

Wood Moisture Tester

HM-540

The Kett logo is displayed in white text on a dark gray square background.

Specific gravity table

Thank you for purchasing this product.
Please read the operating manual carefully and use this product properly.

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1. About specific gravity table

This specific gravity table has been made on the basis of “World Useful Wood 300 Species” (1975 edition) edited by the Department of Wood Engineering, the Forestry and Forest Products Research Institute of the Ministry of Agriculture, Forestry and Fisheries. We added a Japanese syllabary index as well at the end of the book. About wood that has the same name as a general name but has different species, botanical names are also described.

- (1) How to calculate specific gravity in oven dry**
(According to the contents on page 150 of Wood
Engineering Handbook, 1973 edition) Specific
gravities in oven dry in this specific gravity table
are obtained by the formula as follows:

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

r_o : Specific gravity in oven dry

r_u : Air-dried specific gravity

u : Moisture%

- (2) Measurement of plywood specific gravity**

The density of plywood varies with the tree species, adhesive components, and so on in use. Therefore, obtain the density of the plywood to be measured previously, and conduct measurement.

- (3) Cypress scale of this model**

The cypress scale incorporated in this model, HM-540, is different from the one incorporated in the former model, HM-530. In order to further improve the precision of the scale, the cypress scale has been produced again to match with cypress in circulation at present time. The specific gravity of cypress is regarded to be 0.41 in consideration of the real condition resulting from the in-house test this time.

**2. Table of average specific gravity
for each production place**

Domestic timber [conifer]

Wood group number	General name	Specific gravity in oven dry
1	Cypress	0.41
2	Sawara cypress	0.31
3	Chinese juniper	0.61
4	Japanese thuja	0.30
5	Hiba	0.38
6	Aomori cypress, Hiba	0.37
7	Momi fir	0.40
8	Abies homolepis	0.34
9	Sakhalin fir	0.38
10	Veitch's silver fir	0.36
11	Larch	0.49
12	Picea glehnii	0.41
13	yezo spruce	0.39
14	Hondo spruce	0.41
15	Japanese red pine	0.49
16	Japanese White Pine	0.37
17	Japanese Black Pine	0.53

Domestic timber [conifer]

Wood group number	General name	Specific gravity in oven dry
18	Japanese Douglas Fir	0.41
19	Northern Japanese Hemlock	0.48
20	Tsuga	0.47
21	Largeleaf podocarp	0.51
22	Japanese umbrella pine	0.38
23	Pacific yew	0.50
24	Khaya	0.47
25	Cedar	0.34
26	Ginkgo	0.51

Domestic timber [broad-leaved tree]

27	Painted Maple	0.63
28	White Walnut, Kalopanax septemlobus	0.46
29	Alnus hirsuta	0.45
30	Japanese Cherry Birch	0.65
31	Monarch Birch, Monarch Birch	0.65
32	Japanese White Birch	0.56

Domestic timber [broad-leaved tree]

Wood group number	General name	Specific gravity in oven dry
33	Loose-flowered Hornbeam	0.72
34	Japanese hophornbeam	0.66
35	Boxwood	0.71
36	KatsuraTree	0.45
37	Japanese Dogwood	0.63
38	Persimmon tree	0.56
39	Sweet Chestnut	0.51
40	Japanese chinquapin, Japanese chinquapin, Castanopsis sieboldii Hatusima	0.57
41	Japanesechinquapin	0.48
42	Beech	0.59
43	Fagus japonica Maxim.	0.64
44	Quercus acuta	0.89
45	JapaneseChestnutOak	0.86
46	Mossy-overcup oak	0.63
47	Quercus gilva	0.75
48	Shirakashi	0.87
49	Quercus serrata	0.78

Domestic timber [broad-leaved tree]

