

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)

EU, EBU, EBUW, EUR, EL, EBL, ET, ETR, EX, ELM-R/MK, EMC-N, EMC-R, EMC-GB, EMC-MK, EMC-MB, EMC-GE, EMC-ME, EMC-UF/MF, EFC-G/M, EFC-GG, EGA-GG, EAS, ELA, EBTA, ERTA, ER, EKOR, EA-GE/ME

Issued to

HSME Corporation**Busan, 11, 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.****Temperature range: -60° C to 400° C (See certificate)****Max. working press.: 100 to 630 bar (See certificate)****Sizes: Tube OD 4 to 42 mm**Issued at **Høvik** on **2018-08-14**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

Cutting ring pipe couplings acc. to DIN 2353. O-ring on ends of some types.

Materials:

Stainless steel ASTM A276 316 / ASTM A182 F316

Design temperature range:

-60° C to 400° C

Designation	Description
EU	Straight Union
EBU	Bulkhead Union
EBUW	Weld Bulkhead Union
EUR	Reducing Union
EL	Union Elbow
EBL	Bulkhead Union Elbow
ET	Union Tee
ETR	Reducing Tee
EX	Union Cross
ELM-R	Male Elbow
ELM-MK	Male elbow
EMC-N	Male Connector (NPT Thread)
EMC-R	Male Connector(BSPT Thread)
EMC-GB	Male Connector(BSPP Parallel)
EMC-MK	Male Connector(Metric Tapered)
EMC-MB	Male Connector(Metric Parallel)
EMC-GE	Male Connector(BSPP Parallel)
EMC-ME	Male Connector(Metric Parallel)
EMC-UF	Male Connector(Unified Parallel)
EMC-MF	Male Connector(Metric Parallel)
EFC-G	Female Connector(BSPP Parallel)
EFC-M	Female Connector(Metric Parallel)
EFC-GG	Female Connector(BSPP Parallel)
EGA-GG	Standpipe Female Connector(BSPP Parallel)
EAS	Weld Connector
ELA	Adjustable Standpipe Elbow
EBTA	Adjustable Standpipe Branch Tee
ERTA	Adjustable Standpipe Run Tee
ER	Reducer
EKOR	Adjustable Standpipe Reducer
EA-GE	Adjustable Standpipe Male Adapter(BSPP Parallel)
EA-ME	Adjustable Standpipe Male Adapter(Metric Parallel)

Application/Limitation

Normal working pressures defined at 20°C:

Table 1: Pressure rating, general.

Product line	Tube O.D. (mm)	Pressure (Bar)
LL	4 - 12	100
L	6 - 18 22 - 42	315 160
S	6 - 14 16 - 30 38	630 400 315

Table 2: Rating for EMC-R, EMC-MK, EMC-MB

Product line	Tube O.D. (mm)	Pressure (Bar)
LL	4 - 12	100
L	6 - 18 22 - 42	315 160
S	6 - 14 16 - 25 30 - 38	630 400 250

At elevated temperatures, the maximum pressures are to be reduced according to following:

Temperature °C	20	50	100	150	200	250	300	400
Stainless steels	1,00	0,95	0,85	0,77	0,71	0,67	0,63	0,60

Working temperature range of couplings with sealing material is depending on sealing ring materials:

FKM: -20 to 200°C
PTFE (Teflon): -60 to 190°C
NBR -25 to 100°C

Couplings may be used for the following systems:

Systems	Steel only coupling (Without o-ring)	Couplings with o-ring
Flammable fluids:		
- Hydraulic oil	Allowed	May be used only on exposed deck*
- Lubrication oil	Allowed	May be used only on exposed deck *
- Fuel oil	Allowed	Not allowed
- Thermal oil	Allowed	May be used only on exposed deck*
Compressed air:		
- Starting/Control air	Allowed	Not permitted inside machinery space of category A, for systems serving main function** or when function is required by statutory requirements or guidelines.
- Service air (non-essential)	Allowed	Allowed
Steam	Allowed	Allowed
Fresh water:		
- Cooling water system	Allowed	Not permitted inside machinery space of category A, for systems serving main function** or when function is required by statutory requirements or guidelines.
- Condensate return	Allowed	Not permitted inside machinery space of category A, for systems serving main function** or when function is required by statutory requirements or guidelines.
- Non-essential system	Allowed	Allowed
Sanitary	Allowed	Allowed

* As defined in SOLAS II-2 Reg.9.2.3.3.2.2(10).

** Refer DNVGL-RU-SHIP Pt.1 Ch.1 Sec.1 [1.2] Definitions.

Couplings are not approved for use in systems exposed to vacuum.

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

Threaded connections where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized national or international standard with considering below limitations:

- Comply with requirements of a recognized national or international standard.
- Shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
- In CO₂ systems shall be allowed only inside protected spaces and in CO₂ cylinder rooms.
- Tapered threads may be used in class I piping systems when outside diameter is not greater than 33.7 mm

Parallel threads may be used only for class III piping systems.

No product certificate will be required.

Type Approval documentation

Tests carried out

Leakage test, repeated assembly test, burst pressure test, pullout test, vibration test, pressure pulsation test.

Marking of product

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

- Manufacturer's trade mark
- Type designation
- Size

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.