Marine & Offshore

Certificate number: 09738/F0 BV
File number: ACM 135/2504/002
Product code: 2106H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

YOUNGNAM METAL CO., LTD.

Gimhae (Gyeongnam) - KOREA (REPUBLIC OF)

for the type of product

MECHANICAL JOINTS - SLIP-ON JOINTS - GRIP TYPE

GR-S (Grip Ring Type Standard),GR-L (Grip Ring Type Long), GR-S-FPC (Grip Ring Type Standard fire resistant), GR-L-FPC (Grip Ring Type Long fire resistant)

Requirements:
- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 08 May 2030

For Bureau Veritas Marine & Offshore,
At BV PUSAN, on 08 May 2025,
Seungbeom HONG

This certificate was created electronically and is valid without signature

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

GR-S (Grip Ring Type Standard), GR-L (Grip Ring Type Long), GR-S-FPC (Grip Ring Type Standard fire resistant), GR-L-FPC (Grip Ring Type Long fire resistant)

1.1 - Ratings:

Type	Dimension (mm)	Max. Working Pressure (bar)
GR-S / GR-S-FPC	DN 15 to DN 40	20
GR-L / GR-L-FPC	DN 15 to DN 40	20
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 50 & DN 65	18
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 80 & DN 100	16
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 125 & DN 150	12
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 200	7
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 250	7
GR-S / GR-L / GR-S-FPC / GR-L-FPC	DN 300	5
GR-S / GR-S-FPC	DN 350	5

Note: The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

Type of seal	Temperature range (°C)
EPDM	–20 / +100
NBR	–20 / +80
Viton	–20 / +200
Silicon	–60 / +200

1.2 - Materials:

Part	Material
Body	SUS 304 / SUS 316L
Seal	EPDM / NBR / SILICONE / VITON
Fire Protection Cover	SUS 304

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

- Dimension Sheet N° YG-0002-0 dated 21/05/2019 *"GR-S and GR-L types"*
- Dimension Sheet N° YG-0005-0 dated 22/10/2019 *"FPC (fire protection cover)"*
- Drawing N° YG-0002-1 Rev.0 dated 21/05/2019 *"Grip Ring Standard Type - Sizes 15A to 350A"*
- Drawing N° YG-0002-2 Rev.0 dated 21/05/2019 *"Grip Ring Long Type - Sizes 15A to 300A"*
- Drawing N° YG-0005-1 Rev.1 dated 26/09/2024 *"Grip Ring Standard Type (FPC) - Sizes 15A to 350A"*
- Drawing N° YG-0005-2 Rev.1 dated 26/09/2024 *"Grip Ring Long Type (FPC) - Sizes 15A to 300A"*
- Drawing N° YG-2024-08-14-0 Rev. 0 dated 14/08/2024 *"FPC (fire protect cover grip) - Sizes 15A to 350A"*
- Drawing N° YG-2023-11-21-3 Rev. 0 dated 21/11/2023 *"FPC (fire protect cover grip) - Sizes 15A to 300A"*
- Manual of installation of Connecting Couplings N° YNS-20250117-01 dated 17/01/2025
- Catalogue of Fire Protect Cover Rev. 17 dated 11/2023
- Clarification on fire tests conducted on FPC type provided by YOUNGNAM METAL's dated 20/01/2025 *Request for Addition of "Type Approval Certificate" Phrase*

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

3.1 - Initial test reports:

- Repeated assembly test, tightening test, burst test, vacuum test, pull-out test N° SE 08-0220-001 dated 20/02/2008 and N°YNF0805-04/0 dated 15/02/2008, vibration test dated 07/12/2007 and N° 08-2007-01223/01129/01148 dated 28/12/2008, pressure pulsation test dated 07/12/2007
- KOMERI Test report N°07T179/80/81/82/83/84 dated 03/03/2008: Tightness test, pressure pulsation test, burst pressure test, fire endurance test, vacuum test and repeated assembly test.

