VALUES OF THE GAS CONSTANT IN DIFFERENT UNIT SYSTEMS

In SI units the value of the gas constant, R, is:

R = 8.314472 Pa m^3 K^{-1} mol^{-1}
= 8314.472 Pa L K^{-1} mol^{-1}
= 0.08314472 bar L K^{-1} mol^{-1}

This table gives the appropriate value of R for use in the ideal gas equation, $PV = nRT$, when the variables are expressed in other units. The following conversion factors for pressure units were used in generating the table:

1 atm = 101325 Pa
1 psi = 6894.757 Pa
1 torr (mm Hg) = 133.322 Pa [at 0°C]
1 in Hg = 3386.38 Pa [at 0°C]
1 in H_2O = 249.082 Pa [at 4°C]
1 ft H_2O = 2988.98 Pa [at 4°C]

Reference

Mohr, P. J., and Taylor, B. N., "The 2002 CODATA Recommended Values of the Fundamental Physical Constants", *Rev. Mod. Phys.* 77, 1, 2005. See also <http://physics.nist.gov/constants>

Units of *V, T, n*			Units of *P*						
V	***T***	***n***	**kPa**	**atm**	**psi**	**mmHg**	**in Hg**	**in H_2O**	**ft H_2O**
ft^3	K	mol	0.2936228	0.00289784	0.0425864	2.20236	0.0867070	1.17881	0.0982351
		lb·mol	133.1851	1.31443	19.3168	998.973	39.3296	534.704	44.5587
	°R	mol	0.1631238	0.00160990	0.0236591	1.22353	0.0481706	0.654900	0.0545751
		lb·mol	73.99170	0.730242	10.7316	554.984	21.8498	297.058	24.7548
cm^3	K	mol	8314.472	82.0574	1205.91	62363.8	2455.27	33380.4	2781.71
		lb·mol	3771381	37220.6	546993	282878000	1113690	15141100	1261760
	°R	mol	4619.151	45.5875	669.951	34646.5	1364.03	18544.7	1545.39
		lb·mol	2095211	20678.1	303885	15715400	618717	8411730	700979
L	K	mol	8.314472	0.0820574	1.20591	62.3638	2.45527	33.3804	2.78171
		lb·mol	3771.381	37.2206	546.993	28287.8	1113.69	15141.1	1261.76
	°R	mol	4.619151	0.0455875	0.669951	34.6465	1.36403	18.5447	1.54539
		lb·mol	2095.211	20.6781	303.885	15715.4	618.717	8411.73	700.979
m^3	K	mol	0.008314472	0.0000820574	0.00120591	0.0623638	0.00245527	0.0333804	0.00278171
		lb·mol	3.771381	0.0372206	0.546993	28.2878	1.11369	15.1411	1.26176
	°R	mol	0.004619151	0.0000455875	0.000669951	0.0346465	0.00136403	0.0185447	0.00154539
		lb·mol	2.095211	0.0206781	0.303885	15.7154	0.618717	8.41173	0.700979