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MIL-L-2037D
30 December 1965
SUPERSEDING
MIL-L-2037C
14 December 1962
(See 6.10)

MILITARY SPECIFICATION

LUMBER, OAK, WHITE AND RED, FOR SHIP AND BOAT CONSTRUCTION

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. - This specification covers white and red oak lumber for ship and boat construction, including bending for use in boat and ship frames or for parts requiring bends of similar severity.

1.2 Classification. - White and red oak lumber shall be furnished in the following classes and grades, as specified (see 6.2):

Class a - Planking.

Grade I.
Grade II.

Class b - Shaft logs.

Class c - Sawn timber.

Grade I.
Grade II.

Class d - Ceiling.

Class e - Bending.

Grade I.
Grade II.

2. APPLICABLE DOCUMENTS

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

FSC 5510

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SPECIFICATIONS

FEDERAL
TT-P-320 - Pigment, Aluminum; Powder and Paste, for Paint.
TT-W-571 - Wood Preservation; Treating Practices.

MILITARY
MIL-W-1174 - Varnish, Spar, Water-Resisting (Formula No. 80).
MIL-M-15176 - Mica (Extender Pigment).

STANDARDS

MILITARY
MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications, standards, drawings, and publications 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.

NATIONAL HARDWOOD LUMBER ASSOCIATION
Rules for the Measurement and Inspection of Hardwood Lumber, Cypress Veneers and Thin Lumber.

(Application for copies should be addressed to the National Hardwood Lumber Association, 59 East Van Buren Street, Chicago, Illinois 60605).

AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASTM-D2016-62T - Tentative Methods of Test for Moisture Content of Wood.

(Application for copies should be addressed to American Society for Testing and Materials, 1916 Race St., Philadelphia, Pennsylvania 19103).

3. REQUIREMENTS

3.1 Material. - White oak lumber shall be cut from native trees of species in the white oak group. Red oak lumber shall be cut from native trees of species in the red oak group. (See 4.4.4 and 6.7).

3.2 Dimensions. - Lumber shall be uniformly manufactured to not less than the dimensions stated, unless nominal size is specified (see 6.2). Lumber shall have parallel edges and faces, subject to the standard tolerances for variations in sawing or subsequent surfacing (see 4.3.2 and 6.2). Sapwood, wane, or other defects which can be eliminated in sawing or surfacing oversize pieces to the standard nominal dimensions ordered will be permitted for all classes of material.

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3.3 Defects. - The limitations and permitted defects in lumber shall be specified in 3.3.1 through 3.3.4 and Table I. The defects shall be so located in the piece that no combination of them at any point is more weakening than a single maximum permissible defect.

3.3.1 Defects due to foreign organisms. - Lumber shall be free from decay, mold, and stain. The presence of frass, or other indications of active insect attack, shall be cause for rejection. Pinholes resulting from dormant insect infestation shall be admitted providing they do not exceed the limits specified in table I.

3.3.2 Defects due to natural causes. - Lumber shall be free from shake, loose knots, and bark pockets. Sound knots, burl, sapwood, and wane shall be admitted providing they do not exceed the limits specified in table I. An unlimited amount of sapwood shall be admitted where the lumber is pressure treated with a preservative (see 3.4). White oak may contain untreated sapwood within the limits specified in table I.

3.3.3 Defects due to seasoning. - Lumber shall be free from honeycombing. Casehardening, surface checks, end checks or splits, bow, crook, cup, and twist shall be admitted providing they do not exceed the limits specified in table I.

3.3.4 Slope of grain. - Lumber shall not have a slope of grain on any face or edge which exceeds the limits specified in table I.

3.4 Preservative treatment. - All white oak sapwood and all red oak, except as permitted in 3.3.2, shall be treated in accordance with TT-W-571. Treatment shall be with water-borne preservatives, for use under moderate leaching conditions. Penetration of red oak heartwood shall be at least 65 percent of all annual rings, without exception. Penetration of any sapwood shall be 100 percent.

