## Building Material Weights <u>AISC Manual of Load and Resistance Factor Design</u>, 3<sup>rd</sup> ed.

ORES Simmered Sign Sign Sign Sign Sign Sign Sign Sign	Substance	Weight Ib per cu ft	Specific	Substance	Weight Ib per cu ft	Specific Gravity
3.54         84-87         Seasoned minber 15 to 20%           3.55         8.48-90         Green timber 15 to 20%           4.55         8.48-90         Green timber 15 to 20%           4.56         8.8-90         Codar, white, red           2.22         19.26-19.3         Cypress           4.50         7.7         Privace           4.50         7.7.3         Fri, Douglas spruce           4.50         7.7.3         Fri, Louglas spruce           4.50         7.7.3         Fri, Louglas spruce           7.7.4         4.7.4         Fri, Louglas spruce           7.7.5         Fri, Louglas spruce           7.7.7         Fri, Louglas spruce           8.5.7.7         Fri, Coult           9.7.7         Fri, Coult           1.0.7         Goal           1.0.7         Goal           1.0.7         Goal           1.0.8         Fri, Coult           1.0.9         Fri, Coult           1.0.0         Fri, Coult <td>METALS, ALLOYS, ORES Aluminum, cast, hammered</td> <td>165</td> <td>2.55-2.75</td> <td>TIMBER, U.S. SEASONED Moisture content by weight:</td> <td></td> <td></td>	METALS, ALLOYS, ORES Aluminum, cast, hammered	165	2.55-2.75	TIMBER, U.S. SEASONED Moisture content by weight:		
1205   7.7-53   Cedar, while, red	Brass, cast, rolled	534	8.4–8.7	Seasoned timber 15 to 20%		
Secondary Marker   Secondary   Secondar	Bronze, 7.9 to 14% Sri	481	7.7	Ash, white, red	40	0.62-0.65
1208	Copper, cast, rolled	929	8.8-9.0	Cedar, white, red	2 ;	0.32038
456   7.2   Fir, Douglas spruce   488   7.5   7.7   7.7   488   7.5   7.7   488   7.5   7.7   488   7.5   7.7   488   7.5   7.7   488   7.5   7.7   489   7.5   7.7   489   7.5   7.7	Copper ore, pyrites	262	19.25-19.3	Ovpress	<del>,</del> 8	0.48
486	Iron, cast, pig	450	7.2	Fir, Douglas spruce	32	0.51
498 6.7-3 Hemiotors 160-180	Iron, wrought	485	7.6–7.9	Fir, eastern	52	0.40
1.25   1.25	Iron, speigel-eisen	468	7.5	Elm, white	24 g	0.72
100-180   100-	Iron ore, hematite	325	5.2	Hickory	49	0.74-0.84
172   25-30   Maple, while   172   25-30   Maple, while   172   25-30   Oak, ine unit   172   25-30   Oak, ine unit   172   25-30   Oak, ine unit   172   174-183   Maple, while   174-183   174-183   Maple, while   174-183   174-183   Maple, while   174-183   174-183   Maple, while   174-184	pank .	160-180	ı	Locust	46	0.73
172	:	30-160	0 7 9 8	Maple, hard	£ 8.	0.68
172   2.5-3.0   Oak, live   Oak, live   465   7.3-7.6   Oak, live   Diack   465   7.3-7.6   Oak, white   147-183   Pine, Organ   172   172-18   Oak, white   Oak, oak, oak, oak, oak, oak, oak, oak, o	Iron ore, ilmonite	315	4.9-5.2	Oak chestnut	54 8	0.86
70 1137 Oak red black 73-76 Oak red black 73-76 Oak with 7174-183 Pine, 19d Oregon 7124-183 Pine, 19d Oregon 71256 89-92 Pine, 19d Oregon 721-215 Pine, 19d Oregon 722 7-75 Walnut, white black 724 69-72 7253 3.9-4.2 747 70 Oregon 725	Iron slag	172	2.5-3.0	Oak, live	59	0.95
## 465 7.3—7.6 Oak, white operating the control of	Lead	710	11.37	Oak, red, black	41	0.65
12   1.72 + 1.03   Pine, red   1.05   1.72 + 1.05   Pine, red   1.05   1.72 + 1.05   Pine, red   1.05   1.72 + 1.05   Pine, red   1.05   1.05   Pine, red   1.05	Lead ore, galena	465	7.3–7.6	Oak, white	46	0.74
