

INCH-POUND

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 SUPERSEDING
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MILITARY SPECIFICATION
COUPLING HALVES, QUICK-DISCONNECT,
CAM-LOCKING TYPE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers cam-locking type, quick-disconnect coupling halves.

1.2 Classification. Coupling halves and accessories shall be furnished in the types, classes, and sizes designated by the applicable MS or other engineering standard drawings approved by the contracting activity (see 6.2).

1.2.1 Types. Following are types of cam-locking, quick disconnect coupling halves and accessories.

Type I	- Male, Internal Pipe Thread.	- MS27020
Type II	- Male, Hose Shank.	- MS27021
Type III	- Male, External Pipe Thread.	- MS27022
Type IV	- Male, Flanged.	- MS27023
Type V	- Female, Internal Pipe Thread.	- MS27024
Type VI	- Female, Hose Shank.	- MS27025

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: SATBE-TSE, Fort Belvoir, VA 22060-5606 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

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Type VII	- Female, External Pipe Thread.	- MS27026
Type VIII	- Female, Flanged, Circular.	- MS27027
Type VIII A	- Female, Flanged, Hexagon (for D-1 Nozzle-Aircraft).	- MS70091
Type IX	- Cap, Dust.	- MS27028
Type X	- Plug, Dust.	- MS27029
Type XI	- Reducer, Male by Female and Female by Male.	- MS49000
Type XII	- Reducer, Male Cam-Locking by External Pipe Thread.	- MS49001
Type XIII	- Reducer, External Pipe Thread by Female Cam-Locking.	- MS49002
Type XV	- Adapter, 45 Degree-Swivel Collar, Male Cam-Locking (Tank Car).	- MS70088
Type XVI	- Adapter, Female, Cam-Locking to External Straight Threads, (for Use With NATO Equipment).	- MS70096
Type XVII	- Adapter, Male, Cam-Locking to Internal Straight Threads, (for Use With NATO Equipment).	- MS70095
Type XVIII	- Reducer, Female Cam-Locking by Internal Pipe Thread.	- MS70097
Type XIX	- Adapter, Nipple, Male Cam-Locking by External Grooved Pipe.	- MS70100
Type XX	- Y Connection, Quick-Disconnect, Male Cam-Locking to Flange.	- MS39336
Type XXI	- Adapter, Male by Male, Cam- Locking Type.	- MS39352

1.2.2 Classes. Cam-locking, quick-disconnect coupling halves shall be of following classes:

Class 1	- Aluminum Alloy.
Class 2	- Copper Alloy (Brass or Bronze).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

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SPECIFICATIONS

FEDERAL

- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
 PPP-B-636 - Boxes, Shipping, Fiberboard.

MILITARY

- MIL-H-775 - Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing) and Associated Hardware: Packaging of.

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
 MIL-STD-129 - Marking for Shipment and Storage.
 MS27019 - Coupling Assembly, Quick Disconnect, Cam-Locking Type.

(See supplement 1 for list of associated standards.)

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The coupling halves, quick-disconnect, cam-locking type (hereinafter called "coupling(s)") shall be in accordance with military standards as applicable, and shall consist of coupling body, wire rings, cam arms, cam pins, and gasket(s), as specified herein.

3.2 First article. Unless otherwise specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Materials. Materials shall be as specified herein and as shown on the applicable standards (see 1.2.1).

3.3.1 Identification of materials and finishes. The contractor shall identify the specific material, material finish, or treatment for use with

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component and subcomponent and shall make information available upon request to the contracting officer or designated representative.

3.4 Construction.

3.4.1 Male couplings. Male couplings shall be fabricated to the dimensions and tolerances specified on MS27019 and the applicable standards (see 1.2.1). After fabrication, male couplings shall not leak or distort when hydrostatically tested as specified herein and on the applicable standards (see 1.2.1).