3.5 Moisture content. - Lumber shall be seasoned by air or kiln drying to within the following moisture content limits (see 4.4.1):

Class a - 17 ± 3 percent.

Classes b and c - Any stage of seasoning.

Class d - 15 ± 3 percent.

Class e - 15 percent or above.

3.5.1 Moisture content gradient. - For classes a and d, the moisture content of the core shall not vary from that of the shell by more than 3 percent (see 4.4.1).

Table I. Maximum allowable defects

Defect	Class a - Planking		Class b - Shaft Logs	Class c - Sawn Timber		Class d - Ceiling	Class e - Bending Timber	
	Grade I	Grade II		Grade I	Grade II		Grade I	Grade II
Pinholes	Three holes not more than 1/6 inch in average diameter per linear foot.	Four 1/2-inch clusters of three holes each in each linear foot.	Three 1/2-inch clusters of three holes not over 1/4 inch in diameter.	Two clusters of three holes each not more than 1/4 inch in diameter in each 2 linear feet.		Holes less than 1/4 inch in average diameter.	None permitted.	Three holes in any 6 inches of length.
Sound knots	Limited in size to 1 inch in average diameter, spaced 2 feet apart.	Limited in size to 1-1/2 inches in average diameter, spaced 1-1/2 feet apart.	Limited in size to 1-1/2 inches in average diameter, spaced 2 feet apart.	Limited in size to 1/4 of the width of the face on which they appear but not to exceed 3 inches, except that knots near the edges of wide faces in pieces containing the pith are limited to 1/8 of the width of the face. Two knots of maximum size are not permitted in the same 6 inches of length.	Limited in size to 1/3 of the width of the face on which they appear but not to exceed 4 inches, except that knots near the edges of wide faces in pieces containing the pith are limited to 1/4 of the width of the face. Two knots of maximum size are not permitted in the same 6 inches of length.	Limited in size to less than 1/4 inch in diameter, spaced 2 feet apart.	None permitted.	Limited to one sound knot 3/4 inch in diameter within the 12-inch length from each end, except that no knots shall be permitted in middle third of piece.

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Table I. Maximum allowable defects—Continued

Defect	Class a - Planking		Class b - Shaft Logs	Class c - Sawn Timber		Class d - Ceiling	Class e - Bending Timber	
	Grade I	Grade II		Grade I	Grade II		Grade I	Grade II
Burl	Limited to the size of the largest permissible knot.						None permitted.	One burl 3/4 inch in diameter within 12 inches from each end, except no burl shall be permitted in middle third of piece
Slope of grain	Limited to 1 inch in 15 inches of length.	Limited to 1 inch in 10 inches of length.		Limited to 1 inch in 15 inches of length.	Limited to 1 inch in 10 inches of length.	Limited to 1 inch in 18 inches of length.	Limited to 1 inch in 15 inches of length.	
Sapwood	Not limited in lumber to be given preservative treatment.							
Sapwood, untreated, in white oak lumber	Not more than 1/4 the width of any edge or face.						Not more than 1/8 the width of any edge or face.	Not more than 1/6 the width of any edge or face.
Wane	Not over 1/2 the width, 1/4 the thickness, or 1/6 the length.			Not over 1/8 the width, 1/8 the thickness, or 1/2 the length.		Not over 1/4 the width, 1/4 the thickness, or 1/6 the length.	Not over 1/8 the width, 1/8 the thickness, or 1/6 the length.	Not over 1/6 the width, 1/6 the thickness, or 1/6 the length.