Wood group number	General name	Specific gravity in oven dry
50	Isu Tree	0.86
51	Japanese Horse Chestnut	0.49
52	Japanese Walnut	0.47
53	Japanese Wingnut	0.31
54	Camphor Tree	0.48
55	Machilus	0.65
56	Amur Maackia	0.59
57	Black locust, Yellow locust	0.68
58	Japanese White Bark magnolia	0.44
59	Japanese Mulberry	0.56
60	Ash	0.71
61	Fraxinus longicuspis, F. longicuspis	0.68
62	Manchurian Ash	0.61
63	Fraxinus spaethiana	0.51
64	White Popl	0.56
65	Barkhat	0.41
66	Japanese Poplar	0.34

Domestic timber [broad-leaved tree]

Wood group number	General name	Specific gravity in oven dry
67	Aspen	0.41
68	Salix bakko	0.35
69	Toisusu Urbaniana	0.35
70	Paulownia	0.26
71	Japanese Linden, Tilia japonica	0.44
72	Tilia maximowicziana, Tilia maximowiczi-ana	0.39
73	Japanese elm, Japanese elm	0.55
74	JapaneseZelkova	0.58

North American timber [conifer]

Wood group number	General name	Specific gravity in oven dry
75	Lawson cypress, Port Orford Cedar	0.43
76	Yellow cedar, Alaska yellow cedar	0.47
77	Incense cedar	0.38
78	Northern White Cedar	0.32
79	Western redcedar, Western red cedar	0.34
80	Grand fir, Silver fir	0.46
81	Grand fir, Balasam fir	0.38
82	Grand fir, White fir	0.41
83	Grand fir, Grand fir	0.39
84	Grand fir, Abies lasiocarpa	0.34
85	Grand fir, California red fir	0.41
86	Grand fir, Noble fir	0.43
87	Spruce, Engelmann spruce	0.37
88	Spruce, Spruce	0.43
89	Spruce, Black spruce	0.43
90	Spruce, Spruce	0.42
91	Lodgepole pine	0.43

North American timber [conifer]

Wood group number	General name	Specific gravity in oven dry
92	Short-leaf pine	0.54
93	Slash Pine	0.63
94	Sugar pine	0.37
95	Eastern white pine	0.38
96	Long leaf pine	0.63
97	Ponderosa pine	0.42
98	Eastern white pine	0.38
99	Loblolly pine	0.54
100	Douglas fir, Douglas-fir	0.51
101	Eastern hemlock, Hemlock, Eastern hemlock	0.48
102	Pacific hemlock, Hemlock, Western hemlock	0.42
103	Coast redwood, Redcedar, Redwood	0.42
104	Silver fir	0.44

North American timber [broad-leaved tree]

Wood group number	General name	Specific gravity in oven dry
105	Hard maple, Black maple	0.61
106	Soft maple, Red maple	0.57
107	Soft maple, Silver maple	0.51
108	Hard maple, Sugar maple	0.67
109	Birch (Yellow birch)	0.67
110	White oak	0.73
111	Red oak	0.66
112	Pecan, Pecan	0.71
113	Hickory	0.78
114	Butternut	0.40
115	Black walnut, Walnut	0.59
116	White ash, White Ash	0.65
117	Aspen (Quaking aspen)	0.35
118	Cottonwood, Poplar	0.40
119	American linden, American basswood	0.37
120	American elm	0.54
121	Black Cherry	0.51

South Sea timber [Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
122	Mersawa	0.56
123	Palosapis	0.62
124	Apitong, Keruing (<i>Dipterocarpus gracilis</i>)	0.76
125	Apitong, Keruing (<i>D. grandiflorus</i>)	0.70
126	Kapur (<i>Dryobalanops aromatica</i>)	0.66
127	Kapur (<i>D. lanceolata</i>)	0.68
128	Kapur (<i>D. oblongifolia</i>)	0.72
129	Manggachapui, Merawan (<i>Hopea acuminata</i>)	0.71
130	Manggachapui (<i>H. toxworthyi</i>)	0.69
131	Merawan (<i>H. nervosa</i>)	0.65
132	Merawan, Koki (<i>H. odorata</i>)	0.74
133	Giam (<i>H. nutans</i>)	0.95
134	Giam, Kokikhsach (<i>H. pierrei</i>)	0.82
135	Bagtikan, White seraya	0.54
136	White lauan	0.49
137	Rang	1.01
138	Almon [White lauan], Almon	0.50

