

GP 04-04-03	Marine Fender System	July 2001
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Marine Fender System

GP 04-04-03

Scope

- 1) [I] This Global Practice (GP) covers the design, construction and testing of fender systems for mounting on conventional marine facility berths. It does not cover fender systems based on a flexible pile design or flexible dolphin design that depends on the deflection of piles to absorb part of a berthing vessel's impact energy.
- 2) [I] An asterisk (*) indicates that a decision by Purchaser is required, or that additional information shall be furnished by Purchaser.

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1. Required References

[I] This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition.

* [I] Vendor shall comply with any local rules or regulations specified by Purchaser.

1.1. Global Practices–ExxonMobil Engineering Practices

GP 04-01-03	Design Loads for Structures
GP 04-04-01	Marine Piers and Mooring Facilities
GP 19-01-01	Paint and Protective Coatings
GP 20-01-01	Inspection of Equipment and Materials
GP 20-01-02	Administrative Procedures for Obtaining Inspection

1.2. ASTM–American Society for Testing and Materials

ASTM A 123/A 123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
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1.3. AWS–American Welding Society

AWS D1.1/D1.1M	Structural Welding Code - Steel
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2. Vendor Documentation

- 1) * [I] The bidder's proposal shall include the following information:
 - a) Total equipment list (within Vendor scope of supply), with description of each item.
 - b) Materials of construction including specifications and grades.
 - c) Complete calculations of:
 - i) Mounting Structure load capacity (unless specified by Purchaser)
 - ii) Berthing impact energy of design vessel (unless specified by Purchaser)
 - iii) Horizontal and vertical loads to vessel berthing
 - iv) Deadweight load of fender system on support system
 - v) Maximum reaction forces imparted to mounting structure for design impact energy
 - vi) Shear and tension capacities of fender support system
 - vii) Fender spacing (unless specified by Purchaser)
 - d) Component drawings.

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- e) Description of any modifications required to the existing dock structure in order to mount the fender system.
- f) Price list for spare parts and list of recommended spares and special maintenance tools for first two years of service.
- g) A schedule of documentation submission for approval by the Owner's Engineer prior to contract award.
- h) A list of exceptions to this Practice, including detailed explanations of reasons for the exceptions and proposed alternatives. If there are no exceptions, a statement to this effect shall be included.
- i) A list of all sub-contractors and a description of work that they shall be performing.
- j) Inspection Plan covering materials, fabrication and testing quality control and assurance for all components.

3. Materials (Corrosion Protection)

- 1) [M] All hardware (e.g., bolts, brackets, bars, chains) shall be galvanized in accordance with ASTM A 123/A 123M.
- 2) [M] All other ferrous metal surfaces shall be protected in accordance with [GP 19-01-01](#) Service Category II (Marine Atmosphere).

4. Design

- 1) * [O] Purchaser shall specify the maximum and minimum design vessel characteristics including:
 - a) Maximum and minimum "Vessel Size" (DWT or M³ Length Overall, Displacement, Draft, and Molded Depth).
 - b) Maximum and minimum "Length of Parallel Sides" (for use in calculating fender spacing).
 - c) Design berthing velocity (perpendicular to berthing line).
 - d) Vessel Design Impact Energy calculated in accordance with the procedure specified in Appendix A.
- 2) * [O] Purchaser shall provide appropriate berth characteristics to allow Vendor to design the fender system including:
 - a) Structural drawings.
 - b) High, mean, and low water levels referenced to berth deck elevation.
- 3) [O] The fender system shall be capable of accommodating the full range of design vessels at all specified water levels.
- 4) [O], [R] Design impact energy shall be absorbed within the rated energy capacity of the fenders.
- 5) [O], [R] Vessels shall be assumed to approach at angles up to 10 degrees for tankers and 15 degrees for coasters and barges.

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