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Table I. Maximum allowable defects—Continued

Defect		Class a - Planking		Class b - Shaft Logs	Class c - Sawn Timber		Class d - Ceiling	Class e - Bending Timber	
		Grade I	Grade II		Grade I	Grade II		Grade I	Grade II
Surface checks	Width and length	Not over 1/32 inch in width and 4 inches in length.		Not limited.			Not over 1/32 inch in width and 4 inches in length.		
	Depth	Average depth limited to 1/4 of the thickness of the piece.	Average depth limited to 1/3 of the thickness of the piece.		Average depth limited to 1/4 of the thickness of the piece.	Average depth limited to 1/3 of the thickness of the piece.	Average depth limited to 1/4 of the thickness of the piece.		Average depth limited to 1/3 of the thickness of the piece.
End checks or splits		Average length limited to 3/4 of the thickness of the piece.	Average length limited to the thickness of the piece.	None permitted.	Average length limited 3/4 of the thickness of the piece.	Average length limited to the thickness of the piece.	Not longer than width of piece.	Not over 4 inches in length.	Not over 12 inches in length.
Bow		Not over 1 inch deviation per 6 feet of length.						Not over 1/4 inch deviation per 6 feet of length.	
Crook		Not over 1 inch deviation per 6 feet of length.						Not over 1/4 inch deviation per 6 feet of length.	
Cup		Not over 3/8-inch depth per 12 inches of width.		Not limited (not applicable).			Not over 3/8-inch depth per 12 inches of width.	Not over 1/8 inch per 12 inches of width.	
Twist		Not over 1 inch rise in fourth corner in 6 feet of length.		Not over 1/2 inch in fourth corner in 6 feet of length.			Not over 1 inch rise in fourth corner in 6 feet of length.	Not over 1/4 inch rise in fourth corner in 6 feet of length.	
Case-hardening		Slight case-hardening permitted		Not applicable			Slight case-hardening permitted	Not applicable	

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3.6 Specific gravity. - Exceptionally lightweight lumber shall be cause for rejection (see 6.4). Lumber suspected of being abnormally light in weight during inspection handling shall be tested (see 4.4.3). The specific gravity when tested shall be not less than: white oak, 0.65 (40.6 lb. per cu. ft.), and red oak, 0.61 (38.1 lb. per cu. ft.).

3.6.1 Growth rings. - Lumber in classes a, b, c, and d shall have not more than 20 rings per inch, measured on a representative radial line, (see 4.3.6). All class e lumber shall have not less than 6 nor more than 15 growth rings per inch of radius.

3.7 Application of protective coating:

3.7.1 End coating. - The ends of all lumber shall be painted within 24 hours after sawing, with two coats of aluminum or mica paint. Aluminum paint shall consist of 2 pounds of aluminum powder paste conforming to type II, class A, of TT-P-320 and 1 gallon of phenolic varnish conforming to MIL-V-1174. Mica paint shall consist of 2 pounds of mica conforming to type I of MIL-M-15176 and 1 gallon of phenolic varnish conforming to MIL-V-1174. A drying interval of 24 hours shall elapse before applying the second coat. An alternate end coating may be any commercial end coating satisfactory to the bureau or agency concerned.

3.7.2 Side coating. - When lumber is required to be side coated as specified (see 6.2), it shall be given two brush or spray applications of aluminum paint consisting of 2 pounds of aluminum paste conforming to type II, class B, of TT-P-320 and 1 gallon of phenolic varnish conforming to MIL-V-1174. The side coating shall be applied within 24 hours after sawing, with a drying interval of 24 hours before applying the second coat. Treatment for stain and mold prevention, when required (see 5.1), shall precede side-coating applications.

3.7.3 Reapplication of protective coating. - End and side coatings shall be renewed as necessary when lumber is stored outdoors for long periods of time.

3.8 Identification marking. - If specified in contract or order, each piece of lumber which has passed the examination and tests specified herein, shall be marked for species, class and grade (see 6.2). Narrow, thin pieces shall be bundle marked. Lumber shall be tagged or marked on one end.

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, the supplier may utilize his own facilities or any commercial laboratory satisfactory to 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 supplies and services conform to prescribed requirements.

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4.2 Lot. - All lumber of one class and grade to be delivered in one truck or railroad car shall be considered a lot for purposes of inspection.

