Specific Gravity Calculation
IMMERSION METHOD

Materials Needed:

- A sample of material of which the Specific Gravity (SG) is to be determined; approximately 10” in length
  (The more samples used the better the SG results)
- 5-gallon bucket filled ¾ of the way with clean water
- Ruler or tape measure
- Marking utensil (pencil)
- Handheld Moisture Meter

Procedure:

1. Carefully holding a sample, slowly lower it into the water lengthwise (vertically). Be careful not to exert any upward or downward pressure on the sample; continue lowering until the object feels weightless (the buoyant force of the water is equal to the weight of the displaced sample). See Fig. 1
2. Mark the waterline and remove the board.
3. With your measuring device, determine the length of the immersed segment. See Fig. 2
4. Divide the distance immersed by the total length of the sample. The result is the SG of the material including the water content. If for example, the sample is at 12%MC and has an SG calculated to be 0.56 from this immersion method, then the basic wood density or basic wood SG would be = 0.56/(1+0.12) = 0.50 SG.
5. Now since we do not know what the actual MC is, we need to use the measured MC from a handheld meter set to a basic wood SG of 0.50, then the actual SG of the wood can be estimated using the look up table below. The SG value is located in the cell occupied by the row that indicates the Immersion SG value and the Column that has the measured MC value with the meter set to 0.50 SG.
6. Repeat the above steps for all of the samples and average the results.
7. To learn how to use this value or for help using it with your moisture meter, go to www.wagnermeters.com/manuals.php

Fig. 1 Water line

Example:

- The 10” sample shown in Fig. 1 & 2 has 6.2” of its length covered by water.
- 6.2” divided by 10” = Wet SG = 0.62
- Measure MC with handheld meter set to 0.50 SG.
  The reading is 16% MC
- Use the look up table and find the Row with Wet SG of 0.62 (see highlighted 0.62 in table) and Column with MC of 16%MC (see highlighted 16.0 in table) and the Actual SG value is found to be 0.54 SG (see highlighted 0.54 in table).

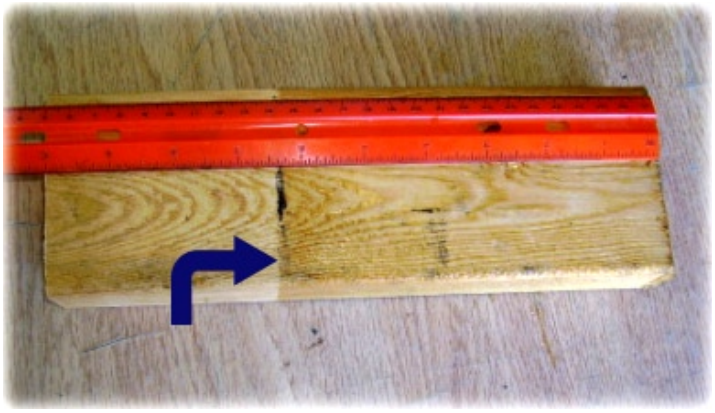

Fig. 2 Measure up to the water line

Information provided by

WAGNER® ELECTRONICS

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ACTUAL SG LOOK UP TABLE

MC READING USING 0.50 SG SETTING - THE GRID VALUE IS THE ACTUAL ESTIMATED SG TO BE USED FOR DIRECT MEASUREMENTS

WET SG AS DETERMINED USING IMMERSION METHOD

	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
0.50	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.38	0.37	0.37	0.36	0.36	0.35
0.51	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.38	0.37	0.37	0.36
0.52	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.39	0.39	0.38	0.38	0.37
0.53	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.39	0.39	0.38
0.54	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.39
0.55	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41	0.40
0.56	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41
0.57	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42
0.58	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44	0.43
0.59	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44
0.60	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.45
0.61	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.46
0.62	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	**0.54**	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48	0.47
0.63	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49	0.49	0.48
0.64	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50	0.50	0.49
0.65	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51	0.50
0.66	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51
0.67	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53	0.53	0.52
0.68	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.53
0.69	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.54
0.70	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56	0.55
0.71	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56
0.72	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58	0.58	0.57
0.73	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59	0.59	0.58
0.74	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59
0.75	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61	0.61	0.60
0.76	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62	0.62	0.61
0.77	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.62
0.78	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63
0.79	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65	0.65	0.64
0.80	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.65
0.81	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.66
0.82	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68	0.68	0.67
0.83	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69	0.69	0.68
0.84	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.69
0.85	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71	0.71	0.70
0.86	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72	0.72	0.71
0.87	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.73	0.72
0.88	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74	0.74	0.73
0.89	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75	0.75	0.74
0.90	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.75
0.91	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77	0.77	0.76
0.92	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.78	0.77
0.93	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78
0.94	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80	0.80	0.79
0.95	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.81	0.80
0.96	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81
0.97	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82
0.98	0.96	0.95	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84	0.84	0.83
0.99	0.97	0.96	0.96	0.95	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85	0.85	0.84
1.00	0.98	0.97	0.97	0.96	0.96	0.95	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90	0.89	0.89	0.88	0.88	0.87	0.87	0.86	0.86	0.85