



Onda Corporation  
 592 Weddell Drive, Suite 7, Sunnyvale, CA 94089  
 PH: (408) 745 - 0383 FAX: (408) 745 - 0956

# Acoustic Properties of

# Liquids

Ref	Liquid	Vendor	$V_L$ mm/s	$\left(\frac{v}{T}\right)_T$ m/s °C	D g/cm <sup>3</sup>	$Z_L$ MRayl	$\frac{1}{\rho^2}$ $10^{-15} \text{ s}^2/\text{m}$
M	Acetate, butyl		1.27		0.871	1.02	
M	Acetate, ethyl, C4H8O2		1.19		0.900	1.069	
M	Acetate, methyl, C3H6O2		1.21		0.934	1.131	
M	Acetate, propyl		1.18		0.891	1.05	
LB	Acetone, (CH <sub>3</sub> ) <sub>2</sub> CO at 25°C		1.174	-4.5	0.791	1.07	54.0
M	Acetonitrile, C <sub>2</sub> H <sub>3</sub> N		1.29		0.783	1.01	
M	Acetonyl acetone, C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>		1.40		0.729	1.359	
M	Acetylendichloride, C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>		1.02		1.26	1.280	
M	Alcohol, butyl, C <sub>4</sub> H <sub>9</sub> OH at 30°C		1.24		0.810	1.003	74.3
CRC	Alcohol, ethanol, C <sub>2</sub> H <sub>5</sub> OH, at 25°C		1.207	-4.0	0.79	0.95	48.5
M	Alcohol, furfuryl, C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>		1.45		1.135	1.645	
LB	Alcohol, isopropyl, 2-Propanol, at 20°C		1.17		0.786	0.920	92.0
CRC	Alcohol, methanol, CH <sub>3</sub> OH, at 25°C		1.103	-3.2	0.791	0.872	30.2
M	Alcohol, propyl (n) C <sub>3</sub> H <sub>7</sub> OH at 30°C		1.22		0.804	0.983	64.5
M	Alcohol, t-amyl, C <sub>5</sub> H <sub>9</sub> OH		1.20		0.810	0.976	
M	Alkazene 13, C <sub>15</sub> H <sub>24</sub>		1.32		0.860	1.132	
M	Aniline, C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>		1.69		1.022	1.675	
DR	Argon, liquid at 87K		0.840		1.43	1.20	15.2
CRC	Benzene, C <sub>6</sub> H <sub>6</sub> , at 25°C		1.295	-4.65	0.87	1.12	873.0
M	Benzol		1.33		0.878	1.16	
M	Benzol, ethyl		1.34		0.868	1.16	
	Bromobenzene C <sub>6</sub> H <sub>5</sub> Br at 22°C		1.167		1.522	1.776	1.63.0
M	Bromoform, CHBr <sub>3</sub>		0.92		2.890	2.670	
M	t-Butyl chloride, C <sub>4</sub> H <sub>9</sub> Cl		0.98		0.84	0.827	
M	Butyrate, ethyl		1.17		0.877	1.03	
M	CARBITOLTM, C <sub>6</sub> H <sub>14</sub> O <sub>3</sub>		1.46		0.988	1.431	
CRC,M	Carbon disulphide, CS <sub>2</sub> at 25°C		1.149		1.26	1.448	
DR	Carbon disulphide, CS <sub>2</sub> , 25°C, 3 GHz		1.310		1.221	1.65	10.1
CRC,M	Carbon tetrachloride, CCl <sub>4</sub> , at 25°C		0.926	-2.7	1.594	1.48	538.0
M	Cesium at 28.5°C the melting point		0.967		1.88	1.82	
LB	Chloro-benzene, C <sub>6</sub> H <sub>5</sub> Cl, at 22°C		1.304		1.106	1.442	167.0



