

ZZ-V-25E
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 SUPERSEDING
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FEDERAL SPECIFICATION

VALVES Two VALVE SPUDS,
 CAPS, AND CORES, PNEUMATIC TIRE

Thus Federal specification was approval by the General Services
 Administration for the use of all Federal agencies

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers valve assemblies, valve spuds, caps, cores, and grommets for use with tubeless tires or inner tubes used on ground vehicles. Valve assemblies, hereinafter referred to as valves, include valve stems, caps, cores, spuds, grommets, bridge washers, and hex nuts, when applicable (see 6.1).

1.2 Classification.

1.2.1 Types, classes, and styles. Valves, valve spuds, caps, and cores shall be of the following types, classes, styles, and T&RA number (see 6.2) :

Type I - Valves, pneumatic tire, inner tube.

Class 1 - Air use, rubber-covered standard bore.

Style A - Straight (TR 1, TR 13, TR 15) .

Style B - Straight, hand-bendable (TR 87A, TR 135, TR 150) .

Style C - Straight (TR 300) .

Class 2 - Air use, rubber base, bare metal stem, straight, standard bore.

Style A - with body threads (TR 70, TR 75A, TR 77A, TR 78A, TR 175A, TR 177A, and TR 179A) .

Style B - Without body threads (TR 460, TR 461, TR 462, TR 463, TR 464, and TR 465).

Class 3 - Air use, rubber base, straight, standard bore.

Style A - Partially threaded stem (TR 87S, TR 87) .

Style B - Fully threaded stem (TR 4) .

Class 4 - Air use, rubber base, without body threads, bent 90°, standard bore.

Style A - Bare metal stem (TR 87) .

Style B - Rubber up stem (TR 110 and TR 87A).

Class 5 - Air-water use, rubber-covered, with indent rings, straight, standard bore.

Style A - (TR 13CW, TR 15CW).

Style B - Hand-bendable (TR 150CW).

Class 6 - Air-water use, rubber base spud with TR CH3 core housing , standard bore (TR 218A, TR 220A).

Class 7 - Repair screw-on, standard bore, bent 86° (TR 1075A, TR 1076A, TR 1077A, TR 1078A, TR 1175A, TR 1177A, TR 1179A) .

Type II - Valves, pneumatic, tire, tubeless.

Class 1 - Air-use, snap-in, standard bore (TR 412, TR 413, TR 414, TR 415, TR 418, TR 423, TR 425).

Class 2 - Air-use, clamp-in, for drop-center runs and side-of-well valve-hole location standard bore, straight (TR 416, TR 416S, TR 500, TR 501, TR 570, TR 571, TR 572, TR 573, TR 574, TR 575) .

Class 3 - Air-use, clamp-in, for sealed rims and center-of-base valve-hole location, standard bore, bent (TR 503A, TR 505A, TR 507A, TR 508A, TR 509, TR 510, TR 511, TR 534).

Class 4 - Air use, clamp-in, bare metal stem with body threads (TR 430) .

Class 5 - Air-water use clamp-in, off-the-road, large bore, with removable valve stem, straight (TR J670)

Class 6 - Air-water use, clamp-in, off-the-road, large bore, bent (TR J650, TR J690).

Class 7 - Air-water use, clamp-in, standard bore, straight (TR 618A).

Class 8 - Air-water use, clamp-in, off-the-road, standard bore, bent (TR 621A, TR 622A, TR 623A) .

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Type III - Valve spuds, pneumatic tire.

- Class 1 - Inner Tube, standard bore (TR SP1000) .
- Class 2 - Inner turn, large bore (TK SP1000).
- Class 3 - Tubeless, large bore (TR SP2) ,
- Class 4 - Inner tube, super large bore (TR SP816).
- Class 5 - Tubless, super large bore (TR SP8 and TR SP9).

Type IV - Valve caps, pneumatic tire.

- Class 1 - Standard bore (TR VC2, TR VC3, TR VC8).
- Class 2 - Large bore (TR VC6, TR VC7).

Type v - Valve cores, pneumatic tire.

- Class 2 - Standard bore (TR cl).
- class 3 - Large bore (TR C2).

Type VI - valve stems, pneumatic are.

- class 1 - Large bore, bent, vehicular (TR J4000 - Horizontal Length).

Type VII - Core housings, pneumatic tires.

- Class 1 - Standard bore (TR Ch3) .
- class 2 - Super large bore (TR CH8, CH6) .

2. APPLICABLE DOKUMENTS

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

Federal Specification:

ZZ-I-550 - Inner Tube, Pneumatic Tire.

