

ZZ-H-428D
 AMENDMENT 4
 27 June 2001
 SUPERSEDING
 AMENDMENT 3
 June 19, 1998

FEDERAL SPECIFICATION

HOSE; NON-METALLIC AND HOSE; PREFORMED: (FOR THE COOLANT SYSTEMS OF AUTOMOTIVE AND OTHER LIQUID-COOLED ENGINES)

The General Services Administration has authorized the use of this amendment, which forms a part of ZZ-H-428D, dated May 8, 1974, by all federal agencies.

PAGE 1

1.1, Scope, delete and substitute as follows:

"1.1 Scope. This specification covers preformed (curved) and straight hose; and wire-reinforced hose, for the coolant systems and heaters of automotive and liquid-cooled engines for use in ambient temperatures of -65 °F. For ambient temperature applications of -40°F and greater (formerly grade B of ZZ-H-428D), use SAE J20 (see 6.1). The preparing activity for this document has determined that SAE J20 is a suitable replacement for ZZ-H-428D, grade B, but users are cautioned to evaluate this document for their particular application before citing it as a replacement document."

1.2.1, delete "Grade B" in its entirety.

1.2.2, delete "Class 1" in its entirety.

PAGE 2

1.2.2.1, delete "and grades" from title and line two of the paragraph.

Table I, delete and substitute as follows:

"Table I. Applicability of classes to types.

Class	Type				
	I	II	III	IV	V
2	X	X	X	X	X
3					X
4	X	X	X	X	

2.1, under Federal Standards, delete the following:

"Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies)."

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PAGE 3

2.1, Military Specifications , delete in its entirety.

Military Standards: delete

"MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-166 - Visual Inspection Guide for Rubber Hose.
MIL-STD-417 - Rubber Compositions, Vulcanized, General Purpose, Solid (Symbols and Tests).
MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing with Appropriate Test Methods."

And substitute the following:

"MS51008 - Hose Preformed; Flexible, Engine Coolant.
MS52130 - Hose, Nonmetallic: Straight, Engine Coolant."

2.2, delete and substitute as follows:

"2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D3951 - Standard Practice for Commercial Packaging (DoD Adopted).
ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness (DoD Adopted).

(Private sector and civil agencies may purchase copies of these voluntary standards from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

SOCIETY OF AUTOMOTIVE ENGINEERS, INC (SAE)

SAE J1684 - Test Method for Evaluating the Electrochemical Resistance of
Coolant System Hoses and Materials.

(Private sector and civil agencies may purchase copies of these voluntary standards from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

(DoD activities may obtain copies of those adopted voluntary standards listed in the DoD Index of Specifications and Standards (DoDISS) free of charge from the Defense Printing Service Detachment Office, Building 4D, Customer Service, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)"

* 3.1, delete in its entirety.

3.2, delete and substitute as follows:

"3.2 Materials. Hose furnished under this specification shall be fungus resistant. Hose furnished under this specification (see 6.1) shall be composed of elastomeric material. This material shall be used in conjunction with reinforcement as applicable (3.3.4)."

PAGE 4

3.3.3, line 3, delete "and of grade B of type V hose".

Line 4, delete ", grade A hose".

PAGES 9 - 11

Table VIII, delete class 1 and corresponding data.

PAGE 12

Table VIII (Cont'd), delete in its entirety and substitute as follows:

"Table VIII - Physical properties requirements (types I through V (Cont'd)).

Physical properties	Cover requirements						
	Applicable types				Classes		
	I and II	III	IV	V	2	3	4
Tensile strength, max., percent	X	X	X		-65 -65 -65	NA NA NA	NA NA NA
Adhesion, min., pounds:							
Tube to ply or cover	X	X			10 8 10 8 10	10 8 8 6 10	10 8 8 6 10
Ply to ply	X				10 8 8	10 8 6	10 8 6
Cover to ply				X	10	10	10

NA - Not applicable"

PAGE 13

Table IX, delete "4.5.1 Hardness, durometer" and substitute "4.5.2 Hardness, durometer".

Delete "4.5.10 Fungi resistance" in its entirety.

Delete "4.5.13 Packaging (and corresponding data)", and substitute "4.5.13 Electrochemical resistance X X" (place the X's in the "Qualification" and "Acceptance" columns respectively).

Delete "4.5.14, Packing" in its entirety.

PAGE 14

3.5.10, delete in its entirety.

Following 3.5.12, add:

"3.5.13 Electrochemical resistance. Hoses shall be electrochemical resistant."

PAGE 15

3.6.1, after "Month and year of manufacture" add "MS part number (see MS52130)."

3.6.2, after "Month and year of manufacture" add "MS part number (see MS51008)."

Following 4.1 add:

"4.1.1 Verification methods. In addition to the examinations and tests specified herein, contractor records may be used to verify conformance to this specification."

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PAGE 16

* 4.2 through 4.2.1, delete in their entirety.

4.3.1.1 through 4.3.1.1.3, delete in their entirety.

4.3.1.2 through 4.3.2.2.1, delete in their entirety and substitute as follows:

"4.3.1.2 Military and non-military.

"4.3.1.2.1 Lot formation. Unless otherwise specified (see 6.2), a lot of hose, as far as practicable, shall consist of all hose of the same formulation and manufactured using essentially the same process, under essentially the same conditions, at essentially the same time.

