
Wood Moisture Tester Model HM-530



Operating Manual

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About the Model HM530 Wood

The model HM530 is a handy wood moisture tester which integrates both display and measurement sections in a single unit. Because the HM530 utilizes a high-frequency measurement format, measurements can be made without leaving marks on the surface of the wood tested. Setting the thickness and specific gravity of the wood to be tested makes it possible to obtain direct digital display of moisture content for all kinds of wood, from low to high moisture content. An alarm function which sounds a buzzer if the measured moisture content exceeds a certain set value is provided to make it possible to sort wood based on moisture content criteria. A temperature compensation function also operates to ensure that correct measurement values are obtained even for wood that is still hot from drying.

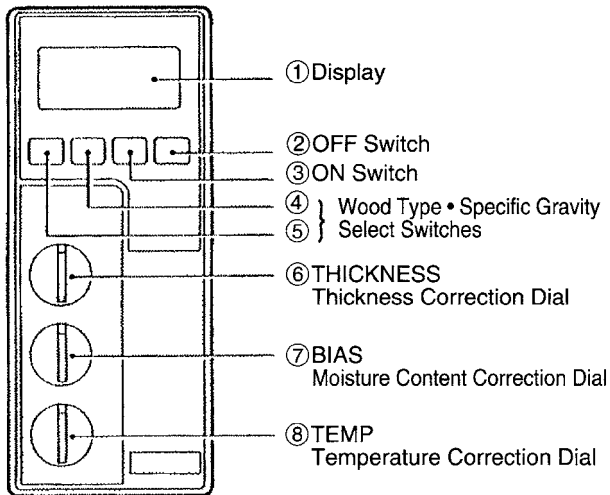
The HM530 can be used for moisture content management in all fields relating to lumber, including lumber drying factories, preservative treatment facilities, lumber mills, plywood manufacturing plants, wood furniture factories, home builders and building contractors.

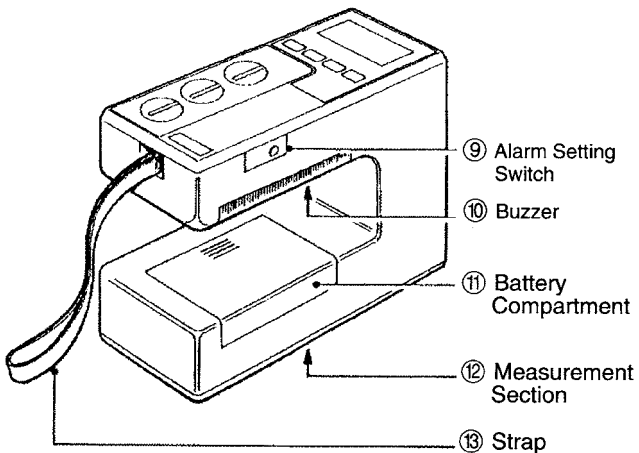
The HM530 was recognized as a "superior moisture content tester" after undergoing the "Performance Examination for Moisture Content Testers for Use with Needle-leaf Tree Lumber" (certification number 89-001) carried out at the Japan Housing Foundation's Lumber Technology Center.

I. Specifications

1. Model : HM530
2. Measurement Principle : High-frequency capacity format
3. Frequency : 20MHz
4. Object of Measurement : Lumber
5. Moisture Content
Measurement Range : 2 ~ 150% (depending upon specific gravity and type of tree)
6. Correction Functions : ①Thickness 10 ~ 40mm
②Specific gravity 0.1 ~ 1.25g/cm²
③Moisture content ±5%
④Temperature Automatic (0 ~ 40°C)
Manual (0 ~ 70°C)
7. Other Functions : ①Alarm ②Auto Power Off ③Warning Signal Display
8. Display : Digital LCD display
① Moisture Content Display 3.5 digits 0.5% resolution
② Specific Gravity Display 2.5 digits 0.01g/cm²
9. Power Supply : 9V alkaline battery 6LR61 (006P type) 1
10. Dimensions : 56(W) x 130(D) x 110(H)mm
11. Weight : Approx. 300g (not including battery)
12. Accessories : 9V alkaline battery 6LR61 (006P type)1
Screwdriver1 Soft case1
Operating Manual1 Specific Gravity Charts1

II. Part Names





III. Measurement Principles

The HM530 is a high-frequency capacity format moisture content tester which detects changes in the dielectric constant due to moisture content. Taking air as 1, the dielectric constant of lumber is approximately 4 ~ 6. The dielectric constant of water is 80, a much higher value than that for lumber. The apparent dielectric constant increases when wood contains moisture. Therefore, determining the relationship between moisture content and dielectric constant beforehand makes it possible to determine the moisture content by measuring the dielectric current. In actuality the high frequency capacity is measured as an indication of the dielectric constant and this is converted to a frequency to display the moisture content.

