

Physical Properties.txt
 Physical properties for NITROGEN
 MW = 28.0134
 Total pressure = 14.700 psia

Property name Property unit	Temperatures, degrees F		
	60.00	80.00	100.00
Gas density lb/ft3	.73886E-01	.71141E-01	.68592E-01
Gas viscosity cp	.17237E-01	.17701E-01	.18158E-01
Igas heat cap cp Btu/lb-F	.24837	.24849	.24863
Gas therm cond Btu/hr-ft-F	.14400E-01	.14793E-01	.15180E-01

Property name Property unit	Temperatures, degrees F		
	120.00	140.00	160.00
Gas density lb/ft3	.66221E-01	.64008E-01	.61939E-01
Gas viscosity cp	.18607E-01	.19050E-01	.19486E-01
Igas heat cap cp Btu/lb-F	.24878	.24895	.24913
Gas therm cond Btu/hr-ft-F	.15563E-01	.15941E-01	.16315E-01

Property name Property unit	Temperatures, degrees F		
	180.00	200.00	220.00
Gas density lb/ft3	.59999E-01	.58177E-01	.56463E-01
Gas viscosity cp	.19916E-01	.20341E-01	.20760E-01
Igas heat cap cp Btu/lb-F	.24932	.24953	.24976
Gas therm cond Btu/hr-ft-F	.16685E-01	.17051E-01	.17414E-01

Property name Property unit	Temperatures, degrees F	
	240.00	260.00
Gas density lb/ft3	.54848E-01	.53322E-01
Gas viscosity cp	.21173E-01	.21582E-01
Igas heat cap cp Btu/lb-F	.24999	.25025
Gas therm cond Btu/hr-ft-F	.17773E-01	.18130E-01

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Total pressure = 100.000 psia

Property name Property unit	Temperatures, degrees F		
	60.00	80.00	100.00
Gas density lb/ft3	.50397	.48495	.46735
Gas viscosity cp	.17237E-01	.17701E-01	.18158E-01
Igas heat cap cp Btu/lb-F	.24837	.24849	.24863
Gas therm cond Btu/hr-ft-F	.14400E-01	.14793E-01	.15180E-01

Property name Property unit	Temperatures, degrees F		
	120.00	140.00	160.00
Gas density lb/ft3	.45099	.43576	.42153
Gas viscosity cp	.18607E-01	.19050E-01	.19486E-01
Igas heat cap cp Btu/lb-F	.24878	.24895	.24913
Gas therm cond Btu/hr-ft-F	.15563E-01	.15941E-01	.16315E-01

Property name Property unit	Temperatures, degrees F		
	180.00	200.00	220.00
Gas density lb/ft3	.40822	.39573	.38399
Gas viscosity cp	.19916E-01	.20341E-01	.20760E-01
Igas heat cap cp Btu/lb-F	.24932	.24953	.24976
Gas therm cond Btu/hr-ft-F	.16685E-01	.17051E-01	.17414E-01

Property name Property unit	Temperatures, degrees F	
	240.00	260.00
Gas density lb/ft3	.37293	.36250
Gas viscosity cp	.21173E-01	.21582E-01
Igas heat cap cp Btu/lb-F	.24999	.25025
Gas therm cond Btu/hr-ft-F	.17773E-01	.18130E-01

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 Total pressure = 200.000 psia

Property name Property unit	Temperatures, degrees F		
	60.00	80.00	100.00
Gas density lb/ft3	1.0108	.97205	.93622
Gas viscosity cp	.17237E-01	.17701E-01	.18158E-01
Igas heat cap cp Btu/lb-F	.24837	.24849	.24863
Gas therm cond Btu/hr-ft-F	.14400E-01	.14793E-01	.15180E-01

