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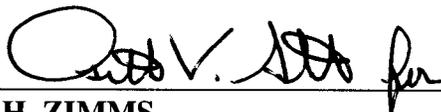
CRITICAL ITEM PRODUCT FABRICATION SPECIFICATION
FOR SLING, HOISTING MK 105 MOD 0
(6,000-POUND SAFE WORKING LOAD)

NAVAL PHST CENTER
CODE 040L3
NAVAL SURFACE WARFARE CENTER, INDIAN HEAD DIVISION
DETACHMENT EARLE
201 HIGHWAY 34 SOUTH
COLTS NECK, NEW JERSEY 07722-5023



N. LAKIN
NAVAL PHST CENTER, NSWCIHD DET EARLE, CODE 713

APPROVED FOR NAVSEA



K. H. ZIMMS
COMMAND, PHST FUNCTIONAL MANAGER
NAVAL PHST CENTER, NSWCIHD DET EARLE, CODE 71

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**CRITICAL ITEM PRODUCT FABRICATION SPECIFICATION
FOR SLING, HOISTING MK 105 MOD 0
(6,000-POUND SAFE WORKING LOAD)**

1. SCOPE.

1.1 Scope. This specification establishes the requirements for manufacture and Government acceptance of the Sling, Hoisting Mk 105 Mod 0.

2. APPLICABLE DOCUMENTS.

2.1 Issue of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

STANDARDS

Federal

FED-STD-191	Textile Test Methods
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Military

DOD-STD-2101	Classification of Characteristics
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MIL-STD-129	Standard Practice for Military Marking
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MIL-STD-2073-1	Standard Practice for Military Packaging
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Commercial

ASQ-Q9001	Quality Management Systems and Requirements
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ASTM-D1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
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ASTM-D5118/D5118M	Standard Practice for Fabrication of Fiberboard Shipping Boxes
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Commercial (cont'd)

EIA-649

National Consensus Standard for
Configuration Management

DRAWINGS

Naval Sea Systems Command

DL 2643482

Sling, Hoisting Mk 105 Mod 0

OTHER DOCUMENTS

Technical Memorandum No.
PHST-36-00

Procedure for Making a Standard Eye
Splice in Double-Braided Line

(Copies of federal or military standards or specifications may be obtained upon request from Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. Drawings and technical specifications may be obtained from the contracting activity. Copies of commercial documents may be obtained by contacting the applicable organizations listed below:

ASQ – American Society for Quality
P.O. Box 3005
Milwaukee, WI 53201-3005

ASTM – American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

EIA – Electronic Industries Alliance
2500 Wilson Boulevard
Arlington, VA 22201-3834

2.2 Conflicting requirements. Conflicting requirements arising between this specification or any specification, publication or drawing listed herein shall be referred in writing to the Procurement Contracting Officer for interpretation, clarification, and correction.

2.3 Requests for change. Changes of a minor and or major nature will be granted only by the cognizant field activity (CFA), that is the Naval Surface Warfare Center, Indian Head Division (NSWC IHD) Detachment Earle. The provisions of the Material Review Board (MRB) do not apply to this item. Requests for deviations, waivers or other changes to this specification or referenced documentation shall be submitted to the Procurement Contracting Officer (PCO) for approval. A copy of the request for change shall be forwarded to the Packaging, Handling, Storage and Transportation (PHST) Center, Naval Surface Warfare Center Indian Head Division, Detachment Earle, Code

7141. Changes shall be prepared and submitted in accordance with the requirements of the contract. EIA-649, "National Consensus Standard for Configuration Management" may be used for general guidance in preparing the requests.

3. REQUIREMENTS.

3.1 Item definition. The Sling, Hoisting Mk 105 Mod 0, hereinafter referred to as sling, is a braided nylon rope pendant with a loop at each end covered with a plastic (polyurethane) tube and pendant stiffened by a plastic (PVC) pipe. The loop at the stiffened end of the pendant is the lifting eye. One to four legs, with hooks at one end, can be attached to the other loop with choker hitches as required. Portions of the sling (pendant and legs) are coated with a flexible abrasion resistant coating to reduce wear. The stiffened portion of the pendant provides a means of raising the lifting eye to the helicopter hook. The sling is used on Naval supply ships for hoisting ammunition/explosives.