4.3 Quality conformance examination. -

4.3.1 Class and grade examination. - Each piece of lumber in the lot shall be examined to determine compliance with the requirements of 3.3 (except casehardening and honeycombing) and 3.6 (except 3.6.1). Each piece of lumber shall be positively identified as white oak or red oak (see 6.7). Particular care shall be taken to prevent lumber containing only sapwood from being accepted as all heartwood. Slope of grain shall be determined in accordance with 4.3.4. Each piece not conforming to class and grade examination shall be rejected.

4.3.2 Dimensions, seasoning and growth ring examination. - (All classes).

4.3.2.1 Sampling procedure. - Samples shall be selected from the lumber which has passed the grade and class examination of 4.3.1. The number of pieces in the lot shall be tallied beforehand, and the samples selected in accordance with MIL-STD-105 at Inspection Level II and the following Acceptable Quality Levels (AQL):

Examination or test	Requirement paragraph	Test paragraph	AQL, percent		
			Classes a and d	b and c	Class e
Dimensions	3.2	4.3.7	4.0	4.0	4.0
Moisture content	3.5	4.4.1	4.0	4.0	4.0
Moisture gradient	3.5.1	4.4.1	4.0	---	---
Case-hardening	3.3.3	4.4.2	4.0	---	---
Honeycomb	3.3.3	4.4.2	4.0	---	---
Growth rings	3.6.1	4.3.6	4.0	4.0	2.5

Any sample piece which does not meet the requirements of 3.2, 3.5, 3.3.3 and 3.6.1 shall be rejected. If the number of nonconforming pieces exceeds the acceptance number, the lot shall be rejected.

4.3.3 Quantity examination. - The quantity of lumber in the lot shall be determined by tally, in accordance with the National Hardwood Lumber Grading Rules.

4.3.4 Slope of grain. - The slope of grain shall be measured on both flatsawed and quartersawed surfaces, over distances sufficiently great to determine the general slope, disregarding short local deviations caused by permissible burls and knots. Where a truly quartersawed or nearly quartersawed surface is present, the slope of grain may be determined by tracing the darker band of the summerwood of a growth ring from the point of inception along the edge of the piece for a convenient distance of 10 or 15 inches from the starting point, and estimating or measuring the divergence from the edge of the piece. Where a truly flat-grained surface is present, the slope of grain may be determined by drawing a line parallel to the pores or to surface checks and

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extending it until it intercepts the edge of the piece. At a convenient distance along this line, such as 10 or 15 inches, estimate or measure the divergence from the edge of the piece. Where there is no flat-grained surface, for example, a square where the growth rings run diagonally from one corner to the opposite one, the slope of grain can be calculated from the angle traced by a swiveled scribe drawn along the surface.

4.3.5 Knots or holes. - Measurement of the diameter of knots or holes shall be determined by averaging the distance between lines drawn parallel to the edges and ends of the piece and touching the extremities of the knot or hole being measured.

4.3.6 Growth rate. - Average annual rings per inch shall be measured on a line at a right angle to the rings of annual growth representative of the average growth in the cross-section at either one end or the other. If the size of the piece permits, the measuring line shall be three inches long. In pieces containing the pith, the measurement may exclude an inner portion of the radius amounting to approximately one-quarter of the least dimension of the piece.

4.3.7 Dimensions. - Dimensions of both rough and surfaced lumber shall be subject to the standard tolerances specified for hardwood lumber in the National Hardwood Lumber Association Grading Rules.

4.3.8 Additional inspection. - Where other specifications form part of this specification for lumber, unless otherwise specified in the contract or order, sampling, examination and tests shall be conducted as required in the referenced specification.

4.4 Test methods. -

4.4.1 Moisture content. - Moisture content shall be determined using an accurate moisture meter or oven test, as applicable, in accordance with ASTM Standard D-2016-62T. If a moisture meter is used, it shall be equipped with insulated probes for determining moisture content and gradient from shell to core. If oven method is selected, moisture content and gradient specimens shall be cut as shown in figure 2a and 2b.