South Sea timber [Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
139	Red meranti (<i>Shorea curtisii</i>)	0.58
140	Red meranti (<i>S. leprosula</i>)	0.49
141	Red meranti (<i>S. parvifolia</i>)	0.46
142	Red meranti (<i>S. pauciflora</i>)	0.59
143	Red meranti (<i>S. teysmanniana</i>)	0.56
144	Red meranti (<i>Shorea</i> spp.)	0.54
145	Red lauan (<i>S. negrosensis</i>)	0.49
146	Tangile [Red lauan] (<i>S. polysperma</i>)	0.53
147	Mayapis [Red lauan] (<i>S. squamata</i>)	0.47
148	Yellow meranti (<i>S. faguetiana</i>)	0.58
149	Yellow meranti (<i>S. resina-nigra</i>)	0.49
150	Yellow meranti (Spp.)	0.52
151	White meranti, Melapi (<i>S. bracteolata</i>)	0.54
152	White meranti, Melapi (Spp.)	0.52
153	White meranti (<i>S. hypochra</i>)	0.63
154	Manggasinoro [Yellow lauan]	0.46
155	<i>Shorea guiso</i> , Balau Laut Merah, Red Selangan batu	0.80

South Sea timber [Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
156	Balau, Selanganbatu (<i>Shorea laevis</i>)	0.91
157	Balau, Selanganbatu (<i>S. maxwelliana</i>)	0.95
158	Sal	0.83
159	Giam, Balau, Selanganbatu (<i>Shorea</i> spp.)	0.92
160	Resak (<i>Vatica cuspidata</i>)	0.92
161	Resak (<i>V. stapfiana</i>)	0.76
162	Resak, Narig, (<i>Vatica</i> spp.)	0.90
163	Narig (<i>V. mangachapoi</i>)	0.87

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
164	Agathis (<i>Agathis alba</i>)	0.44
165	Agathis, Almaciga (<i>A. philippinensis</i>)	0.40
166	Agathis (<i>Agathis</i> spp.)	0.48
167	Araucaria, Hoop pine (<i>Araucaria cunninghamii</i>)	0.47
168	Araucaria, Klinki pine (<i>A. hunsteinii</i>)	0.41
169	<i>Pinus khasya</i> , Benguet pine	0.56
170	Merkus pine, Mindro pine	0.65
171	<i>Dacrydium</i>	0.51
172	<i>Podocarpus</i>	0.49
173	<i>Camptosperma</i>	0.39
174	<i>Camptosperma</i>	0.34
175	Dao	0.62
176	Dao, New Guinea walnut	0.52
177	Rengas	0.76
178	Asam, Mango	0.71
179	Pulai, <i>Alstonia</i>	0.40
180	Jelutong (<i>Dyera costulata</i>)	0.42

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
181	Jelutong (<i>D. lowii</i>)	0.34
182	Kapok	0.28
183	Durian	0.60
184	Canarium, Kedondong	0.52
185	Coast She-Oak	0.84
186	Perupok, Perupok	0.49
187	Terminalia (<i>Terminalia brassii</i>)	0.42
188	Terminalia (<i>Terminalia complanata</i>)	0.44
189	Terminalia (<i>T. copelandii</i>)	0.49
190	Terminalia (<i>T. microcarpa</i>)	0.56
191	Binuang, Erima	0.35
192	Tetramelaceae, Sompong	0.31
193	Dillenia	0.72
194	Ebony, Ebony, Kamagong (<i>Diospyros philippensis</i>)	0.95
195	Ebony, Ebony (<i>Diospyros</i> spp.)	0.83
196	New Guinea basswood	0.34
197	Gubas	0.36