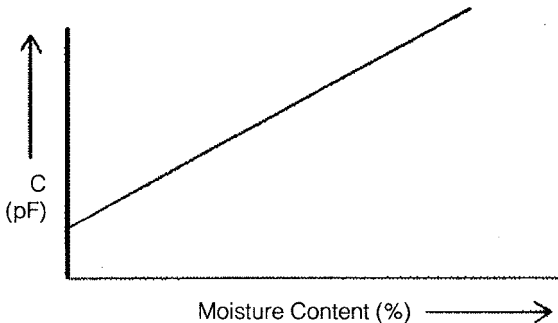
The equation representing this relationship is as indicated below:

$$C = \epsilon \cdot K \text{ (Farad)}$$

ϵ : Dielectric constant of wood containing moisture

K : Constant determined by measurement
section (electrode) shape

C : Capacity

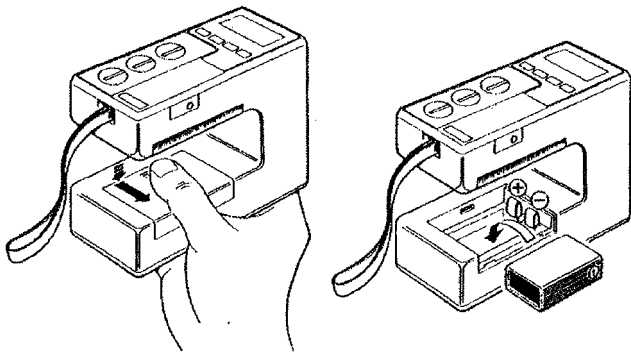


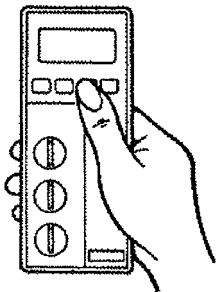
IV. Operation

1. Preparing to Make Measurements

(1) The Power Supply

The HM530 is powered by a 6LR61 9V alkaline battery (006P type).





Point the HM530 into the air and press the **ON** Switch. The buzzer will sound (two beeps), '**888**' is displayed for approximately 2 seconds and then '**000**' is displayed. If '**EEE**' appears in the display at this point, press the **OFF** Switch and then point the HM530 into the air and press the **ON** Switch again.

- * The numbers and/or marks in the display will blink if the battery is low. Please replace the battery if this is the case. Be sure to only use alkaline batteries with the HM530.

(2) Setting the Wood Type (Specific Gravity) and Correction Dials

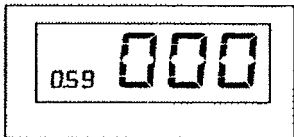
The HM530 has built-in calibrations for different types of wood (specific gravity), wood thickness and temperature. Please set the wood specific gravity, wood thickness and temperature before making measurements.

① Setting the Wood Type or Specific Gravity ([↑] [↓])

Setting the specific gravity of the wood to be measured allows the HM530 to call up the appropriate moisture content graduations.

Ⓐ Using the Specific Gravity to Make Measurements

Press the [↑] [↓] switches to set to the specific gravity of the wood to be measured.



* The specific gravities of different types of wood are given in Specific Gravity of wood on page 33.

Ⓑ Measuring Plywood

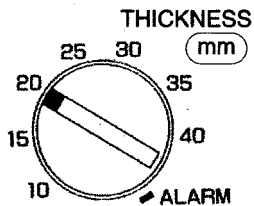
Set the specific gravity to 0.64 in order to measure plywood.

② Setting the Thickness Correction Value

Set the dial to the thickness of the wood to be measured. If the wood thickness is greater than 40mm, set the dial to exactly 40mm. Please note that an electrical signal corresponding to the moisture content (corresponding to the high frequency capacity) will be displayed if the dial is turned fully to the right.

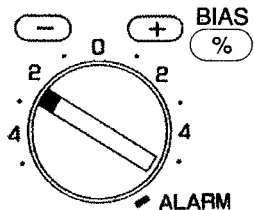
[Example]

Board thickness: 20mm



③ Setting the Moisture Content Correction Value

This dial is usually set to the '0' position when using the HM530. Please refer to section VI., "Notes Regarding Measurement & Handling of the HM530", part 1 for details.

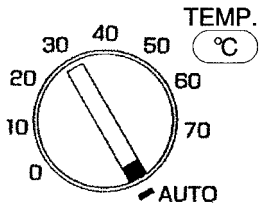


④ Setting the Temperature Correction Value

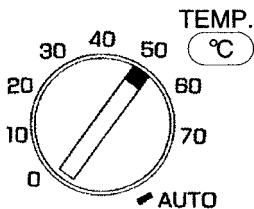
It is not necessary to calculate the temperature correction as the HM530 features an automatic temperature correction function. The Temperature Correction Dial should generally be set to the AUTO position.

- However, the Temperature Correction Dial must be set to the temperature of the wood if the difference between the temperature of the HM530 and the wood is 10°C or greater or if the temperature of the wood is 40°C or greater.