"4.3.1.2.2 Sampling for quality conformance examination. Samples for conformance examination shall be randomly selected in accordance with table IXa. If one or more defects are found, the lot shall be rescreened and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with table IXa. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

"4.3.1.2.3 Sampling for quality conformance testing. Samples for conformance testing shall be randomly selected in accordance with table IXa. If one or more defects are found, the lot shall be rescreened and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with table IXa. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

Table IXa. Sample size.

Lot size	Conformance examination		Conformance testing
	Major	Minor	
2 to 8	5	3	2
9 to 15	5	3	2
16 to 25	5	3	3
26 to 50	5	5	5
51 to 90	7	6	5
91 to 150	11	7	6
151 to 280	13	10	7
281 to 500	16	11	9
501 to 1200	19	15	11
1201 to 3200	23	18	13
3201 to 10 000	29	22	15
10 001 to 35 000	35	29	15
35 001 to 150 000	40	29	15
150 001 to 500 000	40	29	15
500 001 and over	40	29	15

"4.3.2 Examination inspection. Each sample hose selected in accordance with 4.3.1.2.2 shall be examined for defects as listed in the classification of defects in 4.3.2.3."

PAGE 17

4.3.2.3, delete and substitute as follows:

"4.3.2.3 Classification of defects. Using MIL-STD-166 as a guide for examination purposes, defects shall be classified as follows:".

PAGE 18

Classification of defects, defects column, delete "AQL 2.5 percent" and "AQL 4.0 percent".

4.3.3.1, delete and substitute as follows:

"4.3.3.1 Quality conformance tests. Each test unit in the sample specified in 4.3.1.2.3 shall be subjected to the applicable tests shown in table IX."

PAGES 19 and 20

4.3.4 through 4.3.6.2, delete in their entirety.

PAGE 21

4.5.2, last line, delete "method 3021 of Fed. Test Method Std. No. 601." and substitute "ASTM D 2240."

PAGE 22

4.5.6, delete first five lines on page 22 and substitute "1/3 by volume, alcohol."

4.5.8.1, line 3, delete "for grade A hose and at minus 40°±2°F for grade B hose".

4.5.8.2, line 2, delete "for the grade A hose and at minus 40°±2°F for the grade B hose".

PAGE 23

4.5.10, delete in its entirety.

PAGE 24

4.5.13 through 4.5.15, delete and substitute as follows:

"4.5.13 Electrochemical resistance. To determine conformance to 3. 5.13, hoses shall be tested in accordance with SAE J1684. Test method 1 shall be utilized to determine the electrochemical resistance of the hose assembly."

5. through 5.2.2.2, delete and substitute as follows:

"5. **PACKAGING**

"5.1 Packaging requirements. The requirements for packaging shall be in accordance with ASTM D3951, unless detailed requirements are specified in the contract."

PAGE 25

6.2, delete "(f)", "(g)", and "(h)" in their entirety.

Delete "(military)" from (i), (j), and (k).

6.3, delete "Class 1" in its entirety.

PAGE 26

6.3.1, delete "ZZ-H-428c" and substitute "ZZ-H-428D".

Delete "Class 1 Class SB (Suffixes E₃ and E₅)".

* 6.4, delete in its entirety.

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PAGE 27

6.6, delete table in its entirety and substitute as follows:

ZZ-H-428C			ZZ-H-428D		
Type	Grade	Class	Type	Grade	Class
I	A	2	I	A	2
	NA		I	A	4
	NA			SAE J20R1EC Class B	
I	B	2		SAE J20R1EC Class C	
I	B	3		SAE J20R1EC Class D1	
I	B	4		SAE J20R1EC Class D3	
II	A	2	II	A	2
	NA		II	A	4
II	B	1		SAE J20R1EC Class B	
II	B	2		SAE J20R1EC Class C	
II	B	3		SAE J20R1EC Class D1	
	NA			SAE J20R1EC Class D3	
III	A	2	I	A	2
III	A	4	I	A	4
	NA			SAE J20R1EC Class B	
III	B	2		SAE J20R1EC Class C	
III	B	3		SAE J20R1EC Class D1	
III	B	4		SAE J20R1EC Class D3	
IV	A	2	II	A	2
IV	A	4	II	A	4
	NA			SAE J20R1EC Class B	
IV	B	2		SAE J20R1EC Class C	
IV	B	3		SAE J20R1EC Class D1	
IV	B	4		SAE J20R1EC Class D3	
V	A	2	III	A	2
V	A	4	III	A	4
V	B	2		SAE J20R4EC Class C	
V	B	3		SAE J20R4EC Class D1	
V	B	4		SAE J20R4EC Class D3	
VI	A	2	IV	A	2
VI	A	4	IV	A	4
VI	B	2		SAE J20R3EC Class C	
VI	B	3		SAE J20R3EC Class D1	
VI	B	4		SAE J20R3EC Class D3	
VII	A	2	V	A	2
VII	A	3	V	A	3
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Type	Grade	Class	Type	Grade	Class
VII	B	1		SAE J20R5EC Class B	
VII	B	2		SAE J20R5EC Class C	
VII	B	3		SAE J20R5EC Class D1	
VII	B	4		SAE J20R5EC Class D3	

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PAGE 29 and 30

* APPENDIX, delete in its entirety.

The margins of this amendment are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only, and the Government assumes no liability whatsoever for any inaccuracies in these notation. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

MILITARY INTERESTS:

Custodians

Army - AT
Navy - YD
DLA - CC

CIVIL AGENCY
COORDINATING ACTIVITIES:

NASA - JFK
GSA - FSS
HSS - FEC
DOT - ACO
USDA - APS
TREASURY - ATF

Preparing Activity:
DLA - CC

(Project 4720-0319)