4.4.2 Casehardening and honeycomb. - Casehardening shall be determined in accordance with figure 2c. Honeycomb (an internal void or check usually developing along the rays) shall be determined by examination of moisture content section, figure 2a.

4.4.3 Specific gravity. - The specific gravity shall be determined by ascertaining the ratio of the volume below the waterline (see figure 1) to that of the whole piece. This method consists of the following steps:

(a) Cut a piece of wood from the lumber to be tested, about 1 by 1 by 12 inches in dimension, the 12-inch dimension being along the grain.
(b) Dry the piece for 48 hours at 212°F. to 221°F.
(c) Dress the piece so that the cross section is rectangular and uniform throughout the length, and trim it to exactly 10 inches in length. Mark off the length in inches starting with 1 near the end that is to be submerged.

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(d) Place the piece carefully in a tall glass container of water so that the piece floats in an upright position. Note the waterline to which it sinks, quickly remove and mark the waterline (see fig. 1). The average position of the waterline corresponds to the point halfway between the two edges of the piece. The position of the waterline indicates the specific gravity of the piece on the basis of ovendry weight and volume. Thus, if it is halfway between the 7 and 8 inch marks, the specific gravity is 0.75. The test shall be performed quickly up to the time when the waterline is marked, because the ovendry piece will absorb moisture while it is being dressed, cut, and marked, and particularly after it is placed in the water. When determining the acceptability of suspected material, the required immersion depth may be marked on the pieces before testing.

4.4.4 Species and sapwood. - Species and sapwood determination shall be performed with chemical indicators (see 6.7).

4.5 Examination of preparation for delivery. - The packaging, packing and marking shall be examined to determine compliance with Section 5 of this specification.

5. PREPARATION FOR DELIVERY

5.1 Stain and mold preventive. - When material above 20 percent moisture content that has not been treated with a preservative (see 3.4) is shipped during warm weather, or when the shipment will be in transit or storage for more than 15 days between sawing and using, a treatment to prevent the development of stain or mold causing fungi shall be applied (see 6.2). The preventive treatment shall consist of dipping in or spraying with a water solution of 30 pounds of sodium pentachlorophenate in 100 gallons of water,
or other stain-preventing water solutions of equal effectiveness.

5.2 Packaging. - Narrow, thin pieces shall be securely bundled to facilitate handling.

5.3 Packing. - Unless otherwise specified in the contract or order, (see 6.2), the loading of the material shall be as specified by the bureau or agency concerned. As far as practicable, the lumber shall be segregated for species (white oak or red oak), class, grade, thickness, and width. The load shall be blocked and braced to prevent shifting in transit and shall be protected against precipitation and the adverse effects of the direct rays of the sun in shipment. Surfaced lumber and kiln-dried lumber shall be shipped only in closed cars or vans and shall be stored under cover at all times. Bending oak shall be prevented from drying during storage and shipping by solid piling (see 6.9).

5.4 Marking. - In addition to any special marking required by the contract or order, (see 6.2) shipments shall be marked in accordance with MIL-STD-129

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for carload shipments. Suitable tally cards shall be conspicuously posted at access entrance ways within the carrier. The tally cards shall be protected against deterioration and loss. Nomenclature thereon shall be identical with that approved under the contract or order.

6. NOTES

6.1 Intended use. - This lumber is intended for use as solid straight or curved members in small boats, patrol craft, mine sweepers, and other wooden boats or ships where high strength, bendability, and good decay resistance, either natural or acquired by preservative treatment, are required.

6.2 Ordering data. - Procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Species, class, and grade required (see 1.2).
(c) Thickness, width, and length required; actual or nominal dimensions (see 3.2).
(d) The amount of surfacing desired, if any (see 3.2).
(e) Whether side coatings are required (see 3.7.2).
(f) Whether identification marking of each piece is required (see 3.8).
(g) Whether additional inspection is required (see 4.3.8).
(h) Whether anti-stain treatment is required (see 5.1).
(i) That the contractor shall pile material awaiting shipment on stickers (Class e solid piled)and protect it from precipitation and the direct rays of the sun (see 5.3).
(j) Additional information if required (see 5.4).