Automatic Temperature Correction



[Example] Temperature of wood is 50°C



⑤ Setting the Alarm

The alarm function can be used to set an upper limit to the moisture content. The buzzer will sound as a warning if the moisture content of wood measured exceeds the set upper limit.

① Press the **ON** Switch and set the BIAS (Moisture Content Correction Dial) to the ALARM position.

② The display will appear as shown below.

AOF The alarm is not set.

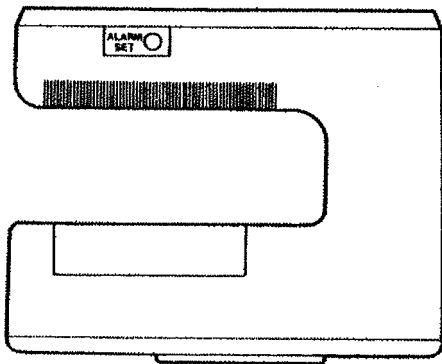
A15 The alarm is set to 15%

[Example] Measuring cedar

* Allowable alarm setting values are limited to the moisture content percentages indicated below:

4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 19, 20, 22, 25, 35%

- © A setting trimmer is located at the ALARM SET on the right side of the HM530. Turning this trimmer with the screwdriver provided causes the value indicated in the display to change. Set the value as required by your particular application.

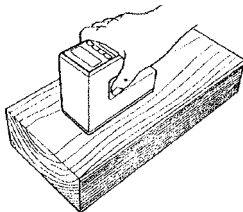


- * Be sure to return the BIAS (Moisture Content Correction) Dial to its original position when you have finished making the alarm setting.

2. Making Measurements

- (1) Point the moisture content measurement section into the air and press the **ON** Switch.
- (2) Press the measurement section lightly against the wood to be tested and the moisture content will be displayed digitally in the display.

Although the display indicated when this is done will disappear if you let go of the HM530, the HM530 was designed so that the state in which the unit is pressed lightly against the object of measurement is the basis of the moisture content graduation, so please use this method.



- (3) When you are finished making measurements, press the **OFF** Switch to turn the unit's power off.

V. Explanation of Functions

1. The Auto Power Off Function

The unit's power will turn off automatically if the unit is left on for 10 minutes without measurements being made.

2. Warning Signal Display

The HM530 can be used to measure moisture content in the range from 2 ~ 150%.

(However, this differs depending on the type of wood being tested.)

The following indicators will appear in the display when the measured value is outside of this range.

000

The moisture content of the wood tested is below the minimum moisture content value.

FFF

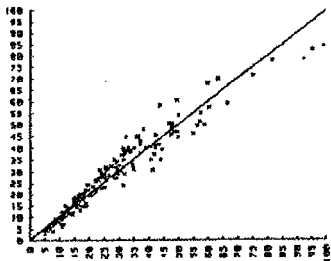
The moisture content of the wood tested is above the maximum moisture content value.

VI. Notes Regarding Measurement & Handling of the HM530

1. Using the BIAS (Moisture Content Correction) Dial

The HM530's moisture content graduation was designed by determining the relationship between the complete drying method and electrostatic capacity and statistical processing of this information. Therefore, as can be seen in the graph below, this graduation is statistically very close to the results obtained using the complete drying method, but there are some discrepancies. In particular, even with the same type of wood produced in the same way in the same place, the electrostatic capacity may vary depending on differences in the part tested, etc., and as a consequence the results do not match those obtained using the complete drying method. Use the following method to make corrections if the measured values do not match or if the values do not match those obtained with other moisture testers.

Values measured with the HM530 (%)



Values measured using the complete drying method (%)

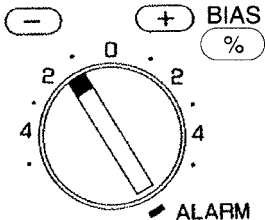
(1) Correcting Moisture Content by Using the Moisture Content Correction Dial

To match the values measured with the HM530 to those obtained using the complete drying method or another moisture content tester.

[Example] Moisture content value obtained
using the complete drying method : 18%
Moisture content value obtained
using the HM530 : 19%

In this case the value obtained using the HM530 is 1% higher than that obtained using the complete drying method, so the Moisture Content Correction Dial is set to -1 to correct for this difference. The moisture content indicated in the display is 18%.

The Moisture Content Correction Dial can be set from -5 to +5%.



(2) Correcting Moisture Content by Using the Specific Gravity of the Wood

① Cedar and Japanese Cypress

Use the method indicated below if the specific gravity (completely dried weight) of the wood being tested differs from the average specific gravity.

- A. Determine the specific gravity of the wood being tested.
If you don't know the specific gravity (completely dried weight), refer to "Specific Gravity Correction" (P.33) in the supplied Specific Gravity Charts to determine the completely dried specific gravity.

- B. Set the Moisture Content Correction Dial correction value to 0 and measure the moisture content of the sample.