3.2 - Test reports (2014):

- Tightness test, pressure pulsation test, burst test, pull-out test, fire endurance test, vacuum test and repeated assembly test report N° YNT-14T001 to N° YNT-14T006 dated 08/04/2014.

- Vibration test report N° 2014-V-003 to N° 2014-V-008 dated 03/05/2014 & 04/05/2014.

- Specimens tested: GR-L DN 40, DN 100, DN 200 & GR-S DN 40, DN 100, DN 200.

3.3 - Type Approval Inspection and Test Plan dated 17/10/2019

3.4 - Test reports (2019):

- Tightness test, vibration test, pressure pulsation test, burst test, pull-out test, fire endurance test, vacuum test and repeated assembly test reports N° YNQ-19TGS015, N° YNQ-19TGS350, N° YNQ-19TGL015 and N° YNQ-19TGL300 dated 11/10/2019

Specimens tested: GR-S DN 15, GR-S DN 350, GR-L DN 015 and GR-L DN 300

4. APPLICATION / LIMITATION

4.1 - May be used on board for services of class II and class III piping systems:

4.1.1 - GR-S-FPC / GR-L-FPC (fire resistant tested under 30 min. wet conditions):

- **Flammable fluids (flash point ≤ 60°C)** - cargo oil (1), crude oil washing (1), vent lines (3)

- **Inert gas** - water seal/scrubber effluent lines, main lines (1+2), distributions lines (1)

- **Flammable fluids (flash point > 60°C)** - cargo oil (1), fuel oil (2), lubricating oil (2), hydraulic oil (2), thermal oil lines (2)

- **Sea water** – bilge lines (4), permanent water filled fire extinguishing systems, non-permanent water fire extinguishing systems (3), ballast system, cooling water, tank cleaning services, non-essential systems

- **Fresh water** - cooling water, condensate return, non-essential systems

- **Sanitary/Drains/Scuppers** - Deck drains (internal) (5), sanitary drains

- **Sounding and venting** - water tanks/dry spaces, oil tanks (flash point > 60°C) (2+3)

- **Miscellaneous** - service air (non-essential), brine, steam (6)

(1)- Not to be used in pump rooms and open decks.

(2)- Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery space provided the joints are located in easily visible and accessible positions (refer to IMO Circular MSC/Circ.734).

(3)- May be used only in cases where such mechanical joints are installed on open decks, as defined in NR 467 Pt C, Ch 4, Sec5, [1.4.3] item b) 2) (10) and not used for fuel oil lines. And corresponding requirements of NR 445.

(4)- Not to be used inside machinery spaces of category A.

(5)- Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

(6)- Slip types may be used for pipes on deck with a design pressure of 10 bar or less.

4.1.2 - GR-S / GR-L (non fire tested):

- **Flammable fluids (flash point ≤ 60°C)** - cargo oil (1), crude oil washing lines (1), vent lines (3)

- **Inert gas** - main lines (1+2), distributions lines (1)

- **Flammable fluids (flash point > 60°C)** - cargo oil (1), fuel oil (2+3), lubricating oil (2+3), hydraulic oil (2+3), thermal oil lines (2+3)

- **Sea water** – bilge lines (4), ballast system (4), cooling water system (4), permanent water filled fire extinguishing systems (3), non-permanent water fire extinguishing systems (3), tank cleaning services, non-essential systems

- **Fresh water** - cooling water (4), condensate return (4), non-essential systems

- **Sanitary/Drains/Scuppers** - Deck drains (internal) (5), sanitary drains

- **Sounding / Vent** - water tanks/dry spaces, oil tanks (flash point > 60°C) (2+3)

- **Miscellaneous** - service air (non-essential), brine, steam (6)

(1)- Not to be used in pump rooms and open decks.

(2)- Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery space provided the joints are located in easily visible and accessible positions (refer to IMO Circular MSC/Circ.734).

