

Density

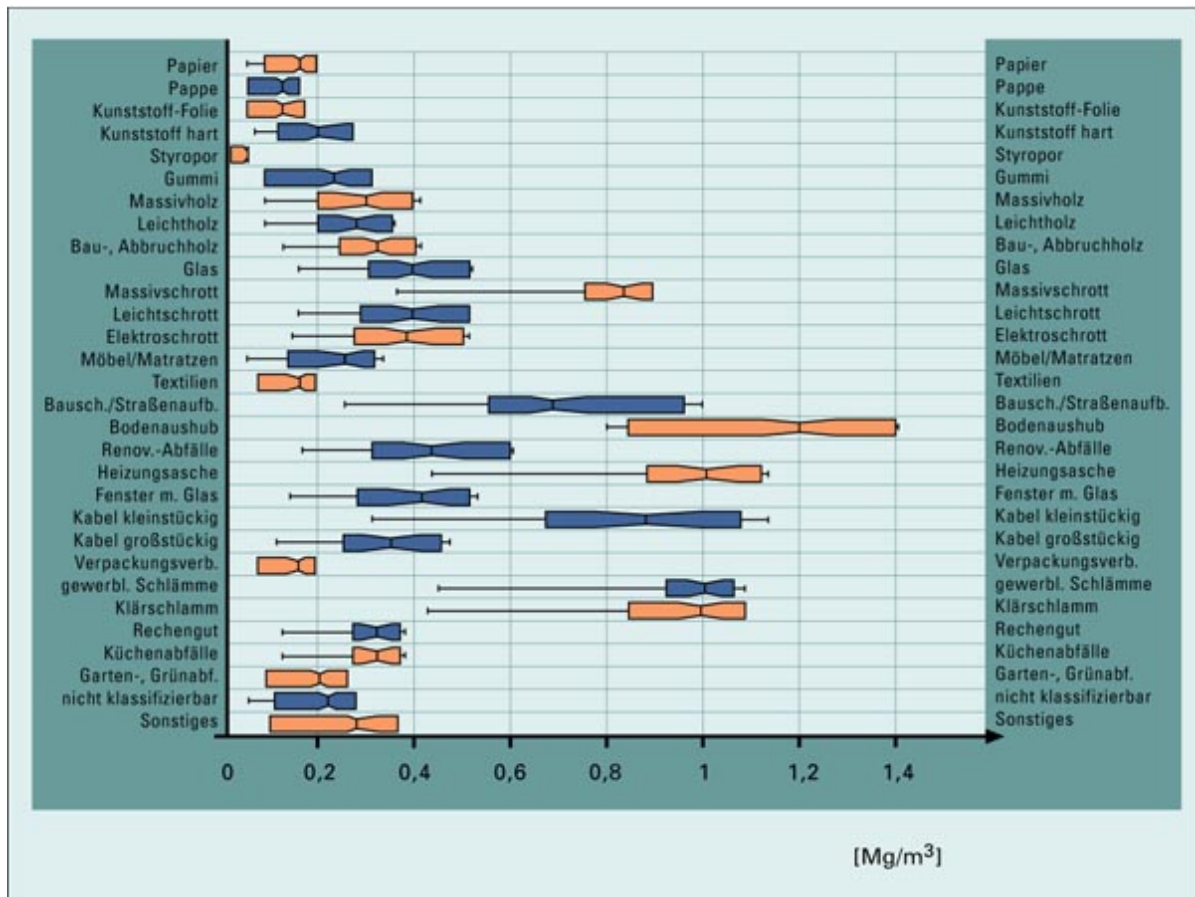
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1 Apparent density

The density of bulk material in original moisture. symbol: ρ ; dimension Mg/m^3

Examples of types of waste	Mg/m^3	Influencing Factor
• Mixed waste	0.3 to 0.7	(depending on the % of ashes)
• Bio waste (separate collection)	0.5 to 0.9	(depending on the % of garden waste)
• Glass (depot container)	0.2 to 0.8	(mixture / container / shard)
• Paper (depot container)	0.1 to 0.35	(mixture / news papers / magazines)
• Garden waste	0.1 to 0.5	(depends on the material)
• branches	0.1 to 0.4	
• plant parts/ mowed grass	0.4 to 0.9	(plant parts / mowed grass)
• DSD light materials	0.01 to 0.2	(depending on container size)



Apparent density of different waste material groups

Papier – paper

Pappe – cardboard

Kunststoff-Folie – plastic foil

Kunststoff hart – hard plastic

Styropor – styrofoam

Gummi – rubber

Massivholz – solid wood

Leichtholz – lightwood

Bau-, Abbruchholz – timber, demolition wood

Glas – glass

Massivschrott – solid scrap

Leichtschrott – light scrap

Electroschrott – electronic scrap

Möbel/Matratzen – furniture/mattresses

Textilien – textiles

Bausch./Straßenaufb. – building rubble/road rubble

Bodenaushub. – excavation residues

Renov. – Abfälle – renovation wastes

Heizungsasche – heating oven ashes

Fenster m. Glass – windows with glass

Kabel kleinstückig – small pieces of cable

Kabel großstückig – big pieces of cable

Verpackungsverb. – composite materials of packaging

Gewerbl. Schlämme – commercial sludge

Klärschlamm – sewage sludge

Rechengut – debris

Küchenabfälle – kitchen waste

Garten-, Grünabf. – garden waste, green waste

Nicht klassifizierbar – non-classifiable

Sonstiges - other

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Eg.	Contents	Minimum/Maximum	Median
	mixed household waste	80l-container: 0.06 – 0.71 kg/l 120l-container: 0.02 – 0.53 kg/l 240l-container: 0.03 – 0.35 kg/l	0.19 kg/l 0.14 kg/l 0.11 kg/l
	packaging waste (light)	80l-container: 0.04 – 0.26 kg/l 120l-container: 0.01 – 0.13 kg/l 240l-container: 0.03 – 0.12 kg/l	0.09 kg/l 0.07 kg/l 0.05 kg/l
	Bio waste	80l-container: 0.30 – 0.90 kg/l 120l-container: 0.30 – 0.66 kg/l 240l-container: 0.02 – 0.53 kg/l	0.50 kg/l 0.50 kg/l 0.49 kg/l

2 Particle Density

$$\rho_s = m_d / V_s \text{ [g/cm}^3\text{]}$$

ρ_s	particle density	[g/cm ³]
m_d	mass of the dry sample	[g]
V_s	volume of the solid (particle volume)	[cm ³]

3 Dry Density

$$\rho_d = \rho / (1 + w/100) \text{ [g/cm}^3\text{]}$$

ρ_d	dry density	[g/cm ³]
ρ	apparent density	[g/cm ³]
w	water content TS	[%]