- C. Use the Correction Chart on the next page to determine the correction value from the completely dried specific gravity obtained in step A above and the moisture content obtained in

Correction Chart

Cedar

① \ ②	Correction Value				
	0.27	0.30	③ 0.34	0.37	0.41
10.0	+2.0	+1.0	±0	-1.0	-2.0
12.0	+2.5	+1.5	±0	-1.0	-2.5
14.0	+3.0	+1.5	±0	-1.0	-3.0
16.0	+3.5	+2.0	±0	-1.5	-3.0
18.0	+4.0	+2.0	±0	-1.5	-3.5
20.0	+4.0	+2.5	±0	-1.5	-4.0

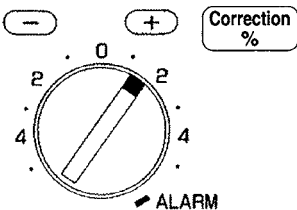
Japanese Cypress

① \ ②	Correction Value				
	0.30	0.34	③ 0.37	0.40	0.45
10.0	+2.0	+1.0	±0	-0.5	-2.0
12.0	+2.5	+1.0	±0	-1.0	-2.5
14.0	+2.5	+1.0	±0	-1.0	-3.0
16.0	+3.5	+1.5	±0	-1.0	-3.5
18.0	+3.5	+1.5	±0	-1.5	-4.0
20.0	+4.0	+1.5	±0	-1.5	-4.5

- ① Completely Dried Specific Gravity
- ② Moisture Content Indicated
- ③ Average Specific Gravity

[Actual Example] Please refer to the cedar chart on page 20.

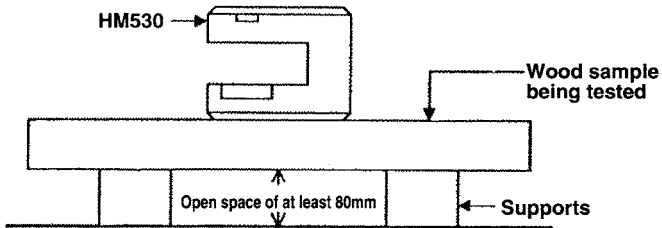
- 16.0% was displayed when cedar with a completely dried specific gravity of 0.30 was measured with the Correction Dial set to the "0" position.
- The chart (shaded portion) indicates that the correction value is +2.0.
- Set the dial to "+2.0" as shown in the diagram.



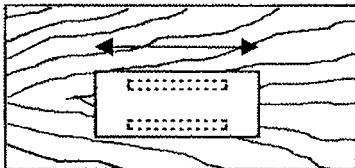
- ② Woods Other than Cedar and Japanese Cypress
Please refer to Specific Gravity Charts provided on page 33.

2. Notes Regarding Measurement

- (1) Be sure that the entire measurement section surface is in good contact with the sample when making measurements. The best results will be obtained if the surface of the wood being tested is flat.
- (2) Set the correction dial to 40mm if the sample of wood being measured is 40mm or greater in thickness.
- (3) If the thickness of the wood is less than 40mm, make measurements with an open space of at least 80mm beneath the sample as shown in the diagram below.



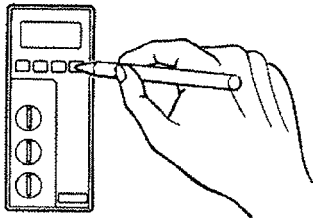
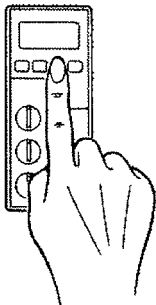
- (4) If the thickness of the sample is 10mm or less, stack several layers of identical material together so that the thickness is greater than 10mm and then make measurements in accordance with (3) above.
- (5) Set the sample so that the direction of the grain and the direction of the measurement electrodes correspond.



- (6) Measures samples with surface areas larger than that of the measurement section (130 x 55mm).

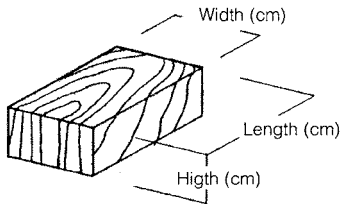
3. Notes Regarding Handling of the MH520

Do not press the ON and OFF switches with pointed objects such as the tip of a ball-point pen. Doing so damages the unit.



VII. Simple Determination of Specific Gravity

- (1) Have the wood to be measured ready.
- (2) Calculate the surface area of the wood sample (cm^3).



- (3) Determine the weight of the wood sample.
- (4) The specific gravity can be determined from the values obtained in steps (2) and (3) above by using the formula indicated below.

$$\text{Specific gravity (g/cm}^3\text{)} = \frac{\text{Weight (g)}}{\text{Surface area (cm}^3\text{)}}$$

- (5) Use the following method to estimate the approximate water content of the wood.

The unit's specific gravity setting adopts the completely dried specific gravity. (This is the specific gravity of wood which contains no moisture at all.) In order to obtain the completely dried specific gravity, the specific gravity obtained in step (4) (the air dried specific gravity) is used to correct (reduce) the moisture content value.

