

ENGINEERING TRIPOS PART IIB

Wednesday 27 April 2011 2.30 to 4

Module 4A3

TURBOMACHINERY I

Answer not more than two questions.

All questions carry the same number of marks.

The approximate percentage of marks allocated to each part of a question is indicated in the right margin.

Attachment: Compressible Flow Data Book (38 pages).

STATIONERY REQUIREMENTS
Single-sided script paper

SPECIAL REQUIREMENTS
Engineering Data Book
CUED approved calculator allowed

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

1 (a) Explain what is meant by a *repeating stage*. Why are repeating stages often used in the design of multistage axial compressors? [15%]

(b) A multistage axial flow air compressor with constant mean radius is designed with repeating stages each with a flow coefficient of 0.5, a stage loading coefficient of 0.4, and an inlet flow angle of 15°. Calculate the relative flow angles at inlet and exit from the rotor blades and sketch the velocity triangles for a stage. Also determine the stage reaction. [35%]

(c) The blade speed is 220 m s⁻¹ and the compressor inlet stagnation temperature is 300 K. Calculate the relative Mach number at inlet and exit from the rotor of the first stage. If the mass flow rate per unit frontal area increases by 10% between the inlet and exit of the first rotor, show that the stagnation pressure loss coefficient is approximately 5%. Use the following loss coefficient definition:

$$Y_p = \frac{p_{01,rel} - p_{02,rel}}{p_{01,rel} - p_1}$$

where $p_{01,rel}$ is the rotor inlet relative stagnation pressure, $p_{02,rel}$ is the rotor exit relative stagnation pressure and p_1 is the rotor inlet static pressure. [35%]

(d) The whole multistage compressor consists of 10 stages and it has a polytropic efficiency of 92%. Calculate the overall stagnation pressure ratio and the isentropic efficiency of the whole compressor. [15%]

Use $\gamma = 1.4$, $R = 287 \text{ J kg}^{-1} \text{ K}^{-1}$ and $c_p = 1005 \text{ J kg}^{-1} \text{ K}^{-1}$ for the air in the compressor.

- 2 (a) A low-speed radial inflow turbine has radial relative flow in the blade passages. Stating clearly any assumptions, show that the difference in relative velocities between the suction and pressure surfaces at a radius r is given by:

$$\Delta V_{rel} = \frac{4\Omega r\pi}{N}$$

where N is the number of blades and Ω is the rotational speed.

[35%]

- (b) With reference to the result derived in part (a), define what is meant by *slip* in radial turbomachines and explain why it arises.

[15%]

- (c) A radial inflow turbine has a slip factor of 0.9 and radial blades at rotor inlet. The flow angle at exit from the stator is 75° and there is no swirl at rotor exit. At the design operating point, the rotor blade tip speed is 260 m s^{-1} and the magnitude of the relative velocity at rotor exit is twice that at rotor inlet. If the rotor mean exit radius is 40% of the rotor inlet radius, calculate:

(i) the relative flow angles at inlet and exit from the rotor; [20%]

(ii) the ratio between the exit kinetic energy and the turbine work output; [10%]

(iii) the turbine reaction level, assuming the kinetic energy at turbine inlet is negligible. [10%]

- (d) List the reasons why radial inflow turbines typically have lower efficiencies than those of axial flow turbines.

[10%]

3 A new two-shaft turbojet engine with a variable area nozzle is to be designed for a supersonic passenger aircraft. Figure 1 shows a schematic of the engine with the station numbering used in this question. The low pressure (LP) and high pressure (HP) compressors have equal pressure ratios. The design overall pressure ratio is 12.5 and at the design flight condition the turbine inlet total temperature is 1700 K. The polytropic efficiencies of all components are 0.93. The design flight condition is at a Mach number of 2.0 and at an altitude where the ambient temperature is 216 K and the atmospheric pressure is 11 kPa. The HP turbine, the LP turbine and the exhaust nozzle are all choked.

