

Metrication Manual
for
Timber Products



Guyana Forestry Commission
December 1999

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1. ACKNOWLEDGEMENTS

This metrication manual was prepared by Ms R M Persaud, Economist of the Planning & Development Division, Guyana Forestry Commission.

Acknowledgements are due to Mr. Anthony Ross and Mr. Adrian Balgobin from the Bureau of Standards for their advice and recommendations towards the development of this manual.

Thanks are also due to GFC Staff for their comments on the final draft of the document.

2. BACKGROUND

SI - The International System of Units

The International System of Units (SI) is a modernized version of the metric system established by international agreement. The metric system of measurement was developed during the French Revolution in the 1790's and was first promoted in the Guyana during the 1970's. The Guyana Bureau of Standards was established in 1984 as the national body responsible for standardization and metrication. In 1997 the Bureau of Standards launched a sensitization campaign on metrication amongst other standards, which brought the 1981 Weights and Measures Act into force and created a dual system of measurements in Guyana.

SI provides a logical and interconnected framework for all measurements in science, industry, and commerce. The metric system is much simpler to use than the existing English system since all its units of measurement are divisible by 10.

GFC and metrication

In 1998, GFC identified the need for standardization of measurement of forest products using the metric system. Since the Bureau of Standards is the national body for metrication and the standardization of measurements, it was agreed that GFC would work closely with the Bureau. The Guyana Bureau of Standards has supported the development of this manual.

The metrication of forest products in Guyana, at a critical time when new revenue and monitoring systems are being implemented, is important to ensure a smooth transition process for all changes. It is also important for Guyana to be on line with international measurements and classification of forest products.

The purpose of this manual is to assist GFC staff and the forest industry to use metric measurements and to enable a smooth transition from imperial to metric units of measurements.

3. GLOSSARY OF TERMS

Board Measure (BM)	The unit measurement for lumber in Guyana used to be board foot or board measure, which is the volume of timber contained in a piece measuring one foot by one foot by one inch thick. This unit is abbreviated FBM (feet board measure) or simply BM.
Bole	Trunk; stem of a tree; 20 cm diameter and up; 2.5 m and up.
Cord (cd)	A traditional unit of volume used to measure stacked firewood. Like most traditional units of trade, the cord has varied somewhat according to local custom. In Guyana, the cord is defined legally as the volume of a stack of firewood 4 feet wide, 8 feet long, and 4 feet high. That's a volume of 128 cubic feet, about 3.6247 cubic meters. The name apparently comes from an old method of measuring a stack of firewood using a cord or string.
Cubic foot (ft ³)	The volume of timber contained in a piece measuring one foot by one foot by one foot. Equals 12 board feet or is equivalent to 0.0283 m ³ .
Cubic foot hoppus (ft ³ hopp)	The cubic volume unit that has been used in the United Kingdom, India, and commonly Guyana for measuring logs. The formula to determine Hoppus feet, often called quarter-girth formula is <i>Hoppus feet = (C/4)² x L/144</i> which is equivalent to approximately 0.036 m ³ .
Cubic metre (m ³)	The SI unit of volume, equal to 10 ⁶ cm ³ , 1000 liters, 35.314 ft ³ , or 1.307 yd ³ . The standard of lumber measurement under metric system equals 423.77 BM.
Firewood	Include parts of a tree made up into bundles or loads, or cut in a manner in which it is usual to cut wood for burning, and all refuse wood generally, but does not include straight logs or poles of any kind.
Log	A bole or a length of bole or large branch after felling, trimming and crosscutting.
Lumber	Wood sawn lengthwise from logs.
Metre (m)	The fundamental metric and SI unit of distance. The meter is equal to approximately 1.093 yards, 3.280 feet, or 39.370 inches.

Piles	Long straight pieces usually destined to be driven into the ground by impact. Used for construction of harbour wharves and as support for bridges and buildings.
Plywood	Consists of three or more sheets of wood glued and pressed together. Disposed so that the grain of each layer is at an angle to the adjoining layers.
Metres (m)	The fundamental metric and SI unit of distance. The meter is equal to approximately 1.093 yards, 3.280 feet, or 39.370 inches. Its name comes from the Latin <i>metrum</i> and the Greek <i>metron</i> , both meaning "measure."
Millimetre (mm)	A common metric unit of distance. One millimetre equals about 0.039 inch.
Poles	Straight pieces of debarked roundwood, 3 metres in length and up. Used to support telephone, telegraph, and electrical transmission lines or scaffolding.
Shingles	Squares of usually Wallaba (<i>Eperua grandiflora</i>) wood used to construct roofs and for paneling purposes.
Spars	Saplings 15-25 cm in diameter.

4. FOREST PRODUCTS MEASUREMENT TECHNIQUES

Volume is the measure of solid content or capacity, usually expressed in units that are cubes of linear units, such as cubic metres and cubic feet, or in units of dry and liquid measure, such as gallons and litres.

Volume has been, and will continue to be, the most widely used measure of wood quantity.

4.1 Methods of Determining Volume

Solid objects may assume the form of polyhedrons, solids of revolution, and solids of irregular shape. There are also standard formulas for computing the volumes of polyhedron, such as cubes, prisms, and pyramids, and the volumes of solids of revolution, such as cones, cylinders, spheres, etc.

Forest wood products, similarly assume the different shapes, i.e. a log assume the shape of a cylinder. The volume of a cylinder is calculated using either of the formulas below

(A) $\pi r^2 \times H = V$, where r is the radius, H is the height and, V is the volume

(B) $\pi D^2 \div 4 \times H = V$, where D is the average of the four diameters located at each end of the cylinder, H is the height and V the volume.

Figure 1: Example of a cylinder

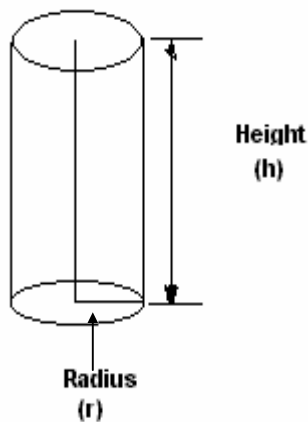
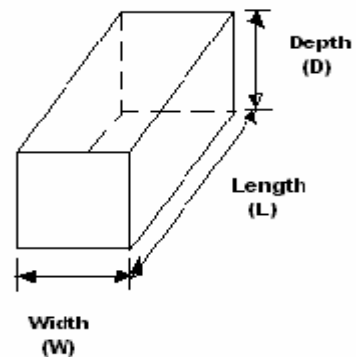


Figure 2: Example of a cube



Other forest products such as lumber, shingles, plywood, staves assume the shape of a cube. The volume of a cube is calculated using the formula $W \times D \times H = V$, where W is the width, D is the depth or thickness, H is the height or length, and V is the volume.

4.2 Deciding when to use various units of measurements

Depending on the physical size of a product, the unit of measurement we choose to apply for calculating volume differs i.e. as the product gets larger to reduce/simplify measurement for the user a unit of measurement with least digits are applied.

For the purpose of measuring forest products in Guyana standard units of measurements for different products are applied as follows and described in later sections in this manual.

All cylindrical products, i.e. logs, length is measured in metres (m) and diameters in centimetres (cm).

All cubes, i.e. lumber, shingles, staves, plywood, etc, length is measured in metres (m) or millimetres (mm), thickness and width in millimetres (mm).

