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SUPERSEDING
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TIRES, SOLID RUBBER, AND WHELLS, SOLID RUBBER TIKE (Industrial)

This Federal Specification was approved by the General Services Administration for the use of all agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers commercial industrial tires, of both solid and cushion elastomer construction, with their accessories, applicable to industrial forklift trucks, tow tractors, warehouse trailers, similar materials handling equipments and special low speed vehicles.

1.2 Classification. Tires shall be of the following types, styles, compound codes, sizes, special design, and construction.

1.2.1 Types and Styles. The tire and wheel, band, or rim assemblies shall be of the following types and styles as specified (see 6.2 and 6.3):

Type I	Cured on (wheel assembly)
Style 1	Standard solid, smooth tread.
Style 2	Standard solid, nondirectional traction (nonskid) tread.
Style 4	Cushion solid, smooth tread.
Style 5	Cushion solid, nondirectional traction (nonskid) tread.
Type II	Pressed on (base band assembly)
Style 1	Standard solid, smooth tread.
Style 2	Standard solid, nondirectional traction (nonskid) tread.
Style 3	Standard solid, rib (grooved] tread.
Style 4	Cushion solid, smooth tread.
Style 5	Cushion solid, nondirectional traction (nonskid) tread.
Style 6	Cushion solid, rib (grooved) tread.
	Pressed on hi-load (base band assembly) (see 3-3.1.)
Style 1	Standard solid, smooth tread.
Style 2	Standard solid, nondirectional traction (nonskid) tread.
Style 3	Standard solid, rib (grooved) tread.
Style 4	Cushion solid, smooth tread.
Style 5	Cushion solid, nondirectional tractior, (nonskid) tread.
Style 6	Cushion solid, rib (grooved) tread.
Type IV	Cushion, hollow, lug base
TYPE V	Industrial solid-tire-on-pneumatic-rim
Style 1	Standard solid, smooth tread.
Style 2	Standard solid, nondirectional traction (nonskid] tread.
Style 3	Standard solid, rib (grooved) tread.

1.2.2 Compound Code. In accordance with standard identification for the tire industry, the compound coding shall be by color code medallion background. Unless otherwise specified herein, the elastomer used in tire manufacture shall be for universal service, red background. When specified (see 6.2), the elastomer used shall be of one or more of the remaining colored backgrounds.

Code Red		Universal service.
Code Blue	-	Low power consumption.
Code Yellow	-	Oil resisting compound.
Code White	-	Static conductive compound.
Code Green	-	Nonmarking compound.
Code Purple	-	Ozone resisting (OZ) compound.
Code Brown	-	Heat resisting (HR) compound.
Code Orange	-	Low temperature resisting compound.

1.2.3 Sizes. The tires, tire and rims, or tire and wheel assemblies shall be of the sizes listed in the Tire and Rim Association (T&RA) Yearbook and as specified (see 6.2).

1.2.4 Social Design and Construction. When specified (see 6.2), tires shall be of special design and construction: 1) as required in the referencing equipment specification, or 2) as specified by the procuring activity.

2. APPLICABLE DOCUMENTS

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

Federal Specification:

QQ-S-781 - Strapping, Steel, Flat and Seals.
NN-P-71 - Pallets, Material Handling Wood, Stringer Construction, 2-way and 4-way (Partial).

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
Fed. Std. No. 595 Colors.
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 at the prices indicated in the Index. The index, which includes cumulative monthly supplements as issued is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Off Ice, Washington, DC 20402.

(Single copies of this specification 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 in Boston; New York; Philadelphia: Washington, DC; Atlanta; Chicago; Kansas City, MO; Fort Worth; Houston; Denver; San Francisco; Los Angeles; and Seattle, WA.

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

Militarv Specifications:

MIL-P-114 - Preservation, Methods of.
MIL-F-15011 - Pallets, Material Handling, Wood, Post Construction, 4-way Entry.
MIL-C-16173 - Corrosion Preventive Compound, Solvent Cutback, Cold-Application.

Miliatary Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.
MIL-STD-193 - Painting Procedures, Tactical Vehicles (Tracked and Wheeled).
MIL-STD-417 - Rubber Compositions, Vulcanized General Purpose, Solid (Symbols and Tests).
MIL-STD-1]86 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; with Appropriate Test Methods.
MS35393 - Tire, Solid Rubber: Standard and Cushion, Industrial

(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 Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

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, Ohio 44313, Phone: Area Code 216/836-5553.)

