

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Expansion Joint for Pipe, Slide Type and Flexible Type**with type designation(s)
Sliding and Flange adapter type

Issued to

Se-Won Ind. Co., Ltd.
Haman-gun, Gyeongsangnam-do, Republic of Korea

is found to comply with

DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**Application :****Products approved by this certificate are accepted for installation on vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
Sliding and Flange adapter type	Depending on material and gasket, see certificate.	16 bar	DN40/50/65/80/100/125/150/200/250/300/350/400/450/500/550/600/650/700/750/800/850
Sliding and Flange adapter type	Depending on material and gasket, see certificate.	10 bar	DN900

Issued at **Høvik** on **2018-08-22**This Certificate is valid until **2023-06-30**.for **DNV GL**DNV GL local station: **Gimhae Station**Approval Engineer: **Morten Engnestangen**

Marianne Spæren Marveng
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.



Product description

Materials:

Middle ring and Follower : FCD450 according to JIS G5502 / SUS304 / SUS316 / SUS316L
Stop Bolt, Washer, bolt & Nut : SS400 / SUS316 / SUS316L
Gasket : NBR, CR, PTFE (Teflon) or FKM (Viton)

Joints with Viton gaskets are considered fire resistant type. Joints with NBR, CR and Teflon gaskets are not fire endurance tested and are not considered fire resistant types.

Application/Limitation

The joints can be used in class II and III piping systems for the following systems according to DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 12:

Joints are approved for use in following systems:

Systems		Limitations/Notes
Flammable fluids (Flash point ≤ 60 °C)		
1	Cargo oil lines	4
2	Crude oil washing lines	4
3	Vent lines	3
Inert gas		
4	Water seal effluent lines	
5	Scrubber effluent lines	
6	Main lines	2,4
7	Distribution lines	4
Flammable fluids (Flash point > 60°C)		
8	Cargo oil lines	4
9	Fuel oil lines	2,3
10	Lubrication oil lines	2,3
11	Hydraulic oil	2,3
12	Thermal oil	2,3
Sea Water		
13	Bilge lines	1
14	Water filled fire extinguishing systems, e.g. sprinkler systems	3
15	Non water filled fire extinguishing systems, e.g. foam, drencher systems	3
16	Fire main (not permanently Filled)	3
17	Ballast system	1
18	Cooling water system	1
19	Tank cleaning services	
20	Non-essential systems	
Fresh water		
21	Cooling water system	1
22	Condensate return	1
23	Non-essential system	
Sanitary/Drains/Scuppers		
24	Deck drains (internal)	6
25	Sanitary drains	
Sounding/ vent		
27	Water tanks/Dry spaces	
28	Oil tanks (flash point > 60°C)	2,3
Miscellaneous		
30	Service air (non-essential)	
31	Brine	
33	Steam	5

Limitations/notes, relevant for non-fire resistant types:

- 1) Inside machinery space of category A – only approved fire resistant types
- 2) 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.

- 3) 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(10) and not used for fuel oil lines.
4) Only in pump rooms and open decks – only approved fire resistant types

Limitations/notes, general:

- 5) May be used for pipes on deck with design pressure 10 bar or less.
6) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

In seawater applications the used materials shall be properly protected.

Austenitic stainless steels are not approved for seawater application. In seawater applications austenitic stainless steels shall be properly protected. Surface preparation and coating shall be approved by society.

Nodular cast iron of the ferritic/pearlitic and pearlitic type (i.e. material FCD450) are subject to the following limitations:

- Shall not be used for piping subject to pressure shock, excessive strains and vibration.
- Shall not be used for class II piping with the following exceptions:
 - Components in hydraulic piping systems where failure would not render the system inoperative or introduce a fire risk.
- May be used for class III piping, with the following exceptions:
 - Installed to pipes fitted on ship sides and bottom and on sea chests.
- Minimum working temperature is 0 °C.

Slip-on joints are not to be used in pipelines in cargo holds, tanks, and other spaces which are not easily accessible. Application of these joints inside tanks for the same media that is in the tanks shall be approved by DNV GL in each case.

Maximum working temperatures couplings with the following gasket materials:

Sealing material	Minimum	Maximum
NBR	-25 °C	100 °C
CR	-20 °C	100 °C
PTFE (TEFLON)	-60 °C	190 °C
FKM (VITON)	-20 °C	200 °C

Type Approval documentation

Tests carried out

Tightness, Burst pressure, Fire test, Vacuum test

Marking of product

For traceability to this type approval, each product is at least to be marked clearly with:

- Manufacturer's name or trademark
- Type designation

The identification marking shall be located in low stressed areas.

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.