- Method

- (1) Make approximate estimates based on experience by touching the sample, etc.
- (2) Use the unit to measure the water content value.
(Use the average specific gravity by region of production as the specific gravity correction value when making this measurement.)

(6) Determine the completely dried specific gravity.

Determine the completely dried specific gravity from the specific gravity and estimated water content obtained in steps (4) and (5) above.

Example: If the air dried specific gravity is 0.2 and the air dried water content (estimated) is 15% , the completely dried specific gravity is 0.18%.

(1) **Calculating the Completely Dried Specific Gravity**

The completely dried specific gravity values in this chart were calculated using the following formula:

$$r_o = \frac{100r_u}{100 + u(1 - 0.84r_u)}$$

r_o : Completely Dried Specific Gravity

r_u : Air dried specific gravity

u : Moisture content %

(2) **Setting the Specific Gravity of Plywood**

Set the specific gravity correction value to 0.64 when measuring the water content of plywood.

Completely Dried Specific Gravity Chart

Air Dried Moisture Content (Estimated)	5~9%	10~14%	15~19%	20~24%	25~30%
Air Dried Specific Gravity					
0.10	0.09	0.09	0.09	0.08	0.08
0.11	0.10	0.10	0.10	0.09	0.09
0.12	0.11	0.11	0.10	0.10	0.10
0.13	0.12	0.12	0.11	0.11	0.10
0.14	0.13	0.13	0.12	0.12	0.11
0.15	0.14	0.14	0.13	0.13	0.12
0.16	0.15	0.14	0.14	0.13	0.13
0.17	0.16	0.15	0.15	0.14	0.14
0.18	0.17	0.16	0.16	0.15	0.15
0.19	0.18	0.17	0.17	0.16	0.15
0.20	0.19	0.18	0.18	0.17	0.16
0.21	0.20	0.19	0.18	0.18	0.17
0.22	0.21	0.20	0.19	0.19	0.18
0.23	0.22	0.21	0.20	0.20	0.19
0.24	0.23	0.22	0.21	0.20	0.20
0.25	0.24	0.23	0.22	0.21	0.21
0.26	0.25	0.24	0.23	0.22	0.21
0.27	0.26	0.25	0.24	0.23	0.22
0.28	0.27	0.26	0.25	0.24	0.23
0.29	0.28	0.27	0.26	0.25	0.24

Air Dried Moisture Content (Estimated)	5~9%	10~14%	15~19%	20~24%	25~30%
Air Dried Specific Gravity					
0.30	0.29	0.28	0.27	0.26	0.25
0.31	0.29	0.28	0.28	0.27	0.26
0.32	0.30	0.29	0.28	0.28	0.27
0.33	0.31	0.30	0.29	0.28	0.28
0.34	0.32	0.31	0.30	0.29	0.28
0.35	0.33	0.32	0.31	0.30	0.29
0.36	0.34	0.33	0.32	0.31	0.30
0.37	0.35	0.34	0.33	0.32	0.31
0.38	0.36	0.35	0.34	0.33	0.32
0.39	0.37	0.36	0.35	0.34	0.33
0.40	0.38	0.37	0.36	0.35	0.34
0.41	0.39	0.38	0.37	0.36	0.35
0.42	0.40	0.39	0.38	0.37	0.36
0.43	0.41	0.40	0.39	0.38	0.37
0.44	0.42	0.41	0.40	0.39	0.38
0.45	0.43	0.42	0.41	0.40	0.38
0.46	0.44	0.43	0.42	0.41	0.39
0.47	0.45	0.44	0.43	0.41	0.40
0.48	0.46	0.45	0.44	0.42	0.41
0.49	0.47	0.46	0.45	0.43	0.42

Air Dried Moisture Content (Estimated)	5~9%	10~14%	15~19%	20~24%	25~30%
Air Dried Specific Gravity					
0.50	0.48	0.47	0.46	0.44	0.43
0.51	0.49	0.48	0.46	0.45	0.44
0.52	0.50	0.49	0.47	0.46	0.45
0.53	0.51	0.50	0.48	0.47	0.46
0.54	0.52	0.51	0.49	0.48	0.47
0.55	0.53	0.52	0.50	0.49	0.48
0.56	0.54	0.53	0.51	0.50	0.49
0.57	0.55	0.54	0.52	0.51	0.50
0.58	0.56	0.55	0.53	0.52	0.51
0.59	0.57	0.56	0.54	0.53	0.52
0.60	0.58	0.57	0.55	0.54	0.53
0.61	0.59	0.58	0.56	0.55	0.54
0.62	0.60	0.59	0.57	0.56	0.55
0.63	0.61	0.60	0.58	0.57	0.56
0.64	0.62	0.61	0.59	0.58	0.57
0.65	0.63	0.62	0.60	0.59	0.58
0.66	0.64	0.63	0.61	0.60	0.59
0.67	0.65	0.64	0.62	0.61	0.60
0.68	0.66	0.65	0.63	0.62	0.61
0.69	0.67	0.66	0.64	0.63	0.62