136   Pine, withe   259   3.7-4.6   Pine, withe   256   29-9.2   Pine, withe   256   29-9.2   Pine, withe   256   29-9.2   Pine, withe   256   29-9.2   Pine, yellow, long-leaf   256   29-9.2   Pine, yellow, short-leaf   256   29-9.2   Popiar   Pine, withe California   250   21.1-21.5   Popiar   Pine, withe California   250   21.1-21.5   Popiar   Pine, withe California   250   27.2   Popiar   Pine, withe California   250	Magnesium, alloys	475	7.2–8.0	Pine, Oregon	3 08	0.3
13.6   13.6	Manganese ore, pyrolusite	259	3.7-4.6	Pine, white	26	0.41
556 8.8-9.0   Pine, yellow, short-leaf     1330 21.1-21.5   Poplar     1350 21.1-21.5   Poplar     1350 21.1-21.5   Poplar     1350 21.1-21.5   Poplar     1350 21.1-21.5   Poplar     1450 6.4-7.5   Wahrut, white Back     1418 6.4-7.0   Adold, Infric 91%     1418 6.9-7.2   Adold, Infric 91%     140 2.9-3.0   Adolds, mulmed 07%     141 3.2	Mercury	849	13.6	Pine, yellow, long-leaf	44	0.70
1965   8 49.2   Popplar	Monel Metal	556	8.8-9.0	Pine, yellow, short-leaf	88	0.61
### 10-20	Nickel	265	8.9-9.2	Poplar	30	0.48
red 499 7.85 Walnut, black   499 7.2-75 Walnut, write   440 6.9-72   253 3.9-42    AARIOUS LIQUIDS   A	Silver cast hammered .	930	10.4-10.6	Spring white black	27	0.40-0.46
red 459 7.2–7.5 Walnut, white 6.9–7.2 253 3.9–4.2 Aninous Liouinos Acides, suphuric 87% Acide	Steel, rolled	490	7.85	Walnut, black	38	0.61
440 69-72 253 3.9-4.2 253 3.9-4.2 AARIOUS LIQUIDS Alcohol, 100% Adds, muritar 91% Adds, aughuru 87% Adds, muritar 91% Adds, aughuru 87% Adds, muritar 91% Adds, aughuru 87% Adds, aughuru 87% Adds, muritar 91% Adds, aughuru 87% Ad	Tin, cast, hammered	459	7.2–7.5	Walnut, white	56	0.41
Available   Avai	Tin ore, cassiterite	418	6.4-7.0			
Avarious Liouins Avarious Liouins Adods, nitro 91% Adds, nitro	Zinc, cast, rolled	253	3.9-4.2			-
Additional Columbia						
Addonon, 10076  bulk 32	50			VARIOUS LIQUIDS	ç	1
Addis, authoricans   Addit, authoricans   Addis, authoricans   Addis, authoricans   Addit,				Alcohol, 100%	94 7	1.20
Acids, sulphruric 87%  bulk 39 - Olys, soda 68%  bulk 48 - Olys, soda 68%  bulk 48 - Olys, soda 68%  147 -1.50 Water, for mx. density.  28 0.90-0.97 Water, iov. C  156 2.40-2.60 Water, sea water  151 2.40-2.00 Water, sea water  152 2.40-2.60 Water, sea water  153 2.40-2.60 GASES  99 0.70-1.15 Ammonia  10-2.0 Garbon monoxide  10-2.0 Garbon monoxide  11.0-2.0 Garbon monoxide  12.5 1.93-2.07 Nitrogen  12.5 1.32 Oxygen				Acids, nitric 91%	96	1.50
bulk 32 - 1/e, soda 66%   1/e, bulk 48 - 0lis, mineral, lubricants   20   147-1.50   147	ARIOUS SOLIDS			Acids, sulphuric 87%	112	1.80
Ly corn, type bulk 39 – Olis vegetable bulk 48 – Olis ruived bulk 48 – Olis mineat bulk 48 – Olis mineat bulk 48 – Olis mineat bulk 49 – Olis mineat bulk 49 – Olis mineat bulk 49 – Olis mineat bulk 40 – Olis mineat of Gas, natural 42 – Olis mineat of Gas, matural 49 – Olis mineating 67 – Oxygen – Oxyge		32	. 1	Lye, soda 66%	106	1.70
. conn.rye bulk 48 - Olis, mineral bulk 49 - Olis, mineral bulk 41 - Olis Olis Mater, foo axis water for one of the common foods 47 - Olis Olis Olis Mater, sea water for one one of the common foods 47 - Olis Olis Olis Olis Olis Olis Olis Olis	-	39	ı	Oils, vegetable	28	0.91-0.94
American	:	80 0	ı	Water 40 may describe	57	0.90-0.93
147-1.50   Water, Ice   Water, Ice   147-1.50   Water, Ice   Water, Ice   Water, Ice   Water, Ice   Ice   147-1.50   Water, Ice   Water, Ice   Ice   147-1.50   Water, Ice	:	6 C		Water 100°C	59 830	0.9584