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
198	Endospermum	0.35
199	Rubber tree, Para rubber tree	0.61
200	Nothofagus, Red beech (<i>Nothofagus fusca</i>)	0.68
201	Nothofagus, Silver beech (<i>N.menziesii</i>)	0.57
202	Nothofagus (<i>Nothofagus</i> spp.)	0.62
203	Mempening, Mempening	0.83
204	Malas	0.89
205	Ramin	0.61
206	Bintangor, Calophyllum (<i>Calophyllum inophyllum</i>)	0.62
207	Bintangor, Calophyllum (<i>C. obliquinervium</i>)	0.71
208	Calophyllum (<i>Calophyllum</i> spp.)	0.68
209	Geronggang	0.43
210	Belian, Belian	0.93
211	Medang, Litsea	0.46
212	Sengonlaut, Molucansaw	0.31
213	Selangan batu	0.78
214	Rose wood	1.08

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
215	Indian rose wood, Rose wood, Sonokeling	0.82
216	Ipil, Merbau, Kwila, Intsia (<i>Intsia bijuga</i>)	0.78
217	Ipil, Merbau, Kwila, Intsia (<i>I. palembanica</i>)	0.74
218	Menggeris	0.79
219	Kempas	0.84
220	Pericopsis	0.75
221	Sepetir (<i>Sindora coriacea</i>)	0.60
222	Padauk (<i>Pterocarpus dalbergioides</i>)	0.68
223	Narra, Padauk, Chinese quince (<i>P. indicus</i>)	0.61
224	Padauk (<i>P. moccrocarpus</i>)	0.83
225	Sepetir (<i>Sindora coriacea</i>)	0.54
226	Sepetir (<i>Sindora</i> spp.)	0.65
227	Pyinkado	0.84
228	Lagerstroemia	0.64
229	Champaka	0.49
230	Jong Kong	0.44
231	Cedrela (<i>Cedrela serrata</i>)	0.36

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
232	Cedrela (C. toona)	0.49
233	Kalantas	0.42
234	Antiaris	0.36
235	Artocarpus (Artocarpus ianceifolius)	0.64
236	Artocarpus (Artocarpus spp.)	0.52
237	Myristica	0.42
238	Kamerere	0.60
239	Eugenia	0.77
240	Brush box (Tristania decorticata)	1.10
241	Brush box (Tristania spp.)	1.03
242	Lenggadai, Bakau, Mangrove (Bruguiera spp.)	0.89
243	Bakau, Mangrove (Rhizophora apiculata)	0.98
244	Bakau, Mangrove (R. mucronata)	0.89
245	Adina	0.63
246	Kalampayang, Labula	0.42
247	Neonauclea	0.79
248	Matoa, Taun, Pometia pinnata, Malugai	0.66

South Sea timber [not Dipterocarpaceae]

Wood group number	General name (botanical name)	Specific gravity in oven dry
249	(Chrysophyllum)	0.67
250	Nato, Nyato	0.60
251	Bitis, Nyatoh batu	1.03
252	Planchonella	0.54
253	White siris	0.34
254	Duabanga	0.38
255	Amberoi	0.36
256	Bayur	0.58
257	Mengkulang, Tarrietia	0.72
258	Celtis	0.65
259	Yamane (Gmelina arborea), Gumari	0.45
260	Teak	0.65
261	Molave	0.69
262	Chilauni	0.65
263	Sengonlaut, Sengon laut	0.30
264	Rok far	0.87

Russian (north sea) timber, European timber

Wood group number	General name (botanical name)	Specific gravity in oven dry
265	Sakhalin fir	0.41
266	Siberian larch, Dahurian larch	0.47
267	yezo spruce	0.43
268	Pinus koraiensis, Korean pine	0.46
269	Pinus sylvestris, Scots pine	0.43
270	Listvennitsa, Siberian larch	0.48
271	Beech (Fagus sylvaticabu)	0.65