Property name Property unit	Temperatures, degrees F		
	120.00	140.00	160.00
Gas density lb/ft3	.90301	.87214	.84336
Gas viscosity cp	.18607E-01	.19050E-01	.19486E-01
Igas heat cap cp Btu/lb-F	.24878	.24895	.24913
Gas therm cond Btu/hr-ft-F	.15563E-01	.15941E-01	.16315E-01

Property name Property unit	Temperatures, degrees F		
	180.00	200.00	220.00
Gas density lb/ft3	.81647	.79127	.76761
Gas viscosity cp	.19916E-01	.20341E-01	.20760E-01
Igas heat cap cp Btu/lb-F	.24932	.24953	.24976
Gas therm cond Btu/hr-ft-F	.16685E-01	.17051E-01	.17414E-01

Property name Property unit	Temperatures, degrees F	
	240.00	260.00
Gas density lb/ft3	.74535	.72437
Gas viscosity cp	.21173E-01	.21582E-01
Igas heat cap cp Btu/lb-F	.24999	.25025
Gas therm cond Btu/hr-ft-F	.17773E-01	.18130E-01

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 Physical properties for OXYGEN
 MW = 32
 Total pressure = 14.700 psia

Property name Property unit	Temperatures, degrees F		
	60.00	80.00	100.00
Gas density lb/ft3	.84426E-01	.81287E-01	.78373E-01
Gas viscosity cp	.19729E-01	.20309E-01	.20880E-01
Igas heat cap cp Btu/lb-F	.22037	.22096	.22156
Gas therm cond Btu/hr-ft-F	.14794E-01	.15259E-01	.15720E-01

Property name Property unit	Temperatures, degrees F		
	120.00	140.00	160.00
Gas density lb/ft3	.75662E-01	.73132E-01	.70767E-01
Gas viscosity cp	.21441E-01	.21994E-01	.22538E-01
Igas heat cap cp Btu/lb-F	.22219	.22282	.22347
Gas therm cond Btu/hr-ft-F	.16176E-01	.16628E-01	.17077E-01

Property name Property unit	Temperatures, degrees F		
	180.00	200.00	220.00
Gas density lb/ft3	.68550E-01	.66468E-01	.64509E-01
Gas viscosity cp	.23075E-01	.23604E-01	.24126E-01
Igas heat cap cp Btu/lb-F	.22413	.22480	.22549
Gas therm cond Btu/hr-ft-F	.17522E-01	.17963E-01	.18402E-01

Property name Property unit	Temperatures, degrees F	
	240.00	260.00
Gas density lb/ft3	.62662E-01	.60918E-01
Gas viscosity cp	.24641E-01	.25149E-01
Igas heat cap cp Btu/lb-F	.22618	.22688
Gas therm cond Btu/hr-ft-F	.18838E-01	.19271E-01

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Total pressure = 100.000 psia

Property name	Temperatures, degrees F		
Property unit	60.00	80.00	100.00
Gas density	.57719	.55531	.53507
lb/ft3			
Gas viscosity	.19729E-01	.20309E-01	.20880E-01
cp			
Igas heat cap cp	.22037	.22096	.22156
Btu/lb-F			
Gas therm cond	.14794E-01	.15259E-01	.15720E-01
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	120.00	140.00	160.00
Gas density	.51627	.49877	.48244
lb/ft3			
Gas viscosity	.21441E-01	.21994E-01	.22538E-01
cp			
Igas heat cap cp	.22219	.22282	.22347
Btu/lb-F			
Gas therm cond	.16176E-01	.16628E-01	.17077E-01
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	180.00	200.00	220.00
Gas density	.46715	.45282	.43935
lb/ft3			
Gas viscosity	.23075E-01	.23604E-01	.24126E-01
cp			
Igas heat cap cp	.22413	.22480	.22549
Btu/lb-F			
Gas therm cond	.17522E-01	.17963E-01	.18402E-01
Btu/hr-ft-F			