4.3 Recording of data

Once the volume is calculated record data to the nearest two decimal places, rounded up or down as required. For example, if when calculated the volume of lumber totals 6.145 m^3 , the volume of lumber that should be recorded is 6.15 m^3 . If the volume totals 6.142 m^3 , then the volume that should be recorded is 6.14 m^3 .

Please note that when calculating the volume, however, as many as five decimal places depending on conversion factors must be used to ensure accuracy in the computation of volumes.

5. MEASURING LOGS

The Brereton method is the most commonly used method for measuring logs as opposed to the cubic foot hoppus measurement. Brereton can also be applied for imperial measure.

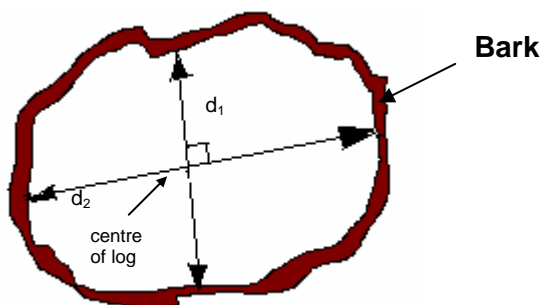
The Brereton method is used to calculate log volume by measuring the length of the log in metres and the diameter under bark at each end of the log in centimetres.

Length

1. Measure the length of the log in metres from the base to the crown end of the log.
2. Measure the shortest distance between butt and crown ends.
3. Record length to the nearest 0.2 metres (20 centimetres) rounded down.

Diameter

1. Measure diameter under bark in centimetres at each end of the log.
2. Measure two diameters at each end.
3. Measure the shortest diameter first (d_1), then the second diameter (d_2) at 90 degrees to the first.
4. Repeat two diameter measurements at the other end of the log (d_3 and d_4).



5. Each line measurement must pass through the centre of the end of the log.
6. Record diameters in centimetres, rounding down to the nearest centimetre.
7. Mark the points where the measurements are made on each end of the log.

Records

1. Enter log length (L)
2. Enter all four diameter measurements (d_1, d_2, d_3, d_4) on the form. Add all four measurements together and divide by 4 to find the mean diameter (D) of the log.
3. $D = (d_1 + d_2 + d_3 + d_4) \div 4$ centimetres
4. Calculate volume (V) by using volume tables or the formula:

$$V = \pi \div 4 \times D^2 \times L \times 0.0001 \text{ cubic metres}$$
$$0.7854 \times D^2 \times L \times 0.0001 \text{ cubic metres}$$

V = volume of log in m^3

See log volume tables in Appendix 1.

6. MEASURING LUMBER

The volume of lumber in metric is measured in cubic metres (m^3) as opposed to board measure (bm), and is calculated by measuring the length of the lumber in metres (m) and the width and thickness in millimetres (mm).

Length

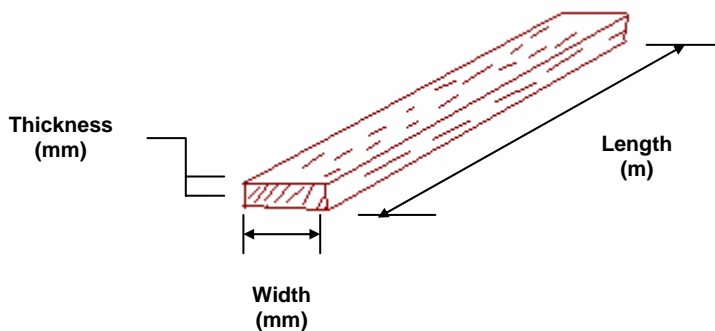
1. Measure the length of the lumber in metres
2. Record the length to the nearest 0.2 metres (20 centimetres) rounded down

Width

1. Measure the width of the lumber in millimetres (mm)

Thickness

1. Measure the thickness of the lumber in millimetres (mm)



Records

1. Calculate lumber volume (V) using volume factor table or the formula:

$$V = \text{No of Pieces} \times (\text{Thickness} \times \text{Width} \times \text{Length}) \div 10^6 = \text{cubic metre (m}^3\text{)}$$

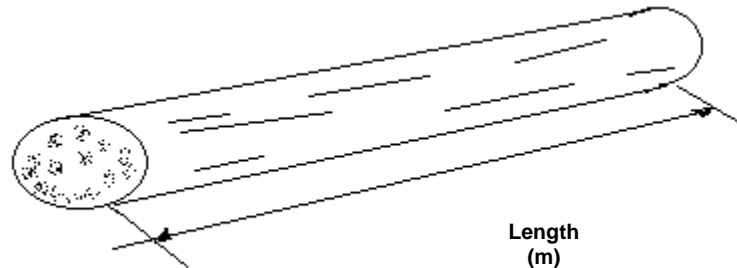
Example: 100 pieces \times (50 mm \times 100 mm \times 2.4 m) \div 1,000,000 mm = 1.20 m^3

2. Record volume of lumber calculated.

For standard sizes of lumber measure the length and apply volume factor (as in Appendix 2) and number of pieces. See Appendix 2 for volume factor table for lumber.

7. MEASURING PILES, POLES, POSTS AND SPARS

Piles, poles, posts and spars in metric are measured in metres as opposed to linear feet and are calculated measuring the length of the pile.



Length

1. Measure the length of the pile, pole, post or spar from the top to the end.
2. Measure the length of the pile, pole or post in metres.
3. Record the length to the nearest 0.2 metres (20 centimetres) rounded down

See Appendix 4 for conversion factors between metric and imperial measurements.

8. MEASURING STAVES

Staves are usually measured pieces. A conversion factor is used to convert to volume measurement. The volume of staves in metric is measured in cubic metres (m^3) and is calculated by measuring the length of the stave in metres (m) and the width and thickness in millimetres (mm).

1. Calculate the volume (V) of staves using conversion factors for standard sizes in the volume table or the formula:

$$V = \text{Number of pieces} \times \text{Thickness (mm)} \times \text{Width (mm)} \times \text{Length (m)} \div 10^6 = m^3$$

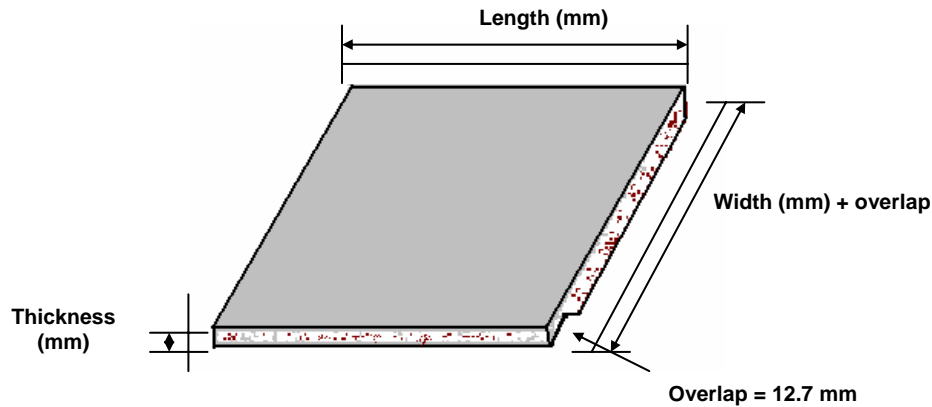
Example: $200 \text{ pieces} \times 5\text{mm} \times 100\text{mm} \times 1.5\text{m} \div 10^6 = 0.15 m^3$

2. Record the volume of staves calculated.

For standard sizes of paling staves measure the length and apply volume factor and the number of pieces. See paling staves volume factor table in Appendix 3.