6.3 This specification specifies the extent of defects and sapwood (see 6.7) permitted in the poorest pieces of timber acceptable.

6.4 Exceptionally lightweight pieces of oak lumber have decidedly decreased strength properties, usually caused by decay fungi or abnormal growth conditions. It is therefore necessary that suspected lightweight lumber be tested (see 3.6 and 4.4.3).

6.5 Because of the nonconformance to standard commercial dimensions, particularly shaft logs and sawn timber of oak lumber conforming to this specification, it is usually necessary to manufacture it to order. When possible, standard commercial nominal sizes should be specified to reduce cost and increase availability. Generally, less difficulty is experienced with oak cut during the winter season. It is recommended that, when practicable, orders be placed so that advantage may be taken of the foregoing. The use of side coatings as specified in 3.7.2 further reduces the amount of seasoning degrade and should be specified in all requests for oak for use by West Coast activities outside the limits of the Continental United States. Side coatings are not necessary on oak which has been thoroughly seasoned before shipment.

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6.6 Table II covers the sizes of oak shaft logs that should be specified for standard motorboats and motor launches listed therein.

Table II. Sizes of oak shaft logs for standard motor boats and motor launches

Thickness	Width	Length	Types of boats for which suitable	Number of shaft logs obtainable from each piece 1/
Inches	Inches	Feet		
5-1/2	16	10	24-foot motor launch	2
5-1/2	16	9	26-foot and 30-foot motor launches	1
5-1/2	17-1/2	10	33-foot motor launch	2
5-1/2	17-1/2	11	36-foot motor launch	2
5-1/2	12-1/2	10	26-foot motor whaleboat	2
5-1/2	12-1/2	16	26-foot motorboat	2
6-1/2	11	11	35-foot and 40-foot motorboats	1
6-1/2	11	13	40-foot motorboat	1
6-1/2	11	18	40-foot motorboat	2 (alternate)
6-1/2	17	10	40-foot motor launch	1
6-1/2	13	13	50-foot motor launch	2

1/ Pieces of single or half length or multiples thereof will be acceptable in sizes where it is indicated that the logs will be cut into halves for use.

6.7 It is very important that lumber secured under this specification be identified as to white oak or red oak, or sapwood or heartwood. The heartwood of white oak has approximately twice the natural decay resistance of red oak heartwood. The sapwood of both species possesses no natural resistance and is subject to rapid decay; hence, sapwood and heartwood of red oak are restricted in this specification unless preservative treatment is given (see 3.2 and 3.4). White oak can be readily differentiated from red oak, as can sapwood from heartwood, by the use of chemical solutions which result in a characteristic color change when applied to questionable boards or timbers. The chemicals and necessary procedures are as follows:

Indicator I - To distinguish oak sapwood from heartwood:

(a) Prepare a 0.5 percent solution of methyl orange in 25 percent alcohol solution.
(b) Apply as a brush stripe to freshly surfaced portion:

(1) Yellow color indicates oak sapwood.
(2) Red color indicates oak heartwood.

Indicator II - To distinguish red oak from white oak:

(a) Prepare Solution A as follows:

(1) Dissolve 6.98 grams of benzidine hydrochloride in 10.6 cc of concentrated hydrochloric acid

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(2) Add 970 grams (cc.) of distilled water.

(b) Prepare Solution B as a 10 percent aqueous solution of sodium nitrite.
(c) Mix equal amounts of Solutions A and B sufficient for 1 day's use. (the two solutions together are unstable for longer periods.)
(d) Apply as a brush stripe to freshly cut or clean bright surface of heartwood only.
(e) Observe color reaction 20 to 30 minutes after applying:

(1) Light to medium reddish-orange color indicates red oak.
(2) Dark greenish-brown color indicates white oak.