3.4.2 Female couplings. Female couplings shall mate with the male coupling as specified in MS27019. Emphasis shall be placed on tolerances to eliminate interchangeability problems among different manufacturing facilities. The torque required to completely close each cam arm and amount of gasket compression shall be in accordance with the values specified in table I. Female couplings, complete with gaskets, shall not leak or distort and the cam arms shall not visually show movement toward the unlocking direction when hydrostatically tested as specified herein and on the applicable standards (see 1.2.1).

TABLE I. Torque values.

Coupling size (inch)	Maximum allowable torque-to-close (inch-pound)	Minimum gasket compression (inch)
1/2 and 3/4	60	0.030
1	70	0.030
1-1/4 to 2-1/2	100	0.030
3	120	0.025
4	150	0.025
6	200	0.025

3.5 Safety. Unless otherwise specified herein and on the applicable standards (see 1.2.1), nonfunctional sharp edges, projecting points, and excessive length of fastening devices shall be avoided.

3.6 Identification marking. The couplings shall be legibly marked by either casting, die-stamping, embossing, or stenciling. On the small size fittings, the couplings can be marked by attaching an aluminum tag. The marking shall include the symbol MS, standard number and dash number, the manufacturer's identification, and size.

3.7 Interchangeability and performance. All parts having the same part number of any single type, size, and class coupling shall be functionally and dimensionally interchangeable. Interchangeable parts are defined as two or more like parts possessing such functional and physical characteristics as to be equivalent in performance and durability, and capable of being exchanged one for

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the other without alteration of the parts themselves or of adjoining parts, except for adjustment, and without selection for fit or performance. When operated with the mating part, there shall be no leakage at the stated working pressure.

3.8 Finish. Class 1 (aluminum alloy) and class 2 (copper alloy) couplings shall be finished as specified on the applicable standards (see 1.2.1).

3.9 Workmanship. All parts, components, and assemblies of the couplings, including castings, forgings, stampings, and machined surfaces, shall be clean and free from sand, dirt, pits, sprues, scale, and other harmful extraneous material. External surfaces shall be free from burrs, sharp edges, and corners, except where sharp edges and corners are required and are not detrimental to safety. Suitable jigs and fixtures shall be used to maintain alignment and tolerance for driving the cam pins.

3.9.1 Castings. Castings shall be sound and free from blowholes, patching, misplaced coring, warping, and any other defects which might render the castings unsound or unsuitable for their intended use.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

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- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Examination. The first article couplings shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 First article tests. The first article shall be tested as specified in 4.5.2 as applicable. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination shall be in accordance with MIL-STD-105. Sample size shall be determined by using MIL-STD-105, table I and table IIa. A lot shall be rejected when one or more defects are found.

4.4.2 Examination. Samples selected in accordance with 4.4.1 shall be examined for the defects specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.4.3 Tests. Samples selected as specified in 4.4.1 shall be tested as specified in 4.5.2 through 4.5.2.2. Failure of any test shall be cause for rejection.

4.5 Inspection procedure.

4.5.1 Examination. The couplings shall be examined as specified herein for the following defects:

Major

101. Material not as specified (see 3.3).
102. Contractor does not have documentation available for identification of material, material finishes, or treatments (see 3.3.1).
103. Dimensions and tolerances not as specified (see 3.4).
104. Safety features not as specified (see 3.5).
105. Identification marking missing or illegible (see 3.6).
106. Coupling halves not interchangeable as specified (see 3.7).
107. Finishes not as specified (see 3.8).
108. Workmanship not as specified (see 3.9).
109. Casting not free from blowholes or unsuitable for intended use (see 3.9.1).

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4.5.2 Tests.