Central and South American timber

Wood group number	General name (botanical name)	Specific gravity in oven dry
272	Parana pine	0.55
273	Alerce	0.42
274	Caribbean pine	0.71
275	Goncalo alves	1.05
276	Primavera	0.44
277	Ipe, Lapacho, Tabebuia	1.11
278	Balsa	0.14
279	Green heart	0.99
280	Albarco (<i>Cariniana brasiliensis</i>)	0.49
281	Albarco (<i>C. pyriformis</i>)	0.57
282	Brazilian rose wood, Rose wood, Jacaranda	0.95
283	Cocobolo	0.95
284	Honduras rose wood	0.98
285	Cativo	0.45
286	Cedro	0.38
287	Mahogany (<i>Swietenia macrophylla</i>)	0.49
288	Mahogany (<i>S. mohogoni</i>)	0.62

Central and South American timber

Wood group number	General name (botanical name)	Specific gravity in oven dry
289	Virola	0.37
290	Banak	0.50
291	Lignum vitae	1.25
292	Cabreuva	0.63
293	Chile Pine	0.45

African timber

Wood group number	General name (botanical name)	Specific gravity in oven dry
294	Okoume	0.40
295	Idigbo, Framire	0.51
296	Afara, Limba	0.51
297	Afrormosia, Kokrodua	0.66
298	Benge	0.93
299	Ovangkol	0.70
300	Bubinga	0.91
301	Zebra wood	0.82
302	Tchitola	0.61
303	African padauk	0.73
304	Tiama	0.53
305	Sapelli	0.61
306	Sipo	0.58
307	African mahogany	0.49
308	Lovoa	0.49
309	Avodire	0.54
310	Iroko	0.66

African timber

Wood group number	General name (botanical name)	Specific gravity in oven dry
311	Azobe, Ekki	1.05
312	Opepe	0.74
313	Longui	0.53
314	Makore	0.62
315	Mansonia	0.64
316	Obeche, Wawa	0.36
317	Asamela (Afroformosia)	0.77

Other

Wood group number	General name (botanical name)	Specific gravity in oven dry
318	Lawson cypress	0.34
319	Taihi	0.44
320	Radiata pine	0.45
321	E. obliqua (Eucalyptus diversicolor)	0.87
322	E. obliqua (E. globulus)	0.80
323	E. obliqua (E. gummifera)	0.84
324	E. obliqua, Jarrah (E. marginata)	0.78
325	E. obliqua (E. obliqua)	0.66
326	White pine (Pinusbungeana)	0.46
327	Bamboo	0.65
328	Bread fruit tree	0.42

3. General name index (Alphabetical order)

(figure in []: tree species number)

[A]	
Abies homolepis	[8]
Abies lasiocarpa	[84]
Adina	[245]
Afara	[296]
African mahogany	[307]
African padauk	[303]
Afrormosia	[297]
Agathis	[164, 165, 166]
Alaska yellow cedar	[76]
Albarco	[280, 281]
Alerce	[273]
Almaciga	[165]
Almon	[138]
Alnus hirsuta	[29]
Alstonia	[179]

Amberoi	[255]
American basswood	[119]
American elm	[120]
American linden	[119]
Amur Maackia	[56]
Antiaris	[234]
Aomori cypress	[6]
Apitong	[124, 125]
Araucaria	[167, 168]
Artocarpus	[235, 236]
Asam	[178]
Asamela (Afrormosia)	[317]
Ash	[60]
Aspen	[67]
Aspen (Quaking aspen)	[117]
Avodire	[309]

Azobe	[311]
[B]	
Bagtikan	[135]
Bakau	[242, 243, 244]
Balagam fir	[81]
Balau	[156, 157, 159]
Balau Laut Merah	[155]
Balsa	[278]
Bamboo	[327]
Banak	[290]
Barkhat	[65]
Bayur	[256]
Beech	[42, 271]
Belian	[210]
Benge	[298]
Benguet pine	[169]

Bintangor	[206, 207]
Binuang	[191]
Birch (Yellow birch)	[109]
Bitis	[251]
Black Cherry	[121]
Black locust	[57]
Black maple	[104]
Black spruce	[89]
Black walnut	[115]
Boxwood	[35]
Brazilian rose wood	[282]
Bread fruit tree	[328]
Brush box	[240, 241]
Bubinga	[300]
Butternut	[114]
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Cabreuva	[292]
California red fir	[85]
Calophyllum	[206, 207, 208]
Camphor Tree	[54]
Camptosperma	[173, 174]
Canarium	[184]
Caribbean pine	[274]
Castanopsis sieboldii Hatusima	[40]
Cativo	[285]
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Celtis	[258]
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Chilauni	[262]
Chile Pine	[293]