9. MEASURING SHINGLES

Shingles are squares of Wallaba (*Eperua grandiflora*) wood used to construct roofs. Traditionally shingles are measured in pieces and then converted into a volume measurement using a conversion factor. The volume of shingles in metric is measured in cubic metres (m³), and is calculated by measuring the length, width and thickness in millimetres (mm).



Records

1. Calculate volume (V) of shingles using volume tables or the formula:

$$V = \text{No. of pieces} \times \text{Thickness (mm)} \times \text{Width (mm)} \times \text{Length (mm)} \div 10^9 = \text{m}^3$$

Example: $200 \text{ pieces} \times 5\text{mm} \times 150\text{mm} \times 450\text{mm} \div 10^9 = 0.0675 \text{ m}^3$

2. Record the volume of shingles calculated.

See shingles volume factor table in Appendix 3.

10. MEASURING CHARCOAL

The weight of charcoal in metric is measured in kilograms (kg), as opposed to pounds (lbs).

Charcoal in Guyana is usually measured in bags of 40 lbs.

The metric conversion for weight is:

$$1 \text{ lb} = 0.453 \text{ 592 kg}$$

Therefore a 40 lb bag of charcoal will be equivalent to $40 \times 0.453 \text{ 592 kg} = 18.14 \text{ kg}$

Records

1. Calculate the weight of charcoal in kilograms (kg).
2. Record the weight of charcoal calculated.

11. MEASURING FIREWOOD

The volume of firewood in metric is measured in cubic metres (m³) as opposed to cords.

A cord (cd) is the traditional unit of volume used to measure stacked firewood. Like most traditional units of trade, the cord has varied somewhat according to local custom. The cord is defined legally as the volume of a stack of firewood 4 feet wide, 8 feet long, and 4 feet high. That's a volume of 128 cubic feet, about 3.6247 cubic meters, or 3.6247 steres. The name apparently comes from an old method of measuring a stack of firewood using a cord or string.

To convert cords of firewood to cubic metres stacked volume use as simple conversion of 1 cord = 3.6247 m³. Therefore 10 cords of firewood would be the same as 10 x 3.6247 m³ = 36.25 m³ stacked volume of firewood.

Note that to calculate the solid volume of firewood you should use a conversion factor of 2.12m³.

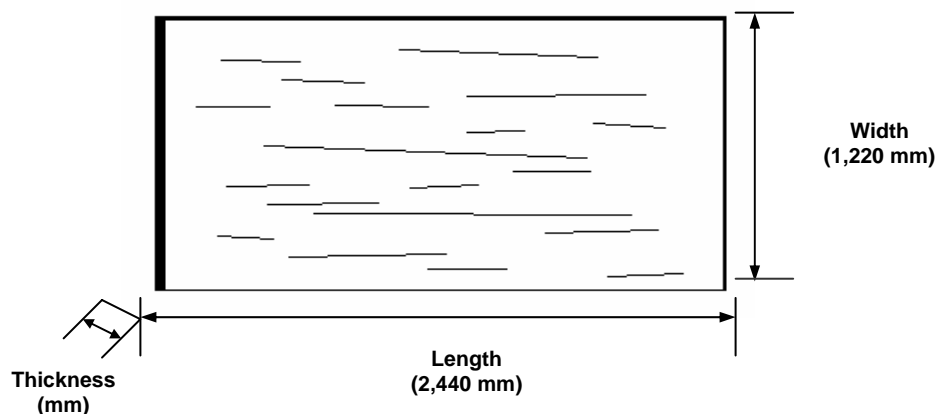
Records

1. Calculate the volume of firewood using the conversion factor for m³
2. Record the volume of firewood calculated.

12. MEASURING PLYWOOD

Plywood comes in standard sheet size of 2,440 mm x 1,220 mm (8ft x 4 ft) measurement with varying thickness of 4mm, 5.2mm, 5.5mm, 9mm, 12mm, 15mm and 18 mm.

1. Calculate all measurements in millimetres (mm)



2. Calculate volume (V) by using the volume factor table or the formula:

$$V = \text{Thickness} \times \text{Width} \times \text{Length} \div 10^9 = \text{m}^3$$

$$\text{Example 1: } 150 \text{ sheets } 12\text{mm} \times 1,220\text{mm} \times 2,440\text{mm} \div 10^9 = 5.36 \text{ m}^3$$

For standard sizes of plywood measure the length and apply the volume factor (as in Appendix 3) and the number of pieces.

APPENDICES

Appendix 1: Log volume tables

Log volume in cubic metres										D = 20
Length (metres)	Diameter (centimetres)									
	20	21	22	23	24	25	26	27	28	29
2.0	0.06	0.07	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.13
2.2	0.07	0.08	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
2.4	0.08	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16
2.6	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17
2.8	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18
3.0	0.09	0.10	0.11	0.12	0.14	0.15	0.16	0.17	0.18	0.20
3.2	0.10	0.11	0.12	0.13	0.14	0.16	0.17	0.18	0.20	0.21
3.4	0.11	0.12	0.13	0.14	0.15	0.17	0.18	0.19	0.21	0.22
3.6	0.11	0.12	0.14	0.15	0.16	0.18	0.19	0.21	0.22	0.24
3.8	0.12	0.13	0.14	0.16	0.17	0.19	0.20	0.22	0.23	0.25
4.0	0.13	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.25	0.26
4.2	0.13	0.15	0.16	0.17	0.19	0.21	0.22	0.24	0.26	0.28
4.4	0.14	0.15	0.17	0.18	0.20	0.22	0.23	0.25	0.27	0.29
4.6	0.14	0.16	0.17	0.19	0.21	0.23	0.24	0.26	0.28	0.30
4.8	0.15	0.17	0.18	0.20	0.22	0.24	0.25	0.27	0.30	0.32
5.0	0.16	0.17	0.19	0.21	0.23	0.25	0.27	0.29	0.31	0.33
5.2	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.34
5.4	0.17	0.19	0.21	0.22	0.24	0.27	0.29	0.31	0.33	0.36
5.6	0.18	0.19	0.21	0.23	0.25	0.27	0.30	0.32	0.34	0.37
5.8	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.33	0.36	0.38
6.0	0.19	0.21	0.23	0.25	0.27	0.29	0.32	0.34	0.37	0.40
6.2	0.19	0.21	0.24	0.26	0.28	0.30	0.33	0.35	0.38	0.41
6.4	0.20	0.22	0.24	0.27	0.29	0.31	0.34	0.37	0.39	0.42
6.6	0.21	0.23	0.25	0.27	0.30	0.32	0.35	0.38	0.41	0.44
6.8	0.21	0.24	0.26	0.28	0.31	0.33	0.36	0.39	0.42	0.45
7.0	0.22	0.24	0.27	0.29	0.32	0.34	0.37	0.40	0.43	0.46
7.2	0.23	0.25	0.27	0.30	0.33	0.35	0.38	0.41	0.44	0.48
7.4	0.23	0.26	0.28	0.31	0.33	0.36	0.39	0.42	0.46	0.49
7.6	0.24	0.26	0.29	0.32	0.34	0.37	0.40	0.44	0.47	0.50
7.8	0.25	0.27	0.30	0.32	0.35	0.38	0.41	0.45	0.48	0.52
8.0	0.25	0.28	0.30	0.33	0.36	0.39	0.42	0.46	0.49	0.53
8.2	0.26	0.28	0.31	0.34	0.37	0.40	0.44	0.47	0.50	0.54
8.4	0.26	0.29	0.32	0.35	0.38	0.41	0.45	0.48	0.52	0.55
8.6	0.27	0.30	0.33	0.36	0.39	0.42	0.46	0.49	0.53	0.57
8.8	0.28	0.30	0.33	0.37	0.40	0.43	0.47	0.50	0.54	0.58
9.0	0.28	0.31	0.34	0.37	0.41	0.44	0.48	0.52	0.55	0.59
9.2	0.29	0.32	0.35	0.38	0.42	0.45	0.49	0.53	0.57	0.61
9.4	0.30	0.33	0.36	0.39	0.43	0.46	0.50	0.54	0.58	0.62
9.6	0.30	0.33	0.36	0.40	0.43	0.47	0.51	0.55	0.59	0.63
9.8	0.31	0.34	0.37	0.41	0.44	0.48	0.52	0.56	0.60	0.65
10.0	0.31	0.35	0.38	0.42	0.45	0.49	0.53	0.57	0.62	0.66