58         0.90–0.97         Water snow, fresh fallen           ressed         47         0.40–0.50         Water, sea water           ressed         47         0.70–0.80         Water, sea water           potential         161         2.40–2.60         Actions           plate or crown         161         2.45–2.72         Actions           rystal         59         0.86–1.02         GASES           splied         42         0.70–1.15         Air, 0°C 780 mm           s. pilled         42         0.70–1.15         Ammonia           caousthouc         59         0.92–0.96         Carbon doxide           goods         1.0–2.0         Gas, inturnating         Gas, inturnating           ef         -         67         -         Gas, matural           ef         1.53         Hydrogen         -           r         125         1.32         Oxygen		93	1.47-1.50	Water, ice	56	0.88-0.92
28         0.40–0.50         Water, sea water           pressed         47         0.70–0.80         Water, sea water           common         156         2.40–2.80         2.40–2.72         2.40–2.72         2.40–2.00 <t< td=""><td>Fats</td><td>28</td><td>0.90-0.97</td><td>Water, snow, fresh fallen</td><td>8</td><td>.125</td></t<>	Fats	28	0.90-0.97	Water, snow, fresh fallen	8	.125
150   240-260   156   246-272   156   246-272   156   246-272   156   246-272   156   156   246-272   157	Flour, loose	58	0.40-0.50	Water, sea water	64	1.02-1.03
plate or crown 161 2.45-2.72 CASES 59 0.86-1.02 Air, 0°C 780 mm 2.90-380 CASES 58 0.70-1.15 Air, 0°C 780 mm 2.20-380 CASES 58 0.70-1.15 Air, 0°C 780 mm 2.20 CASES 59 0.70-1.15 Air, 0°C 780 mm 2.20 Air, 0°C	Glass common	156	2.40-2.60			2
roystal 184 2.90–3.00  rowstal 59 0.86–1.02  sa, piled 42  Ar, O-C 780 mm  Ammonia	Glass, plate or crown	161	2.45-2.72			
r         59         0.86–1.02 (ASES         ASES           ss. piled         42         0.70–1.15 (Ammonia (ASES)         Ammonia (ASES)           t. caouchrouc         59         0.92–0.96 (Carbon monoxide (ASES)         Ammonia (ASES)           goods         1.0–2.0 (Carbon monoxide (ASES)         Carbon monoxide (ASES)         Ammonia (ASES)           remainated, piled         48         -         Gas, illuminating (ASES)         Ammonia (ASES)           remainated, piled         67         -         Gas, matural (ASES)         Ammonia (ASES)           remainated, piled         67         -         1.53         Hydrogen           r         125         1.32         Oxygen	Glass, crystal	184	2.90-3.00			-
8s 0.70-1.19 Aft 0-7 for mm  1,0-2.10 Carbon dioxide 1,0-2.0 Carbon monoxide 1,0-2.0 Carbon dioxide 1,0-3.0 Carbon dioxide 1,0-3.	Leather	29	0.86-1.02	GASES		,
# 1.00	Paper	28	0.70-1.15	Air, U.C. 760 mm	0807	0.10
rr goods 94 1.0–2.0 Carbon monoxide   1.0–2.0 Carbon monoxide   1.0–2.0 Carbon monoxide   1.0	Rubber caoutchouc	2 4 5	0.92-0.96	Carbon dioxide	.1234	1.5291
ranulated, piled 48 – Gas, illuminating 67 – Gas, ratural 67 – Gas, ratural 67 – 68, ratural 68 – 1.53 Hydrogen 7125 1.93–2.07 Nitrogen 78 – 1.32 Oxygen 79 – 1.32	Rubber goods	94	1.0-2.0	Carbon monoxide	.0781	0.9673
ler 67 – Gas. natural	Salt, granulated, piled	48	1		.028036	0.35-0.45
1.53 Hydrogen 125 1.93–2.07 Nitrogen 82 1.32 Oxygen	Saltpeter	67	1	Gas, natural	.038039	0.47-0.48
125 1.93–2.07 Nitrogen	Starch	96	1.53	Hydrogen	.00559	0.0693
20 Zeil	Sulphur	125	1.93–2.07	Nitrogen	.0784	0.9714
	Wool	70	1.32	Oxygen	7690.	1.1030

weights per cubic foot are derived from average specific gravities, except where stated that weights are for bulk, heaped, Or	erial, etc.	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
 weights per cubic foot	loose material, etc.	