Air Dried Moisture Content (Estimated)	5~9%	10~14%	15~19%	20~24%	25~30%
Air Dried Specific Gravity					
0.70	0.68	0.67	0.65	0.64	0.63
0.71	0.69	0.68	0.66	0.65	0.64
0.72	0.70	0.69	0.67	0.66	0.65
0.73	0.71	0.70	0.68	0.67	0.66
0.74	0.72	0.71	0.70	0.68	0.67
0.75	0.73	0.72	0.71	0.69	0.68
0.76	0.74	0.73	0.72	0.70	0.69
0.77	0.75	0.74	0.73	0.71	0.70
0.78	0.76	0.75	0.74	0.73	0.71
0.79	0.77	0.76	0.75	0.74	0.72
0.80	0.78	0.77	0.76	0.75	0.73
0.81	0.79	0.78	0.77	0.76	0.74
0.82	0.80	0.79	0.78	0.77	0.76
0.83	0.81	0.80	0.79	0.78	0.77
0.84	0.82	0.81	0.80	0.79	0.78
0.85	0.83	0.82	0.81	0.80	0.79
0.86	0.84	0.83	0.82	0.81	0.80
0.87	0.85	0.84	0.83	0.82	0.81
0.88	0.86	0.85	0.84	0.83	0.82
0.89	0.87	0.86	0.85	0.84	0.83

Air Dried Moisture Content (Estimated)	5~9%	10~14%	15~19%	20~24%	25~30%
Air Dried Specific Gravity					
0.90	0.88	0.87	0.86	0.85	0.84
0.91	0.90	0.88	0.87	0.87	0.85
0.92	0.91	0.90	0.89	0.88	0.87
0.93	0.92	0.91	0.90	0.89	0.88
0.94	0.93	0.92	0.91	0.90	0.89
0.95	0.94	0.93	0.92	0.91	0.90
0.96	0.95	0.94	0.93	0.92	0.91
0.97	0.96	0.95	0.94	0.93	0.92
0.98	0.97	0.96	0.95	0.94	0.93
0.99	0.98	0.97	0.96	0.95	0.95
1.00	0.99	0.98	0.97	0.97	0.96
1.01	1.00	0.99	0.98	0.98	0.97
1.02	1.01	1.00	1.00	0.99	0.98
1.03	1.02	1.01	1.01	1.00	0.99
1.04	1.03	1.02	1.02	1.01	1.01
1.05	1.04	1.03	1.03	1.02	1.02
1.06	1.05	1.04	1.04	1.04	1.03
1.07	1.06	1.05	1.05	1.05	1.04
1.08	1.07	1.06	1.06	1.06	1.05
1.09	1.08	1.08	1.07	1.07	1.07
1.10	1.09	1.09	1.09	1.08	1.08

VIII. SPECIFIC GRAVITY OF WOOD

Note : Species are written in italics.

(A) Adina	0.63
Afara	0.51
African mahogany	0.49
African padauk	0.73
Afrormosia	0.66
Agathis	0.42
Agoho	0.84
Alaska yellow cedar	0.38
Albarco	
<i>Cariniana brasiliensis</i>	0.49
<i>C. pyriformis</i>	0.57
Alerce	0.42
Almaciga	0.40
Almon	0.54
Alstonia	0.40
Amberoi	0.36
American elm	0.54
American basswood	0.37
Antiaris	0.36
Apitong	0.73
Artocarpus	
<i>Artocarpus lanceifolius</i>	0.64
<i>Artocarpus spp</i>	0.52
Aspen (Quaking aspen)	0.35
Avodiré	0.54
Azobe	1.05

(B) Bagtikan	0.54
Bakau	0.92
Balasan fir	0.38
Balau	
<i>Shorea guiso</i>	0.80
<i>S. laevis</i>	0.91
<i>S. maxwelliana</i>	0.95
<i>Shorea spp</i>	0.92
Balsa	0.14
Banak	0.50
Basswood	0.36
Batu	
Selanqan batu	
<i>Shorea guiso</i>	0.80
<i>S. laevis</i>	0.91
<i>S. maxwelliana</i>	0.95
<i>Shorea spp (Shorea)</i>	0.92
Nyatoh batu	1.03
Bayur	0.58
Beech	
Red beech	0.68
Silver beech	0.57
Belian	0.93
Benihi	0.34
Benge	0.93
Benguet pine	0.56

Bintangor	
<i>Calophyllum inophyllum</i>	0.62
<i>C. obliquinervium</i>	0.71
Binuang	0.35
Birch (Yellow birch)	0.67
Bitis	1.03
Black maple	0.61
Black spruce	0.43
Black walnut	0.59
Bloodwood (Red bloodwood)	0.84
Blue gum	0.80
Brazilian rose wood	0.95
Bubinga	0.91
Butternut	0.40
(C) California red fir	0.41
Calophyllum	
<i>Calophyllum inophyllum</i>	0.62
<i>C. obliquinervium</i>	0.71
<i>Calophyllum spp</i>	0.68
Camptosperma	0.34
Canarium	0.52
Caribbean pine	0.71
Cativo	0.45
Cedrela	
<i>Cedrela toona</i>	0.49