Log volume in cubic metres

D = 30

Length (metres)	Diameter (centimetres)									
	30	31	32	33	34	35	36	37	38	39
2.0	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22	0.23	0.24
2.2	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.24	0.25	0.26
2.4	0.17	0.18	0.19	0.21	0.22	0.23	0.24	0.26	0.27	0.29
2.6	0.18	0.20	0.21	0.22	0.24	0.25	0.26	0.28	0.29	0.31
2.8	0.20	0.21	0.23	0.24	0.25	0.27	0.29	0.30	0.32	0.33
3.0	0.21	0.23	0.24	0.26	0.27	0.29	0.31	0.32	0.34	0.36
3.2	0.23	0.24	0.26	0.27	0.29	0.31	0.33	0.34	0.36	0.38
3.4	0.24	0.26	0.27	0.29	0.31	0.33	0.35	0.37	0.39	0.41
3.6	0.25	0.27	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43
3.8	0.27	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.45
4.0	0.28	0.30	0.32	0.34	0.36	0.38	0.41	0.43	0.45	0.48
4.2	0.30	0.32	0.34	0.36	0.38	0.40	0.43	0.45	0.48	0.50
4.4	0.31	0.33	0.35	0.38	0.40	0.42	0.45	0.47	0.50	0.53
4.6	0.33	0.35	0.37	0.39	0.42	0.44	0.47	0.49	0.52	0.55
4.8	0.34	0.36	0.39	0.41	0.44	0.46	0.49	0.52	0.54	0.57
5.0	0.35	0.38	0.40	0.43	0.45	0.48	0.51	0.54	0.57	0.60
5.2	0.37	0.39	0.42	0.44	0.47	0.50	0.53	0.56	0.59	0.62
5.4	0.38	0.41	0.43	0.46	0.49	0.52	0.55	0.58	0.61	0.65
5.6	0.40	0.42	0.45	0.48	0.51	0.54	0.57	0.60	0.64	0.67
5.8	0.41	0.44	0.47	0.50	0.53	0.56	0.59	0.62	0.66	0.69
6.0	0.42	0.45	0.48	0.51	0.54	0.58	0.61	0.65	0.68	0.72
6.2	0.44	0.47	0.50	0.53	0.56	0.60	0.63	0.67	0.70	0.74
6.4	0.45	0.48	0.51	0.55	0.58	0.62	0.65	0.69	0.73	0.76
6.6	0.47	0.50	0.53	0.56	0.60	0.63	0.67	0.71	0.75	0.79
6.8	0.48	0.51	0.55	0.58	0.62	0.65	0.69	0.73	0.77	0.81
7.0	0.49	0.53	0.56	0.60	0.64	0.67	0.71	0.75	0.79	0.84
7.2	0.51	0.54	0.58	0.62	0.65	0.69	0.73	0.77	0.82	0.86
7.4	0.52	0.56	0.60	0.63	0.67	0.71	0.75	0.80	0.84	0.88
7.6	0.54	0.57	0.61	0.65	0.69	0.73	0.77	0.82	0.86	0.91
7.8	0.55	0.59	0.63	0.67	0.71	0.75	0.79	0.84	0.88	0.93
8.0	0.57	0.60	0.64	0.68	0.73	0.77	0.81	0.86	0.91	0.96
8.2	0.58	0.62	0.66	0.70	0.74	0.79	0.83	0.88	0.93	0.98
8.4	0.59	0.63	0.68	0.72	0.76	0.81	0.86	0.90	0.95	1.00
8.6	0.61	0.65	0.69	0.74	0.78	0.83	0.88	0.92	0.98	1.03
8.8	0.62	0.66	0.71	0.75	0.80	0.85	0.90	0.95	1.00	1.05
9.0	0.64	0.68	0.72	0.77	0.82	0.87	0.92	0.97	1.02	1.08
9.2	0.65	0.69	0.74	0.79	0.84	0.89	0.94	0.99	1.04	1.10
9.4	0.66	0.71	0.76	0.80	0.85	0.90	0.96	1.01	1.07	1.12
9.6	0.68	0.72	0.77	0.82	0.87	0.92	0.98	1.03	1.09	1.15
9.8	0.69	0.74	0.79	0.84	0.89	0.94	1.00	1.05	1.11	1.17
10.0	0.71	0.75	0.80	0.86	0.91	0.96	1.02	1.08	1.13	1.19