3.2 Characteristics.

3.2.1 Performance. The sling shall meet the following performance requirements.

3.2.1.1 Inspection. The sling, when examined in accordance with 4.2.1 and 4.3.1, shall comply with the fabrication and assembly requirements of DL 2643482 and other drawings and specifications listed thereon.

3.2.1.2 Hoisting strength. The sling, when load tested in accordance with 4.2.2 and 4.3.2 shall meet the requirements of drawings 2643484 (notes 8, 12 and 22) and 2643485 (notes 5 and 11). Failure to meet these requirements shall be cause for rejection. Inspection shall be accomplished in accordance with 3.2.1.1 prior to testing.

3.2.1.3 Abrasion resistance. The sling, when subjected to the test of 4.2.3, shall at the conclusion of testing be visually identical to the uncoated fiber rope sample(s) from the bulk spool. The fiber rope may be exposed beneath the abrasion resistant coating. However, the woven geometry of the fiber rope shall be visually the same as the untested spool sample. Any strands or braids that are cut, pulled, or raised from the rope body shall constitute failure of the abrasion coating and be considered unacceptable.

3.3 Design and construction.

3.3.1 Production drawings. The sling shall be fabricated and assembled in accordance with DL 2643482.

3.3.2 Standards of manufacture. The detailed requirements for materials, design and construction of slings to be manufactured in accordance with this specification are provided by DL 2643482 and the drawings, specifications and standards listed thereon.

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3.3.3 Workmanship. Workmanship shall be of sufficiently high quality to assure that completed slings will comply with all requirements of this specification. Particular attention shall be paid to eye splices, coatings, thimbles, plating, marking, and freedom of parts from burrs and sharp edges. Any coating spikes shall be removed. The assembly must lay flat with no twist after splicing. The assembled sling shall be thoroughly cleaned of all dirt, chips, and other foreign matter. Any coatings shall be smooth and evenly distributed. Thimbles shall be held tightly within the sling eye, with ends closed.

3.4 Identification.

3.4.1 Serialization. Serialization of the sling (pendant) is required. To obtain serial number(s), the contractor shall contact the Procurement Contracting Officer in writing with a copy to the Naval Surface Warfare Center, Indian Head Division, Detachment Earle, PHST Center, Code 7141, 201 Highway 34 South, Colts Neck, NJ 07722-5023 no later than 60 days before first article submittal. (Legs are unserialized).

3.5 First article. Unless otherwise specified in the contract or purchase order, one preproduction sample, consisting of one pendant and four sling legs, hereinafter referred to as first article, shall be submitted for inspection and testing prior to regular production. The first article samples shall be fully representative of those proposed for production and demonstrate the adequacy and suitability of the contractor's processes and procedures set forth by this specification. Inspection of the first article shall be completed before resuming production of the remaining slings. **The first article shall not be previously load tested.** Unless otherwise specified in the contract or purchase order, the Government shall be responsible for performing the inspection/test requirements as specified herein. The contractor shall be responsible for delivery of the first article(s) to:

Naval Surface Warfare Center
Indian Head Division, Detachment Earle
Building C-54, Code 7141
201 Highway 34 South
Colts Neck, NJ 07722-5023

In addition to the first article sling, the following items shall be supplied with each first article submitted.

3.5.1 Nylon fiber rope samples. Each first article submission shall be accompanied by nylon fiber rope samples of both the pendant and leg. The samples shall have the ends whipped (taped or wrapped, braided nylon twine may be used in accordance with drawing 2643485, item 2) to prevent unraveling. The samples to be submitted are listed below:

a. Three, six-foot long, nylon fiber rope sections of 1-1/8 inch diameter rope material, from the rope spool from which the production pendants are to be made. The sections shall have the abrasion resistant coating applied per drawing 2644648-2. The

application method shall be identical to that used for the first article assembly. The coating shall be applied along the rope length for the entire diameter up to the whipping. Do not allow the abrasion coating to wick from the bitter ends.

b. Three, six-foot long, nylon fiber rope sections of 7/8 inch diameter rope material, from the rope spool from which the production legs shall be made. The sections shall have the abrasion resistant coating applied per drawing 2643485. The application method shall be identical to that used for the first article assembly. The coating shall be applied along the rope length for the entire diameter up to the whipping. Do not allow the abrasion coating to wick from the bitter ends.

c. **One, uncoated three-foot sample of 1-1/8 inch diameter rope material, and one uncoated three-foot sample of 7/8 inch diameter rope material.** The material shall be taken from the rope spools from which the production assemblies are to be made. The ends shall be whipped as in 3.5.1 above.