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M	Chloro-benzene, C <sub>6</sub> H <sub>5</sub> Cl		1.30		1.10	1.432	
CRC,M	Chloroform, CHCl <sub>3</sub> , at 25°C		0.987	-3.4	1.49	1.47	
M	Cyclohexanol, C <sub>6</sub> H <sub>12</sub> O		1.45		0.962	1.40	
M	Cyclohexanone, C <sub>6</sub> H <sub>10</sub> O		1.42		0.948	1.391	
M	Diacetyl, C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>		1.24		0.99	1.222	
M	1,3 Dichloroisobutane C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub>		1.22		1.14	1.390	
M	Diethyl ketone		1.31		0.813	1.07	
M	Dimethyl phthalate, C <sub>8</sub> H <sub>10</sub> O <sub>4</sub>		1.46		1.20	1.758	
M	Dioxane		1.38		1.033	1.425	
CRC,M	Ethanol amide, C <sub>2</sub> H <sub>7</sub> NO, at 25°C		1.724	-3.4	1.018	1.755	
CRC,M	Ethyl ether, C <sub>4</sub> H <sub>10</sub> O, at 25°C		0.985	-4.87	0.713	0.7023	
M	d-Fenchone		1.32		0.94	1.241	
M	Florosilicone oil, Dow FS-1265		0.76				
M	Formamide, CH <sub>3</sub> NO		1.62		1.134	1.842	
M	Furfural, C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>		1.45		1.157	1.670	
3m	Fluorinert FC-40	3M	0.640		1.19	1.86	
3m	Fluorinert FC-70	3M	0.687		1.94	1.33	
3m	Fluorinert FC-72	3M	0.512		1.68	0.86	
3m	Fluorinert FC-75	3M	0.585		1.76	1.02	
3m	Fluorinert FC-77	3M	0.595		1.78	V	
3m	Fluorinert FC-104	3M	0.575		1.76	1.01	
3m	Fluorinert FG-43	3M	0.655		1.85	1.21	
LB	Fluoro-benzene, C <sub>6</sub> H <sub>5</sub> F, at 22°C		1.18		1.024	1.025	317.0
AS	Freon, TF	VWR	0.716		1.57	1.12	
DR	Gallium at 30°C mp=28.8°C (expands 3% freezes)		2.87		6.09	17.5	1.58
M	Gasoline		1.25		0.803	1.00	
CRC	Glycerin - CH <sub>2</sub> OHCHOHCH <sub>2</sub> OH, at 25°C		1.904	-2.2	1.26	2.340	
M	Glycol - 2,3 butylene		1.48		1.019	1.511	
M	Glycol - diethylene C <sub>4</sub> H <sub>10</sub> O <sub>3</sub>		1.58		1.116	1.770	
CRC	Glycol - ethylene 1,2-ethanediol @ 25°C		1.658	-2.1	1.113	1.845	120.0
JA	Glycol - ethylene Preston II	Preston	1.59		1.108	1.76	



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JA	Glycol - polyethylene 200	SW	1.62		1.087	1.75	
JA	Glycol - polyethylene 400	SW	1.62		1.06	1.71	
M	Glycol - polypropylene (Polyglycol P-400) at 38°C		1.30				
M	Glycol - polypropylene (Polyglycol P-1200) at 38°C		1.30				
M	Glycol - polypropylene (Polyglycol E-200) at 29°C		1.57				
M	Glycol - tetraethylene C8H18O6		1.58		1.12	1.784	
M	Glycol, triethylene, C6H14O4		1.61		1.123	1.81	
DR	Helium-4, liquid at 0.4K		0.238		0.147	0.035	1.73
DR	Helium-4, liquid at 2K		0.227		0.145	0.033	70.0
DR	Helium-4, liquid at 4.2K		0.183		0.126	0.023	226.0
	n-Hexane, C6H14, liquid at 30°C		1.103		0.659	0.727	87.0
M	n-Hexanol, C6H14O		1.30		0.819	1.065	
AS	Honey, sue bee orange		2.03		1.42	2.89	
	Hydrogen, liquid at 20°K		1.19		0.07	0.08	5.6
LB	Iodo-benzene, C6H5I, at 22°C		1.104		1.183	2.012	242.0
M	Isopentane, C5H12		0.992		0.62	0.615	
CRC,M	Kerosene		1.324	-3.6	0.81	1.072	
M	Linalool		1.40		0.884	1.23	
CRC	Mercury at 25.0°C		1.450		13.5	19.58	5.8
M	Mesityloxide, C6H16O		1.31		0.85	1.115	
M	Methylethylketone		1.21		0.805	0.972	
M	Methylene iodide		0.98				
M	Methyl naphthalene, C11H10		1.51		1.090	1.645	
M	Monochlorobenzene, C6H5Cl		1.27		1.107	1.411	
M	Morpholine, C4H9NO		1.44		1.00	1.442	
DR	Neon, liquid at 27K		1.20		1.20	0.72	23.1
LB	Nicotin, C10H14N2, at 20°C		1.49		1.01	1.505	
CRC,M	Nitrobenzene, C6H6NO2, at 25°C		1.463	-3.6	1.20	1.756	
DR	Nitrogen N2, liquid at 77K		0.860		0.80	0.68	13.8
M	Nitromethane CH3NC2		1.33		1.13	1.504	
JA	Oil - baby	J&J	1.43		0.821	1.17	



