SRI LANKA STANDARD 629:1983
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UNIT MASS OF BUILDING MATERIALS

BUREAU OF CEYLON STANDARDS

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SLS 629:1983

Gr.9

BUREAU OF CEYLON STANDARDS
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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
UNIT MASS OF BUILDING MATERIALS

FOREWORD

This Sri Lanka Standard was authorised for adoption and publication by the Council of the Bureau of Ceylon Standards on 1983-12-20, after the draft, finalised by the Drafting Committee on Unit Mass of Building Materials was approved by the Civil Engineering Divisional Committee.

This standard provides data on unit masses of building materials and components and is expected to guide the designers in carrying out structural calculations. Data is provided in SI units to facilitate designing and planning in metric units.

It is emphasized that the unit mass given for any component or material should not be taken as the exact value, but only as a fair average which could be considered as adequate for purposes of load calculations. Whenever a material exhibits appreciable variation in its unit mass, a range of values has been given.

Unit masses of individual building materials and building components are classified and given in alphabetical order.

The material incorporated in this standard is based on information received from manufacturing concerns, research organizations, publications of such institutions and similar publication of the Indian Standards Institution. The assistance received thereform is gratefully acknowledged.

1 SCOPE

This standard lays down unit mass of materials and parts or components used in building construction.

2 REFERENCES

This standard makes reference to the following Sri Lanka Standards:

SLS 2 Clay roofing tiles
SLS 147 Rigid unplasticized polyvinyl chloride pipes for potable cold water supplies.

3 BUILDING MATERIALS AND BUILDING COMPONENTS

3.1 The unit masses of materials and components used in building construction are given in the schedule.

SCHEDULE

UNIT MASS OF MATERIAL

1 AGGREGATES (COARSE)

1.1 Stones	**Unit mass (kg/m^3)**
Gneiss	2 400 to 2 700
Granite	2 650 to 2 800
Laterite	2 000 to 2 400
Limestone	2 400 to 2 650
Marble	2 600 to 2 800

1.2 Gravel	**Unit mass (kg/m^3)**
Loose	1 600
Moderately rammed and dry	1 900

2 ASBESTOS CEMENT PRODUCTS

2.1 Asbestos cement close fitting ridges	**Length (mm)**	**Breadth (mm)**	**Unit mass(kilogram per ridge)**
	1 092	267	5.56

2.2 Asbestos cement half round gutter	**Length (mm)**	**Diameter (mm)**	**Unit mass (kilogram per ridge**
	1 830	150	8.30
	1 830	225	12.35

2.3 Asbestos cement half round bend

Diameter (mm)	Angle	Unit mass (kilogram per bend)
100	$92\frac{1}{2}^{\circ}$	2.00
100	$112\frac{1}{2}^{\circ}$	1.86
100	135°	1.86
150	$92\frac{1}{2}^{\circ}$	3.93
150	$112\frac{1}{2}^{\circ}$	3.31
150	135°	3.41

2.4 Asbestos cement double branch pipe

Diameter (mm)	Unit mass (kilogram per pipe)
100	3.76
150	7.98

2.5 Asbestos cement rain-water pipe

Diameter (mm)	Length (mm)	Unit mass (kilogram per pipe)
100	1 830	11.00
150	1 830	16.40

2.6 Asbestos cement sheets

	Length (mm)	Breadth (mm)	Unit mass (kilogram per sheet)
2.6.1 *Large section corrugated*	3 050	1 090	46
	2 500	1 090	37
	2 000	1 090	28
2.6.2 *Small section corrugated*	3 050	760	28
	2 500	760	22
	2 000	760	17
2.6.3 *Semi corrugated*	3 050	1 115	43
	2 500	1 115	35
	2 000	1 115	26
2.6.4 *Plain*	1 220	1 220	13

2.6.5 *Asbestos cement rainwater cowls*

Diameter (mm)	Unit mass (kilogram per cowl)
100	5.0
150	6.0

2.6.6 *Asbestos cement rainwater shoe*

100	1.7
150	2.3

2.6.7 *Asbestos cement rainwater swan neck*

Diameter (mm)	Projection (mm)	Unit mass(kilogram per neck)
100	225	3.0
100	305	3.3
100	450	4.0
100	525	5.0