(3)- May be used only in cases where such mechanical joints are installed on open decks, as defined in NR 467 Pt C, Ch 4, Sec5, [1.4.3] item b) 2) (10) and not used for fuel oil lines. And corresponding requirements of NR 445

(4)- Not to be used inside machinery spaces of category A.

(5)- Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

(6)- Slip types may be used for pipes on deck with a design pressure of 10 bar or less.

4.2 - Not to be used for scuppers and discharge (overboard), starting/control air and CO2 system.

4.3 - In all cases the pipes are to be suitably supported and anchored. The joints are to be at any time accessible, excepting inside tanks where permitted by the Bureau Veritas rules.

4.4 - The couplings cannot be used on sea water or fresh water pipes passing through fuel oil or cargo tanks.

4.5 - The material of the internal sealing sleeve is to be suitable for the proposed medium. EPDM is not to be used for hydrocarbons applications.

4.6 - The wall thickness and the material of the tubes are to be in accordance with the applicable Society's Rules.

4.7 - The use of stainless steel is restricted according to Bureau Veritas Rules *NR 467, Pt C, Ch 1, Sec 10, Table 5.* and corresponding requirement in *NR 445*

5. PRODUCTION SURVEY REQUIREMENTS

5.1 - The products are to be supplied by **YOUNGNAM METAL CO., LTD.** in compliance with the type described in this certificate.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note *NR 320* and as such does not require a BV product certificate.

5.3 - **YOUNGNAM METAL CO., LTD.** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of *NR 320* for HBV products.

5.4 - For information, **YOUNGNAM METAL CO., LTD.** has declared to Bureau Veritas the following production site:

YOUNGNAM METAL CO., LTD.
12-3, Jillye-ro, 74 Beon-gil, Jillye,
Gimhae (Gyeongnam),
KOREA (REPUBLIC OF)

6. MARKING OF PRODUCT

The couplings shall be marked with at least:

- Manufacturer's name

-Type designation

- Size

7. OTHERS

It is **YOUNGNAM METAL CO., LTD.**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate N° 09738/E0 BV issued by the Society.

***** END OF CERTIFICATE *****

Marine & Offshore

Certificate number: 05755/H0 BV
File number: ACM 135/2504/001
Product code: 2107H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

YOUNGNAM METAL CO., LTD.

Gimhae (Gyeongnam) - KOREA (REPUBLIC OF)

for the type of product

MECHANICAL JOINTS - SLIP-ON JOINTS - SLIP TYPE

MF-RS, MF-RL (Multi Flex Round types)
RCH-S, RCH-L, RCH-E, RCD-E (Repair Clamps types)

Requirements:
- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate is a renewal of certificate N° 05755/G0 BV expiring on 16/04/2025

This certificate will expire on: 16 Apr 2030

For Bureau Veritas Marine & Offshore,
At BV PUSAN, on 01 Apr 2025,
Dong-hyok SHIN

This certificate was created electronically and is valid without signature

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Multi Flex Series:

- MF-RS (Standard Type)

- MF-RL (Long Type)

Repair Clamps Series:

- RCH-S (Hinge Standard Type)

- RCH-L (Hinge Long Type)

- RCH-E (Hinge Elbow Type)

- RCD-E (Double Lock Elbow Type)

1.1 - Ratings

Type	Pipe OD (mm)	Max. working pressure (bar)
MF- RS / MF-RL	21.7	20
MF- RS / MF-RL	27.2	20
MF- RS / MF-RL	34.0	20
MF- RS / MF-RL	42.7	20
MF- RS / MF-RL	48.6	20
MF- RS / MF-RL	60.5	18
MF- RS / MF-RL	76.3	18
MF- RS / MF-RL	89.1	16
MF- RS / MF-RL	114.3	16
MF- RS / MF-RL	139.8	14
MF- RS / MF-RL	165.2	14
MF- RS / MF-RL	216.3	10
MF- RS / MF-RL	267.4	10
MF- RS / MF-RL	318.5	8
MF- RS / MF-RL	355.6	8
MF- RS / MF-RL	406.4	5
MF- RS / MF-RL	457.2	5
MF- RS / MF-RL	508.0	4