Property name	Temperatures, degrees F	
Property unit	240.00	260.00
Gas density	.42666	.41470
lb/ft3		
Gas viscosity	.24641E-01	.25149E-01
cp		
Igas heat cap cp	.22618	.22688
Btu/lb-F		
Liq heat cap cp	.41320	.40641
Btu/lb-F		

Physical Properties.txt

Gas therm cond .18838E-01 .19271E-01
 Btu/hr-ft-F

Physical properties for HYDROGEN

MW = 2.0159

Total pressure = 14.700 psi

Property name	Temperatures, degrees F		
Property unit	60.00	80.00	100.00
Gas density	.53109E-02	.51141E-02	.49315E-02
lb/ft3			
Gas viscosity	.70736E-02	.73355E-02	.76006E-02
cp			
Igas heat cap cp	3.4518	3.4799	3.5054
Btu/lb-F			
Gas therm cond	.10765	.11230	.11699
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	120.00	140.00	160.00
Gas density	.47614E-02	.46026E-02	.44542E-02
lb/ft3			
Gas viscosity	.78685E-02	.81390E-02	.84117E-02
cp			
Igas heat cap cp	3.5285	3.5493	3.5678
Btu/lb-F			
Gas therm cond	.12171	.12644	.13118
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	180.00	200.00	220.00
Gas density	.43149E-02	.41842E-02	.40611E-02
lb/ft3			
Gas viscosity	.86864E-02	.89627E-02	.92406E-02
cp			
Igas heat cap cp	3.5842	3.5986	3.6111
Btu/lb-F			
Gas therm cond	.13593	.14067	.14541
Btu/hr-ft-F			

Property name	Temperatures, degrees F	
Property unit	240.00	260.00
Gas density	.39451E-02	.38355E-02
lb/ft3		
Gas viscosity	.95196E-02	.97997E-02
cp		

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Igas heat cap cp
Btu/lb-F
Gas therm cond
Btu/hr-ft-F

3.6218 3.6308
.15013 .15483

Total pressure = 215.000 psia

Property name	Temperatures, degrees F		
Property unit	60.00	80.00	100.00
Gas density	.77011E-01	.74174E-01	.71539E-01
lb/ft3			
Gas viscosity	.70736E-02	.73355E-02	.76006E-02
cp			
Igas heat cap cp	3.4518	3.4799	3.5054
Btu/lb-F			
Gas therm cond	.10765	.11230	.11699
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	120.00	140.00	160.00
Gas density	.69086E-01	.66796E-01	.64653E-01
lb/ft3			
Gas viscosity	.78685E-02	.81390E-02	.84117E-02
cp			
Igas heat cap cp	3.5285	3.5493	3.5678
Btu/lb-F			
Gas therm cond	.12171	.12644	.13118
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	180.00	200.00	220.00
Gas density	.62644E-01	.60756E-01	.58978E-01
lb/ft3			
Gas viscosity	.86864E-02	.89627E-02	.92406E-02
cp			
Igas heat cap cp	3.5842	3.5986	3.6111
Btu/lb-F			
Gas therm cond	.13593	.14067	.14541
Btu/hr-ft-F			

Property name	Temperatures, degrees F	
Property unit	240.00	260.00
Gas density	.57302E-01	.55719E-01
lb/ft3		
Gas viscosity	.95196E-02	.97997E-02
cp		

Physical Properties.txt

Igas heat cap cp	3.6218	3.6308
Btu/lb-F		
Gas therm cond	.15013	.15483
Btu/hr-ft-F		

Physical properties for BENZENE

MW = 78.114

Total pressure = 80.000 psia

Property name Property unit	Temperatures, degrees F		
	50.00	70.00	90.00
Gas density lb/ft3	1.8890	1.6139	1.4533
Liq density lb/ft3	55.538	54.804	54.064
Gas viscosity cp	.72686E-02	.75632E-02	.78575E-02
Liq viscosity cp	.77795	.66031	.56719
Igas heat cap cp Btu/lb-F	.23480	.24596	.25693
Liq heat cap cp Btu/lb-F	.36363	.37664	.38945
Gas therm cond Btu/hr-ft-F	.64245E-02	.69648E-02	.75216E-02
Liq therm cond Btu/hr-ft-F	.63713E-01	.64834E-01	.65836E-01