<i>Cedrela serrate</i>	0.36
Cedro.....	0.38
Cedar	
Alaska yellow cedar.....	0.47
Incense cedar.....	0.38
Port Orford cedar.....	0.43
Yellow cedar.....	0.47
Western red cedar.....	0.34
White cedar.....	0.32
Celtis.....	0.65
Champaka.....	0.49
Chrysophyllum.....	0.67
Cocobolo.....	0.95
Cottonwood.....	0.40
Cypress	
Lawson cypress.....	0.43
Taiwan cypress.....	0.44
Taiwan red cypress.....	0.34
(D) Dacrydium.....	0.51
Dao	
<i>Dracontomelon dao</i>	0.62
<i>D. mangiferum</i>	0.52
Dillenia.....	0.72
Douglas-fir.....	0.51
Duabanga.....	0.38

Durian	0.60
(E) Eastern arbor-vitae	0.32
Eastern hemlock	0.48
Eastern white pine	0.38
Ebony	
<i>Diospyros philippensis</i>	0.95
<i>Diospyros spp</i>	0.83
Ekki	1.05
Elm (American elm)	0.54
Endospermum	0.35
Engelmann spruce	0.37
Erima	0.35
Eugenia	0.77
(F) Framiré	0.51
Fir	
Balasam fir	0.38
California red fir	0.41
Douglas-fir	0.51
Grand fir	0.39
Noble fir	0.43
Siberian fir	0.41
Silver fir	0.46
Subalpine fir	0.34
White fir	0.41

(G)	Geronggang	0.43
	Giam	
	<i>Hopea nutans</i>	0.95
	<i>H. Pierrei</i>	0.82
	Gmelina	0.45
	Goncalo alves	1.05
	Grand fir	0.39
	Green heart	0.99
	Guajacan	1.25
	Gubas	0.36
	Guijo	0.80
(H)	Hard maple	0.64
	Hemlock	
	Eastern hemlock	0.48
	Western hemlock	0.42
	Hickory	0.78
	Honduras mahogany	0.49
	Honduras rose wood	0.98
	Hoop pine	0.47
(I)	Idigbo	0.51
	Igem	0.49
	Incense cedar	0.38
	Indian rose wood	0.82
	Intsia	0.76

Ipe	1.11
Ipil	0.76
Iroko	0.66
(J) Jacaranda	0.95
Jarra	0.78
Jelutong	0.38
Jong Kong	0.44
(K) Kalampayang	0.42
Kalantas	0.42
Kamagong	0.95
Kamerere	0.60
Kapok	0.28
Kapur	0.69
Karri	0.87
Kedondong	0.52
Kempas	0.84
Keruing	0.76
Khsach	0.82
Klinki pine	0.41
Koki	0.78
Kokikhsach	0.82
Kokrodua	0.66
Korean pine	0.46
Krabak	0.64

Kuku	0.75
Kwila	
<i>Intsia bijuga</i>	0.78
<i>I. pelembanica</i>	0.74
(L) Labula	0.42
Lagerstroemia	0.64
Lapacho	1.11
Larch (Siberian larch)	0.47
Lauan	
Yellow lauan	0.46
White lauan	0.49
Lawson cypress	0.43
Lenggadai	0.89
Lignum vitae	1.25
Limba	0.51
Litsea	0.46
Loblolly pine	0.54
Lodgepole pine	0.43
Long leaf pine	0.63
Longui	0.53
Lovoa	0.49
(M) Mahogany	
African mahogany	0.49
Honduras mahogany	0.49

<i>Swietenia mahogany</i>	0.62
Makore.....	0.62
Malas.....	0.89
Malugai.....	0.66
Manggachapui.....	0.70
Manggasinoro.....	0.46
Mango.....	0.71
Mangrove.....	0.92
Mansonia.....	0.64
Maple	
Black maple.....	0.57
Hard maple.....	0.64
Red maple.....	0.57
Soft maple.....	0.54
Sugar maple.....	0.67
Matoa.....	0.66
Mayapis.....	0.47
Medang.....	0.46
Melapi.....	0.53
Mempening.....	0.83
Menggeris.....	0.79
Mengkulang.....	0.72
Meranti	
Red meranti	
<i>Shorea curtisii</i>	0.58
<i>S. leprosula</i>	0.49

<i>S. parvifolia</i>	0.46
<i>S. pacuiflora</i>	0.59
<i>S. teysmanniana</i>	0.56
<i>Shorea spp (Rubroshorea)</i>	0.54
Yellow meranti	0.53
White meranti	
<i>Shorea bracteslata</i>	0.54
<i>S. hypochra</i>	0.63
<i>Shorea spp (Authoshorea)</i>	0.52
Merawan	0.70
Merbau	0.78
Merkus pine	0.65
Mersawa	0.56
Messmate stringy bark.....	0.66
Mindro.....	0.65
Molave	0.69
Molucansaw	0.31
Myristica	0.42
(N) Narig.....	0.87
Narra	0.61
Nato.....	0.60
Neconauclea.....	0.79
New Guinea basswood	0.34
New Guinea walnut	0.52
Noble fir	0.43