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

Substance	Weight Ib per cu ft	Specific Gravity	Substance	Weight Ib per	Specific
ASHLAR, MASONRY			MINERALS		diavity
Granite, syenite, gneiss	165	2.3-3.0	Asbestos	153	2.1-20
Candatono binostono	000	2.3-2.8	barytes	281	4.50
	2	1.7-1.7	Dasall	184	2.7-3.2
MORTAR RUBRI F			:	60	2.55
MASONRY			Chalk	103	1.7-1.8
Granite, svenite, queiss	155	2.2-2.8	Clay marl	137	1.8-2.6
Limestone, marble	150	22-26	Dolomite	2 2	1.8-2.6
Sandstone, bluestone	130	2.0-2.2	Feldspar orthoclase	0 25	2.9
			Gneiss, serpentine	159	25-26
DRY RUBBLE MASONRY			Granite, syenite	175	25.20
Granite, syenite, gneiss	130	1.9-2.3	Greenstone, trap	187	200
Limestone, marble	125	1.9-2.1	Gypsum, alabaster	159	25.00
Sandstone, bluestone	110	1.8-1.9	Hornblende	187	30.0
			Limestone, marble	165	2.5-28
BRICK MASONRY			Magnesite	187	3.0
Pressed brick	140	2.2-2.3	Phosphate rock, apatite	200	3.2
Common brick	120	1.8-2.0	Porphyry	172	2.6-2.9
Soft brick	100	1.5-1.7	Pumice, natural	40	0.37-0.90
			Quartz, flint	165	2.5-2.8
CONCRETE MASONRY			Sandstone, bluestone	147	2.2-2.5
Cement, stone, sand	144	2.2-2.4	Shale, slate	175	2.7-2.9
Cement, slag, etc.	130	1.9-2.3	Soapstone, talc	169	2.6-2.8
Cement, cinder, etc.	100	1.5-1.7			
VARIOUS BUILDING					1 1
MATERIALS			STONE, QUARRIED, PILED		
Ashes, cinders	40-45	1	Basalt, granite, gneiss	96	1
Cement, portland, loose .	06	ı	Limestone, marble, quartz	92	1
Cement, portland, set	183	2.7-3.2	Sandstone	82	1
Lime, avpsum, loose	53-64			85	ı
Mortar, set	103	1.4-1.9	Greenstone, hornblende	107	. 1
Slags, bank slag	67-72				
Slags, bank screenings	98-117	1			
Slags, machine slag	96	1			
Slads, slad sand	49-55	ı	BITUMINOUS SUBSTANCES		
0	3		Asphaltum	50	11-15
EARTH, ETC., EXCAVATED			Coal, anthracite	26	1.4-1.7
Clay, dry	63	1	Coal. bituminous	84	1.2-1.5
lastic	110	1	Coal lignite	78	1.1-1.4
Clay and gravel, dry	100	,	Coal peat turf dry	47	0.65-0.85
Farth dry loose	76	ı	Coal charcoal nine	. 60	0.28-0.44
Farth dry packed	8		Coal charcoal cak	3 6	0.47-0.57
Earth moiet loces	9 0		Coal, criaticoal, can	3 1	10-14
Earlin, moist, nodes	0 9		Coal, coke	0.5	0.0
Earth mid flowing	90		Oraplite	2 0	200 200
Forth mild packed	2 4		Detroloum	8 1	0.0
Earlin, mou, packed	500	ı	Lettoleum	ŧ.	0.07
hiprap, ilmestone	80-83	1	Petroleum, refined	25	0.79-0.02
Hiprap, sandstone	26	1	Petroleum, benzine	46	0.73-0.73
nipiap, stiale	50.00	1	Petroleum, gasoline	24.5	0.00-0.03
Sand, gravel, dry, loose	501-06	ı	Pitch	69	1.07
Sand, gravel, dry, packed	100-120	1	lar, bituminous	75	02.1
Sand, gravel, wet	118-120	ı			
EXCAVATIONS IN WATER					
Sand or gravel	9		COAL AND COKE BILED		
	92		Coal authracite	47_58	1
Clav	80	1	Coal bituminous liquite	40-54	1
Bivor mid	8 8		Coal, broat trit	900	١
Soil	9 6	ı	Coal peat, tull	20-20	,
Otopo vipros	2 2		Coal criaticoal	1 6	1
Storie libidi	6		Coal coke	23-32	