Users are cautioned to prevent skin contact with the chemicals and to avoid spilling of chemicals on clothing. It will be noted that it is necessary to apply Indicator II as a 50-50 mixture of Solutions A and B, as a misleading color reaction can otherwise occur. The chemicals are readily obtainable and provide positive identification rapidly.

6.8 Working stresses. - Working stresses for lumber in Classes a, b, or c under normal loading in wet conditions are specified in table III. Increases of these stresses for use under dry conditions are listed.

Table III. Working stresses for classes a, b, and c white or red oak in the wet condition under normal loading

Class and grade	Bending or tension		$E \times 10^3$	Compression parallel		Compression perpendicular	Shear
	2" to 4"	5" +		2" to 4"	5" +		
a -I	1,700	1,700	1,500	1,120	1,120	400	150
a -II and b	1,350	1,350	1,500	950	950	400	135
c -I	1,700	1,700	1,500	1,100	1,100	400	150
c -II	1,300	1,300	1,500	1,000	1,000	400	135
PERCENT INCREASE FOR DRY USE UNDER NORMAL LOADING							
a -I	15	0	10	25	10	50	10
a -II and b	5	0	10	15	10	50	10
c -I	15	0	10	25	10	50	10
c -II	5	0	10	15	10	50	10

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6.9 Storage of Class e lumber. - To insure that bending oak moisture content will be not less than 15 percent at the time of use, it is necessary that stock be segregated for special handling. Stocks should be marked well to insure against stickering. They should be kept solid piled and protected from high temperature or direct sunlight. A suitable covering should be used to minimize evaporation.

6.10 CHANGES FROM PREVIOUS ISSUE. THE EXTENT OF CHANGES (DELETIONS, ADDITIONS, ETC.) PRECLUDE THE ANNOTATION OF THE INDIVIDUAL CHANGES FROM THE PREVIOUS ISSUE OF THIS DOCUMENT.

Custodians:
Army - MO
Navy - SH
Air Force - 69

Review activities:
Army - MO,
Navy - SH
Air Force - 69

User activities:
Navy - CG, YD

Preparing activity:
Navy - SH
(Project 5510 - 0057)

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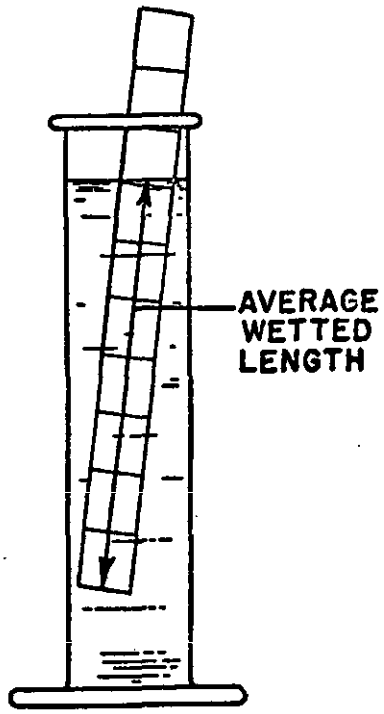

Figure 1.—Specific gravity.