Log volume in cubic metres

D = 40

Length (metres)	Diameter (centimetres)									
	40	41	42	43	44	45	46	47	48	49
2.0	0.25	0.26	0.28	0.29	0.30	0.32	0.33	0.35	0.36	0.38
2.2	0.28	0.29	0.30	0.32	0.33	0.35	0.37	0.38	0.40	0.41
2.4	0.30	0.32	0.33	0.35	0.36	0.38	0.40	0.42	0.43	0.45
2.6	0.33	0.34	0.36	0.38	0.40	0.41	0.43	0.45	0.47	0.49
2.8	0.35	0.37	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.53
3.0	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.57
3.2	0.40	0.42	0.44	0.46	0.49	0.51	0.53	0.56	0.58	0.60
3.4	0.43	0.45	0.47	0.49	0.52	0.54	0.57	0.59	0.62	0.64
3.6	0.45	0.48	0.50	0.52	0.55	0.57	0.60	0.62	0.65	0.68
3.8	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.72
4.0	0.50	0.53	0.55	0.58	0.61	0.64	0.66	0.69	0.72	0.75
4.2	0.53	0.55	0.58	0.61	0.64	0.67	0.70	0.73	0.76	0.79
4.4	0.55	0.58	0.61	0.64	0.67	0.70	0.73	0.76	0.80	0.83
4.6	0.58	0.61	0.64	0.67	0.70	0.73	0.76	0.80	0.83	0.87
4.8	0.60	0.63	0.67	0.70	0.73	0.76	0.80	0.83	0.87	0.91
5.0	0.63	0.66	0.69	0.73	0.76	0.80	0.83	0.87	0.90	0.94
5.2	0.65	0.69	0.72	0.76	0.79	0.83	0.86	0.90	0.94	0.98
5.4	0.68	0.71	0.75	0.78	0.82	0.86	0.90	0.94	0.98	1.02
5.6	0.70	0.74	0.78	0.81	0.85	0.89	0.93	0.97	1.01	1.06
5.8	0.73	0.77	0.80	0.84	0.88	0.92	0.96	1.01	1.05	1.09
6.0	0.75	0.79	0.83	0.87	0.91	0.95	1.00	1.04	1.09	1.13
6.2	0.78	0.82	0.86	0.90	0.94	0.99	1.03	1.08	1.12	1.17
6.4	0.80	0.84	0.89	0.93	0.97	1.02	1.06	1.11	1.16	1.21
6.6	0.83	0.87	0.91	0.96	1.00	1.05	1.10	1.15	1.19	1.24
6.8	0.85	0.90	0.94	0.99	1.03	1.08	1.13	1.18	1.23	1.28
7.0	0.88	0.92	0.97	1.02	1.06	1.11	1.16	1.21	1.27	1.32
7.2	0.90	0.95	1.00	1.05	1.09	1.15	1.20	1.25	1.30	1.36
7.4	0.93	0.98	1.03	1.07	1.13	1.18	1.23	1.28	1.34	1.40
7.6	0.96	1.00	1.05	1.10	1.16	1.21	1.26	1.32	1.38	1.43
7.8	0.98	1.03	1.08	1.13	1.19	1.24	1.30	1.35	1.41	1.47
8.0	1.01	1.06	1.11	1.16	1.22	1.27	1.33	1.39	1.45	1.51
8.2	1.03	1.08	1.14	1.19	1.25	1.30	1.36	1.42	1.48	1.55
8.4	1.06	1.11	1.16	1.22	1.28	1.34	1.40	1.46	1.52	1.58
8.6	1.08	1.14	1.19	1.25	1.31	1.37	1.43	1.49	1.56	1.62
8.8	1.11	1.16	1.22	1.28	1.34	1.40	1.46	1.53	1.59	1.66
9.0	1.13	1.19	1.25	1.31	1.37	1.43	1.50	1.56	1.63	1.70
9.2	1.16	1.21	1.27	1.34	1.40	1.46	1.53	1.60	1.66	1.73
9.4	1.18	1.24	1.30	1.37	1.43	1.50	1.56	1.63	1.70	1.77
9.6	1.21	1.27	1.33	1.39	1.46	1.53	1.60	1.67	1.74	1.81
9.8	1.23	1.29	1.36	1.42	1.49	1.56	1.63	1.70	1.77	1.85
10.0	1.26	1.32	1.39	1.45	1.52	1.59	1.66	1.73	1.81	1.89

Length (metres)	Diameter (centimetres)									
	50	51	52	53	54	55	56	57	58	59
2.0	0.39	0.41	0.42	0.44	0.46	0.48	0.49	0.51	0.53	0.55
2.2	0.43	0.45	0.47	0.49	0.50	0.52	0.54	0.56	0.58	0.60
2.4	0.47	0.49	0.51	0.53	0.55	0.57	0.59	0.61	0.63	0.66
2.6	0.51	0.53	0.55	0.57	0.60	0.62	0.64	0.66	0.69	0.71
2.8	0.55	0.57	0.59	0.62	0.64	0.67	0.69	0.71	0.74	0.77
3.0	0.59	0.61	0.64	0.66	0.69	0.71	0.74	0.77	0.79	0.82
3.2	0.63	0.65	0.68	0.71	0.73	0.76	0.79	0.82	0.85	0.87
3.4	0.67	0.69	0.72	0.75	0.78	0.81	0.84	0.87	0.90	0.93
3.6	0.71	0.74	0.76	0.79	0.82	0.86	0.89	0.92	0.95	0.98
3.8	0.75	0.78	0.81	0.84	0.87	0.90	0.94	0.97	1.00	1.04
4.0	0.79	0.82	0.85	0.88	0.92	0.95	0.99	1.02	1.06	1.09
4.2	0.82	0.86	0.89	0.93	0.96	1.00	1.03	1.07	1.11	1.15
4.4	0.86	0.90	0.93	0.97	1.01	1.05	1.08	1.12	1.16	1.20
4.6	0.90	0.94	0.98	1.01	1.05	1.09	1.13	1.17	1.22	1.26
4.8	0.94	0.98	1.02	1.06	1.10	1.14	1.18	1.22	1.27	1.31
5.0	0.98	1.02	1.06	1.10	1.15	1.19	1.23	1.28	1.32	1.37
5.2	1.02	1.06	1.10	1.15	1.19	1.24	1.28	1.33	1.37	1.42
5.4	1.06	1.10	1.15	1.19	1.24	1.28	1.33	1.38	1.43	1.48
5.6	1.10	1.14	1.19	1.24	1.28	1.33	1.38	1.43	1.48	1.53
5.8	1.14	1.18	1.23	1.28	1.33	1.38	1.43	1.48	1.53	1.59
6.0	1.18	1.23	1.27	1.32	1.37	1.43	1.48	1.53	1.59	1.64
6.2	1.22	1.27	1.32	1.37	1.42	1.47	1.53	1.58	1.64	1.70
6.4	1.26	1.31	1.36	1.41	1.47	1.52	1.58	1.63	1.69	1.75
6.6	1.30	1.35	1.40	1.46	1.51	1.57	1.63	1.68	1.74	1.80
6.8	1.34	1.39	1.44	1.50	1.56	1.62	1.67	1.74	1.80	1.86
7.0	1.37	1.43	1.49	1.54	1.60	1.66	1.72	1.79	1.85	1.91
7.2	1.41	1.47	1.53	1.59	1.65	1.71	1.77	1.84	1.90	1.97
7.4	1.45	1.51	1.57	1.63	1.69	1.76	1.82	1.89	1.96	2.02
7.6	1.49	1.55	1.61	1.68	1.74	1.81	1.87	1.94	2.01	2.08
7.8	1.53	1.59	1.66	1.72	1.79	1.85	1.92	1.99	2.06	2.13
8.0	1.57	1.63	1.70	1.76	1.83	1.90	1.97	2.04	2.11	2.19
8.2	1.61	1.68	1.74	1.81	1.88	1.95	2.02	2.09	2.17	2.24
8.4	1.65	1.72	1.78	1.85	1.92	2.00	2.07	2.14	2.22	2.30
8.6	1.69	1.76	1.83	1.90	1.97	2.04	2.12	2.19	2.27	2.35
8.8	1.73	1.80	1.87	1.94	2.02	2.09	2.17	2.25	2.33	2.41
9.0	1.77	1.84	1.91	1.99	2.06	2.14	2.22	2.30	2.38	2.46
9.2	1.81	1.88	1.95	2.03	2.11	2.19	2.27	2.35	2.43	2.52
9.4	1.85	1.92	2.00	2.07	2.15	2.23	2.32	2.40	2.48	2.57
9.6	1.88	1.96	2.04	2.12	2.20	2.28	2.36	2.45	2.54	2.62
9.8	1.92	2.00	2.08	2.16	2.24	2.33	2.41	2.50	2.59	2.68
10.0	1.96	2.04	2.12	2.21	2.29	2.38	2.46	2.55	2.64	2.73