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Chinese quince	[223]
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Coast redwood	[103]
Coast She-Oak	[185]
Cocobolo	[283]
Cottonwood	[118]
Cypress	[1]
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Dacrydium	[171]
Dahurian larch	[266]
Dao	[175, 176]
Dillenia	[193]
Douglas fir	[100]
Duabanga	[254]
Durian	[183]

[E]	
E. obliqua	[321, 325]
Eastern hemlock	[101]
Eastern white pine	[95, 98]
Ebony	[194, 195]
Ekki	[311]
Endospermum	[198]
Engelmann spruce	[87]
Erima	[191]
Eugenia	[239]
[F]	
F. longicuspis	[61]
Fagus japonica Maxim.	[43]
Framire	[295]
Fraxinus longicuspis	[61]
Fraxinus spaethiana	[63]

[G]	
Geronggang	[209]
Giam	[133, 134, 159]
Ginkgo	[26]
Gmelina arborea	[259]
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Gubas	[197]
Gumari	[259]
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Hiba	[5, 6]
Hickory	[113]
Hondo spruce	[14]

Honduras rose wood	[284]
Hoop pine	[167]
[I]	
Idigbo	[295]
Incense cedar	[77]
Indian rose wood	[215]
Intsia	[216, 217]
Ipe	[277]
Ipil	[216, 217]
Iroko	[310]
Isu Tree	[50]
[J]	
Jacaranda	[282]
Japanese Black Pine	[17]
Japanese Cherry Birch	[30]
Japanese chinquapin	[40]

Japanese Dogwood	[37]	JapaneseChestnutOak	[45]	Keruing	[124, 125]
Japanese Douglas Fir	[18]	Japanesechinquapin	[41]	Khaya	[24]
Japanese elm	[73]	JapaneseZelkova	[74]	Klinki pine	[168]
Japanese hophornbeam	[34]	Jarrah	[324]	Koki	[132]
Japanese Horse Chestnut	[51]	Jelutong	[230]	Kokikhsach	[134]
Japanese Linden	[71]	[K]		Kokrodua	[297]
Japanese Mulberry	[59]	Kalampayang	[246]	Korean pine	[268]
Japanese Poplar	[66]	Kalantas	[233]	Kwila	[216, 217]
Japanese red pine	[15]	Kalopanax septemlobus	[28]	[L]	
Japanese thuja	[4]	Kamagong	[194]	Labula	[246]
Japanese umbrella pine	[22]	Kamerere	[238]	Lagerstroemia	[228]
Japanese Walnut	[52]	Kapok	[182]	Lapacho	[277]
Japanese White Bark magnolia	[58]	Kapur	[126, 127, 128]	Larch	[11]
Japanese White Birch	[32]	Katsura Tree	[36]	Largeleaf podocarp	[21]
Japanese White Pine	[16]	Kedondong	[184]	Lawson cypress	[75, 318]
Japanese Wingnut	[53]	Kempas	[219]	Lenggadai	[242]

Lignum vitae	[291]
Limba	[296]
Listvennitsa	[270]
Litsea	[211]
Loblolly pine	[99]
Lodgepole pine	[91]
Long leaf pine	[96]
Longui	[313]
Loose-flowered Hornbeam	[33]
Lovoa	[308]
[M]	
Machilus	[55]
Mahogany	[287, 288]
Makore	[314]
Malas	[204]
Malugai	[248]

Manchurian Ash	[62]
Manggachapui	[129, 130]
Manggasinoro	[154]
Mango	[178]
Mangrove	[242, 243, 244]
Mansonia	[315]
Matoa	[248]
Mayapis	[147]
Medang	[211]
Melapi	[151, 152]
Mempening	[203]
Menggeris	[218]
Mengkulang	[257]
Merawan	[129, 131, 132]
Merbau	[216, 217]
Merkus pine	[170]