Table 17-14. Weights and Measures United States System	LINEAR MEASURE   LINEAR MEASURE   Feet   Yards   Rods   Furlongs   Milles	SQUARE AND LAND MEASURE       Square Feet     Square Yards     Square Fods     Acres     Sq. Miles       0.08944 = 0.00772     .000772     .000207       1.0 = 1.0 =     .000207     .000207       272.25 = 30.25 = 1.0 = .00625 = .0000098     .00625 =       43.560.0 = 4,840.0 = 102,400.0 = 640.0 = 1.0	AVOIRDUPOIS WEIGHTS  Grains Drams Ounces Pounds Tons  1.0 = 0.09657 = .000286 = .000143 = .000000714  27.34375 = 1.0 = .0625 = .003906 = .0000195  437.5 = 16.0 = 1.0 = .0625 = .000306  7.000.0 = 2.560 = 1.0 = .005  14.000.000.0 = 512.000.0 = 32.000.0 = 1.0	DRY MEASURE           Pints         Quarts         Pecks         Feet         Bushels           1.0         = .5         = .0853         2.0         2.2         4.0         2.2         4.445         2.1         0         2.2         4.0         2.2         4.445         2.1         0         2.2         4.0         2.2         4.445         2.1         0         2.2         4.0         2.2         4.445         2.1         0         2.2         4.0         2.2         4.0         2.2         4.0         2.2         4.0         2.2         4.0	LIQUID MEASURE  U.S. Cubic  U.S. Cubic  1.0 - 25 = .125 = .03125 = .00418  4.0 = 1.0 = .59 = .125 = .01671  8.0 = 2.0 = 1.0 = .590 = .03372  32.0 = 8.0 = 4.0 = 1.0 = .1337  7.48052 = 1.0
--	---	---	--	--	--

Motoriolo	Weight		Weight
Materials	lb ber sq ft	Materials	lb per sq ft
CEILINGS		PARTITIONS	
Channel suspended system	-	Clay tile	
Lathing and plastering	See Partitions	3 in.	17
Acoustical fiber tile	-	4 in.	18
		6 in.	58
		8 in.	34
		10 in.	40
FLOORS		Gypsum block	
Steel deck	See Manufacturer	2 in.	91/2
		3 in.	101/2
Concrete-Reinforced 1 in.		4 in.	121/2
Stone	121/2	5 in.	2 41
Slag	111/2	6 in.	181/5
Lightweight	6 to 10	Wood studs 2×4	7
		12-16 in. o.c.	2
Concrete-Plain 1 in.		Steel partitions	4
Stone	12	Plaster 1 in.	
Slag	F	Cement	10
Lightweight	3 to 9	Gypsum	· s
		Lathing	
Fills 1 inch		Metal	1/2
Gypsum	9	Gypsum board 1/2 in.	. 2
Sand	80		
Cinders	4		
Torroga	ç		
Committee Committee St. in	2 9		
Lingland 1 in	2 *	WALLS	
Months 3, in	- 0	Blick	
Mastic 74-III.	n =	. i	40
Softwood 3/ Jin	1 2	o ii.	98 5
Soliwood 9/4-III.	2/,5	. IZ II.	120
		House aggregate)	
BOOFS		7 in	Ş
Copper or tin	-	<u>.</u> .9	8 8
Corrioaled steel	See Manufactuer		2 12
3-ply ready roofing	1	121/- in	8 8
2 plught and ground		12./2 III.	8
Spy left and graver	2/5	Hollow concrete block	
opi en and graver	•	(Light aggregate)	č
Society		i .	- 2
Mood	0	<u>.</u>	8 8
Aschall	. «		8 12
Clay tile	9 to 14	Clavitile (Load bearing)	3
Slate 1/4 in.	10	4 in	52
•	•		30
Sheathing		<u>c</u>	33
Wood 3/4 in.	e	12 in.	45
Gypsum 1 in.	4	Stone 4 in.	25
		Glass block 4 in.	18
Insulation 1 in.		Window, Glass, Frame, & Sash	89
Loose	1/2	Curtain walls	See Manufacturer
	c	Objectively of any 4 ip	45
Poured	7	Structural glass 1 in.	2

AMERICAN INSTITUTE OF STEEL CONSTRUCTION