Federal Standards:

Fed. Std. No. 123 - Marking for Shipment (Civil Agencies) .
 Fed. Std. No. 308 - Inner Tubs, Pneumatic Tire.
 Fed. Test Method Std. No. 601 - Rubber Sampling and Testing

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards, and at the prices indicates in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, Us. Government Printing Office, Washington, D.C. 20402.

(Single copies of this specifications and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices Boston; New York; Washington, D. C. ; Atlanta; Chicago; Kansas City, MO; Fort Worth; Denver; San Francisco; Los Angeles; and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks , and the Index of Federal Specifications and Standards, from established distribution points in their agencies I

Military Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
 MS-52119 - Nut, Plain Hexagon.
 MS-52120 - Grommet, Rubber.

(Copies of Military Specifications and Standards required by suppliers in connection With specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publication. The following document forms 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.

The Tire and Rim Association (T&RA) , Inc. :

Yearbook.

(Application for copies should be addressed to the Tire and Rim Association, Inc., 3200 West Market Street Akron, OH 44313.)

3. REQUIREMENTS

3.1 Preproduction sample. When required (see 6.2), and as specified by the contracting office, the products furnished under this specification shall be those which have been inspected and which have passed the preproduction inspection specified herein (see 4.2) .

3.2 Materials. Materials shall be as specified herein. When not specifically covered, materials shall be suitable for the intended use.

3.2.1 Valve materials.

3.2.1.1 Valve stems. Metal valve stems shall be of brass.

3.2.1.2 Rubber valve covers and bases. Rubber covers and bases of valves shall be made from compounds containing isobutylene-isoprene synthetic rubber (butyl), synthetic natural, natural rubber, styrene-butadiene synthetic rubber (SBR), or ethylene-propylene-diene terpolymer (EPDM).

3.2.1.3 Base preparation of valves for replacement use. Tire valves with a rubber base shall have a layer of uncured gum stock cemented to the bases to permit their air-tight application to the buffed and cleaned valve-hole locations, and cemented when necessary on the inner tubes when cured with commercially available field vulcanizers (Refer to manufacturer's recommendations.)

3.2.3 Cap materials. Cap shells shall be made of brass, nylon, or polyethylene. Unless otherwise specified (see 6.2), and TR-VC-3 cap seats shall be of sealant material.

3.2.3 Core materials. Core barrels, swivels, stems, and gasket cups shall be of brass or equipment. Core seal spring shall be of stainless steel. Materials characteristics of the cores shall not change sufficiently so as to affect valve performance when subject to the operational environment.

3.2.4 Spud materials.

3.2.4.1 Spud stems. Spud stems shall be of brass.

3.2.4.2 Rubber base spuds. Rubber bases of spuds for application to inner tubes conforming to 22-1-550 shall be of the same materials shown in 3.2.1.2.

3.2.4.3 Base preparation spuds for replacement use. Spuds with a rubber base shall have the same preparation as rubber valve bases for replacement use (see 3.2.1.3) .

3.2.5 Grommet materials. Grommets shall be of rubber compound type EPDM (ethylene-propylene) or equivalent.

3-2.5.1 Ozone resistance. All grommets and rubber valve parts, as part of production, shall have resistance to weathering as accepted in standard commercial practice.

3.3 Design and construction.

3.3.1 Valve.

3.3.1.1 Valve components. Unless otherwise specified (see 6.2) , valves shall conform to the applicable reference (see 1.2.1). Each valve shall consist of a cap, a core, and when required a spud, all as specified herein as well as a metal stem, *r-cove*, when required. All caps, cores, and spuds used as valve components shall meet all applicable requirements.

3.3.1.: Valve interior design. Valve interior design shall be such that when the core is properly installed , the tip of the core plunger pin shall position .035 below, to .010 above, the valve hp.

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3.3.1.3 Bridge washer. Each type I, class 2, style A and Class 7 valve shall, when specified (see 6.2), be furnished with a bridge washer suitable for its intended purpose.

3.3.1.4 Repair valves. Screw-on type repair valves (type I, class 7) shall be furnished with a .485-26 threaded recess in the base.

3.3.2 Cap. Unless otherwise specified (see 6.2) , caps shall be furnished and shall conform to the applicable reference (see 1.2.1) and may be screwdriver, swivel sealing type (TR VC2) , dome, swivel sealing type (TR VC3) or dome, polyethylene dust cover type (TR VCB).

3.3.3 Core.

3.3.3.1 Core fit. Unless otherwise specified (see 6.2) , cores shall conform to the applicable reference (see 1.2.1) . Cores supplied for replacement shall fit as do original cores without modification of cores or valves.

3.3.3.2 Deflation by core Cores shall be so constructed that when installed for use, tire pressure can be decreased by depressing the core plunger pin. It shall not be necessary to remove the core from the valve to deflate the tire or tube.