3.5.2 Subcomponent samples. When manufacturer supply sources differ from suggested sources listed on drawing 5167030, Hook, Safety Adjustable Swivel, three untested samples shall be submitted for tensile yield testing with the first article submission. Do not package with the fiber rope sample items.

3.5.3 First article sample marking. The first article sling shall be marked in accordance with drawing 2643484 (pendant) and 2643485 (leg), except for the line containing the Test Expiration Date. The Test Expiration Date line shall read:

TEST EXPIRATION DATE FA/NT MM/YY (month/year)

This will serve to identify the First Article (FA) as not previously load tested (NT) and the month (MM) and year (YY) the sling was submitted for Government testing.

4. QUALITY ASSURANCE PROVISIONS

4.1 General. The contractor shall provide an inspection system conforming to the requirements of ASQ-Q9001, or other inspection system approved by the Government, and assure that all parts and materials submitted conform to the requirements of this specification and drawings listed therein. Except as otherwise specified in the contract or order, the supplier 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 this specification, where such inspections are deemed necessary to assure that supplier and services conform to prescribed requirements. Unless otherwise specified, all tests shall be performed at an ambient temperature of 70 +/-20 degrees Fahrenheit with ambient humidity.

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4.2 First article inspection and tests.

4.2.1 Inspection. Prior to all tests, the first article sling shall be 100 percent physically examined for compliance with Data List (DL) 2643482 and drawings and notes thereon. Inspection shall consist of a visual and dimensional inspection of the characteristics of the component parts and complete sling(s) to ensure compliance with the drawings. Measuring instruments sufficient to verify drawing tolerances shall be used. The assembly must lie flat with no twist after splicing. Inspection shall include the examination of material certifications for parts and the comparison of these documents with the item(s) they describe. [The Government reserves the right to perform splice examination in accordance with Tech Memo PHST-36-00. This may involve physical destruction of the first article sling.] Note: Classification of characteristics symbols, Critical (C), Major (M), and Minor (Mi), are in accordance with DOD-STD-2101.

4.2.2 Static overload test.

4.2.2.1 Pendant assembly (C1). The first article pendant assembly shall withstand a static overload of 60% of the design load, that is 18,000 pounds (+900/-0), for a period of 5 minutes. The load shall be applied with the pendant assembly configured as described on drawing 2643484 of DL 2643482. The pendant shall meet the requirements of 3.2.1.2. The abrasion resistant coating shall remain uniform, smooth and evenly distributed throughout the entire rope length after test. Loss of coating adhesion or exposure of uncoated rope or rope fibers shall be cause for rejection. [The Government reserves the right to perform a static overload test to failure. Any first article pendant assembly which fails at or below the static design load (5 x Safe Working Load), that is 30,000 pounds held for 5 minutes, shall be investigated as to the cause of failure. If failure is determined to be due to a contractor liable deficiency, the first article pendant assembly shall be considered unacceptable.]

4.2.2.1.1 Pendant measurement (M101). The pendant assembly shall be measured after proof testing (60% of the design load only). The pendant shall be allowed to rest for a minimum of 24 hours before measurement. The measurement shall be conducted as specified by drawing 2643484. Any first article that fails to meet this requirement will be considered unacceptable.

4.2.2.2 Leg assemblies (C2). The four leg assemblies shall be tested separately and each leg shall withstand a static overload of 60% of the design load, that is 12,000 pounds (+600/-0), for a period of 5 minutes. The load shall be applied with the leg assembly configured as described on drawing 2643485 of DL 2643482. Any evidence of fraying, chafing or failure of splices or parts shall be cause for rejection. The abrasion resistant coating shall remain uniform, smooth and evenly distributed throughout the entire rope length after test. Loss of coating adhesion or exposure of uncoated rope or rope fibers shall be cause for rejection. [The Government reserves the right to perform a static overload test to failure. Any first article leg assembly which fails at or below the static design load (5 x Safe Working Load), that is 20,000 pounds held for 5 minutes, shall be investigated as to the cause of failure. If failure is determined to be due to a contractor liable deficiency, the first article leg assembly shall be considered unacceptable].