Uniform Classification Committee, Agent:

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Publishing Officer, Room 202, Union Station, 516 West Jackson Boulevard, Chicago, Illinois 60606.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification

(Application for copies should be addressed to the National Motor Freight Traffic Association, Agent, 1616 P Street, NW, Washington, D.C. 20036.)

3. REQUIREMENTS

3.1 Qualification. The commercial, industrial type tires furnished under this specification shall be products which have been qualified (see 3.2, 3.3, 3.8) and have been listed on or approved for listing on the applicable Qualified Products list. Qualification retest will be required if the manufacturer has modified his product, changed his material or processing sufficiently that the validity of previous qualification is questionable or when deemed necessary to determine that the quality of the product is being maintained. Suppliers shall submit a list of tires they propose co supply to the Government. This list of tires shall include brands, size, type of tread design, type of service, plant that produced the tires, location of each plant, locations of laboratory test facilties, and who shall be the contact representative for the company. From this list, tires of particular brands shall be tested for qualification in order that the manufacturer may be ellgible to be awarded contracts. Orders for tires under this specification shall be listed on the QPL and not be of a quality lower than the equlvalent grade the supplier furnished for sale through commercial channels. A qualified tire brand will qualify other tire brands having an equal or higher quality level rating, provideed each is of the same construction and body material.

3.2 Qualification Tests, Inspections, and Examinations. Qualification shall be performed under the supervision of the Government representative at the prospective supplier's or other commercial laboratory acceptable to the Government, or at a Government laboratory, if specified. The costs incurred for the qualification shall be borne by the prospective supplier. The qualification shall consist of: physical examination (see 4.1.7), maximum tire outside diameter (see 3.5.1), maximum tire section width (see 3.5.1), maximum tire load ratings (see T&RA), approved rim contours (see T&RA), skid depth where applicable, hardness (see 3.6.4), rubber tensile strength and elongation (see 3.6.5), adhesion (see 3.6.3) hidden defects (see 3.6.2), and indoor endurance (see 3.6.7) in accordance with Table II.

3.2.1 Tread Composition. The physical properties of tread types I, II and III tires shall be in accordance with Table I. Physical property examinations permissible values shall also be in accordance with Table I.

Table I

Physical Properties Values and Tests

Physical Properties	Permissible Values	Tests (paragraph)
Types I and II Original properties:		
Hardness - Durometer A	65 ± 10	3.6.4
Tensile strength	2000 p.s.i. (min.)	3.6.5
Elongation	200 percent (min.)	3.6.5
Type III Original properties:		
Hardness - Durometer A	75 + 20 - 10	3.6.4
Tensile strength	3800 p.s.i. (min.)	3.6.5
Elongation	300 percent (min.)	3.6-5
Types I, II, and III		
Change from original value after accelerated aging for 70 hours at 158° ± 20°F.		3.6.6
Hardness - Durometer	+5	3.6.4
Tensile strength	-15 percent	3.6.5
Elongation	-25 percent	3.6.5

3.3 Materials. Materials shall be as specified herein. Material not specified shall be selected by the supplier as being compatible with the intended use in accordance with engineering and production standards of the industrial tire and wheel industry. The tire and applicable band, wheel, or rim shall be new, except as specified herein.

3.3.1 Elastomer Composition. The elastomer for the tires shall be of any suitable polymer that conform to the requirements of this specification. The hi-load designated tires (type III) shall be made of a high load carrying capacity elastomer such as polyurethane or the equivalent.

3.4 Compound Code Tires. Unless otherwise specified (see 1.2.2), code red, universal service tires shall be furnished and shall be in accordance with requirements (a) below. When one or more of the other compound code tires cited in 1.2.2 are specified, these tires shall be in accordance with the following minimum requirements (b) through (h):

(a) Code red - Universal service. industry standard tire inherently capable of performance in ambient air temperatures ranging from +125° to -40°F.

(b) Code blue - Lower power consumption. Industry standard low power consumption tire.

(c) Code yellow - Oil resisting. The swell volume increase of the tire shall not exceed 20 percent of the original dimensions when tested as specified in 3.4.2.

(d) Code white - Static conductive. These tires shall be compounded to have a dc resistivity not exceeding 1 million ohm centimeters when tested as specified in 3.4.3.