3.3.3.3 Core plunger pin height. Core design shall be such that when the core is properly installed, the tip on the core plunger pin shall position .035" below to .010" above the valve lip.

3.3.4 Spud. Unless otherwise specified (see 6.2) , spuds shall conform to the applicable reference (see 1.2.1).

3.3.5 Grommet. Unless otherwise specified (see 6.2) , grommet design characteristics shall conform to MS-52120 (AT) and be capable of its intended purpose.

3.3.6 Nut, hexagon, plain. Unless otherwise specified (see 6.2) , design characteristics shall conform to MS-52119 (AT) and be capable of its intended purpose .

3.4 Physical properties.

3.4.1 Valves.

3.4.1.1 Tensile strength. Valves with rubber bases shall conform to the pull values of Table I.

TABLE I. Least allowable tensile strength values

Type	Class	Pounds
I	1	100
	2	300
	3	100
	4	100
	5	100
	6	100
III	1	300
	2	300
	4	300

3.4.1.2 Valve stern base closure. Valves, type 1, classes 5 and 6, shall have sufficient spinning or closing of the inner well of the metal groove to effect a mechanical lock of the rubber in the groove. There shall be no cracks or flaws in the stem wall.

3.4.1.3 Crack resistance of rubber. Valves, type 11, class 1, shall have no cuts or cracks in the rim-hole sealing area.

3.4.1.4 Distortion resistance Valves, type I, classes 1 and 5, shall be of such a strength and hardness as to prevent distortion or other damage when subjected to proper field mounting and servicing methods

3.4.1.5 valve bendability

3.4.1.5.1 Hard-bendable valves Valves, type i, class 1, style B, and class 5, style B, shall permit hard-bending once without cracking.

3.4.1.5.2 Tool-bendable valves. Valves, type I, class 2 (except TR70) , and TR87 from class 3, style A, shall permit tool-bending once without cracking.

3.4.1.5.3 Factory-bent valves. valves, type 1, classes 4 and 7, and type II, classes 3, 6, and 8 shall not be cracked.

3.4.1.6 Hardness of valve rubber covers and bases. The shore A durometer hardness of unaged rubber compound shall be not less than 55 not more than 70 for tube applications. The Shore A durometer hardness of the rubber shall be not less than 60 nor more than 70 for snap-in valve applications. **Shore A hardness** shall not increase to more than 75 for valves aged in storage up to 2 years.

3.4.2 Spuds.

3.4.2.1 Hardness of rubber bases. The durometer hardness of rubber compound of type II, class 1, class 2, and class ~~spuds~~ shall be the same as for valves with rubber bases.

3.4.2.2 Tensile strength. Type III, class 1, class 2, and class 4 spuds shall conform to the pull value of Table I.

3.4.2.3 Base closure. Spuds, type III, class 1, class 2, and class 4, shall prove sufficient spinning or closing of the inner wall of the metal groove to effect a mechanical lock of the rubber in the groove. There shall be no cracks or flaws in the spuds wall.

3.5 Environmental requirements.

3.5.1 Valves. Unless otherwise specified (see 6.2), rubber used externally on valves, type II, class 1, shall meet resistance-to-ozone cracking requirements as specified herein (see 4.5.4.7), valve being cantilevered 10° out of normal position.

3.5.1.1 Low temperature leakage. Unless otherwise specified valve cores, type V, shall meet the following low temperature and pressure requirements without leaking in excess of one bubble per minute with valve mouth in down position:

Classes 2 and 3 - -40°F at 200 ± 5 psig.

3.5.1.1.1 High temperature leakage. Unless otherwise specified, valve cores, type V, shall meet the following high temperature and pressure requirements without leaking in excess of one bubble per minute with valve mouth in down position:

Class 2 - 200°F at 200 ± 5 psig.
class 3 - 165°F at 200 ± 5 psig.

To assure that damage has not occurred to the cores during test, no removal torque of cores that have not been retightened shall be more than 1/2 pound-inches more than the permissible installation torque (see 4.5.2). All barrel gaskets shall be intact and undamaged.

3.6 Performance.

3.6.1 Valves. Valves, having type V, class 2 cores as part of their assembly, shall allow an air flow input rate of at least 4.3 cubic feet per minute. Valves, having type V, class 3 cores as part of their assembly, shall allow an air flow input rate of at least 8.0 cubic feet per minute.

3.6.2 Caps. Caps TR VC2 and TR VC3 shall pneumatically seal the mouth of the valve stems and demonstrate no visible leakage of air file under 100 psig of air pressure for 30 seconds. In addition, the TR VC8 shall be capable of withstanding finger tightening with no effects in the performance of its intended service.