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CRC,M	Oil - castor, C11H10O10 @ 25°C		1.477	-3.6	0.969	1.431	
GD	Oil - castor, @ 20.2°C @ 4.224 MHz		1.507		0.942	1.420	10100.0
JA	Oil - corn	Mazola	1.46		0.922	1.34	
M	Oil - diesel		1.25				
M	Oil - gravity fuel AA		1.49		0.99	1.472	
MH	Oil - jojoba		1.455		1.17	1.24	
JA	Oil - linseed		1.46		0.94	1.37	
M	Oil - linseed		1.77		0.922	1.63	
JA	Oil - mineral, light	Diamond	1.44		0.825	1.19	
JA	Oil - mineral, heavy	Diamond	1.46		0.843	1.23	
JA	Oil - olive		1.445		0.918	1.32	
M	Oil - paraffin		1.42		0.835	1.86	
JA	Oil - peanut	Planter	1.436		0.914	1.31	
M	Oil - SAE 20		1.74		0.870	1.51	
	Oil - SAE 30		1.7		0.88	1.5	
JA	Oil - silicon Dow 200, 1 centistoke	DC	0.96		0.818	0.74	
JA	Oil - silicon Dow 200, 10 centistoke	DC	0.968		0.940	0.91	
JA	Oil - silicon Dow 200, 100 centistoke	DC	0.98		0.968	0.95	
JA	Oil - silicon Dow 200, 1000 centistoke	DC	0.99		0.972	0.96	
MH	Oil - silicon Dow 704 @ 79°F	DC	1.409		1.02	1.437	
MH	Oil - silicon Dow 705 @ 79°F	DC	1.458		1.15	1.68	
GD	Oil - silicon Dow 710 @ 20°C	DC	1.352		1.11	1.50	8200.0
JA	Oil - safflower		1.45		0.90	1.30	
JA	Oil - soybean	Wesson	1.43		0.93	1.32	
M	Oil - sperm		1.44		0.88	1.268	
JA	Oil - sunflower		1.45		0.92	1.34	
M	Oil - transformer		1.39		0.92	1.28	
JA	Oil - wintergreen (methyl salicylate)	CVS	1.38		1.60	1.60	
DR	Oxygen, O <sub>2</sub> , liquid at 90K		0.900		1.11	1.0	9.9
M	Paraffin at 15°C		1.30				
	n-Pentane, C <sub>5</sub> H <sub>12</sub> , liquid at 15°C		1.027		0.626	0.642	100.0



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M	Polypropylene oxide (Ambiflo) at 38°C		1.37				
M	Potassium at 100°C, mp=63.7°C ('M' other temps)		1.82		0.83	1.51	
M	Pyridine		1.41		0.982	1.39	
M	Sodium, liquid at 300°C (see 'M' for other temps)		2.42		8.81	21.32	
M	Solvesso #3		1.37		0.877	1.202	
AS	Sonotrack couplant	Echo	1.62		1.04	1.68	
M	Tallow at 16°C		0.39				
M	Thallium, mp=303.5°C, used in photocells	C	1.62		11.9	19.3	
M	Trichorethylene		1.05		1.05	1.10	
CRC	Turpentine, at 25°C		1.255		0.88	1.104	
M	Univis 800		1.35		0.87	1.191	
M	Water - heavy, D2O		1.40		1.104	1.54	
M	Water - liquid at 20°C		1.48		1.00	1.483	
CRC,DR	Water - liquid at 25°C		1.4967	2.4	0.998	1.494	22.0
	Water - liquid at 30°C		1.509		1.00	1.509	19.1
DR	Water - liquid at 60°C (temps to 500°F in 'CRC')		1.55		1.00	1.55	10.9
M	Water - salt 10%		1.47				
M	Water - salt 15%		1.53				
M	Water - salt 20%		1.60				
CRC	Water - sea, at 25°C		1.531	2.4	1.025	1.569	
DR	Xenon - liquid at 166K		0.630		2.86	1.80	22.0
CRC,M	Xylene Hexafluoride, C <sub>8</sub> H <sub>4</sub> F <sub>6</sub> , at 25°C		0.879		1.37	1.222	
M	m-Xylol, C <sub>8</sub> H <sub>10</sub>		1.32		0.864	1.145	