Length (metres)	Diameter (centimetres)									
	60	61	62	63	64	65	66	67	68	69
2.0	0.57	0.58	0.60	0.62	0.64	0.66	0.68	0.71	0.73	0.75
2.2	0.62	0.64	0.66	0.69	0.71	0.73	0.75	0.78	0.80	0.82
2.4	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.85	0.87	0.90
2.6	0.74	0.76	0.78	0.81	0.84	0.86	0.89	0.92	0.94	0.97
2.8	0.79	0.82	0.85	0.87	0.90	0.93	0.96	0.99	1.02	1.05
3.0	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.06	1.09	1.12
3.2	0.90	0.94	0.97	1.00	1.03	1.06	1.09	1.13	1.16	1.20
3.4	0.96	0.99	1.03	1.06	1.09	1.13	1.16	1.20	1.23	1.27
3.6	1.02	1.05	1.09	1.12	1.16	1.19	1.23	1.27	1.31	1.35
3.8	1.07	1.11	1.15	1.18	1.22	1.26	1.30	1.34	1.38	1.42
4.0	1.13	1.17	1.21	1.25	1.29	1.33	1.37	1.41	1.45	1.50
4.2	1.19	1.23	1.27	1.31	1.35	1.39	1.44	1.48	1.53	1.57
4.4	1.24	1.29	1.33	1.37	1.42	1.46	1.51	1.55	1.60	1.65
4.6	1.30	1.34	1.39	1.43	1.48	1.53	1.57	1.62	1.67	1.72
4.8	1.36	1.40	1.45	1.50	1.54	1.59	1.64	1.69	1.74	1.79
5.0	1.41	1.46	1.51	1.56	1.61	1.66	1.71	1.76	1.82	1.87
5.2	1.47	1.52	1.57	1.62	1.67	1.73	1.78	1.83	1.89	1.94
5.4	1.53	1.58	1.63	1.68	1.74	1.79	1.85	1.90	1.96	2.02
5.6	1.58	1.64	1.69	1.75	1.80	1.86	1.92	1.97	2.03	2.09
5.8	1.64	1.70	1.75	1.81	1.87	1.92	1.98	2.04	2.11	2.17
6.0	1.70	1.75	1.81	1.87	1.93	1.99	2.05	2.12	2.18	2.24
6.2	1.75	1.81	1.87	1.93	1.99	2.06	2.12	2.19	2.25	2.32
6.4	1.81	1.87	1.93	2.00	2.06	2.12	2.19	2.26	2.32	2.39
6.6	1.87	1.93	1.99	2.06	2.12	2.19	2.26	2.33	2.40	2.47
6.8	1.92	1.99	2.05	2.12	2.19	2.26	2.33	2.40	2.47	2.54
7.0	1.98	2.05	2.11	2.18	2.25	2.32	2.39	2.47	2.54	2.62
7.2	2.04	2.10	2.17	2.24	2.32	2.39	2.46	2.54	2.61	2.69
7.4	2.09	2.16	2.23	2.31	2.38	2.46	2.53	2.61	2.69	2.77
7.6	2.15	2.22	2.29	2.37	2.44	2.52	2.60	2.68	2.76	2.84
7.8	2.21	2.28	2.35	2.43	2.51	2.59	2.67	2.75	2.83	2.92
8.0	2.26	2.34	2.42	2.49	2.57	2.65	2.74	2.82	2.91	2.99
8.2	2.32	2.40	2.48	2.56	2.64	2.72	2.81	2.89	2.98	3.07
8.4	2.38	2.45	2.54	2.62	2.70	2.79	2.87	2.96	3.05	3.14
8.6	2.43	2.51	2.60	2.68	2.77	2.85	2.94	3.03	3.12	3.22
8.8	2.49	2.57	2.66	2.74	2.83	2.92	3.01	3.10	3.20	3.29
9.0	2.54	2.63	2.72	2.81	2.90	2.99	3.08	3.17	3.27	3.37
9.2	2.60	2.69	2.78	2.87	2.96	3.05	3.15	3.24	3.34	3.44
9.4	2.66	2.75	2.84	2.93	3.02	3.12	3.22	3.31	3.41	3.51
9.6	2.71	2.81	2.90	2.99	3.09	3.19	3.28	3.38	3.49	3.59
9.8	2.77	2.86	2.96	3.05	3.15	3.25	3.35	3.46	3.56	3.66
10.0	2.83	2.92	3.02	3.12	3.22	3.32	3.42	3.53	3.63	3.74

Length (metres)	Diameter (centimetres)									
	70	71	72	73	74	75	76	77	78	79
2.0	0.77	0.79	0.81	0.84	0.86	0.88	0.91	0.93	0.96	0.98
2.2	0.85	0.87	0.90	0.92	0.95	0.97	1.00	1.02	1.05	1.08
2.4	0.92	0.95	0.98	1.00	1.03	1.06	1.09	1.12	1.15	1.18
2.6	1.00	1.03	1.06	1.09	1.12	1.15	1.18	1.21	1.24	1.27
2.8	1.08	1.11	1.14	1.17	1.20	1.24	1.27	1.30	1.34	1.37
3.0	1.15	1.19	1.22	1.26	1.29	1.33	1.36	1.40	1.43	1.47
3.2	1.23	1.27	1.30	1.34	1.38	1.41	1.45	1.49	1.53	1.57
3.4	1.31	1.35	1.38	1.42	1.46	1.50	1.54	1.58	1.62	1.67
3.6	1.39	1.43	1.47	1.51	1.55	1.59	1.63	1.68	1.72	1.76
3.8	1.46	1.50	1.55	1.59	1.63	1.68	1.72	1.77	1.82	1.86
4.0	1.54	1.58	1.63	1.67	1.72	1.77	1.81	1.86	1.91	1.96
4.2	1.62	1.66	1.71	1.76	1.81	1.86	1.91	1.96	2.01	2.06
4.4	1.69	1.74	1.79	1.84	1.89	1.94	2.00	2.05	2.10	2.16
4.6	1.77	1.82	1.87	1.93	1.98	2.03	2.09	2.14	2.20	2.25
4.8	1.85	1.90	1.95	2.01	2.06	2.12	2.18	2.24	2.29	2.35
5.0	1.92	1.98	2.04	2.09	2.15	2.21	2.27	2.33	2.39	2.45
5.2	2.00	2.06	2.12	2.18	2.24	2.30	2.36	2.42	2.48	2.55
5.4	2.08	2.14	2.20	2.26	2.32	2.39	2.45	2.51	2.58	2.65
5.6	2.16	2.22	2.28	2.34	2.41	2.47	2.54	2.61	2.68	2.74
5.8	2.23	2.30	2.36	2.43	2.49	2.56	2.63	2.70	2.77	2.84
6.0	2.31	2.38	2.44	2.51	2.58	2.65	2.72	2.79	2.87	2.94
6.2	2.39	2.45	2.52	2.59	2.67	2.74	2.81	2.89	2.96	3.04
6.4	2.46	2.53	2.61	2.68	2.75	2.83	2.90	2.98	3.06	3.14
6.6	2.54	2.61	2.69	2.76	2.84	2.92	2.99	3.07	3.15	3.24
6.8	2.62	2.69	2.77	2.85	2.92	3.00	3.08	3.17	3.25	3.33
7.0	2.69	2.77	2.85	2.93	3.01	3.09	3.18	3.26	3.34	3.43
7.2	2.77	2.85	2.93	3.01	3.10	3.18	3.27	3.35	3.44	3.53
7.4	2.85	2.93	3.01	3.10	3.18	3.27	3.36	3.45	3.54	3.63
7.6	2.92	3.01	3.09	3.18	3.27	3.36	3.45	3.54	3.63	3.73
7.8	3.00	3.09	3.18	3.26	3.35	3.45	3.54	3.63	3.73	3.82
8.0	3.08	3.17	3.26	3.35	3.44	3.53	3.63	3.73	3.82	3.92
8.2	3.16	3.25	3.34	3.43	3.53	3.62	3.72	3.82	3.92	4.02
8.4	3.23	3.33	3.42	3.52	3.61	3.71	3.81	3.91	4.01	4.12
8.6	3.31	3.40	3.50	3.60	3.70	3.80	3.90	4.00	4.11	4.22
8.8	3.39	3.48	3.58	3.68	3.78	3.89	3.99	4.10	4.20	4.31
9.0	3.46	3.56	3.66	3.77	3.87	3.98	4.08	4.19	4.30	4.41
9.2	3.54	3.64	3.75	3.85	3.96	4.06	4.17	4.28	4.40	4.51
9.4	3.62	3.72	3.83	3.93	4.04	4.15	4.26	4.38	4.49	4.61
9.6	3.69	3.80	3.91	4.02	4.13	4.24	4.36	4.47	4.59	4.71
9.8	3.77	3.88	3.99	4.10	4.21	4.33	4.45	4.56	4.68	4.80
10.0	3.85	3.96	4.07	4.19	4.30	4.42	4.54	4.66	4.78	4.90

