EUROPEAN UNION RECOGNISED ORGANISATION (EU RO) MUTUAL RECOGNITION TYPE APPROVAL CERTIFICATE

Certificate No:
MRP0000008

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

Young Nam Metal Co.,Ltd.

Gimhae-si, Gyeongsangnam-do, **Korea, Republic of**

for
Mechanical Joints

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

The product is found to comply with
EU RO Mutual Recognition Technical Requirements for Mechanical Joints

Intended service
See page 2

Type	Temperature range	Max. working press.	Sizes
GR-S	-50°C to 220°C (see page 3)	see page 3	DN15 to DN300 (see page 3)
FPC-GR-S	-30°C to 100°C (see page 3)	see page 3	DN15 to DN300 (see page 3)

This is to certify:

that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognised Organisation Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements.

This Certificate is valid until **2029-01-28**.

Issued at **Høvik** on **2024-01-29**

DNV local unit: **Gimhae Station**

Approval Engineer: **Maheshraja Venkatesan**

for **DNV**
Digitally signed by Bosman van der Merwe

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

Grip type slip-on mechanical joints of two designations of same design:

- GR-S (without fire protection cover)
- FPC-GR-S (with fire protection cover)

Material of construction:

Part	*Material grade*
Casing	SUS 304/316L
Grip ring	SUS 301
Insert ring and wire ring	SUS 304
Slide plate	SUS 304/316L
Rubber sealing	EPDM/ NBR/ SILICONE/ VITON
Bolting	SUS 304/316L
Fire protection cover	SUS 304

Manufactured by

YOUNG NAM METAL CO., LTD.,
Gimhae-si, Gyeongsangnam-do, Republic of Korea

Application/Limitation

Couplings covered by this certificate are approved to be used in class II and III piping systems according to the latest requirements of governing rules in following applications:

Systems		***Classification of Piping system***	**GR-S (non-fire-resistant type)**	**FPC-GR-S (fire resistant type) [8)]**
Flammable fluids (flash point ≤ 60 °C)				
1.	Cargo oil lines	dry	NP	NP
2.	Crude oil washing lines	dry	NP	NP
3.	Vent lines	dry	NP	NP
Inert gas				
4.	Water seal effluent lines	wet	+	+
5.	Scrubber effluent lines	wet	+	+
6.	Main lines	dry	NP	NP
7.	Distribution lines	dry	NP	NP
Flammable fluids (flash point > 60 °C)				
8.	Cargo oil lines	dry	NP	NP
9.	Fuel oil lines	wet	NP	+[2) 3)]
10.	Lubricating oil lines	wet	NP	+[2) 3)]
11.	Hydraulic oil	wet	NP	+[2) 3)]
12.	Thermal oil	wet	NP	+[2) 3)]
	Fresh water			
13.	Cooling water system	wet	NP	+[4)]
14.	Condensate return	wet	NP	+[4)]
15.	Non-essential systems	dry, dry/wet, wet	+	+
	Sanitary/drains/scuppers			
16.	Deck drains (internal)	dry	+[5)]	+[5)]
17.	Sanitary drains	dry	+	+
18.	Scuppers and discharge (overboard)	dry	NP	NP
	Sounding/vent			
19.	Water tanks/dry spaces	dry/wet	+	+
20.	Oil tanks (f.p > 60 °C)	dry	+[2) 3)]	+[2) 3)]
	Miscellaneous			
21.	Starting/control air	dry	NP	NP
22.	Service air (non essential)	dry	+	+
23.	Brine	wet	+	+

Systems		***Classification of Piping system***	**GR-S (non-fire-resistant type)**	**FPC-GR-S (fire resistant type) [8)]**
24.	CO_2 system (outside protected space)	dry	NP	NP
25.	CO_2 system (inside protected space)	dry	NP	NP
26.	Steam	wet	+[6)]	+[6)]

Abbreviations

+ Application permitted (with limitations, if any, as in the footnotes below)
NP Application not permitted

Footnotes

1) Not permitted when mechanical joints are installed in pump rooms and open decks.
2) Not permitted 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.
3) Not permitted 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.
4) Not permitted when mechanical joints are installed in machinery spaces of category A.
5) Permitted only above bulkhead deck of passenger ships and freeboard deck of cargo ships.
6) Permitted to be used for pipes on deck with a design pressure of 10 bar or less.
7) Pipe couplings made of austenitic stainless steel material grades covered by this certificate are not permitted to use in sea-water applications.
8) Only the FPC-GR-S type with EPDM and NBR sealings are considered as fire resistant types in 'wet' conditions.