Property name Property unit	Temperatures, degrees F		
	110.00	130.00	150.00
Gas density lb/ft3	1.3376	1.2469	1.1724
Liq density lb/ft3	53.318	52.563	51.798
Gas viscosity cp	.81513E-02	.84443E-02	.87363E-02
Liq viscosity cp	.49243	.43165	.38165
Igas heat cap cp Btu/lb-F	.26771	.27830	.28871
Liq heat cap cp Btu/lb-F	.40206	.41447	.42669
Gas therm cond Btu/hr-ft-F	.80942E-02	.86817E-02	.92833E-02
Liq therm cond Btu/hr-ft-F	.66717E-01	.67483E-01	.68128E-01

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Physical properties for ETHANOL

MW = 46.07

Total pressure = 80.000 psia

Property name Property unit	Temperatures, degrees F		
	50.00	70.00	90.00
Gas density lb/ft3	.82431	.77265	.72894
Liq density lb/ft3	49.641	49.248	48.800
Gas viscosity cp	.81267E-02	.84568E-02	.87875E-02
Liq viscosity cp	1.3511	1.0920	.89628
Igas heat cap cp Btu/lb-F	.32817	.33738	.34654
Liq heat cap cp Btu/lb-F	.60162	.61901	.63634
Gas therm cond Btu/hr-ft-F	.76470E-02	.81495E-02	.86664E-02
Liq therm cond Btu/hr-ft-F	.98450E-01	.96441E-01	.94380E-01

Property name Property unit	Temperatures, degrees F		
	110.00	130.00	150.00
Gas density lb/ft3	.69118	.65805	.62861
Liq density lb/ft3	48.299	47.743	47.132
Gas viscosity cp	.91183E-02	.94491E-02	.97796E-02
Liq viscosity cp	.74594	.62859	.53569
Igas heat cap cp Btu/lb-F	.35565	.36469	.37367
Liq heat cap cp Btu/lb-F	.65371	.67115	.68866
Gas therm cond Btu/hr-ft-F	.91971E-02	.97412E-02	.10298E-01
Liq therm cond Btu/hr-ft-F	.92271E-01	.90119E-01	.87914E-01

Physical properties for METHANOL

Physical Properties.txt
 MW = 32.04
 Total pressure = 80.000 psia

Property name Property unit	Temperatures, degrees F		
	85.00	105.00	125.00
Gas density lb/ft3	.49247	.46914	.44831
Liq density lb/ft3	49.136	48.679	48.160
Gas viscosity cp	.12503E-01	.12805E-01	.13102E-01
Liq viscosity cp	.52529	.45324	.39503
Igas heat cap cp Btu/lb-F	.32958	.33550	.34153
Liq heat cap cp Btu/lb-F	.61139	.62413	.63653
Gas therm cond Btu/hr-ft-F	.11066E-01	.11498E-01	.11936E-01
Liq therm cond Btu/hr-ft-F	.11431	.11117	.10794

Property name Property unit	Temperatures, degrees F		
	145.00		
Gas density lb/ft3	.42956		
Liq density lb/ft3	47.577		
Gas viscosity cp	.13395E-01		
Liq viscosity cp	.34745		
Igas heat cap cp Btu/lb-F	.34765		
Liq heat cap cp Btu/lb-F	.64876		
Gas therm cond Btu/hr-ft-F	.12382E-01		
Liq therm cond Btu/hr-ft-F	.10466		