Length (metres)	Diameter (centimetres)									
	80	81	82	83	84	85	86	87	88	89
2.0	1.01	1.03	1.06	1.08	1.11	1.13	1.16	1.19	1.22	1.24
2.2	1.11	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34	1.37
2.4	1.21	1.24	1.27	1.30	1.33	1.36	1.39	1.43	1.46	1.49
2.6	1.31	1.34	1.37	1.41	1.44	1.48	1.51	1.55	1.58	1.62
2.8	1.41	1.44	1.48	1.51	1.55	1.59	1.63	1.66	1.70	1.74
3.0	1.51	1.55	1.58	1.62	1.66	1.70	1.74	1.78	1.82	1.87
3.2	1.61	1.65	1.69	1.73	1.77	1.82	1.86	1.90	1.95	1.99
3.4	1.71	1.75	1.80	1.84	1.88	1.93	1.97	2.02	2.07	2.12
3.6	1.81	1.86	1.90	1.95	2.00	2.04	2.09	2.14	2.19	2.24
3.8	1.91	1.96	2.01	2.06	2.11	2.16	2.21	2.26	2.31	2.36
4.0	2.01	2.06	2.11	2.16	2.22	2.27	2.32	2.38	2.43	2.49
4.2	2.11	2.16	2.22	2.27	2.33	2.38	2.44	2.50	2.55	2.61
4.4	2.21	2.27	2.32	2.38	2.44	2.50	2.56	2.62	2.68	2.74
4.6	2.31	2.37	2.43	2.49	2.55	2.61	2.67	2.73	2.80	2.86
4.8	2.41	2.47	2.53	2.60	2.66	2.72	2.79	2.85	2.92	2.99
5.0	2.51	2.58	2.64	2.71	2.77	2.84	2.90	2.97	3.04	3.11
5.2	2.61	2.68	2.75	2.81	2.88	2.95	3.02	3.09	3.16	3.23
5.4	2.71	2.78	2.85	2.92	2.99	3.06	3.14	3.21	3.28	3.36
5.6	2.81	2.89	2.96	3.03	3.10	3.18	3.25	3.33	3.41	3.48
5.8	2.92	2.99	3.06	3.14	3.21	3.29	3.37	3.45	3.53	3.61
6.0	3.02	3.09	3.17	3.25	3.33	3.40	3.49	3.57	3.65	3.73
6.2	3.12	3.19	3.27	3.35	3.44	3.52	3.60	3.69	3.77	3.86
6.4	3.22	3.30	3.38	3.46	3.55	3.63	3.72	3.80	3.89	3.98
6.6	3.32	3.40	3.49	3.57	3.66	3.75	3.83	3.92	4.01	4.11
6.8	3.42	3.50	3.59	3.68	3.77	3.86	3.95	4.04	4.14	4.23
7.0	3.52	3.61	3.70	3.79	3.88	3.97	4.07	4.16	4.26	4.35
7.2	3.62	3.71	3.80	3.90	3.99	4.09	4.18	4.28	4.38	4.48
7.4	3.72	3.81	3.91	4.00	4.10	4.20	4.30	4.40	4.50	4.60
7.6	3.82	3.92	4.01	4.11	4.21	4.31	4.41	4.52	4.62	4.73
7.8	3.92	4.02	4.12	4.22	4.32	4.43	4.53	4.64	4.74	4.85
8.0	4.02	4.12	4.22	4.33	4.43	4.54	4.65	4.76	4.87	4.98
8.2	4.12	4.23	4.33	4.44	4.54	4.65	4.76	4.87	4.99	5.10
8.4	4.22	4.33	4.44	4.54	4.66	4.77	4.88	4.99	5.11	5.23
8.6	4.32	4.43	4.54	4.65	4.77	4.88	5.00	5.11	5.23	5.35
8.8	4.42	4.53	4.65	4.76	4.88	4.99	5.11	5.23	5.35	5.47
9.0	4.52	4.64	4.75	4.87	4.99	5.11	5.23	5.35	5.47	5.60
9.2	4.62	4.74	4.86	4.98	5.10	5.22	5.34	5.47	5.60	5.72
9.4	4.72	4.84	4.96	5.09	5.21	5.33	5.46	5.59	5.72	5.85
9.6	4.83	4.95	5.07	5.19	5.32	5.45	5.58	5.71	5.84	5.97
9.8	4.93	5.05	5.18	5.30	5.43	5.56	5.69	5.83	5.96	6.10
10.0	5.03	5.15	5.28	5.41	5.54	5.67	5.81	5.94	6.08	6.22

Appendix 2: Lumber volume factor table

Factor table for preferred nominal sizes for structural lumber as specified in the Building Code of Guyana													Length = 1 metre		
Thickness (mm)	Width (mm)														
	50	75	100	125	150	175	200	225	250	275	300	350	400	450	500
12	0.00060	0.00090	0.00120												
16	0.00080	0.00120	0.00160												
19	0.00095	0.00143	0.00190												
25		0.00188	0.00250	0.00313	0.00375	0.00438	0.00500	0.00563	0.00625						
32		0.00240	0.00320	0.00400	0.00480	0.00560	0.00640	0.00720	0.00800						
38		0.00285	0.00380	0.00475	0.00570	0.00665	0.00760	0.00855	0.00950						
44		0.00330	0.00440	0.00550	0.00660	0.00770	0.00880	0.00990	0.01100						
50	0.00250	0.00375	0.00500	0.00625	0.00750	0.00875	0.01000	0.01125	0.01250	0.01375	0.01500				
62		0.00465	0.00620	0.00775	0.00930	0.01085	0.01240	0.01395	0.01550	0.01705	0.01860				
75		0.00563	0.00750	0.00938	0.01125	0.01313	0.01500	0.01688	0.01875	0.02250					
100			0.01000	0.01250	0.01500	0.01750	0.02000	0.02250	0.02500	0.03000	0.03500				
125			0.01250	0.01563	0.01875	0.02188	0.02500	0.02813	0.03125	0.03438	0.03750	0.04375			
150				0.02250	0.02625	0.03000	0.03375	0.03750	0.04125	0.04500	0.05250	0.06000			
175					0.03500	0.03938	0.04375	0.04813	0.05250	0.06125	0.07000				
200						0.04000	0.04500	0.05000	0.05500	0.06000	0.07000	0.08000	0.09000	0.10000	
225							0.05063	0.05625	0.06188	0.06750	0.07875	0.09000	0.10125	0.11250	
250								0.06250	0.06875	0.07500	0.08750	0.10000	0.11250	0.12500	
300										0.10500	0.12000	0.13500	0.15000		
400											0.16000	0.18000	0.20000		
450												0.20250	0.22500		
500														0.25000	

Instructions for applying volume factor table for lumber

1. Measure the size of the product.
2. Look up volume factor for appropriate width and thickness. For example if a piece of board measures 25mm x 75mm, and assuming the length is 3.2 metres.

