

Thermal Conductivity of Gases with Minimum Sensitivity and ISL Gas Groups										
Gas Type			Conductivity 400 K mW/mK	difference from air mW/mK	Minimum Sensitivity		Gas Group 0-3	Calculated or Tested with Error	Formula Weight	Min Sensitivity g/yr
Name	Trade Name	Chemical Formula			ppm	cc/sec				
Air			33.3	0	N/A	N/A	N/A	N/A		
Helium		He	190.6	157.3	130	5.42E-06	0	T +/-20%	4.00	0.03
Hydrogen		H ₂	230.4	197.1	100	4.17E-06	0	T +/-25%	2.02	0.01
Ammonia		NH ₃	37.4	4.1	310	1.29E-05	1	T +/-10%	17.03	0.28
Butane		C ₄ H ₁₀	28.4	-4.9	310	-1.29E-05	1	T +/-10%	58.12	0.97
Krypton		Kr	12.3	-21	749	-3.12E-05	1	C	83.80	3.37
Neon		Ne	60.3	27	583	2.43E-05	1	C	20.18	0.63
Sulfur dioxide		SO ₂	14.3	-19	828	-3.45E-05	1	C	64.07	2.85
Sulfur hexa fluoride		SF ₆	20.6	-12.7	290	-1.21E-05	1	T +/-35%	146.06	2.27
Trichloromethane		CHCl ₃	11.1	-22.2	709	-2.95E-05	1	C	119.38	4.54
Xenon		Xe	7.3	-26	605	-2.52E-05	1	C	131.29	4.26
1,1,2-Trichlorotrifluoroethane	R113	C ₂ Cl ₃ F ₃	13.6	-19.7	798	-3.33E-05	1	C	187.38	8.03
1,2-Dichlorotetrafluoroethane	R114	C ₂ Cl ₂ F ₄	15.7	-17.6	894	-3.72E-05	1	C	170.92	8.20
Dichlorodifluoromethane	R12	CCl ₂ F ₂	15	-18.3	860	-3.58E-05	1	C	120.91	5.58
	R1301		11.0	-22.3	705	-2.94E-05	1	C		-
Tetrafluoroethane	R134a	C ₂ H ₂ F ₄	14.0	-19.3	760	-3.17E-05	1	T +/-20%	102.03	4.16
Chlorodifluoromethane	R22	CHF ₂ Cl	13.0	-20.3	775	-3.23E-05	1	C	86.47	3.60
Acetone		C ₃ H ₆ O	20.2	-13.1	1,201	-5.00E-05	2	C	46.07	2.97
Argon		Ar	22.6	-10.7	1,470	-6.13E-05	2	C	39.95	3.15
Boron trifluoride		BF ₃	24.6	-8.7	1,808	-7.53E-05	2	C	67.81	6.58
Carbon dioxide		CO ₂	25.1	-8.2	1,918	-7.99E-05	2	C	44.01	4.53
Deuterium oxide		D ₂ O	27	-6.3	2,497	-1.04E-04	2	C	20.04	2.69
Diethyl ether		C ₄ H ₁₀ O	25	-8.3	1,895	-7.90E-05	2	C	74.12	7.54
Ethanol		C ₂ H ₅ OH	25.8	-7.5	2,097	-8.74E-05	2	C	46.07	5.19
Hexane		C ₆ H ₁₄	23.4	-9.9	1,589	-6.62E-05	2	C	86.17	7.35
Hydrogen sulphide		H ₂ S	20.5	-12.8	1,229	-5.12E-05	2	C	34.08	2.25
Hydrogen chloride		HCL	19.5	-13.8	1,140	-4.75E-05	2	C	36.46	2.23
Isobutane		C ₄ H ₁₀	27.9	-5.4	2,913	-1.21E-04	2	C	58.12	9.09
Methane		CH ₄	49.1	15.8	996	4.15E-05	2	C	16.04	0.86
Methanol		CH ₄ O	26.2	-7.1	2,215	-9.23E-05	2	C	32.04	3.81
Nitrous oxide		N ₂ O	26	-7.3	2,155	-8.98E-05	2	C	44.01	5.09
Pentane		C ₅ H ₁₂	24.9	-8.4	1,873	-7.80E-05	2	C	72.15	7.25
Perfluorocyclobutane	C318	C ₄ F ₈	19.5	-13.8	1,140	-4.75E-05	2	C	200.03	12.24
Propane		C ₃ H ₈	30.6	-2.7	760	-3.17E-05	2	T +/-20%	44.09	1.80
Tetra fluoromethane	R14	CF ₄	24.1	-9.2	1,710	-7.12E-05	2	C	88.00	8.07
Water		H ₂ O	27.1	-6.2	2,537	-1.06E-04	2	C	18.02	2.45
Acetylene		C ₂ H ₂	45.4	12.1	1,000	4.17E-05	3	T +/-25%	26.04	1.40
Carbon monoxide		CO	32.3	-1	15,730	-6.55E-04	3	C	28.01	23.65
Ethane		C ₂ H ₆	35.4	2.1	7,490	3.12E-04	3	C	32.08	12.90
Ethylene		C ₂ H ₄	34.6	1.3	12,100	5.04E-04	3	C	28.05	18.21
Nitric oxide		NO	33.1	-0.2	78,650	-3.28E-03	3	C	30.01	126.67
Nitrogen		N ₂	32.3	-1	15,730	-6.55E-04	3	C	28.01	23.65
Oxygen		O ₂	33.7	0.4	39,325	1.64E-03	3	C	32.00	67.53
Trichlorofluoromethane	R11	CFCl ₃	20.0	-13.3	1,183	-4.93E-05	3	C	137.37	8.72

Bold indicates result of "Tests" all other figures are calculated

The thermal characteristics give an idea of expected result however as there is a heating effect which is not considered in the theory therefore actual results do differ.

Results assume nozzle off

Nozzle dilutes leak 10 to 1 and assumes only 30% capture