(e) Code green - Nonmarking. These tires shall be compounded to not leave discoloring residual surface marks on floors l nd operating surfaces that cannot be removed by rubbing with dry fingers when tested l s specified in 3.4.4.

(f) Code purple - Ozone resisting. These tires shall resist the effects of expo sure to ozone atmosphere to the extent that no cracks shall be evident in the specimen when examined under 7-power magnification after being tested as specified in 3.4.5.

(g) Code brown - Heat resisting. These tires shall resist the effect of exposure to all heated surfaces and ambient temperatures within a range from +225° to at least -25°F. The specimens shall not harden in excess of 135 percent of the original hardness specified in Table I, when tested as specified in 3.2.4, and shall remain suitable for the intended use when tested as specified in 3.4.6.

(h) Code orange - Low temperataure resisting (Arctic). These tires shall resist the effect of exposure to all ambient temperatures within a range from +120° to -65°F. The specimens shall not crack when tested as specified in 3.4.7.

3. 4.1 Compound Code Tire Tests. When special compound tires other than code red or code blue tires are specified 1.2.2 and 6.2), these special compound tires shall be tested as follows.

3.4.2 Code Yellow, Oil Resisting Tires. The tires shall be tested in accordance with Fed. Test Method Std. No. 601, method 6211, for 70 hours at 212°F, using medium No. 3 as specified in Fed. Test Method No. 601, method 6001. Nonconformance to (3.4c) shall constitute failure of this test.

3.4.3 Code White, Static Conductive Tires. The tires shall be tested for direct current resistivity as specified in Fed. Test Method Std. No. 601, method 91111. Nonconformance to (3.4d) shall constitute failure of this test.

3.4.4 Code Green, Nonmarking Tires. The tires shall be vertically loaded to not less than 20 percent of the T&RA rated loaded, and rolled over a smooth wooden surface for not less than a 5-foot distance at a slip angle offset not leas than 20”, either side, from the direction of travel. Nonconformance to (3.4e), shall constitute failure of this test.

2.4.5 Code Purple, Ozone Resisting Tires. The tires shall be subjected to the test for ozone resistance specified in MIL-STD-617, under suffix C2, in Table II. Air conditions during test shall provide minimum airflow across the specimens of 4.5 cubic feet per minute with a minimum air velocity of 2 linear feet per minute. Nonconformance to (3.4f) shall constitute failure of this test.

3.4.6 Code Brown, Heat Resisting Tires. The tires shall be conditioned at not less than 225°F for not less than 22 hours and then tested as specified in (3.2.4). The tires shall then be tested as specified in MIL-STD-417, suffix F-1, except that the lower temperature shall be minus 25°F in lieu of minus 40°F. The solenoid or motor-driven impact apparatus conforming to Fed. Test Method Std. No. 601, method 5321 or 5311 shall be used. Nonconformance to (3.4g) shall constitute failure of this test.

3.4.7 Code Orange, Low Temperature Resisting Tires. The tires shall be subjected to the low temperature brittleness test specified in Fed. Test Method Std. No. 601, method 5311, using methanol or ethanol for the heat-transfer medium. Nonconformance to (3.4h) shall constitute failure of this test.

Table II

Tires Needed For Qualification:	Characteristics	Number of Examinations	Retest Acc - Rej	Retest Acc - Rej
For each type (in Style 2 tested).	Visual Examination Major Defects	2		
	Total Examinations	2	0 - 1	0 - 1
	Visual Examination Minor Defects	2		
	Total Examinations	2	1 - 2	0
	Hardness	2		
	Outside Diameter	2		
2	Section Width	2		
	Rim Contours	2		
	Total Examinations	8	1 - 2	0
	Tensile Strength	2		
	Elongation	2		
	Total Examinations	4	1 - 2	0 - 1
	Adhesion (Tire to Wheel or Band)	2		
	Total Examinations	2	1 - 2	0 - 1
	Indoor Endurance	2		
2	Hidden Defects	2		
Total Tires 4	Total Examinations	4	0 - 1	0 - 1

3.5 Design and Construction.

3.5.1 Dimensions. Tires, bands, and wheels shall be furnished in accordance with the T&RA Yearbook. For types I, II, and III tire assemblies! the outside diameter, the base width, section height (tires section and base band height), and outside diameter of the mounting wheel shall conform to the T&RA Yearbook within the following tolerances:

(a)	Overall diameter	± 3/16 inch
(b)	Base width	+ O inch -1/32 inch
(c)	Section height	compatible with OD tolerance

For Types IV and V tires, the tire overall diameter dimensions shall correspond to dimensions applicable for pneumatic tires of the same T&RA size. Traction tread and rib tread depth shall be in accordance with the standards of the industrial tire industry.