Pressure ratings:

	Type GR-S		**Type FPC-GR-S**	
Size	**Model**	**design pressure (bar)**	**Model**	**design pressure (bar)**
½"	GR-S 15A	20	FPC-GR-S 15A	20
¾"	GR-S 20A	20	FPC-GR-S 20A	20
1"	GR-S 25A	20	FPC-GR-S 25A	20
1¼"	GR-S 32A	20	FPC-GR-S 32A	20
1½"	GR-S 40A	20	FPC-GR-S 40A	20
2"	GR-S 50A	18	FPC-GR-S 50A	18
2½"	GR-S 65A	18	FPC-GR-S 65A	18
3"	GR-S 80A	16	FPC-GR-S 80A	16
4"	GR-S 100A	16	FPC-GR-S 100A	16
5"	GR-S 125A	16	FPC-GR-S 125A	16
6"	GR-S 150A	16	FPC-GR-S 150A	16
8"	GR-S 200A	15	FPC-GR-S 200A	15
10"	GR-S 250A	11	FPC-GR-S 250A	11
12"	GR-S 300A	8	FPC-GR-S 300A	8

Temperature ratings:

Seal material	**Design temperature range**
EPDM	-30°C to +100°C
NBR	-20°C to +80°C
VITON	-30°C to +220°C
SILICONE	-50°C to +190°C

Materials chosen for the specific system shall be suitable for the intended medium and environmental conditions. Couplings with EPDM sealings shall not be used in hydrocarbon applications.

At elevated temperatures, the maximum working pressure should be reduced with the following factors:

Temperature (°C)	20	50	100	120	150	200	220
Stainless Steel	1	0.95	0.85	0.81	0.77	0.71	0.69

The approval is only valid when the couplings are assembled with tubing of correct temperature and tolerances as recommended by the manufacturer.

Type Approval documentation

Name	Number	Date
FPC (Fire protection cover) GR-S (Grip ring standard): part list (FPC-GR-S)	YG-0007-2 Rev.0	2022.11.22
FPC (Fire protection cover) - out drawings & dimension sheet	YG-0007-3 Rev.0	2022.11.22
Grip ring type standard type coupling - out drawings & dimension sheet (GR-S)	YG-00007-0 Rev. 1	2022.08.18
GR-S (Grip ring standard): part list	YG-00007-1 Rev. 2	2023.05.11
GR-S Type Fire Protection Cover – out drawing & Dimension sheet	YG-2023-11-21-0 Rev. 1	2023.11.21
Youngnam Metal Co., Ltd. EU RO MR Type approval test reports	YNQ-22TGS150	Test date: 27-SEP-2022 to 18-NOV-2022
	YNQ-22TGS150-1	
	YNQ-22TGS300	
	YNQ-22TGS300-1	
Youngnam Metal Co., Ltd. Type approval test reports from DNV certificate TAP0000204	YNQ-19TGS015	11-Oct-2019
Vibration test report GR-s 150A	GNTP-RVT22-009	2022-11-25
Vibration test report GR-S 300A	GNTP-RVT22-010	2022-11-25
Type test reports for GR-S (40A) – Fire endurance test	YNT-14T001	April 08, 2014
Type test reports for GR-S (100A) – Fire endurance test	YNT-14T003	April 08, 2014
Datasheet: General purpose Silicone elastomer	-	April 20, 2020
Data sheet for NBR	2003250001	2020.03.25
Data sheet – Black Viton Rubber	-	-
Data sheet for EPDM	2004130001	2020.04.13

Tests carried out

Burst pressure test, Vibration test, Pressure pulsation test, Fire test in ‘wet’ conditions, Vacuum test, Pull-out test, Tightness test, Repeated assembly test

Marking of product

For traceability to this Type Approval each mechanical joint is to be marked at least with the following particulars:

- 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 every year to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.

Generic Statement for EU RO MR Type Approval Certificate

When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- American Bureau of Shipping (ABS);
- Bureau Veritas (BV);
- China Classification Society (CCS);
- Croatian Register of Shipping (CRS);
- DNV;
- Indian Register of Shipping (IRS);
- Korean Register (KR);
- Lloyd's Register Group Ltd. (LR);
- Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);
- Polish Register of Shipping (PRS);
- RINA Services S.p.A. (RINA);
- Russian Maritime Register of Shipping (RS).

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).