Mersawa	[122]
Mindro pine	[170]
Molave	[261]
Molucansaw	[212]
Momi fir	[7]
Monarch Birch	[31]
Mossy-overcup oak	[46]
Myristica	[237]
[N]	
Narig	[162, 163]
Narra	[223]
Nato	[250]
Neonuclea	[247]
New Guinea basswood	[196]
New Guinea walnut	[176]
Noble fir	[86]

Northern Japanese Hemlock	[19]
Northern White Cedar	[78]
Nothofagus	[200, 201, 202]
Nyato	[250]
Nyato batu	[251]
[O]	
Obeche	[316]
Okoume	[294]
Opepe	[312]
Ovangkol	[299]
[P]	
Pacific hemlock	[102]
Pacific yew	[23]
Padauk	[222, 223, 224]
Painted Maple	[27]
Palosapis	[123]

Para rubber tree	[199]
Parana pine	[272]
Paulownia	[70]
Pecan	[112]
Pericopsis	[220]
Persimmon tree	[38]
Perupok	[186]
Picea glehnii	[12]
Pinus khasya	[169]
Pinus koraiensis	[268]
Pinus sylvestris	[269]
Planchonella	[252]
Podocarpus	[172]
Pometia pinnata	[248]
Ponderosa pine	[97]
Poplar	[118]

Port Orford Cedar	[75]
Primavera	[276]
Pulai	[179]
Pyinkado	[227]
[Q]	
Quercus acuta	[44]
Quercus gilva	[47]
Quercus serrata	[49]
[R]	
Radiata pine	[320]
Ramin	[205]
Rang	[137]
Red beech	[200]
Red lauan	[145, 146, 147]
Red maple	[106]
Red meranti	[139, 144]

Red oak	[111]
Red Selangan batu	[155]
Redceder	[103]
Redwood	[103]
Rengas	[177]
Resak	[160, 161, 162]
Rok far	[264]
Rose wood	[214, 215, 282]
Rubber tree	[199]
[S]	
Sakhalin fir	[9, 265]
Sal	[158]
Salix bakko	[68]
Sapelli	[305]
Sawara cypress	[2]
Scots pine	[269]

Selanganbatu	[156, 157, 159]
Selangan batu	[213]
Sengonlaut	[212, 263]
Sepetir	[221, 225, 226]
Sepetir paya	[221, 225, 226]
Shirakashi	[48]
Shorea guiso	[155]
Short-leaf pine	[92]
Siberian larch	[266, 270]
Silver beech	[201]
Silver fir	[80, 104]
Silver maple	[107]
Sipo	[306]
Sitka spruce	[90]
Slash Pine	[93]
Soft maple	[106, 107]

Sompong	[192]
Sonokeling	[215]
Spruce	[87, 88, 89, 90]
Sugar maple	[108]
Sugar pine	[94]
Sweet Chestnut	[39]
[T]	
Tabebuia	[277]
Taihi	[319]
Tangile	[146]
Tarrietia	[257]
Taun	[248]
Tchitola	[302]
Teak	[260]
Terminalia	[187, 190]
Tetramelaceae	[192]

Tiama	[304]
Tilia japonica	[71]
Tilia maximowicziana	[72]
Toisusu Urbaniana	[69]
Tsuga	[20]
[M]	
(Vatica spp.)	[162]
Veitch's silver fir	[10]
Viola	[289]
[W]	
Walnut	[115]
Wawa	[316]
Western hemlock	[102]
Western red cedar	[79]
White Ash	[116]
White fir	[82]

White lauan	[136, 138]
White meranti	[151, 152, 153]
White oak	[110]
White pine	[326]
White Popl	[64]
White seraya	[135]
White siris	[253]
White Walnut	[28]
[Y]	
Yamane	[259]
Yellow cedar	[76]
Yellow lauan	[154]
Yellow meranti	[148, 149, 150]
Yezo spruce	[267]
[Z]	
Zebra wood	[301]

4. Correction of specific gravity

(Calculation method for specific gravity in oven dry)

This table of average specific gravity for each production place has average specific gravities of typical tree species, but dispersion of ± 0.1 is observed with respect to each specific gravity even for the same tree species on an individual basis.