3 BRICKS

	Length (mm)	Breadth (mm)	Height (mm)	Unit mass (kg/m^3)
3.1 Common burnt clay bricks	220	105	65	1 425 to 1 705
3.2 Lotus flower grill bricks	228	228	114	430
3.3 Grill bricks with six vents	216	114	102	650
3.4 Perforated grill bricks	127	127	102	1 230
	254	120	63	1 080
3.5 Hollow grill bricks	178	178	114	445

4 CEMENT

	Unit mass (kg/m^3)
4.1 Portland cement	1 300 to 1 400
4.2 Masonry cement	1 100 to 1 200

5 CHIPBOARD

Thickness (mm)	Unit mass (kg/m^3)
6	800
10	740
12	690
16	670
20	650
25	620

6 CONCRETE

Unit mass (kg/m^3)
2 250 to 2 550

7 CONCRETE PIPES

(Refer also SLS 452)

7.1 Socket and spigot joints (Class NP1)

Diameter (mm)	Length (m)	Wall thickness (mm)	Unit mass (kilogram per pipe)
100	1.00	25	27
150	1.00	25	38
200	1.00	25	49
225	1.00	25	54
250	1.00	25	59
300	1.25	25	106
350	1.25	25	132
400	1.25	25	149
450	1.25	25	185

7.2 Tongue and groove joints (Class NP3)

350	2.5	75	605
400	2.5	75	675
450	2.5	75	745
500	2.5	75	815
600	2.5	80	1 030
700	2.5	80	1 180
800	2.5	90	1 505
900	2.5	100	1 885
1 000	2.5	100	2 075
1 100	2.5	115	2 640
1 200	2.5	115	2 855

7.3 Tongue and groove joints (Class NP2)

Diameter (mm)	Length (m)	Wall (mm) thickness	Unit mass (kilogram per pipe)
150	1.0	25	32
200	1.0	28	48
225	1.0	30	58
250	1.0	34	73
300	1.0	36	90
350	2.5	37	270
400	2.5	38	315
450	2.5	40	370
500	2.5	45	460
600	2.5	47	575
700	2.5	52	740
800	2.5	58	940
900	2.5	62	1 125
1 000	2.5	65	1 305
1 100	2.5	70	1 545
1 200	2.5	75	1 805
1 400	2.5	85	2 380
1 600	2.5	90	2 870
1 800	2.5	100	3 580

7.4 Collar joints (Class NP2)

Diameter (mm)	Length (m)	Wall (mm) thickness	Unit mass kilogram per pipe	Unit mass kilogram per collar
100	2.0	25	47	5.7
150	2.0	25	66	7.1
200	2.0	25	85	8.5
225	2.0	25	94	9.2
250	2.0	25	104	10.1
300	2.0	30	187	14.4
350	2.0	32	230	17.3
400	2.0	32	261	19.0
450	2.0	35	320	31.2
500	2.0	35	353	34.1
600	2.0	40	483	45.6
700	2.0	40	558	51.9
800	2.0	45	717	66.2
900	2.0	50	896	82.0
1 000	2.0	55	1 094	100.0
1 100	2.0	60	1 312	120.0
1 200	2.0	65	1 550	140.0
1 400	2.0	75	2 086	188.0
1 600	2.0	80	2 534	226.0
1 800	2.0	90	3 209	286.0
2 000	2.5	100	5 955	352.0
2 200	2.5	110	4 787	426.0

8 EARTHENWARE PIPE	Diameter (mm)	Length (m)	Unit mass (kg)
	102	0.60	8 to 8.5

9 LIMES (SLAKED)	Unit mass (kg/m^3)
	620

10 **PIPES**
(see Clauses 7 and 8)

11 PLYWOOD DOOR SASH	Length (m)	Breadth (m)	Thickness (mm)	Unit mass (kg)
	2.06	0.69	30	13.5
	2.06	0.84	30	14.5
	2.06	1.07	30	20.5