3.6.3 Cores.

3.6.3.1 Air flow input rate. Valve core, type V, class 2, shall allow an air flow input rate of at least 4.3 cubic feet per minute. valve cores, type V, class 3, shall allow an air flow input rate of at least 8.0 cubic feet per minute

3.6.3.2 Pressure retention. Unless otherwise specified, valve cores, type V, shall meet the following pressure retention requirements for at least one minute without visible leakage:

Classes 2 and 3 - 25 psig and 200 psig .

3.7 Dimensions. Unless otherwise specified (see 6.2), dimensions for valves, caps, cores, and spuds shall conform to the applicable reference (see 1.1.1).

3.8 Applicability of fittings. Applicability of cores, caps, and spuds shall be as outlined in the applicable reference (see 1.1.1).

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3.4 Marking. As a minimum each valve shall be stamped, included, or otherwise permanently and legibly marked with the T&RA designation number. Other marking, as required by Military Standards, shall be applied when Military Standards are referenced (see 6.2).

3.10 Workmanship. Valves and their components shall meet the requirements listed herein and, in covers or bases. incomplete or damaged threads, poor adherence of gum stock, and protective coverings to bottoms of rubber bases, valve holes and drillings not clear and incorrect valve bends.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. 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 the specification where such inspections are deemed necessary to assure that supplies and services conform to prescriptive requirements.

4.2 Preproduction inspection. When specified (see 6.2), preproduction samples shall be furnished for preproduction inspection and testing as follows:

(a) Valves:

- (1) Ten valves of one type and class shall be furnished for each type and class of valve, and at least one of each of any others of the same type and class. Whenever type I, class 1, style B, class 2, class 3, style A, or class 5, style B valves are furnished, not less than three valves each will be furnished to provide for bending tests.
- (2) Two rubber specimens of each rubber compound used shall be furnished when applicable for durometer hardness test. Specimens submitted shall be at least 1" square by 1/4" thick and shall be certified by the supplier as being exactly the same as, or having same from the same batch that was used on the other products he has submitted for testing.

(b) Caps - Fifteen caps shall be furnished of each class.

(c) Cores - Seventy-five cores shall be furnished of each class and length.

(d) Spuds - Four valve spuds shall be furnished of each class. Two rubber specimens as specified herein, shall be furnished for durometer hardness test, when applicable.

The preproduction samples shall be representative of the units proposed to be furnished under contract. Preproduction inspection shall be conducted by the contractor under supervision of the Government, and shall consist of examination for defects listed in Table II, and testing as specified in Tables IIIA through IIID, as applicable, in the order listed. The contractor shall submit the first preproduction inspector test report, verified by a Government representative as directed by the contracting officer (see 6.2).

4.3 Quality conformance inspection.

4.3.1 Sampling for valves, spuds, caps, and cores.

4.3.1.1 Lot formation. Unless otherwise specified (see 6.2), a lot shall consist of all valves, spuds, caps, or cores from an identifiable production period from one manufacturer, submitted at one time for acceptance.

4.3.1.2 Sampling for quality, conformance examination. Samples for quality conformance examination shall be selected in accordance with MIL-STD-105.

4.3.1.3 Sampling for quality conformance testing. Samples for quality conformance testing shall be selected in accordance with inspection level S-2 of MIL-STD-105.

4.3.2 Examination inspection for valves, spuds caps, and cores

4.3.2.1 Acceptable quality levels. Each valve, spud, cap, or core, as applicable, selected in accordance with 4.3.1.2, shall be examined for conformance to the following acceptable quality levels (AQL) on the basis of percent defective

<u>Classification</u>	<u>AQL</u>
Major	2.5
Minor	4.0

4.3.2.2 Classification of defects. For examination purpose, defects shall be classified in accordance with Table II.

TABLE II. Classification of defects

Categories	Requirement Paragraphs	Defects	Method of Inspection
MAJOR			
101	3.2.1.2, 3.2.4.2	Incomplete rubber covers and bases.	Visual
102	3.2.1.3, 3.2.4.3	Poor adherence of gum stock and protective coverings to bottom of rubber base.	Visual
103	3.3.1.1	Incomplete assembly.	Visual
104	3.3.2	Incorrect cap construction.	Visual
105	3.3.3.1, 3.3.3.3	Incorrect core construction.	Visual & Gage
106	3.3.4	Incorrect spud construction.	Visual
107	3.4.1.4, 3.4.1.5.3	Metal characteristics nonconformance.	Visual
108	3.7	Incorrect dimensions.	Visual
109	3.10	Incomplete or damaged threads, valve holes not clear, incorrect bends.	Visual & Gage
MINOR			
201	3.9	Marking nonconformance.	Visual

4.3.3 Testing inspection for valves. Samples selected in accordance with 4.3.1.3 shall be subjected to the applicable tests specified in Tables IIIA through IIID, using an AQL of 6.5 on the basis of percent defective.

