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MIL-C-19713A(SHIPS)
AMENDMENT - 3
8 June 1962
SUPERSEDING
Amendment-2
6 July 1961

MILITARY SPECIFICATION

COOLERS, FLUID, AFTER AIR, DIESEL ENGINE, NAVAL SHIPBOARD

This amendment forms a part of Military Specification MIL-C-19713A (SHIPS), 30 December 1959.

Pages 1 and 2, paragraph 2.1: Add the following specifications:

FEDERAL
"QQ-A-601 - Aluminum Alloy Sand Castings."

MILITARY
"MIL-A-8625 - Anodic Coatings for Aluminum and Aluminum Alloys.
"MIL-Q-9858 - Quality Control System Requirements."

Pages 1 and 2, paragraph 2.1: Delete:

"NAVY DEPARTMENT General Specifications for Inspection of Material."

Page 3, paragraph 2.1 continued: Under Publications add:

"NAVSHIPS 250-637-2 - Instructions for Torch Brazing of Ferrous and Non-Ferrous Piping.
"NAVSHIPS 250-648-8 - Inspection and Test of Silver-Brazed Piping Systems."

Page 3, paragraph 2.2: Add the following publications:

"AMERICAN SOCIETY FOR TESTING MATERIALS
B-152 Copper Sheet, Strip, Plate, and Rolled Bar
B-209 Aluminum-Alloy Sheet and Plate (Tentative)
B-234 Aluminum-Alloy Drawn Seamless Tubes for Condensers and Heat Exchangers (Tentative)

(Application for copies should be addressed to the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.)"

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Page 4, paragraph 3.2.3: Delete and substitute:

"3.2.3 Welding and allied processes. - Welding shall be in accordance with Standard MIL-STD-278. When brazing alloys containing nickel, such as composition 70-30 or 90-10 copper-nickel, grade IV silver-base-brazing-alloy conforming to Specification MIL-S-15395 shall be used. Brazing of piping joints including root connections shall be accomplished in accordance with NAVSHIPS 250-637-2; where these joints are 1/2 inch or above in nominal size, preinserted ring fittings shall be used. Face feed fittings may be used in sizes below 1/2 inch."

Pages 4 and 5, paragraphs 3.3.3 through 3.3.3.3: Delete and substitute:

"3.3.3 Shock resistance. -

"3.3.3.1 When the engine application requires Class HI shock resistance (see 6.1) the cooler shall be of shock resistant design.

"3.3.3.2 Shock resistant design. -

"3.3.3.2.1 Cooler structure, supporting members and bolting shall be designed for the shock design numbers of figure 1.

"3.3.3.2.2 Unless otherwise specified in the contract or order, bolts designed to be stressed in shear shall be installed in holes no greater than the following sizes:

Nominal bolt diameter (inch)	Maximum diameter of hole (inch)
3/4 and smaller	Nominal bolt diameter plus 1/32
Larger than 3/4	Nominal bolt diameter plus 1/16

"3.3.3.2.3 Units that are rigidly supported shall not be attached to two structures which can deflect relative to each other under shock loadings.

"3.3.3.2.4 Shock mounts shall not be used without prior approval of the bureau or agency concerned.

"3.3.3.2.5 For further guidance in developing a shock resistance design see the appendix to this specification."

Page 10, table I, items 1 and 5: Delete and substitute and add footnotes 6, 7 and 8:

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Part	Material	Specification
"Shell 6/	Aluminum (quarter hard)	MIL-A-19070
	Aluminum (half hard)	MIL-A-17357
	Aluminum alloy 7/	QQ-A-601
	Steel 1/	QQ-S-741
	Steel 2/ (zinc coated)	QQ-S-775
"Fins for tubes 6/	Admiralty brass	Commercial
	Tinned copper 8/	ASTM B152
	Aluminum alloy 996A	ASTM B234
	Aluminum alloy M1A	ASTM B234
	Aluminum alloy 990A	ASTM B209
	Aluminum alloy 996A	ASTM B209

"6/ Aluminum alloys shall be given an electrolytic anodic treatment conforming to Specification MIL-A-8625.
"7/ Alloys 214, 355 and 356 only.
"8/ The surface of the fin shall be tinned to a thickness of not less than 0.001 inch. Plating shall be smooth and of fine grain appearance, free from 'burnt' deposits such as occur in high current density areas."