3.5.2 Base Bands and Wheels. Types I, II, and III base bands and wheels shall be new and shall conform to the requirements specified (see 6.2).

3.5.3 Wheels. Types IV and V tires shall be compatible for mounting on wheels in accordance with applicable T&RA Yearbook tables shown in Yearbook Section 5, for type IV tires and Yearbook Section 2, 3, or 5 for type V tires. Unless otherwise specified (see 6.2), type V tires shall be furnished mounted on the applicable T&RA truck and bus type remountable rim or disc wheel, as specified (see 6.2).

3.5.& Finish. When specified (see 6.2) after the tire has been applied, the exposed metal surfaces of base bands and wheel or rims shall be painted in accordance with MIL-STD-193, system A2 except chat the color of the enamel shall be yellow, color chip number 13538 of Fed. Std. No. 595.

3.6 Performance.

3.6.1 Indoor Endurance. When the endurance test is specified (see 6.2), the tires shall be tested in l ccordance with 3.6.7. The tires shall exhibit no evidence of cracking, chipping, chunking, blowouts open-tread splice, blister or other visible defects prior to removal from the wheel or base band and cut for inspection when tested as specified in (3.6.2). Separation shall be allowable on one side only. Separation size shall not exceed l/4-inch in depth, measured from the rim edge, l nd the combined length of separations shall not exceed one-third of the circumference of the tire.

3.6.2 Hidden Defects Inspection. After the endurance test has been completed, l visual in-n of the tested tire shall be made for evidence of hidden defects. The tire and wheel band shall be cut into not less than four equal cross sections, with each section being cut circumferentially in mid-crown and on each side of the crown at the point of maximum shoulder thickness. The cut sections shall then be inspected for evidence of hidden defects such as gouges, porosity, splits, cracks, blisters, sharp or burred edges, slivers, splints, lumps, pits, mold residue or otherwise not true or smooth.

3.6.3 Adhesion. For types I, II, and III tires, the load required to separate the tread from a base band or a wheel shall be not less than 60 pounds per inch of tire width at the base. The area of adhesion shall be complete. The rubber separated during the test shall show no l violence of blistering or porosity.

3.6.3.1 Apparatus. A tension-testing machine or apparatus having a power-actuated clamp shall be used to apply and measure the force required to strip the tire from the metal wheel or rim to which it is adhered. The clamp shall travel at a rate of 6 inches per minute. The machine shall be provided with means for measuring the applied tension. Provision shall be made for mounting the tire and permitting it to rotate freely about a fixed axis of rotation.

3.6.3.2 Procedure. The tire shall be prepared for testing by cutting down to the bonding surface of the metal wheel or base band and circumferentially along its edges on both sides to minimize tearing. The tire shall also be cut transversely down to the metal base and separated circumferentially a sufficient distance to permit a firm gripping of this free end of the tire by the power-actuated clamp. The tire shall be mounted on the hub and spindle assembly and positioned in such a manner that its axis of rotation will remain parallel to the line of separation during testing and that the applied force will be normal to the tangent of the wheel or rim at the line of separation. With the free end of the tire gripped by the machine clamp, the machine shall be started and the tire stripped from the metal base. If during the test the tire begins to tear instead of separating wholly from the wheel, the machine shall be stopped and the tire shall be cut with a knife to the metal base and the test started again. Force measurements shall be recorded and the average force to separate the rubber from the rim shall be determined. Alternatively, the average force may be determined from an integrating device attached to the testing machine which determines the area under the force separation curve. The tire and the ambient air temperature, prior to and during the tests, shall be between 70° and 110° F, with the actual temperature recorded. The tire shall have been conditioned at the temperature recorded. The tire shall have been conditioned at this Temperature for a minimum of 16 hours prior to the test. Nonconformance to (3.6.3) shall constitute failure of this test.

3.6.4 Hardness. The tire shall be subjected to the durometer hardness test specified in Fed. Test Method Std. No. 601, methods 3021 and 3025. Nonconformance to (3.2.1) or 3.4(g), as applicable, shall constitute failure of this test.