Type	Pipe OD (mm)	Max. working pressure (bar)
RCH-S / RCH-L	21.7 / 27.2 / 34.0	14
RCH-S / RCH-L	42.7 / 48.6	12
RCH-S / RCH-L	60.5 / 76.3	10
RCH-S / RCH-L	89.1 / 114.3 / 139.8 / 165.2	8
RCH-S / RCH-L	216.3 / 267.4	7
RCH-S / RCH-L	318.5 / 355.6	6
RCH-S / RCH-L	406.4 / 457.2	4
RCH-S / RCH-L	508.0	3
RCH-E	21.7	11
RCH-E	27.2 / 34.0 / 42.7 / 48.6	8
RCH-E	60.5 / 76.3 / 89.1 / 114.3 / 139.8 / 165.2	7
RCD-E	216.3 / 267.4	6
RCD-E	318.5 / 355.6 / 406.4	5
RCD-E	457.2	4
RCD-E	508.0	3

Temperature range depending on seal material:

- For EPDM: -20°C to +100°C
- For NBR: -20°C to +80°C
- For VITON: -20°C to +200°C
- For SILICON: -60°C to +200°C

1.2 - Materials

Part	Material
Body	SUS 304 / SUS 316L
Seal	EPDM / NBR / VITON / SILICON

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

2.1 - For Multi Flex series:

- Drawing N° YM-0001-0 Rev.0 dated 21/05/2019: *Multi flex type - drawing & dimension sheet.*
- Drawing N° YM-0001-1 Rev.0 dated 21/05/2019: *MF-RS (Standard Type).*
- Drawing N° YM-0001-2 Rev.0 dated 21/05/2019: *MF-RL (Long Type).*

2.2 - For Repair Clamp series:

- Drawing N° YR-0003-0 Rev.0 dated 21/05/2019: *Repair clamp hinge standard type - drawing & dimension sheet.*
- Drawing N° YR-0003-1 Rev.0 dated 21/05/2019: *RCH-S (Hinge Standard Type).*
- Drawing N° YR-0003-2 Rev.0 dated 21/05/2019: *RCH-L (Hinge Long Type).*
- Drawing N° YR-0004-0 Rev.0 dated 21/05/2019: *Repair clamp hinge elbow type - drawing & dimension sheet.*
- Drawing N° YR-0004-1 Rev.0 dated 21/05/2019: *RCH-E (Hinge Elbow Type).*
- Drawing N° YR-0004-2 Rev.0 dated 21/05/2019: *RCD-E (Double Lock Elbow Type).*

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

3.1 - Initial test reports:

- Burst test, repeated assembly test, tightening test, vacuum test, pull-out test report N° YNF-0805-04/0 dated 15/02/2008 and report N° SE 08-0220-001 dated 20/02/2008.
- Pressure pulsation test dated 07/12/2007 /
- Vibration test N° 08-2007-01223/01129/01148 dated 28/12/2008
- Pull Out test N°SE 08-0220-001 dated 20/02/2008
- KOMERI Test report N°07T185/86/87/88/89/90 dated 03/03/2008: tightness test, pressure pulsation test, burst pressure test, fire endurance test: vacuum test and repeated assembly test

3.2 - 2014 Test reports:

Test report including tightness test, burst test, fire endurance test and vacuum test:

- Report N° YNT-14T007 to N° YNT-14T012 dated 08/04/2014.

Specimens tested: MF-RS DN 40, DN 100, DN 200 & MF-RL DN 40, DN 100, DN 200.

3.3 - Type Approval Inspection and Test Plan dated 17/10/2019.

3.4 - 2019 Test reports:

Test report including tightness test, burst test, vacuum.

- Report N° YNQ-19THS015, N° YNQ-19THS100 and N° YNQ-19THS500 dated 11/10/2019.