Thickness	Width	Volume factor
25	75	0.00188

3. Then multiply the volume factor by the length by the number of pieces to get volume. For example the volume of 1000 pieces of 25 x 75 of 3.2 metres length is calculated by multiplying 0.00188 x 3.2 metres x 1000 pieces = 6.03 m³.

Appendix 3: Volume tables for other forest products

Volume table for preferred sizes for paling staves

**Length =
1.5 m**

Thickness (mm)	Width (mm)					
	75	100	125	150	175	200
5	0.00056	0.00075	0.00094	0.00113	0.00131	0.00150
10	0.00113	0.00150	0.00188	0.00225	0.00263	0.00300
15	0.00169	0.00225	0.00281	0.00338	0.00394	0.00450

Volume table for standard sizes of shingles as specified by the Guyana Timber Grading Rules

Length = 450 mm

Thickness (mm)	Width (mm)			
	100	125	150	175
5	0.00023	0.00028	0.00034	0.00039
6	0.00027	0.00034	0.00041	0.00047
7	0.00032	0.00039	0.00047	0.00055
8	0.00036	0.00045	0.00054	0.00063

Volume table for plywood

Length = 2440 mm

Thickness (mm)	Width (mm)
	1220
4.0	0.0119
5.2	0.0155
5.5	0.0164
9.0	0.0268
12.0	0.0357
15.0	0.0447
18.0	0.0536

Instructions for applying volume tables

1. Measure the size of the product.
2. Look up volume for appropriate width and thickness. For example if a piece of shingle measures 5mm x 100mm, and assuming the length is of standard 450 mm.

Thickness	Width	Volume
5	100	0.00023

3. Then multiply the volume by the number of pieces.

Appendix 4: Other conversion tables

Metric Conversion Tables

Useful Conversion factors for Timber Products

to convert	into	multiply by
cubic feet (ft ³) hoppus	cubic metres (m ³)	0.0361
cubic feet (ft ³) hoppus	cubic metre hoppus	0.0283
cubic ft (ft ³)	m ³	0.0283
cubic ft (ft ³)	m ³ hoppus	0.0222
cubic metre (m ³)	m ³ hoppus	0.7852
board measure (BM)	m ³	0.002 358
linear ft	metres (m)	0.30 48
Pounds (lbs)	kg	0.453 592
cords	m ³	3.624 7

Source: GFC and FAO

Length

to convert	into	multiply by
inches (in)	centimetres (cm)	2.540*
	metres (m)	2.540 x 10 ⁻²
	millimetres (mm)	25.4*
feet (ft)	centimetres (cm)	30.48*
	metres (m)	0.304 8*
	millimetres (mm)	304.8*
yards (yd)	centimetres (cm)	91.44*
	metres (m)	0.914 4*
miles	kilometres (km)	1.609 344*
	metres (m)	1 609.344*
international	kilometres (km)	1.852*
nautical miles	metres (m)	1 822*

Area

to convert	into	multiply by
square inches	cm ²	6.451 6*
	mm ²	645.16*
square feet	cm ²	929.03
	m ²	0.092 903
square yards	cm ²	8 361
	m ²	0.836 1
square miles	km ²	2.589 99
	ha	258.99
acres	m ²	4 046.856
	ha	0.404 69

* An asterisk denotes exact conversion

Volume & Capacity

to convert	into	multiply by
cu. inches	mm ³	16 387.064*
	cm ³	16.387 1
	litres(l)	0.016 387
cubic feet	cm ³	28 316.85
	m ³	0.028 316 85
	litres (l)	28.32
pint	litres (l)	0.568 26

Mass

to convert	into	multiply by
ounces (oz)	grams (gm)	28.349 5
pounds (lb)	kg	0.453 592
ton	kg	1 016.047
	tonne	1.016 047

Conversion factors

LENGTH	mm	cm	m	Km	in	ft	yd	mile
1 millimetre		0.1	0.001	0.000001	0.03937	0.003281	0.001094	
1 centimetre	10		0.01	0.00001	0.393701	0.032808	0.010936	
1 metre	1000	100		0.001	39.370079	3.28084	1.093613	0.000621
1 kilometre	1000000	100000	1000		39370.0787	3280.8399	1093.6133	0.621371
1 inch	25.40	2.54	0.0254	0.000025		0.0833333	0.027778	0.000016
1 foot	304.80	30.48	0.3048	0.000305	12		0.333333	0.000189
1 yard	914.40	91.44	0.9144	0.000914	36	3		0.000568
1 mile	1609344	160934	1609.34400 0	1.609344	63360	5280	1760	
AREA	sq cm	sq m	sq km	sq in	sq ft	sq yd	acre	sq mile
1 sq centimetre		0.0001		0.155	0.001076	0.000120		
1 sq metre	10000		0.000001	1550	10.763910	1.195990	0.000247	
1 sq kilometre		1000000			10763910.4	1195990.05	247.105382	0.386102
1 sq inch	6.4516	0.000645			0.006944	0.000772		
1 sq foot	929.0304	0.092903		144		0.111111	0.000023	
1 sq yard	8361.2736	0.836127		1296	9		0.000207	
1 acre	40468564.2	4046.85642	0.00404686	6272640	43560	4860		0.001563
1 sq mile		25899811	2.589988	40138560	27874000	3097600	640	
WEIGHT	g	kg	M. tonne	S. ton	L. ton	oz	lb	kati
1 gram		0.001	0.000001			0.035274	0.002205	0.001653
1 kilogram	1000		0.001	0.001102	0.000984	35.273962	2.204623	1.653467
1 tonne (metric)		1000		1.10231	0.984207	35273.9619	2204.62262 0	16534.6697
1 ton (US)	907185	907.185	0.907185		0.89286	32000	2000	1500
1 ton (UK)	1016046.91	1016.04691	1.016046	1.12		35840	2240	1680
1 ounce	28.349523	0.028350	0.000028	0.000031	0.000028		0.0625	0.046875
1 pound	453.59237	0.453594	0.000454	0.0005	0.000446		16	0.75
1 kati	604.78983	0.604790	0.000605	0.000667	0.000595	21.333333	1.333333	
CAPACITY	cu. cm	litre	cu. m	cu. in	cu. ft	cu. yd	UK gallon	US gallon
1 cu centimetre		0.001000	0.000001	0.061024	0.000035		0.000220	0.000264
1 litre	1000		0.001	61.123744	0.035315	0.001308	0.21997	0.264180
1 cu metre	1000000	1000		61023.7441	35.314668	1.307951	219.969	264.179854
1 cu inch	16.387064	0.016387	0.000016		0.0005787	0.000021	0.003605	0.004329
1 cu foot	28316.85	28.316850	0.028317	1758		0.037037	6.228862	7.480741
1 cu yard	764554.86	764.554860	0.764555	46656	27		168.178557	201.979900
1 gallon (UK)	4546.09	4.54609	0.004546	277.419432	0.160544	0.005946		1.200912
1 gallon (US)	3785.3	3.7853	0.003785	230.993179	0.133677	0.004951	0.8237	