12 PLYWOOD SHEET	Unit mass (kg/m^3)
	650

13 PVC WATER PIPES *(see also SLS 147)*	Diameter (mm)	Unit mass (kg/m)
13.1 Smaller pipes	10	0.13
	13	0.16
	16	0.25
	20	0.30
	25	0.43
	30	0.52
	40	0.77
	50	1.10
	65	1.59
	75	2.12

13.2 Larger diameter pipes

Diameter (mm)	Type*	Unit mass (kg/m)
110	400	1.39
110	600	1.96
110	1 000	3.12
160	400	2.88
160	600	4.15
160	1 000	6.47
225	400	5.60
225	600	8.10
225	1 000	12.80
280	400	8.59
280	600	12.45
280	1 000	19.73
315	400	10.81
315	600	15.89
315	1 000	25.07

14 PVC ELECTRICAL CONDUIT PIPES

Diameter (mm)	Unit mass (kg/m)
18	0.083
20	0.11
25	0.16
30	0.33
40	0.43
50	0.50

15 PVC GUTTERS

Diameter (mm)	Unit mass (kg/m)
90	0.48
150	0.49

16 SOILS

	Unit mass (kg/m^3)
16.1 Sand (River)	
Dry clean	1 500 to 1 600
Wet	1 750 to 2 000

The figures given under type refer to maximum working pressure in megapascals.

		Unit mass (kg/m^3)
16.2	**Silt**	
	Wet	1 750 to 1 900
	Clay fills :	
	Dry lumps	1 050
	Dry compact	1 450
	Damp compact	1 750
	Wet compact	2 000
16.3	**Peat**	
	Dry	560 to 640
	Sandy compact	800
	Wet compact	1 350
16.4	**Earth**	
	Dry	1 400 to 1 800
	Moist	1 600 to 2 000
16.5	**Aluvial**	1 600

17 STEEL PRODUCTS

17.1 **Mild steel flats**	Width (mm)	Thickness (mm)	Unit mass(kg/m)
	12	6	0.6
	16	6	0.8
	20	6	0.9
	25	6	1.2
	30	6	1.5
	40	6	1.9
	45	10	3.5
	45	16	5.6
	50	6	2.4
	50	10	3.9
	50	12	4.7
	63	10	4.9
	63	12	5.9
	75	10	5.9
	75	12	7.1
	80	16	10.0
	100	6	4.7
	100	10	7.9
	100	16	12.6
	125	10	9.8
	125	25	24.5

17.2 Hot rolled mild steel round bar for concrete reinforcements

Diameter (mm)	Unit mass (kg/m)
6.3	0.25
8.0	0.40
10.0	0.62
12.0	0.89
16.0	1.58
20.0	2.47
22.0	2.99
25.0	3.85
28.0	4.84
32.0	6.31
40.0	9.86

17.3 Hot rolled equal leg angles

Sectional dimensions (mm) x (mm)	Thickness (mm)	Unit mass (kg/m)
25 x 25	3	1.10
30 x 30	3	1.40
40 x 40	5	3.00
50 x 50	6	4.50
50 x 50	7	5.20
65 x 65	6	5.90
65 x 65	7	6.80
75 x 75	7	7.90
75 x 75	10	11.10

17.4 Hot rolled unequal leg angles

65 x 50	6	5.20
65 x 50	7	6.00
75 x 50	7	6.50
75 x 50	8	7.40
75 x 50	10	9.10

18 TILES

18.1 Roofing tiles	Length (mm)	Breadth (mm)	Thickness (mm)	Unit mass (kg/100)
Flat tiles *(see also SLS 2)*	410	245	25	265
Ridge tiles	405	330	25	320
Ridge tiles	480	250	25	320
Half round tiles (top)	405	140	63	185
Half round tiles (bottom)	405	140	63	165
Half tiles	405	120	35	140
Tiles with glues	405	246	35	250
Tiles laid over corrugated asbestos sheets	324	132	8	88

18.2 Pressed tiles	Length (mm)	Breadth (mm)	Thickness (mm)	Unit mass (kg/100)
Cement pressed tiles	203	203	19	12
Terrazo pressed tiles	254	254	19	285
	305	305	19	440
Clay pressed tiles	152	152		24

18.3 Wall tiles	Length (mm)	Breadth (mm)	Unit mass (kg/100)
Ceramic wall tiles	114	114	11
	152	152	24

19 TIMBER

NOTE - The unit masses given are based on an average moisture content of 12 per cent.