4.5.2.1 Closing torque and gasket compression test procedure, female couplings. The female coupling shall be washed of any residual lubricant and dried prior to being coupled with the male coupling randomly selected by the Government. The coupling and measurement of coupling action and gasket compression shall be as follows:

- a. After insertion of the male coupling half into the female coupling to the maximum penetration without using the cam arms or any other gasket compression force, measurement shall be made of the distance from the outside end of the male coupling half to the insertion end of the female coupling at three points spaced equidistant around the face circumference. The average closing distance shall be computed to the nearest thousandth of an inch.
- b. After insertion to the maximum penetration, each female coupling cam arm shall be subjected to a closing torque. This closing torque shall be applied simultaneously to each cam arm and shall be sufficient to completely close the female coupling over the male coupling half. Measure the maximum closing torque during the closing movement of each cam arm. Closing torque in excess of the maximum allowable torque specified in table I shall constitute failure of this test. When the cam arms are completely closed, measurement shall be made to compute the amount of gasket compression. Nonconformance to the value of gasket compression required in table I shall constitute failure of this test.

4.5.2.2 Hydrostatic. The male and female coupling shall be subjected to an internal hydrostatic pressure as specified on the applicable standards using appropriate caps or other fixtures. The hydrostatic pressure shall be sustained for not less than 1 minute. Gaskets shall be in place during testing of female couplings. The fluid used for the test shall be distinctly dyed to facilitate visual examination for leakage. Evidence of leakage, distortion, or movement of cam arms shall constitute failure of this test.

4.6 Inspection of packaging.

4.6.1 Military. Preservation, packing, and marking for military levels of protection shall be examined to determine compliance with the quality assurance provisions of MIL-H-775.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or level C, as specified (see 6.2).

5.1.1 Level A. Couplings shall be preserved in accordance with the level A preservation requirements of MIL-H-775.

5.1.2 Level C. Couplings shall be preserved in accordance with the level C requirements of MIL-H-775.

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5.2 Packing. Packing shall be level A, level B, or level C, as specified (see 6.2).

5.2.1 Level A. Couplings, preserved as specified in 5.1, shall be packed in accordance with the level A packing requirements of MIL-H-775. Overseas type boxes conforming to PPP-B-601 shall be used whenever necessary.

5.2.2 Level B. Couplings, preserved as specified in 5.1, shall be packed in accordance with the level B packing requirements of MIL-H-775. Closure of fiberboard boxes for level B packing shall be in accordance with method V closure requirements of PPP-B-636.

5.2.3 Level C. Couplings, preserved as specified in 5.1, shall be packed in accordance with level C requirements of MIL-H-775.

5.3 Marking. In addition to any special marking specified in the contract or purchase order, marking shall be in accordance with MIL-STD-129.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The quick-disconnect couplings and accessories covered by this specification are primarily used in suction hose, discharge hose, and nozzles for various fittings or manifolds for handling of liquid petroleum products.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2)
- c. Part or identifying number required (see 1.2 and applicable MS).
- d. When a first article test is required (see 3.2).
- e. Level of preservation and packing required (see 5.1 and 5.2).

6.3 First article. When first article inspection is required, the coupling(s) should be a preproduction model. The first article shall consist of one or more units. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results and disposition of the first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not

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submit alternate bids unless specifically requested to do so in the solicitation.

6.4 International standardization. Certain provisions of this specification and referenced standards are the subject of international standardization agreement. When amendment, revision, or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices, as required.

6.5 Subject term (key word) listing.

Adapter, hose
Fittings, hose
Coupling, quick disconnect
Fuel, transport of
Water, transport of

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - ME
Navy - YD
Air Force - 99

Preparing activity:
Army - ME

Project 4730-0131

Review activities:

Army - AV, GL
Air Force - 82
DLA - CS

User activities:

Army - AT
Navy - MC

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-C-27487G

2. DOCUMENT DATE (YYMMDD)
921125

3. DOCUMENT TITLE
Coupling Malves, Quick-Disconnect, Cam-Locking Type

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)
(1) Commercial
(if applicable)
(2) AUTOVON

7. DATE SUBMITTED

8. PREPARING ACTIVITY

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