Nothofagus	
<i>Nothofagus fasca</i>	0.68
<i>N. menziesii</i>	0.57
<i>Nothofagus spp</i>	0.62
Nyato	0.60
Nytoh batu	1.03

(O) Oak

Red oak	0.66
Tasmanian oak	0.66
White oak	0.73
Obeche	0.36
Okoume	0.40
Opepe	0.74
Ovangkol	0.70

(P) Padauk

African padauk	0.73
<i>Pterocarpus dalbergioides</i>	0.68
<i>P. indicus</i>	0.61
<i>P. macrocarpus</i>	0.83
Palosapis	0.62
Pecan	0.71
Pericopsis	0.75
Perupok	0.49
Phdiek	0.63

Pine

Benguet pine	0.56
Caribbean pine	0.71
Eastern white pine	0.38
Hoop pine	0.47
Klinki pine	0.41
Korean pine	0.46
Long-leaf pine	0.63
Lodge pole pine	0.43
Loblolly pine	0.54
Mindro pine	0.65
Merkus pine	0.65
Parana Pine	0.55
Ponderosa pine	0.42
Radiate pine	0.45
Short-leaf pine	0.54
Siberian red pine	0.43
Western white pine	0.38
Planchonella	0.54
Podocarpus	0.49
Port Orford cedar	0.43
Primavera	0.44
Pulai	0.40
Pyinkado	0.84

(Q) Quaking aspen	0.35
(R) Radiata pine	0.45
Ramin	0.61
Rang	1.01
Red beech	0.68
Red Bloodwood	0.84
Red lauan	0.49
Red maple	0.57
Red meranti	0.54
Red oak	0.66
Redwood	0.42
Rengas	0.76
Resak	
<i>Cotylelobium melanoxylon</i>	0.94
<i>Vatica cuspidata</i>	0.92
<i>V. stapfiana</i>	0.76
Rose wood	
Brazilian rose wood	0.95
Honduras rose wood	0.98
Indian rose wood	0.82
Thailand rose wood	1.08
Ru	0.64
Rubber tree	0.61

(S) Sal	0.83
Sapele	0.61
Sapelli	0.61
Selanganbatu	
<i>Shorea guiso</i>	0.80
<i>S. leavis</i>	0.91
<i>S. maxwelliana</i>	0.95
<i>Shorea spp (Shorea)</i>	0.92
Sengonlaut	0.31
Sepetir	
<i>Sindora coriacea</i>	0.54
<i>Sindora spp</i>	0.65
Sepetirpaya	0.64
Sequoia	0.42
Seraya (Yellow seraya)	0.49
Short-leaf pine	0.54
Silver beech	0.57
Siberian fir	0.41
Siberian larch	0.47
Siberian spruce	0.43
Siberian red pine	0.43
Silver fir	0.46
Sipo	0.58
Slash pine	0.63
Sonokeling	0.82
Sompong	0.30

Soft maple	0.54
Spruce	
Black spruce	0.43
Sitka spruce	0.42
Western white spruce	0.43
Strobe pine	0.38
Subalpine fir	0.34
Sugar maple	0.67
Sugar pine	0.37
(T) Tabebuia	1.11
Taihi	0.44
Taiwan red cypress	0.34
Taiwan cypress	0.44
Tagayasan	0.78
Tarrietia	0.72
Tangile	0.53
Tasmanian oak	0.66
Taun	0.66
Tchitola	0.61
Teak	0.65
Terentang	0.39
<i>Terminalia</i>	
<i>Terminalia brassii</i>	0.42
<i>T. complanata</i>	0.44
<i>T. copelandii</i>	0.49

<i>T. microcarpa</i>	0.56
Tetrameles.....	0.30
Thailand rose wood.....	1.08
Tiama.....	0.53
<i>Tristania</i>	1.65
(U) Ulin.....	0.93
(W) Walnut	
Walnut.....	0.59
Black walnut.....	0.59
New Guinea walnut.....	0.52
Wawa.....	0.36
Western red cedar.....	0.34
Western white spruce.....	0.43
Western white pine.....	0.38
Western hemlock.....	0.42
White ash.....	0.65
White cedar.....	0.32
White fir.....	0.41
White lauau.....	0.49
White oak.....	0.73
White meranti	
<i>Shorea bracteolata</i>	0.54
<i>S. hypochra</i>	0.63
<i>Shorea spp (Anthoshorea)</i>	0.52

White seraya	0.54
White siris	0.34
(Y) Yang	0.70
Yamane	0.45
Yellow birch	0.67
Yellow cedar	0.47
Yellow lauan	0.46
Yellow meranti	0.53
Yellow seraya	0.49
(Z) Zebra wood	0.82



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