4.4. Control tests.

4.4.1 Sampling for control tests. Samples shall be selected at the rate of 12 of each 1,000 Units produced except that not more than 24 not less than 12 units shall be selected in any 30-day period. The first test sample shall be taken at or near the start of production. Samples shall be subjected to the tests specified in Tables IIIA through II ID. As used herein, the term "unit" refers to a single valve assembly or component thereof, as applicable. The term "sample" refers to the quantity of units being tested.

4.4.2 Failure. Failure of a control test sample to pass any specified examination or test may be cause for the Government to refuse to accept subsequent lots until it has been proven to the satisfaction of the Government that the faults revealed by the tests have been corrected.

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TABLE IIIA. Order of valve and valve stem tests

Number of preproduction specimens to be tested (by type, class, and style).				Paragraphs Requirement	Test	Tests	Pre-production	Type of Testing	
I-1-A,C	I-1-B	I-2	I-3					I-4	Quality conformance
2	2	2	2	3.4.1.6	4.5.4.1	Durometer	X	X	-
2	2	2	2	3.4.1.1	4.5.4.2	Tensile	X	X	-
2	2	2	2	3.4.1.5.1	4.5.4.5.1	Hand-bendability	X	-	X
1	1	1	1	3.4.1.5.2	4.5.4.5.2	Tool-bendability	X	-	X
1	1	1	1	3.6.1	4.5.4.6	Air flow rate	X	X	-
I-5	I-6	I-7		Requirement	Test	Tests	Pre-production	Quality conformance	Control
2	2	2		3.4.1.6	4.5.4.1	Durometer	X	X	-
2	2	2		3.4.1.1	4.5.4.2	Tensile	X	X	-
1		1		3.4.1.2	4.5.4.3	Closure	X	-	X
1	1	1		3.4.1.5.1	4.5.4.5.1	Hand-bendability	X	-	X
1	1	1		3.6.1	4.5.4.6	Air flow rate	X	X	-
II-1	II,2-8			Requirement	Test	Tests	Pre-production	Quality conformance	Control
2				3.4.1.6	4.5.4.1	Durometer	X	X	-
3				3.4.1.3	4.5.4.4	Crack resistance	X	-	X
1	1			3.6.1	4.5.4.6	Air flow rate	X	X	-
4				3.5.1	4.5.4.7	Ozone	X	-	X

TABLE IIIB. Order of spud tests

Number of preproduction specimens to be tested (by class):				Paragraphs Requirement	Test	Tests	Pre-production	Type of testing	
1	2	4						Quality conformance	Control
2	2	2		3.4.2.1	4.5.7.1	Durometer	X	X	-
2	2	2		3.4.2.2	4.5.7.2	Tensile	X	X	-
1	1	1		3.4.2.3	4.5.7.3	Closure	X	-	X

TABLE IIIC. Order of cap tests

Number of preproduction specimens to be tested (by class)					Type of testing		
					Pre-production	Quality conformance	Control
1	2	Paragraphs		Tests			
		Requirement	Test				
10	10	3.6.2	4.5.5	Cap leakage	X	X	-

TABLE IIID. Order of core tests

Number of preproduction specimens to be tested (by class)						Type of testing		
						Pre-production	Quality conformance	Control
1	2	3	Paragraphs		Tests			
			Requirement	Test				
5	5	5	3.3.3.1	4.5.6.1	Fit	X	X	-
25	25	25	3.6.3.2	4.5.6.2	Pressure retention	X	X	-
5	5	5	3.6.3.1	4.5.6.3	Air flow rate	X	X	-
25	25	25	3.5.1.1	4.5.6.4	Low temperature leakage	X	-	X
25	25	25	3.5.1.2	4.5.6.5	High temperature leakage	X	-	X

4.5.1 Temperature and pressure conditions. Unless otherwise specified herein, all testing shall be conducted at ambient conditions of temperature ($77^{\circ} \pm 12^{\circ}\text{F.}$) and pressure ($14.5 \text{ psia} \pm .2 \text{ psia}$).

4.5.2 Valve core installation. Unless otherwise specified herein, type V, class 2 cores shall be torqued to 1-1/2 to 3 pound-inches, and type v, class 3 cores shall be torqued to 3 to 5 pound-inches.

4.5.3 Leakage testing. All leakage tests shall be accomplished by (a) completely immersing the test assembly in water or alcohol with the valve stems positioned mouth down, or (b) using automatic test equipment, as applicable, to the intended use and test conditions.

4.5.4 Valve tests.

4.5.4.1 Durameter hardness test. To determine conformance to 3.4.1.6, the rubber compound shall be subjected to the durameter hardness test specified in method 3021 of Fed. Test Method Std. No. 601, using a type A Shore durameter.