Specimens tested: RCH-S DN 15, RCH-S DN 100, RCH-S DN 500.

Test report including tightness test, burst test and a vacuum test.

- Report N° YNQ-19THL015, N° YNQ-19THL100 and N° YNQ-19THL500 dated 11/10/2019.

Specimens tested: RCH-L DN 15, RCH-L DN 100, RCH-L DN 500.

Test report including tightness test, burst test and a vacuum test.

- Report N° YNQ-19THE015 and N° YNQ-19THE100 dated 11/10/2019.

Specimens tested: RCH-E DN 15 and RCH-E DN 100.

Test report including tightness test, burst test and a vacuum test.

- Report N° YNQ-19TDE500

Specimen tested: RCD-E DN 500

3.5 - Types RCH-S, RCH-L, RCH-E and RCD-E have not been tested for fire resistance.

4. APPLICATION / LIMITATION

4.1 - May be used on board for services of class II and class III:

- **Flammable fluids (flash point ≤ 60°C)** - cargo oil (1), crude oil washing (1), vent lines (3)
- **Inert gas -** water seal/scrubber effluent lines, main lines (1+2), distributions lines (1)
- **Flammable fluids (flash point > 60°C)** - cargo oil (1), fuel oil (2), lubricating oil (2), hydraulic oil (2), thermal oil lines (2)
- **Sea water** – bilge lines (4), permanent water filled fire extinguishing systems, non-permanent water fire extinguishing systems (3), ballast system, cooling water, tank cleaning services, non-essential systems

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

- Sanitary/Drains/Scuppers - Deck drains (internal) (5), sanitary drains

- Sounding and venting - water tanks/dry spaces, oil tanks (flash point > 60°C) (2+3)

- Miscellaneous - service air (non-essential), brine, steam (6)

(1)- Not to be used in pump rooms and open decks.

(2)- Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery space provided the joints are located in easily visible and accessible positions (refer to IMO Circular MSC/Circ.734).

(3)- May be used only in cases where such mechanical joints are installed on open decks, as defined in Ch 4, Sec5, [1.4.3] item b) 2) (10) and not used for fuel oil lines.

(4)- Not to be used inside machinery spaces of category A.

(5)- Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

4.2 - Not to be used for:

- Sanitary/Drains/Scuppers - scuppers and discharge (overboard),

- Miscellaneous - starting/control air and CO2 systems.

4.3 - In all cases, the associated pipes are to be suitable supported and anchored. The joints are to be at any time accessible, excepting inside tanks where permitted by the Bureau Veritas Rules.

4.4 - Assembly instructions given by the manufacturer are to be complied with.

4.5 - The wall thickness and the material of the tubes are to be in accordance with the applicable Society Rules.

4.6 - The use of stainless steel is restricted according to Bureau Veritas Rules *NR467, Pt C, Ch 1, Sec 10, Table 5.*

4.7 - The packing material is to be compatible with the fluid to be conveyed and the maximum working temperature.

4.8 - The couplings cannot be used on sea water or fresh water pipes passing through fuel oil or cargo tanks.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 - The products are to be supplied by **YOUNGNAM METAL CO., LTD.** in compliance with the type described in this certificate.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note *NR 320* and as such does not require a BV product certificate.

5.3 - **YOUNGNAM METAL CO., LTD.** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of *NR320* for HBV products.

5.4 - For information, **YOUNGNAM METAL CO., LTD.** has declared to Bureau Veritas the following production site:

YOUNGNAM METAL CO., LTD.:

12-3, Jillye-ro, 74 Beon-gil, Jillye,

Gimhae (Gyeongnam),

KOREA (REPUBLIC OF)

6. MARKING OF PRODUCT

The couplings shall be marked with:

- Manufacturer 's name
- Type designation
- Maximum working pressure
- Size

7. OTHERS

It is **YOUNGNAM METAL CO., LTD.**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate N° 05755/G0 BV issued by the Society.

***** END OF CERTIFICATE *****