This device uses the principle of high frequency capacitance, and accordingly, a moisture value is dependent on a difference in the specific gravity setting.

(Example) For cedar/beech

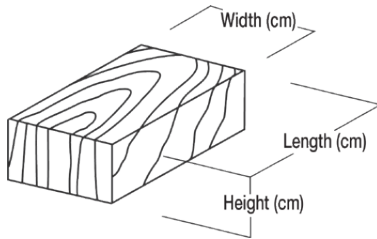
	Cedar			Beech		
	Average specific gravity	Maximum specific gravity	Minimum specific gravity	Average specific gravity	Maximum specific gravity	Minimum specific gravity
Specific gravity in oven dry	0.34	0.41	0.27	0.59	0.71	0.46
Difference with average specific gravity	–	+0.07	–0.07	–	+0.12	–0.13
Displayed moisture value (%)	13.9	11.1	17.1	15.7	10.7	22.9
Difference with displayed moisture value at average specific gravity	–	–2.8	+3.2	–	–5.0	+7.2

If the specific gravity setting differs by 0.1, the moisture value differs by approx. 5%. Therefore, it is recommended to use this device with not only utilizing the table of average specific gravity for each production place but also with obtaining a correct specific gravity (specific gravity in oven dry) in order to use this device with high precision.

A specific gravity in oven dry can be obtained from the table of specific gravity in oven dry by measuring the actual air-dried specific gravity of a timber to be measured and roughly estimating the moisture of the timber.

Simple method of how to obtain specific gravity (specific gravity in oven dry)

- (1) Prepare timber to be measured.
- (2) Calculate the volume of the timber. (cm³)



- (3) Obtain the mass of the timber. (g)
- (4) The specific gravity can be obtained from the values of (2) and (3).

$$\text{Specific gravity (g/cm}^3\text{)} = \frac{\text{Mass (g)}}{\text{Volume (cm}^3\text{)}}$$

- (5) The moisture of the timber can be roughly estimated by the method as follows:
Specific gravity in oven dry (the specific gravity of timber in the state of fully excluding moisture) is used for the specific gravity setting of this device, and accordingly, to obtain this specific gravity in oven dry, the moisture of the specific gravity (air-dried specific gravity) obtained by in the step (4) is corrected (moisture decreasing).

[Method]

- Experiential method is used for estimation, for example, touching with your hand.
- Measurement is conducted with the use of HM-500/520/540.
(At this point, a value listed in the table of average specific gravity for each production place is used for the value of specific gravity correction)

- (6) Obtain the specific gravity in oven dry.
Obtain the specific gravity in oven dry by the specific gravity obtained in the step (4) and the moisture estimated in the step (5).

[Example]

When the air-dried specific gravity is 0.2 and the air-dried moisture (estimation) is 15%, the specific gravity in oven dry becomes 0.18.

Table of specific gravity in oven dry

Air-dried moisture (estimation) Air-dried specific gravity	5 to 9%	10 to 14%	15 to 19%	20 to 24%	25 to 30%
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 (estimation) Air-dried specific gravity	5 to 9%	10 to 14%	15 to 19%	20 to 24%	25 to 30%
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 (estimation) Air-dried specific gravity	5 to 9%	10 to 14%	15 to 19%	20 to 24%	25 to 30%
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 (estimation) Air-dried specific gravity	5 to 9%	10 to 14%	15 to 19%	20 to 24%	25 to 30%
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 (estimation) Air-dried specific gravity	5 to 9%	10 to 14%	15 to 19%	20 to 24%	25 to 30%
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	10.7	1.07
1.10	1.09	1.09	1.09	1.08	1.08

Notes

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