4.5.4.2 Tensile strength test. To determine conformance to 3.4.1.1, valve stems specified in Table I shall be pulled to destruction at the rate of 5 inches per minute in a tensile machine. In preparation for the test, the cap shall be removed and the valve stem shall be firmly and completely mated in the threaded adapter of the pull mechanism while the valve assembly base is clamped into a fixture with an adapter ring. The adapter rig shall have an inside diameter of 3/4" for type I, classes 3 and 4 valve assemblies and 1-1/4" for type 1, classes 1, 2, 5, and 6 valve assemblies.

4.5.4.3 Closure test. To determine conformance to 3.4.1.2, the rubber-base stem of the valve being tested shall be cut to expose the degree of closure in the valve stern base.

4.5.4.4 Crack resistance of rubber test. To determine conformance to 3.4.1.3, the straight length of the rim hole sealing area shall be stretched 10 percent to elongate the section sufficiently to permit visual examination.

4.5.4.5 Bendability test.

4.5.4.5.1 Hand-bendable test. To determine conformance to 3.4.1.5.1, valve stem shall be examined after being hand-bent to an angle of $69^{\circ} \pm 1^{\circ}$ while the lower portion is held solidly in a fixture

4.5.4.5.2 Tool-bendable test. To determine conformance to 3.4.1.5.2, valve stem shall be examined after being bent by standard valve bending tools to 86° at the valve base end, and length permitting to 90° at not less than 1-1/2" from cap end.

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4.5.4.6 Air flow rate test. To determine conformance to 3.6.1, for 30 seconds valve assembly shall be subjected to clean and dry air flow delivered by a standard air duck through a 1/4" inside diameter air hose 25 feet long. Pressure at the inlet end of the hose shall remain between 90 and 100 psig for duration of the test. The receiving tank, on which the valve assembly is mounted shall have a capacity of 1.3 to 2.5 cubic feet, and shall be precharged to 5 psig before beginning the test. For calculations, this test shall be considered to be performed under isothermal conditions.

4.5.4.7 Valve stem ozone resistance test, when specified

4.5.4.7.1 Preparation for testing. Valve stems, at least 72 hours old, shall be lubricated with soap solution and mounted in the base plate (figure 1). Valve stems shall then be washed with cold tap water for at least 15 minutes to remove the lubricant. Valve stems shall be bent 10° away from normal perpendicular position (80° with relation to the base plate). Care shall be taken that valve stem pairs retain the prescribed angular position for the duration of the test. The valve stem-and-plate combination shall be placed in an ozone chamber.

4.5.4.7.2 Procedure. To determine conformance to 3.5.1, valve stems shall show no evidence of cracking when being inspected under 5-power magnification, after being subjected to an ozone concentration of 50 ± 5 parts of ozone to 100,000,000 parts of air, by volume, for 40 hours, at a temperature of 100° ± 5° F.

4.5.4.8 Grommet ozone resistance test, when specified

4.5.4.8.1 Preparation for testing. Grommets shall be collapsed until the inner diameter touches at two opposite areas. To retain this configuration, bind the grommet with wire.

4.5.4.8.2 Procedure. To determine conformance to 3.2.5.1, grommets shall show no evidence of cracking when inspected under 5-power magnification, after being subjected to an ozone concentration of 50 ± 5 parts of ozone to 1000,000,000 parts of air, by volume, for 72 hours, at a temperature of 100° ± 5° F.

4.5.5 cap test. To determine conformance to 3.6.2, cap shall demonstrate no leakage while finger-tight on valve stem having no core, under specified pressure, the valve being immersed for the specified time.

4.5.6 Core tests

4.5.6.1 Fit test. To determine conformance to 3.3.3.1, valve core threads shall demonstrate no visible damage or engagement roughness during or after 16 cycles of being tightened into a previously unused valve stem and subsequently loosened.

4.5.6.2 Pressure retention test. To determine conformance to 3.6.3.2, valve cores shall be installed in test manifold, and while immersed for leakage observation, be subjected to the specified internal pressures for the specified length of time.

4.5.6.3 Air flow input rate test. To determine conformance to 3.6.3.1, valve cores shall be subjected to the same air flow rate test as that specified herein for valves (see 4.5.4.6).

4.5.6.4 Low temperature leakage test. Previously unused and untested cores shall be installed in a test manifold at specified pressure in manifold and the entire assembly shall be lowered to the specified temperature. After 24 hours of conditioning at the specified temperature and pressure, cores shall be checked for 1 minute at specified temperature and pressure for leakage. After leakage test, cores and assembly shall now be allowed to rise to ambient temperature the specified pressure being maintained, and the cores again checked for 1 minute for leakage. To conform to 3.5.1.1, no excess leakage shall be registered during any of the leakage tests mentioned in this paragraph. However, retightening is permitted if leakage is found.

