

ACOUSTIC PROPERTIES OF MATERIALS

MATERIAL	LONGITUDINAL VELOCITY		SHEAR VELOCITY		ACOUSTIC IMPEDANCE
	(in/μs) *	(m/s)	(in/μs) *	(m/s)	
Acrylic resin (Perspex®)	0.107	2,730	0.056	1,430	3.22
Aluminum	0.249	6,320	0.123	3,130	17.06
Beryllium	0.508	12,900	0.350	8,880	23.5
Brass, naval	0.174	4,430	0.083	2,120	37.30
Cadmium	0.109	2,780	0.059	1,500	24.02
Columbium	0.194	4,920	0.083	2,100	42.16
Copper	0.183	4,660	0.089	2,260	41.61
Glycerine	0.076	1,920	—	—	2.42
Gold	0.128	3,240	0.047	1,200	62.60
Inconel®	0.229	5,820	0.119	3,020	49.47
Iron	0.232	5,900	0.127	3,230	45.43
Iron, cast (slow)	0.138	3,500	0.087	2,200	25.00
Lead (fast)	0.220	5,600	0.126	3,200	40.00
Lead	0.085	2,160	0.028	700	24.49
Lucite®	0.106	2,680	0.050	1,260	3.16
Mercury	0.057	1,450	—	—	19.66
Molybdenum	0.246	6,250	0.132	3,350	63.75
Motor oil (SAE 20 or 30)	0.069	1,740	—	—	1.51
Nickel, pure	0.222	5,630	0.117	2,960	49.99
Platinum	0.156	3,960	0.066	1,670	84.74
Polyamide (slow)	0.087	2,200	0.043	1,100	2.40
(nylon, Perlon®) (fast)	0.102	2,600	0.047	1,200	3.10
Polystyrene	0.092	2,340	—	—	2.47
Polyvinylchloride, PVC hard	0.094	2,395	0.042	1,060	3.35
Silver	0.142	3,600	0.063	1,590	37.76
Steel, 1020	0.232	5,890	0.128	3,240	45.41
Steel, 4340	0.230	5,850	0.128	3,240	45.63
Steel, 302 austenitic stainless	0.223	5,690	0.123	3,120	45.45
Steel, 347 austenitic stainless	0.226	5,740	0.122	3,090	45.40
Tin	0.131	3,320	0.066	1,670	24.20
Titanium, Ti 150A	0.240	6,100	0.123	3,120	27.69
Tungsten	0.204	5,180	0.113	2,870	99.72
Uranium	0.133	3,370	0.078	1,980	63.02
Water (20°C)	0.058	1,480	—	—	1.48
Zinc	0.164	4,170	0.095	2,410	29.61
Zirconium	0.183	4,650	0.089	2,250	30.13

*Conversion Factor: 1 m/s = 3.937 x 10⁻⁵ in/μs
Source: Nondestructive Testing Handbook 2nd Edition Volume 7
Ultrasonic Testing ASNT 1991 ed. Paul McIntire