, Vacuum test, Pull-out test, Tightness test, Repeated assembly 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

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 approval are complied with. Reference is made to DNVGL-CP-0338.

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**.

DNV local station: **Gimhae Station**

Approval Engineer: **Maheshraja Venkatesan**



for **DNV**
Digitally Signed By: Ragavendhra Rao, Vishnumurthi
Location: DNV Høvik, Norway
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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 therefore 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:

<p>1) Flammable fluids (flash point ≤ 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Crude oil washing lines ⁽¹⁾ - Vent lines ⁽⁵⁾ <p>2) Inert gas</p> <ul style="list-style-type: none"> - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽¹⁾ ⁽⁶⁾ - Distributions lines ⁽¹⁾ <p>3) Flammable fluids (flash point > 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Fuel oil lines ⁽⁵⁾ ⁽⁶⁾ - Lubricating oil lines ⁽⁵⁾ ⁽⁶⁾ - Hydraulic oil ⁽⁵⁾ ⁽⁶⁾ - Thermal oil ⁽⁵⁾ ⁽⁶⁾ <p>4) Fresh water</p> <ul style="list-style-type: none"> - Cooling water system ⁽⁴⁾ - Condensate return ⁽⁴⁾ - Non-essential system 	<p>5) Sea water</p> <ul style="list-style-type: none"> - 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 <p>6) Sanitary/drains/scuppers</p> <ul style="list-style-type: none"> - Deck drains (internal) ⁽³⁾ - Sanitary drains <p>7) Sounding/vent</p> <ul style="list-style-type: none"> - Water tanks/dry spaces - Oil tanks (f.p. > 60°C) ⁽⁵⁾ ⁽⁶⁾ <p>8) Miscellaneous</p> <ul style="list-style-type: none"> - Service air (non-essential) - Brine - Steam ⁽²⁾
<p>(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.</p>	

Type Approval documentation

Test report numbers: YNQ-19TML015, YNQ-19TML300, YNQ-19TML500, YNQ-19TMS015, YNQ-19TMS300 and YNQ-19TMS500 dated 2019-10-11

Drawing numbers: YM-0001-0, YM-0001-1 and YM-0001-2 dated 2019-05-21

Test reports KOMERI-07T185,186,187,188,189,190

Gasket datasheets:

- General purpose Silicone elastomer dated April 20, 2020
- Document no. 2003250001 - Data sheet for NBR dated 2020.03.25
- Data sheet – Black Viton Rubber
- Document no. 2004130001 - Data sheet for EPDM dated 2020.04.13

Drawing numbers YR-0003-0, YR-0003-1, YR-0003-2, YR-0004-0, YR-0004-1 and YR-0004-2 dated 2019.05.21

Test report numbers: YNQ-19THL015, YNQ-19THL0250 and YNQ-19THL500 witnessed by DNV dated 21-Oct-2019

Test report numbers: YNQ-19THS015, YNQ-19THS0250 and YNQ-19THS500 witnessed by DNV dated 21-Oct-2019

Test report numbers: YNQ-19THE015, YNQ-19TDE250 and YNQ-19TDE500 witnessed by DNV dated 21-Oct-2019

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.