Pages 11 and 12, tables II and III, items 1 and 5: Delete and substitute and add footnotes 5, 6 and 7:

Part	Material	Specification
"Shell 5/	Aluminum (quarter hard)	MIL-A-19070
	Aluminum (half hard)	MIL-A-17357
	Aluminum alloy 6/	QQ-A-601
	Steel 1/	QQ-S-741
	Steel 2/ (zinc coated)	QQ-S-775
"Fins for tubes 5/	Admiralty brass	Commercial
	Tinned copper 7/	ASTM B152
	Aluminum alloy 996A	ASTM B234
	Aluminum alloy M1A	ASTM B234
	Aluminum alloy 990A	ASTM B209
	Aluminum alloy 996A	ASTM B209

"5/ Aluminum alloys shall be given an electrolytic anodic treatment conforming to Specification MIL-A-8625.
"6/ Alloys 214, 355 and 356 only.
"7/ The surface of the fin shall be tinned to a thickness of less than 0.001 inch. Plating shall be smooth and of fine grain appearance, free from 'burnt' deposits such as occur in high current density areas."

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Page 12, table III, item 12: Delete and substitute:

Part	Material	Specification
"Pipe plugs and adaptors	Valve bronze; aluminum bronze, stress relieved, composition 5; gun metal; or Naval wrought brass	MIL-B-16541 MIL-B-15939 MIL-M-16576 MIL-B-994"

Page 16, paragraph 3.8.1, item (e) and footnote 1/: Delete and substitute:

"(e) Tube expander for double tube sheet construction only (see 3.7.4) 1/

"1/ Standard tube expander and tube plugs will be shipbuilder furnished.

Page 17, paragraph 4.1: Delete and substitute:

"4.1 The supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and services acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

"4.1.1 Quality control system. - The contractor shall provide and maintain a quality control system acceptable to the Government for the supplies covered by this specification. The system of quality control shall be in accordance with Specification MIL-Q-9858 supplemented as specified in 4.1.1.1, 4.1.1.2 and 4.1.1.3.

"4.1.1.1 Description of procedures. - Procedures shall be assembled in manual form and shall include a flow chart showing the developments of the product through the manufacturing cycle. The procedures shall indicate organization and responsibility for the control of quality.

"4.1.1.2 Inspection during manufacture. - The contractors shall establish as a minimum, four inspection points located as follows:

(a) Initial set-up.
(b) First assemble.
(c) Second assemble.
(d) Roving floor.

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"4.1.1.3 Storage.- Supplies shall be stored in a dry area."

Page 17, paragraph 4.4, line 1: Delete "by the Government inspector".

Page 17, paragraph 4.5.2: Delete and substitute:

"4.5.2 Shock tests.-

"4.5.2.1 When shock resistance is required and the engine has not passed Class HI shock test (see 6.1), no shock test is required for engine mounted coolers. (It is intended that the cooler will be tested with the engine.)

"4.5.2.2 When shock resistance is required and the cooler is separately mounted, or the engine on which it will be mounted has passed Class HI shock test (see 6.1), coolers weighing 4500 pounds or less shall be shock tested. Shock tests shall be performed as specified in Specification MIL-S-901 with the following modification:

(a) Under the test procedure for medium weight equipment, the first blow in each group shall be applied using the standard (horizontal) mounting adaptor; the second blow in each group shall be applied with the unit mounted on adaptors holding it at a 45 degree angle from the horizontal in the direction of its least transverse strength.

"4.5.2.3 Waiver of shock testing will be considered for coolers if they are of similar design, construction, weight, and materials to coolers which have successfully passed test in accordance with Specification MIL-S-901 modified as above."

Page 17, paragraph 4.5.4, line 2: Delete superior "2/".

Page 17: Add as paragraph 4.5.5.

"4.5.5 Where silver brazed pipe joints have been used for making equipment connections which will become part of a system designated as hazardous in manual NAVSHIPS 250-648-8, inspection shall be in accordance with requirements of applicable sections of that manual."

Page 17, footnote 2/: Delete.

Page 17, paragraph 4.6: Delete.

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Page 19, paragraph 6.1: Add:

"(x) Whether engine application requires class HI shock resistance (see 3.3.3.1).

"(y) If cooler is to be engine mounted, whether the engine which it will serve has passed class HI shock test (see 4.5.2.1 and 4.5.2.2)".

Preparing activity:
Navy - Ships
(Project 4420-N047Sh)