Common name	Botanical name	Unit mass (kg/m^3)
Alubo	*Syzygium makul*	785
Amba	*Mangifera indica*	560 to 640
Etamba	*Mangifera zeylanica*	
Andunwenna	*Ilex zeylanicum*	560
Aridda	*Campnosperma zeylanica*	480
Atuketiya	*Xylopia parvifolia*	560 to 640
Bakmee	*Nauclea orientalis*	560
Batadomba	*Syzygium operculatum*	720 to 960
Beraliya	*Hopea jucunda*	880 to 1 120
Kana beraliya		
Maha beraliya		
Pini beraliya		
Rath beraliya		
Blackwood	*Acacia melanoxylon*	720
Bombi	*Listsea glutimosa*	480 to 560
Buruta (Satinwood)	*Chloroxylon swietenia*	960
Calamander (Kahime-deriya)	*Disopyros quaesita*	1 120
Dambu	*Syzygium gardneri*	960
Daminiya	*Grewia tilifolia*	800
Dawata	*Carallia brachiata*	720
Dawu	*Ageissue latifolia*	880
Dawulkurundu	*Neolitsea cassia*	720
Del:		
Bedi del (wal del)	*Artocarpus nobilis*	560 to 640
Rata del	*Artocarpus incisa*	560 to 640
Dickwenna	*Pityranthe verrucosa*	800
Diyapara	*Wormia friquetra*	720
Diyataliya	*Mastixia tetrandra*	480
Domba	*Calophyllum inophyllum*	560 to 720
Dorana	*Diperocarpus glandulosus*	800 to 880

Common name	Botanical name	Unit mass (kg/m^3)
Dun		
Yakahalu, Yakahalu dun	*Doona congestiflora*	880 to 1 120
Dunumandala	*Sterospermum personatum*	640
Durulla	*Hopea discolor*	720 to 1 120
Iri durulla	*Hopea discolor*	720 to 1 120
Ebony (Kaluwara)	*Diospyros ebenum*	1 120
Eta-demata	*Gmeli arborea*	480
Gammalu	*Pterocarpus marsupium*	800
Godakirilla	*Holaptelea integrifolia*	640
Godapara	*Dillenia retusa*	800
Gulumora	*Pometia eximia*	720
Hal	*Vateria copallifera*	480
Halmilla (Trincomalee wood)	*Berrya cordifolia*	800
Hampalanda	*Terminalia parviflora*	720
Hedawaka	*Chaetocarpus coxiaceus*	880
Bu-Hedawaka	*Chaetocarpus pubescens*	880
Helamba	*Mitragyna parvifolia*	640
Hik	*Lannea coromandelica*	720
Hora	*Dipterocarpus zeylanicus*	800 to 880
Bu-Hora	*Dipterocarpus hispidus*	800 to 880
Hulanhik	*Chukrasia tubularis*	800
Kahata (Patama oak)	*Careya arborea*	720
Kalumediriya	*Diospyros quaesita*	1 120
Kaluwara	*Diospyros ebenum*	1 120
Kanagonna	*Artocarpus lakoocha*	560 to 640
Karaw	*Phyllanthus indicus*	720
Katuboda	*Cullenia ceylanica*	560 to 640
Katuimbul	*Salmalia malabarica*	400
Keeriya	*Acacia leucophoea*	720
Kekuna	*Canarium zeylanicum*	480
Ketakela	*Bridelia moonii*	720
Kina	*Calophyllum walkeri*	
Walukina	*Calophyllum bractatum*	560 to 720
Gurukina	*Calophyllum calaba*	

