
**Ships and marine technology — Gasketed
mechanical couplings for use in piping
systems — Performance specification**

*Navires et technologie maritime — Accouplements mécaniques avec
joints pour systèmes de tuyauteries — Spécification des performances*



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Foreword

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Ships and marine technology — Gasketed mechanical couplings for use in piping systems — Performance specification

1 Scope

This International Standard provides the performance characteristics and qualification tests required for gasketed mechanical couplings, including grooved-type mechanical couplings for grooved-end pipe, mechanical restraint couplings for plain-end pipe and mechanical compression couplings for plain-end pipe. These couplings are for use at temperatures within the recommended temperature range of their respective gaskets.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

class

differentiates joint characteristics such as rigid, flexible, restrained and unrestrained

2.2

failure

any leakage or joint separation, unless otherwise determined to be due to a pipe or fitting defect

2.3

fitting

a device used to change pipe direction, size or adapt to other joining methods

NOTE This device is used with pipe or other fittings to create a working system. Shapes such as elbows, tees, crosses, reducers and special shapes are used as needed to fulfil system design specifications.

2.4

flexible

characteristic of a joint wherein there is available limited angular and axial pipe movement

2.5

gasketed mechanical coupling

GMC

a device used to join pipe-to-pipe, pipe-to-fitting, or fitting-to-fitting wherein an elastomeric (gasket) is used to seal the joint

NOTE A coupling may or may not provide mechanical restraint of the pipe or fitting.

2.6

working pressure grade

joint working pressure as established by tests using representative pipe or tube and the gasketed mechanical coupling (GMC)

2.7

grooved mechanical coupling (Type 1)

a device which consists of two or more housings, closure members such as sets of bolts and nuts or pins, and a pressure-responsive gasket

NOTE It is used to mechanically join and seal grooved pipe and/or fittings, forming a joint.

See Figure 1.

2.8

grooved mechanical coupling housing

structural parts of a grooved mechanical coupling which mechanically fit into pipe or fitting grooves providing mechanical pipe or fitting restraint and enclosure of the gasket

2.9

plain-end mechanical coupling

plain-end GMCs consisting of Type II Classes 1, 2 and 3

2.9.1

Type II Classes 1 and 2

device consisting of gasket(s), housing(s), sleeve(s), end rings, threaded fasteners, pipe or fitting anchoring (gripping) features and seal retainers as applicable

NOTE These devices are used to create a seal and restrain plain-end pipe or fittings. See Figures 2 and 3.

2.9.2

Type II Class 3

device consisting of gasket(s), housing(s), sleeve, end rings and threaded fasteners as applicable

NOTE Tightening of the fasteners compresses the gasket(s), creating a seal on the outside of the plain-end pipe. See Figure 4.

2.10

joint

interface formed between pipe and pipe, pipe and fitting, or fitting and fitting where a GMC is used to seal this interface within a specified working pressure and, where applicable, provide mechanical holding strength

2.11

joint pressure rating

working pressure for the joint on the pipe or fitting material and thickness to be used in the actual piping application

2.12

leakage

escape of fluid (gaseous or liquid) from any point of the specimen

2.13

penalty run

a penalty run is performed with penalty-run specimens when the original test specimen leaks or separates during testing as a result of any cause which is not related to the design of the GMC being qualified

2.14

penalty-run specimens

additional specimen(s) which are tested in the place of the original specimen(s)

NOTE These additional specimen(s) are assembled using the same methods, along with additional GMCs of the same type, working pressure, class and configuration; and additional pipes or fittings with the same sizes, nominal wall thickness, material and material condition as the original test specimen.

2.15

pressure-responsive gasket

gasket design such that application of a pressure load to the gasket enhances its sealing capabilities; that is, additional pressure results in additional force between the gasket and the surface which it is sealing

2.16**restrained**

characteristic of the joint wherein thrust loads generated by internal pressure or external means are absorbed within the joint

2.17**rigid**

characteristic of a joint where there is essentially no available free angular or axial pipe movement

2.18**specimen**

a prepared assembly consisting of the test joint including a GMC and pipes or fittings

NOTE The specimen is placed in a controlled environment and tested to determine if the joint performs according to the standards established by the test.

2.19**type**

differentiation of kind of pipe or fitting which gasketed mechanical couplings are used to join (that is, grooved or plain end)

2.20**unrestrained**

characteristic of a joint wherein thrust generated by internal pressure or external means is not absorbed by the joint

2.21**size**

dimensions of the piping system or component, primarily nominal diameter and wall thickness

2.22**life cycle**

complete series and stages of events in the development and manufacture of a product, from the initial conceptualization through to production, modifications and maintenance

3 Classification**3.1 Design types**

Gasketed mechanical couplings (GMCs) are classified into the following design types:

- Type I, grooved mechanical couplings;
- Type II, plain-end mechanical couplings.

3.2 Working pressures

Gasketed mechanical couplings (GMCs) are classified into various working pressures, or grades, based on successful completion of testing defined herein. Working pressures range from approximately 0,7 MPa to 30 MPa and vary by GMC manufacturer. The GMC manufacturer should be consulted for specific working pressures available.

3.3 Joint characteristics

Gasketed mechanical couplings (GMCs) are classified by the following joint characteristics:

- Class 1: rigid and restrained;
- Class 2: flexible and restrained;
- Class 3: flexible and unrestrained.

4 Ordering information

Orders for GMCs (Gasketed Mechanical Couplings) in accordance with this International Standard shall include the following characteristics:

- quantity (number of gasketed mechanical couplings);
- size;
- type (I, II);
- working pressure (consult GMC manufacturer);
- class (joint characteristic);
- housing material and finish;
- gasket material, including operating temperature limitations;
- bolt (stud) and nut material and finish;
- other requirements agreed to between purchaser and GMC manufacturer.

5 Materials

The materials used for construction of GMCs shall be as agreed upon by the manufacturer and the purchaser, provided that such materials have been used to qualify the joint's performance in accordance with this International Standard.

6 Workmanship, finish and appearance

6.1 GMC machined surfaces

Machined surfaces shall be free from burrs, cracks, laps and seams which would affect the suitability for the intended service. Machined surface finishes shall be as specified by the manufacturer.

6.2 Unmachined surfaces

Unmachined surfaces, such as forging or casting surfaces, shall be free from scale, blisters, fins, folds, seams, laps, segregations and cracks which would affect suitability for the intended service.

7 Other requirements

7.1 Testing requirements

GMCs shall be subjected to the tests described in Annex A for the purpose of qualifying the GMC design. These tests shall be repeated when changes are made in the design, material, or manufacturing process that degrade the performance of the GMC. Degradation determination is to be made by the manufacturer or upon agreement between the manufacturer and purchaser.