4.5.6.5 High temperature leakage test. Previously unused and untested cores shall be installed in new tank stems and the tank stems installed in the test manifold. The complete assembly shall be placed in an oven and conditioned for 24 hours at specified temperatures and pressure. Then the cores shall be checked for 1 minute for leakage, in water at the specified temperature, except that no water shall be above 200° F. At this point, should any of the cores be leaking, half of those leaking shall be retightened to determine whether the cup gasket or barrel gasket caused the leakage and the leakage status of all cores recorded. The assembly shall now be allowed to cool to ambient temperature the pressure being maintained. The cores shall again be checked for 5 minutes for leakage. If leakage is discovered, retightening is again permitted. To conform to 3.5.1.2, no excess leakage shall be registered during any of the leakage tests mentioned in this paragraph. Non-retightened cores shall be removed, the removal torque being recorded as well as the condition of each barrel gasket.

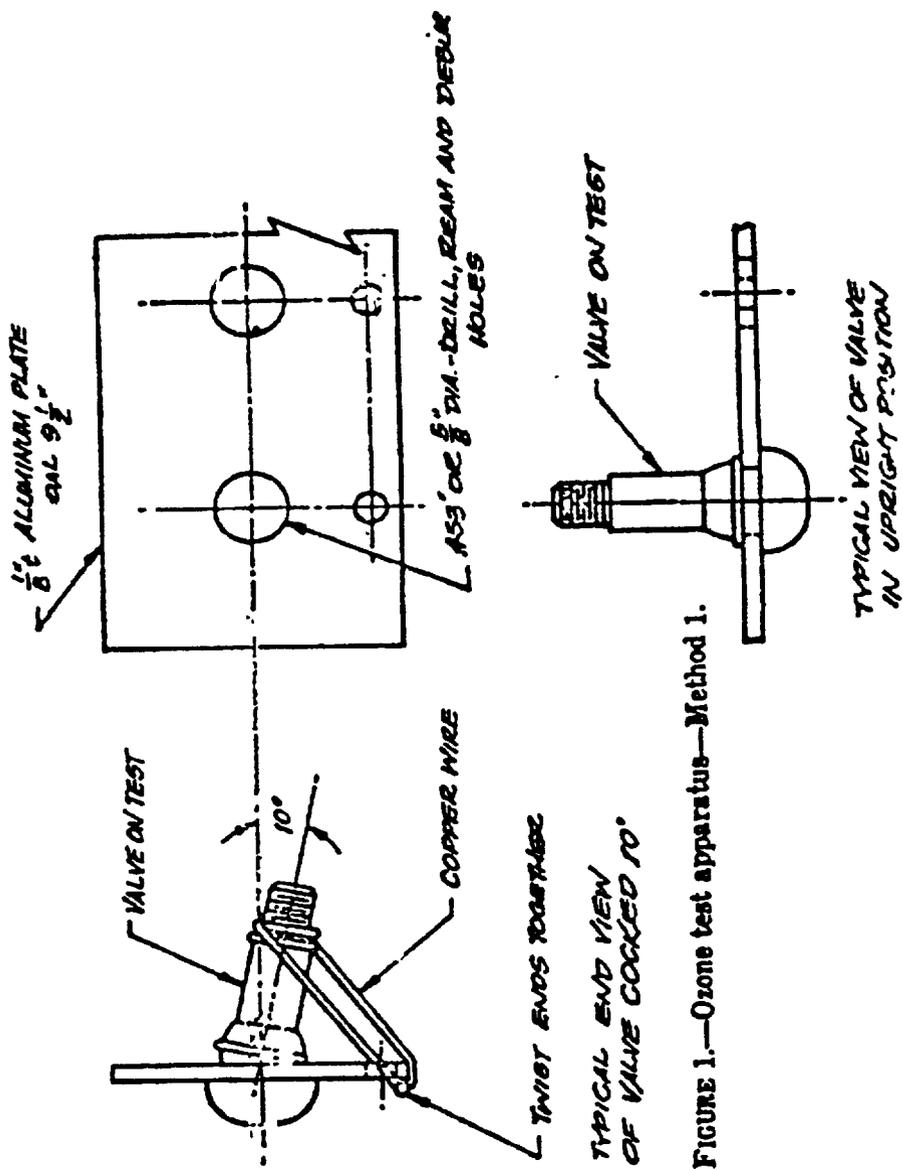


FIGURE 1.—Ozone test apparatus—Method 1.

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4.5.7 Spud test.

4.5.7.1 Durameter hardness test To determine conformance to 3.4.2.1, the rubber compound shall be subjected to the durameter hardness test specified in method 3021 of Fed. Test Method Std. No. 601, using a type A Shore durameter.