3.6.5 Tensile Strength and Elongation. The tire shall be subjected to the tensile strength and elongation tests specified Fed. Test Method Std. No. 601, methods 4111 and 6121, respectively. Nonconformance to (3.2.1) shall constitute failure of this test.

3.6.6 Aged Tensile Strength and Elongation. The tire shall be subjected to the aging procedures specified in Fed. Test Method Std. No. 601, method 7221. Nonconformance to (3.2.1) shall constitute failure of this test.

3.6.7 Indoor Endurance Test. The sample tires shall be endurance tested in accordance with (3.6.1) on the apparatus described in (3.6.7.1). nonconformance to (3.6.2) shall constitute failure of this test.

3.6.7.1 Apparatus. The apparstus shall consist of l rotating steel drum, having a smooth flat faced rim. The steel drum shall have a diameter of either 36 or 67.23 inches, with a rim width sufficient to provide full support to the one or more tires being tested under the loads specified herein. During the test, the apparatus shall be located in an air space controlled at a temperature of 100° ± 5°F.

3.6.7.2 Procedure. Each sample tire shall be loaded against the drum and run continuously for 48 hours at 5 miles per hour. The rated load capacity shall conform to loads shown in the T&RA, Inc. Yearbook. At the conclusion of the test operation, each tire shall be examined externally and then internally.

3.7. Identification Marking. Unless otherwise specified (see 6.2), each tire shall have the following information legibly molded or branded on or into the outboard sides of types I and III tires and on either side of type 11 tires in symbols or letters not less than l/4-inch high; manufacturer's name or trademark, nominal tire size, date of manufacture of recognizable and commonly used date code, type, style, and compound code (see 1.2).

3.8 Workmanship. All workmanship on the tires and on their components shall be in accordance with the manufacturing and production standards of the industrial tire and component industry. Tires shall be correctly fabricated and quality shall be consistent within the tire manufacturer's" or the T&RA tolerance limits, whichever arc the closer limits. All corrections and repairs shall be within those limits of acceptability imposed by the original equipment manufacturer' s of the materials handling equipment industry. The tires and their components shall conform to the quality and grade established by this specification, with no sharp edges, burrs, slivers, metal defect, cracks, blisters, gouges, splits, porosity, damage, or permanent deformation. Overspray of primer or paint on rubber shall not be considered a defect; however, overspray shall be avoided.

4. QUALITY ASSURANCE PROVISIONS

4.1 Lot Purchases.

4.1.l Responsibility for Inspection. If specified in the contract or purchase order (Note: To require inspection, the purchasing agent or contracting officer should consider the number of tires being purchased. A sample size is 4 tires), the supplier is responsible for performance of all inspection requirements as specified herein (see 6.2). Unless 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 speccified 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 the supplies and services conform to prescribed requirements.

4.1.2 In-Process Inspection. Inspection shall be performed throughout the manufacturing process to assure that no deviation is made from the indicated requirements. These shall include all processes such as preparation of chemicals for compounding, compounding of rubber, tire assembly, forming, and vulcanizing. Wherever a deviation is noted, correction shall be made. Failure to make immediate correction may cause rejection of the affected lot of tires.

4.1.3 inspection of Component and Material. In accordance with (4.1.1), the contractor is responsible for insuring that components and materials used are manufactured, sampled, examined, and tested in accordance with the requirements of this specification.

4.1.4 Material Furnished for Tests. Tires and all related materials used for or in tests shall be furnished by the manufacturer without cost to the Government.

4.1.5 Sampling for Inspection and Acceptance. Sampling for inspection and acceptance shall be performed in accordance with the provisions set forth in MIL-STD-105. A sample size shall consist of 4 tires (2 tires for physical examinations and adhesion test, and 2 tires for indoor endurance and hidden defects) for each type, in style 2 being tested.

4.1.6 Inspection Lot. The inspection lot shall consist of all complete tires of the same type, style, compound code, and size offered for acceptance at one time.

4.1.7 Physical Examination. The sample unit. (of a sample) shall be one completely abricated tire (see 4.1.5). Physical examination of each sample shall be in l ccordance with Table II, inspected for:

Hardness	(see 3.6.4)
Outside Diameter	(see 3.5.1)
Section Width	(see 3.5.1)
Rim Contours	(see T&RA)
Adhesion	(ace 3.6.3)
Indoor Endurance	(see 3.6.7)

A tire failing to pass one or more of the above characteristics shall be considered l defective tire. The Accepted Quality Level (AQL) shall be 4.0 percent defective. The inspection level shall be S-1.