Common name	Botanical Name	Unit mass (kg/m^3)
Kirihembiliya	*Palaquium grande*	560 to 720
Kirikon	*Agaia roxburghiana*	960
Kiripedda	*Palaquium grande*	560 to 720
Kohomba	*Azadirachta indica*	720
Kolon	*Adina cordifolia*	720
Kon	*Schleichera oleosa*	960
Kos	*Artocarpus heterophyllus*	560 to 640
Kududawalu	*Neolitsea cassia*	720
Kumbuk	*Terminalia arjuna*	720 to 800
Liyan	*Homalium zeylanicum*	705
Lunumadala	*Stereospermium personatum*	640
Lunumidella	*Melia dubia*	400
Madan	*Syzygium cumini*	720
Mahogany	*Swietenia macrophylla*	560
Malaboda	*Myristica dactyloides*	480
Mara	*Albizzia lebbek*	640
Suriyamara, Hurimara	*Albizzia odoratissima*	880
Hulanmara, Kabalmara	*Albizzia chinensis*	560
Mee	*Madhuca longifolia*	960
Wana mee	*Madhuca fulva*	960
Mendora	*Vatica chinensis*	640 to 1 120
Mihiriya	*Gordonia ceylanica*	800
Milla	*Vitex pinnata*	880 to 960
Moonamal	*Mimusops elengi*	960 to 1 040
Mora	*Euphoria longana*	960
Muruta	*Lagerstroemia speciosa*	640
Na	*Mesua ferrea*	1 120
Nedun	*Pericopsis mooniana*	800
Neralu	*Elaeodendron glaucum*	720
Netaw	*Xylopia parvifolia*	560 to 640
Palu	*Manilkara hexandra*	1 120

Common name	Botanical name	Unit mass (kg/m^3)
Panakka	*Pleurostylia opposita*	800
Patkela	*Bridelia retusa*	720
Pelen	*Kurrimia ceylanica*	720
Pihimbiya	*Filicium decipiens*	960
Rukattana	*Alstonia scholaris*	400
Sapu		
Gini sapu	*Michaelia champaca*	560
Wal sapu	*Michaelia nilagirica*	640
Silky oak	*Grevillea robusta*	560
Talan	*Litsea gardneri*	480 to 560
Tawenna	*Palaquium rubiginosum*	720
Tekka (Teak)	*Tectona grandis*	720
Timbiri	*Diospyros embryopteris*	720
Eta-timbiri	*Diospyros oocarpa*	720
Tiniya	*Doona ongestifloria*	480
Toona	*Cedrella spp.*	560
Ubberiya	*Carallia calycina*	880
Ululu	*Machilus macarantha*	560
Uruhonda (Urukanu)	*Urandra apicalis*	560 to 640
Weera	*Drypetes sepiaria*	960
Welang	*Pterospermum canasens*	640
Welipenna	*Anisophyllea cinnamomoides*	800
Wewarana	*Alseodaphne semecarpifolia*	800

BUREAU OF CEYLON STANDARDS

The Bureau of Ceylon Standards (BCS) is the national standards organization of Sri Lanka and was established by the Hon. Minister of Industries & Fisheries, as provided for by the Bureau of Ceylon Standards Act. No. 38 of 1964.

The principal object of the Bureau as set out in the Act are to promote standards in industry and commerce, prepare national Standards Specifications and Codes of Practice and operate a Standardization Marks Scheme and provide testing facilities, as the need arises.

The Bureau is financed by Government grants and the sale of its publications. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The detailed preparation of Standard Specifications is done by Drafting Committees composed of experts in each particular field assisted by permanent officers of the Bureau. These Committees are appointed by the Divisional Committees, which are appointed by the Council. All members of the Drafting and Divisional Committees render their services in an honorary capacity. In preparing the Standard Specifications, the Bureau endeavours to ensure adequate representation of all view points.

In the international field the Bureau represents Sri Lanka in the International Organization for Standardization (ISO) and will participate in such fields of Standardization as are of special interest to Sri Lanka.

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