4.5.7.2 Tensile strength test. To determine conformance to 3.4.2.2, spuds shall be pulled to destruction at the rate of 5 inches per minute in a tensile machine. In preparation for the test, the body thread shall be firmly and completely mated into the threaded adapter of the pull mechanism while the base is clamped into a fixture with an adapter ring. The adapter ring shall have an inside diameter of 1-1/2 inches.

4.5.7.3 Closure test. To determine conformance to 3.4.2.3, the rubber' base of the spud being tested shall be cut to expose the degree of closure in the spud base.

5. PREPARATION FOR DELIVERY

5.1 Cleaning, drying, preservation, packaging, packing, and marking. Cleaning, drying, preservation, packaging, packing, and marking shall be level A, B, or C in accordance with the applicable packaging standard or packaging data sheet (see 6.2).

5.2 Marking for civil agencies. In addition to any special marking required by the contract or purchase order, interior packages and exterior shipping containers shall be marked in accordance with Fed. Std. No. 123.

6. NOTES

6.1 Intended use. The pneumatic tire valve and spuds, caps, and cores covered by the specification are intended for repair, replacement, and as original equipment on pneumatic tire inner tubes or rims for tubeless pneumatic tires. The type I, class 7 valves are intended for repair of type I, class 2, style A valves provided an acceptable length is used.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents

- (a) Title, number and date of this specification.
- (b) Type, class, style, and KS or T&RA number for valve required (see 1.2.1).
- (c) Type of rubber rover for snap-in valve, if different (see 3.2.1.2).
- (d) Type of material for cap seats, if different (see 3.2.2).
- (e) Design, construction (see 3.3.1.1, 3.3.2, 3.3.3.1, 3.3.4, 3.3.5, 3.3.6, 3.7).
- (f) Inspection responsibility, if different (see 4.1).
- (g) Lot formation, if different (see 4.3.1.1).
- (h) Preproduction inspection requirement when and as specified by the contracting officer (see 3.1 and 4.2).
- (i) When cleaning, drying, preservation, packaging, packing and marking shall be in accordance with the applicable packaging standard or packaging data sheet (see 5.11).
- (j) Selection of applicable level of preservation, packaging, and packing required (see 5.1).
- (k) Special marking, when required (see 5.2).
- (l) Bridgewashers shall be furnished when specified by the contracting officer (see 3.3.1.3).
- (m) Caps shall be of brass finished in black when directed by the contracting officer (see 3.3.2).
- (n) Ozone resistance (see 3.2.5.1, 3.5.1, and 4.5.4.7).

6.3 Identification of valves, cores, caps, grommets, and spuds types, classes, and design features. Identification by Tire and Rim Association, Inc., valve number as applied to types, classes, and design features, shall be as indicated in the applicable references (see 1.2.1).

Custodina:

Amy - AT
Navy - YD
Air Force - 84

Preparing Activity:

GSA-TPUS

Review Interest:

Navy - YD
Air Force - 84

User Interest:

Army - ME
Navy - As, (OG, MC, OS, SH

Orders for this publication are to be placed with the General Services Administration, acting as an agent for the Superintendent of Documents. See Section 2 of this specification to obtain extra copies and other documents referenced herein.

GENERAL SERVICES ADMINISTRATION - FEDERAL SUPPLY SERVICE

BUDGET BUREAU NO.

SPECIFICATION COMMENT SHEET

29-R0175

INSTRUCTIONS

This form provides a way for users of this specification to inform the originator of problems encountered in its use. It is not to be used to request changes to accommodate proprietary features. All comments will be considered and appreciated but please do not expect a reply. To comment detach, complete, fold, staple, and mail to GSA-OPP-YAE, CMBg. #4, Rm. 420, Wash. DC 20406

NOTE Comments on this form do not constitute or imply authorization to waive any part of the document or serve to amend contractual requirements.

1. SPECIFICATION

ZZ-V-25E

2. CONTRACT NO (if any)

3. QUANTITY ON CONTRACT (Optional)

4. DOLLAR VALUE (Optional)

5. GENERAL NATURE OF PROBLEM (e.g., inspection difficulties, manufacturers unable to meet tolerances, containers collapse under normal warehousing conditions, etc.)

6. SPECIFIC REQUIREMENTS AFFECTED (Include paragraph number and lines of wording)

7. SPECIFIC PROBLEMS (e.g. tests in 4.2.2 will not assure that the battery will last required time, temperature ranges in table 2 do not conform to commercially available items.)

8. RECOMMENDATIONS

9. NAME OF MANUFACTURER ASSOCIATION GOVT. AGENCY ETC

10. ADDRESS (Number, Street, City, State and Zip Code)

11. NAME AND TITLE OF SUBMITTER

12. DATE