4.1.5 Visual Examination. The sample unit (of a sample) shall be one completely fabricated tire (see 4.1.5). Visual examnation shall be in accordance with Table II l nd 111. The AQL for major defects shall be 4.0 percent defective and for minor defects, 6.5 percent defective. The inspection level shall be S-4.

Table III

Examination Schedule

Classification	Examine	Defect
Major		
101	Tire	Type, style, tread, compound code, or size not as specified
102	Tire	Special design l nd construction not l s specified, when l pplicable.
103	Tire	Nonconformance to T&RA Yearbook.
104	Tire finish	Gouges, porosity, splits, cracks, or blisters.
105	Wheels or bands	Nonconformance to T&RA Yearbook or not as specified.
106	Wheel or band finish	Sharp or burred l dges, slivers, splits, cracks, or l etal defects.
107	Wheel or band finish	Not finished as specified.
108	Workmanship	Warped, fractured, deformed, or otherwise damaged.
109	Marking	Omission or lack of legibility of manufacturer's identification.
Minor		
201	Tire finish	Lumps, pits, mold residue or otherwise not true l nd smooth.
202	Workmanship	Crease, oil, dirt, other foreign matter embedded in surface, or other evidence of imperfection.
203	Harking	Manufacturer's name or trademark, type, style, compound code, size, and date of manufacture not legibly molded or branded in the location as specified; not of size, symbols, or letters specificd,

4.2 Inspection and Preparation for Delivery.

4.2.1 Quality Conformance Inspection of the Pack.

4.2.1.1 Unit of Product. For the purpose of inspection, a completed pallet prepared for shipment shall be considered a unit of product. A lot shall be the number of pallets offered for delivery at one time.

4.2.1.2 Sampling. Sampling for examination and testing shall be in accordance with MIL-STD-105, inspection level S-4.

4.2.1.3 Examination. Samples selected in accordance with 4.2.1.2 shall be examined for the defects specified in Table IV. AQL shall be 4.0 defects, expressed in terms of defects per hundred.

Table IV

Examination for Preparation for Delivery

Classification	Examine	Defect
109	Markings	Omitted, incorrect, illegible, of incorrect size, location, sequence, or method of application.
110	Cleaning	Not clean.
111	Preservation	Preservation incorrectly applied or missing or not as specified.
112	Packing	Pallets not as specified. Length exceeds 72 inches, or shortest dimension less than 28 inches.
113	Materials	Components missing, damaged, or otherwise defective.
114	Workmanship	Inadequate application of components such as loose strapping, inadequate stapling, blocking and cushioning inadequate, missing or incorrect. Load not rigid. Tires not loaded flat.
115	Weight	Weight per pallet more than 2,000 pounds.

4.2.1.4 Pack Test. Test the pack in accordance with the pendulum test and the railroad-car test specified in MIL-STD-1186. Nonconformance to 5.2.I.l shall constitute failure of this test.

5. PREPARATION FOR DELIVERY

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

5.1.1 Level A. Each tire shall be cleaned in accordance with mIL-P-116, process C-1 and thoroughly dried. All unpainted q etal surfaces shall be coated with a preservative conforming to MIL-C-16173, grade 1.

5.1.2 Level C. Tires shall be cleaned and the metallic portion preserved in a manner to assure protection against corrosion from the supply source to the first receiving activity. The supplier’s standard practice may be used when it meets these requirements.

5.2 Packing. Packing shall be levels A or C as specified (see 6.2).

5.2.1 Level A. Unless otherwise specified (see 6.2), the tires shall be packed on pallets conforming to Federal Specification NN-P-71, Type IV, Croup 111 Woods or MIL-P-15011. Unless otherwise specified herein, the standard size of the pallet shall be 40 to 48 inches. When required, the standard pallet dimensions may be increased or decreased to the size demanded by the dimensions of the tires to be loaded, provided that the following conditions are observed: the longest dimension shall not exceed 72 inches and the shortest dimension shall be not less than 28 inches, and shall permit the loaded pallet to be handled by forklift and pallet lift trucks.

5.2.1.1 Packing Procedure . Tires shall be packed in a flat position. The load arrangement with blocking, bracing, and 1-1/4 by 0.035 inch strapping, conforming to QQ-S-781, type I or II, class B, shall provide a compact rigid load that will withstand without damage, impact forces, vibration, and compression encountered during shipment and storage when tested as specified in 4.2.1.4. The gross weight shall not exceed 2,000 pounds.

