

Measurement Standards for Solid Waste and Recovered Materials¹ Volume-to-Weight Conversion Factors

<u>Material</u>	<u>Volume/Count</u>	<u>Weight in Pounds²</u>	<u>Source</u>
Mixed rigid plastic, no film or dairy, whole, loose	one cubic yard	49	NRC
Commingled (cans, glass & plastic)	one cubic yard	180	Mass ³
Commingled (cans & glass)	one cubic yard	270	Mass
Commingled residential recyclables without glass (cans, plastic & paper)	one cubic yard	260	Richland ⁴
Commingled campus recyclables (food/bev. containers, paper, cardboard)	one cubic yard	139	Recyclemania
Commingled commercial recyclables (food/bev. containers, glass, paper, cardboard)	one cubic yard	88	CCG-1 ⁵
Commingled multifamily recyclables (food/bev. containers, glass, paper, cardboard)	one cubic yard	96	CCG-1
Commingled single family recyclables (food/bev. containers, glass, paper, cardboard)	one cubic yard	126	CCG-1
Commingled commercial recyclables without glass (food/bev. containers, paper, cardboard)	one cubic yard	155	Pierce ⁶
Food waste	one cubic yard	800	EPA NRMRL ⁷
Food waste, solid and liquid fats	55 gallon drum	412	NRC ⁸
Biosolids	one cubic yard	1,682	Ecology ⁹
Crop residue (straw)	one cubic yard	227	NRAES ¹⁰
Yard debris, mixed (uncompacted)	one cubic yard	250	Oregon DEQ ¹¹
Yard debris, mixed (compacted)	one cubic yard	640	Oregon DEQ
Yard trimmings, grass	one cubic yard	350	EPA NRMRL
Yard debris ¹²	one cubic yard	416	NRAES
Trimmings & Prunings	one cubic yard	127	CIWMB ¹³
Sawdust (dry)	one cubic yard	275	Oregon DEQ
Sawdust (wet)	one cubic yard	530	Oregon DEQ

¹ This table is for general guidance only. Not for contract payment. Includes solid wastes and materials collected for recycling, disposal, composting, and other beneficial uses.

² For reporting in tons, use short tons (1 short ton = 2,000 pounds).

³ California Integrated Waste Management Board, CalRecovery report (w/Tellus), 1991.

⁴ City of Richland, Washington, recycling audits, 2009.

⁵ Developed by Cascadia Consulting Group for King County, Washington, 2013.

⁶ Pierce County, Washington, recycling audits.

⁷ Environmental Protection Agency National Risk Laboratory (EPA NRML).

⁸ National Recycling Coalition.

⁹ Washington Department of Ecology (Ecology), industry surveys.

¹⁰ On-Farm Manual Composting Handbook (NRAES-54), 1992, NRAES Cooperative Extension.

¹¹ Oregon Dept. of Environmental Quality. 2007 Oregon Material Recovery & Waste Generation Rates Report, 2008.

¹² Average of grass (loose and compact), leaves (loose/dry and compact/moist) and shrub trimmings.

¹³ California Integrated Waste Management Board. Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste, 2006.

<u>Material</u>	<u>Volume/Count</u>	<u>Weight in Pounds²</u>	<u>Source</u>
Sawdust (very wet)	one cubic yard	900	WSU Puy. ¹⁴
Shrub trimmings	one cubic yard	429	NRAES
Stumps & Logs	one cubic yard	1080	CCG-2 ¹⁵
Tree trimmings (landclearing)	one cubic yard	1,296	NRAES
Grass clippings	one cubic yard	400-1,500	NRC
Wood chips (green)	one cubic yard	473	Oregon DEQ
Wood chips (dry)	one cubic yard	243	Oregon DEQ
Manure	one cubic yard	1628	FEECO ¹⁶
Manure, cow	one cubic yard	1,458	NRAES
Manure, horse	one cubic yard	1,379	NRAES
Pallets and crates	one cubic yard	169	CIWMB
Scrap Wood	one cubic yard	300	USGBC ¹⁷
Rubble	one cubic yard	1,400	USGBC
Mattress (foam rubber)	one	55	CURC
Mattress (queen inner spring)	one	100	SLTD ¹⁸
Mattress (queen hybrid)	one	115	SLTD
Used motor oil	one gallon	7.4	NRC
Antifreeze	gallon	8.42	NRC
Computer (15" monitor)	one	30	Ecology
Computer (17" monitor)	one	45	Ecology
Computer (21" monitor)	one	60	Ecology
Fluorescent tubes (4' straight)	one	0.5	LightRecycle ¹⁹
Fluorescent tubes (8' straight)	one	1.0	LightRecycle
Fluorescent tubes (curved shapes)	one	0.25	LightRecycle
CFLs (compact fluorescent lamps)	one	0.25	LightRecycle
HIDs (high intensity discharge lamps)	one	1.5	LightRecycle

For a complete list of conversion factors maintained by the U.S. Environmental Protection Agency, see Volume-to-Weight Conversion Factors (April 2016):

https://www.epa.gov/sites/production/files/2016-04/documents/volume_to_weight_conversion_factors_memorandum_04192016_508fnl.pdf

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¹⁴ Washington State University Puyallup Extension Office, 2010.

¹⁵ Developed by Cascadia Consulting Group for a waste composition study in San Diego, California in 2000.

¹⁶ "FEECO International Complete Systems and Equipment Handbook," 9th printing.

¹⁷ US Green Building Council. LEED Reference Guide for Green Building Design and Construction 2009 Edition.

¹⁸ Sleep Like The Dead: <http://www.sleeplikethedead.com/mattress-lightweight.html>, April 7, 2017.

¹⁹ Peter Thermos, LightRecycle Washington Program Manager, 2016.