Physical properties for TOLUENE
 MW = 92.141
 Total pressure = 80.000 psia

Property name Property unit	Temperatures, degrees F		
	100.00	120.00	140.00

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Gas density	2.5219	1.8681	1.6544
lb/ft3			
Liq density	53.181	52.525	51.860
lb/ft3			
Gas viscosity	.71769E-02	.74346E-02	.76909E-02
cp			
Liq viscosity	.46573	.41071	.36523
cp			
Igas heat cap cp	.28135	.29221	.30291
Btu/lb-F			
Liq heat cap cp	.41391	.42688	.43975
Btu/lb-F			
Gas therm cond	.67765E-02	.72670E-02	.77694E-02
Btu/hr-ft-F			
Liq therm cond	.64744E-01	.65678E-01	.66519E-01
Btu/hr-ft-F			

Property name	Temperatures, degrees F		
Property unit	160.00	180.00	200.00
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Gas density	1.5128	1.4058	1.3197
lb/ft3			
Liq density	51.185	50.500	49.803
lb/ft3			
Gas viscosity	.79456E-02	.81986E-02	.84500E-02
cp			
Liq viscosity	.32726	.29526	.26806
cp			
Igas heat cap cp	.31345	.32382	.33404
Btu/lb-F			
Liq heat cap cp	.45239	.46493	.47730
Btu/lb-F			
Gas therm cond	.82832E-02	.88075E-02	.93420E-02
Btu/hr-ft-F			
Liq therm cond	.67248E-01	.67881E-01	.68407E-01
Btu/hr-ft-F			

Property name	Temperatures, degrees F	
Property unit	220.00	240.00
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Gas density	1.2477	1.1860
lb/ft3		
Liq density	49.092	48.367
lb/ft3		
Gas viscosity	.86997E-02	.89475E-02
cp		
Liq viscosity	.24475	.22463
cp		
Igas heat cap cp	.34410	.35399
Btu/lb-F		
Liq heat cap cp	.48953	.50163
Btu/lb-F		

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Gas therm cond	.98859E-02	.10439E-01
Btu/hr-ft-F		
Liq therm cond	.68828E-01	.69144E-01
Btu/hr-ft-F		

Physical properties for WATER

MW = 18.016

Total pressure = 80.000 psia

Property name Property unit	Temperatures, degrees F		
	80.00	100.00	120.00
Gas density lb/ft3	.26857	.25699	.24649
Liq density lb/ft3	62.152	61.899	61.611
Gas viscosity cp	.95226E-02	.99213E-02	.10322E-01
Liq viscosity cp	.87712	.69584	.56571
Igas heat cap cp Btu/lb-F	.44732	.44828	.44927
Liq heat cap cp Btu/lb-F	.99807	.99801	.99845
Gas therm cond Btu/hr-ft-F	.85900E-02	.93080E-02	.10026E-01
Liq therm cond Btu/hr-ft-F	.34973	.35997	.36873

Property name Property unit	Temperatures, degrees F		
	140.00	160.00	180.00
Gas density lb/ft3	.23691	.22812	.22001
Liq density lb/ft3	61.288	60.929	60.533
Gas viscosity cp	.10724E-01	.11128E-01	.11533E-01
Liq viscosity cp	.47004	.39820	.34324
Igas heat cap cp Btu/lb-F	.45030	.45135	.45244
Liq heat cap cp Btu/lb-F	.99940	1.0009	1.0028
Gas therm cond Btu/hr-ft-F	.10744E-01	.11462E-01	.12180E-01
Liq therm cond Btu/hr-ft-F	.37610	.38220	.38711

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Property name	Temperatures, degrees F
Property unit	200.00
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Gas density	.21252
lb/ft3	
Liq density	60.102
lb/ft3	
Gas viscosity	.11941E-01
cp	
Liq viscosity	.30051
cp	
Igas heat cap cp	.45356
Btu/lb-F	
Liq heat cap cp	1.0053
Btu/lb-F	
Gas therm cond	.12898E-01
Btu/hr-ft-F	
Liq therm cond	.39093
Btu/hr-ft-F	