5.2.2 Level C. Tires, preserved as specified in 5.1, shall be packed in a manner to assure carrier acceptance and safe delivery to destination at the lowest transportation rate for such supplies. Packing shall comply with Uniform Freight Classification rules or National Motor Freight Classification rules.

5.3 Marking.

5.3.1 Civil Agencies. In addition to any special marking required by the contract or order, shipping containers and pallets shall be marked in accordance with Fed. Std No. 123.

5.3.2 Military Agencies. In addition to any special marking required by the contract or ordre, shipping containers and pallets shall be marked in accordance with MIL-STD-129.

5.3.3 Special Marking. Each tire shall be identified using two paper tags as specified in MIL-STD-0129. Each tag and each exterior container and pallet shall be clearly marked with the following:

(a) Tire (as applicable).
(b) Specification number.
(c) Name of supplier (and name of manufacturer if not the same).
(d) Government order number (or contract number if order number not assigned).
(e) Size of tire.
(f) Type and style of tire.
(g) Compound code of tire (when specified).
(h) Rate of pack.
(i) Shelf life expiration date.

6. NOTES

6.1 Intended Use. The solid rubber tires covered by this specification are intended for use industrial materials handling equipment such as forklift, power and handtrucks, tractors, and trailers not intended for operation at a speed of over 10 miles per hour.

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

(a) Title, number, and date of this specification.
(b) Types and styles of tire assemblies required (see 1.2.1).
(c) When compound code(s) other than code red, for Universal Service, arc required (see 1.2.2 and 3.4).
(d) Size(s) of tire assemblies required (see l.2.3).
(e) When tire assemblies of special design and construction are required and equipment specification or other requirements are needed (see 1.2.4).
(f) Applicable requirements for types I, II, and III base bands and wheels (see 3.5.2).
(g) When type V tires are to be furnished unmounted (see 3.5.3).

(h) Whether remountable rims or disc wheels are required (see 3.5.3).
(i) When exposed metal surfaces of base bands, wheels, or rims require painting as specified in 3.5.4.
(j) When indoor endurance as specified in 3.6.1 is required.
(k) When marking is to be ocher than as specified (see 3.7).
(1) Selection of applicable level of preservation and packing required (see 5.1 and 5.2).
(m) Size and construction of loading pallets when different from standard (see 5.2.1).
(n) When source inspection as specified in 4.1 is required.

6.3 Type and Style Definitions. Terms used in the classification of types and styles (see 1.2.1) are described as follows:

(a) Cured On. Tire bonded directly to the metal wheel during the molding and vulcanizing operation.
(b) Pressed On. Tire bonded directly to a remountable, metal base band during the -molding and vulcanizing operation? the latter to be subsequently pressed on to a metal wheel.
(c) Standard Solid. Tire of comparatively low section height (including base band) - usually 2 inches or less.
(d) Hi-load Solid. Solid tires in which materials have been used such that the load carrying ability of any given size may be increased to the limit designated by the manufacturer of the special tire.
(e) Cushion Solid. Tire having a sectional height (including base band) relatively larger than the standard tread - usually 2-1/2 inches or over. This does not include semi-pneumatic type tires.
(f) Cushion Hollow. Tires having a hollow torus form with a lug base mounted on a matching lug based rim wheel. This tire assembly is also called a zero pressure type tire.
(g) Smooth Tread. Tire having a smooth road surface.
(h) (Nonskid) Nondirectional Traction Tread. Tire, the road surface of which is designed with lug, cleats, or other nonskid configuration.
(i) (Grooved) Rib Tread. Tire having one or more grooves running circumferentially on its road surface.

4.4 Supersession Data. This specification supersedes ZZ-T-391D, dated November 4, 1970; ZZ-T-391C, dated July 6, 1964; ZZ-T-391B, dated March 9, 1960; and ZZ-T-391A, dated July 23, 1946.

MILITARY INTEREST:

Custodians:

Army - ME
Navy - YD
Air Force - 8 4

User Activities:

Army - MD, AT
Navy - MC

Preparing Activity:

GSA-TPUS

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GENERAL SERVICES ADMINISTRATION - FEDERAL SUPPLY SERVICE

SPECIFICATION COMMENT SHEET

BUDGET BUREAU NO 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-T-391E

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

GSA DC 69 9761

FORM GSA FEB 69 2200