4.2.2.2.1 Leg measurement (M102). The leg assembly shall be measured after proof testing (60% of the design load only). The leg shall be allowed to rest for a minimum of 24 hours before measurement. The measurement shall be conducted as specified on drawing 2643485. Any first article that fails to meet this requirement will be considered unacceptable (provided investigation concludes that failure is due to manufacturing non-conformance).

4.2.2.3 Adjustable swivel hook. (When required, see 3.5.2). Each adjustable swivel hook shall withstand a static tensile test of 25,000 pounds (ultimate) for a period of 2 minutes. Any sample that fails shall be investigated as to the cause of failure. If failure is due to a contractor liable deficiency, the first article hook shall be considered unacceptable. The load shall be applied using a straight-line pull test configuration. A load/deflection curve shall be generated during the test.

4.2.3 Abrasion test.

4.2.3.1 Pendant assembly test sample (C3). The portion of pendant assembly sample, (drawing 2643484 of DL 2643482), that is coated with abrasion resistant solution shall be cycled 2,000 strokes (1,000 cycles minimum) on the test fixture called out in figure 5309 of FED-STD-191. The pendant assembly sample shall meet the requirements of 3.2.1.3.

4.2.3.2 Leg assembly test sample (C4). The portion of each leg sample assembly, (drawing 2643485 of DL 2643482), that is coated with abrasion resistant solution shall be cycled 2,000 strokes (1,000 cycles minimum) on the test fixture called out in figure 5309 of FED-STD-191. The sample sling leg assembly shall meet the requirements of 3.2.1.3.

4.3 Production quality conformance inspection and test.

4.3.1 Inspection. Prior to all tests, the production sling(s) shall be 100 percent physically examined for compliance with Data List (DL) 2643482 and drawings and notes thereon. Inspection shall consist of a visual and dimensional inspection of the characteristics of the component parts and complete sling(s) to ensure compliance with the drawings. Measuring instruments sufficient to verify drawing tolerances shall be used. The assembly must lie flat with no twist after splicing. Inspection shall include the examination of material certifications and the comparison of these documents with the item(s) they describe. Unless otherwise specified in the contract or order, the contractor is responsible for the performance of all production quality conformance inspection and test requirements as specified herein. Inspection shall be performed again after completion of all testing to assure the production slings remain in compliance with the applicable DL and the requirements of this specification.

4.3.2 Static overload test (C1) and (C2). Each pendant and sling leg assembly shall be tested in accordance with 4.2.2 for a period of five minutes (60% of the design load only). Any evidence of fraying, chafing or failure of splices or parts shall be cause for rejection. The abrasion resistant coating shall remain uniform, smooth and evenly

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distributed throughout the entire rope length after the test. Loss of coating adhesion or exposure of uncoated rope fiber, shall be cause for rejection.

5. PREPARATION FOR DELIVERY

5.1 Packaging and packing. Unless otherwise specified in the contract or purchase order, each sling (1 pendant and 4 legs) shall be preserved in accordance with MIL-STD-2073-1, Method 10, and packed in a fiberboard box, style RSC, class-weather resistant, grade W5C, in accordance with ASTM D5118/D5118M. Closing/sealing of fiberboard box shall be in accordance with ASTM D1974 Method 4A2.

5.1.1 Fiber rope sample packaging. The fiber rope sample(s) shall be packed in a separate fiberboard box from the first article submission. The fiber rope sample(s) shall be packed to eliminate movement during transportation. The packing media shall not contain inks or dye that may adhere to the rope sample(s). The fiber rope sample box may be shipped within the first article submission box.

5.1.2 Subcomponent sample packaging. (When required, see 3.5.2). Wrap or package the samples separately from the fiber rope samples. The subcomponent samples should be restrained in a manner that eliminates damage to themselves or other components.

5.2 Marking. In addition to any special marking required by the contract or order, the fiberboard box shall be marked in accordance with MIL-STD-129.

5.3 Documentation. Copies of DD Form 250 (DD-250), Material Inspection and Receiving Report and original DD Form 1222 (DD-1222), Requests for and Results of Tests, shall accompany each first article and production lot submission.