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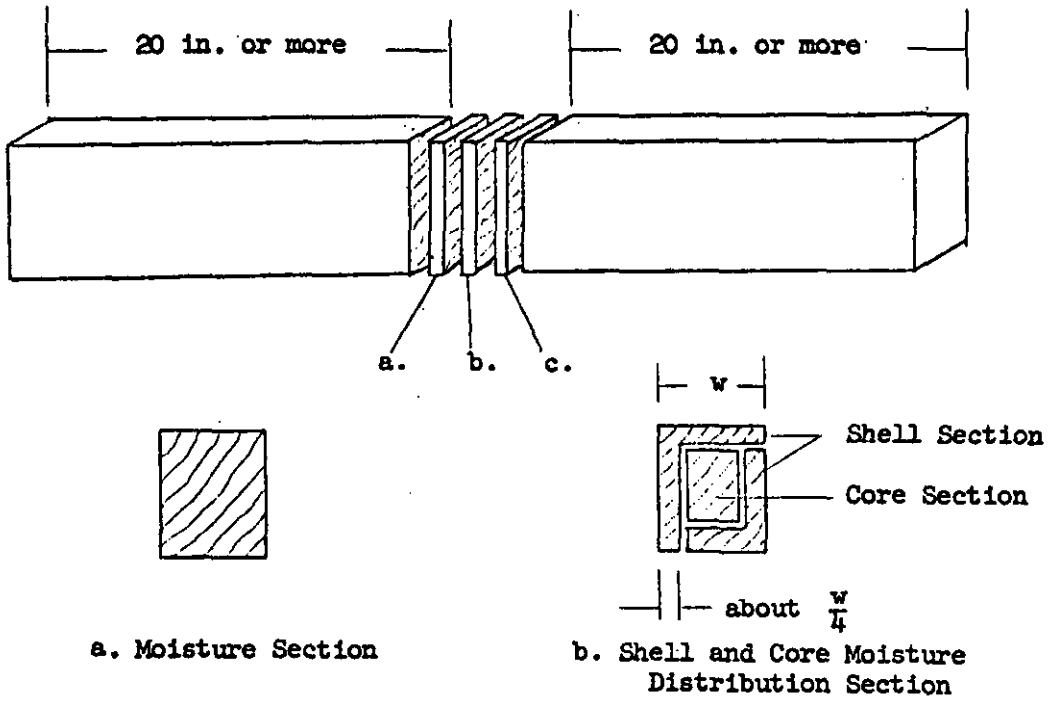
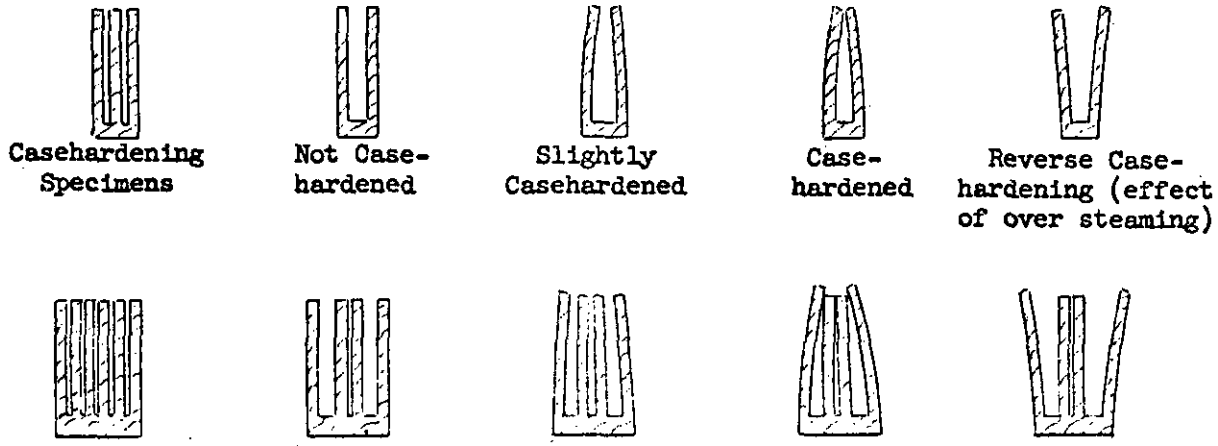


a. Moisture Section

b. Shell and Core Moisture Distribution Section



c. Casehardening - Material that is less than 1-1/2 inches thick is cut into three prongs, and the middle prong removed, material that is 1-1/2 inches thick or thicker is cut into six prongs, and the second and fifth prongs removed.

Figure 2 - Test Sections for Determining Moisture Content, Moisture Distribution and Casehardening

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity *(as indicated on reverse hereof)*.

SPECIFICATION

ORGANIZATION *(Of submitter)*	CITY AND STATE

CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT
		$

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)*	DATE

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