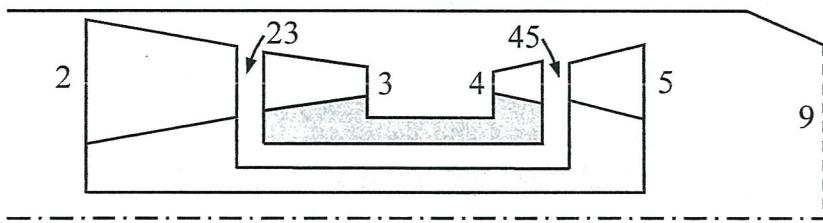


Fig. 1

- (a) Derive the following two equations for the low pressure turbine:

$$\frac{T_{05}}{T_{045}} = \left(\frac{A_{45}}{A_9} \right)^{0.263} \quad \text{and} \quad \frac{P_{05}}{P_{045}} = \left(\frac{A_{45}}{A_9} \right)^{1.131} \quad [20\%]$$

- (b) Stating any assumptions, calculate the exhaust jet velocity. [30%]

- (c) The nozzle area A_9 is increased by 10%. Find the new jet velocity and the change in propulsive efficiency. Assume that the engine inlet conditions and the turbine inlet temperature are the same as in part (b). [30%]

- (d) State three practical benefits of varying the nozzle area. [10%]

- (e) Evaluation of the new design suggests that the compressor is incompatible with the turbine inlet temperature. Discuss briefly how the compressor pressure ratio might be substantially increased. [10%]

Take $R = 287 \text{ J kg}^{-1} \text{ K}^{-1}$, with $\gamma = 1.4$, $c_p = 1005 \text{ J kg}^{-1} \text{ K}^{-1}$ in the compressor and $\gamma = 1.333$, $c_p = 1149 \text{ J kg}^{-1} \text{ K}^{-1}$ in the turbine.

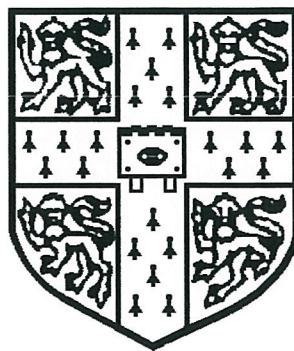
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Compressible Flow

Data Book

for Part II of the
Engineering Tripos

2009 Edition



Cambridge University Engineering Department

PERFECT GAS RELATIONS FOR COMPRESSIBLE FLOW

Ratios of stagnation to static quantities

$$\frac{T}{T_0} = \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-1}$$

$$\frac{p}{p_0} = \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{\gamma}{\gamma-1}}$$

$$\frac{\rho}{\rho_0} = \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{1}{\gamma-1}}$$

Notes:

- (1) $T_0 = \text{const.}$ in adiabatic flow with no shaft work
- (2) If flow is isentropic, $p_0 = \text{const.}$ and $\rho_0 = \text{const.}$ when $T_0 = \text{const.}$

Mach number relations (see tables)

$$\frac{V}{\sqrt{c_p T_0}} = \sqrt{\gamma - 1} M \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{1}{2}}$$

$$\frac{\dot{m} \sqrt{c_p T_0}}{A p_0} = \frac{\gamma}{\sqrt{\gamma - 1}} M \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{1}{2} \left(\frac{\gamma + 1}{\gamma - 1}\right)}$$

$$\frac{\dot{m} \sqrt{c_p T_0}}{A p} = \frac{\gamma}{\sqrt{\gamma - 1}} M \left(1 + \frac{\gamma - 1}{2} M^2\right)^{\frac{1}{2}}$$

$$\frac{F}{\dot{m} \sqrt{c_p T_0}} = \frac{\sqrt{\gamma - 1}}{\gamma} \frac{1 + \gamma M^2}{M} \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{1}{2}} \quad \text{where} \quad F = (p + \rho V^2) A$$

$$\frac{\frac{1}{2} \rho V^2}{p_0} = \frac{1}{2} \gamma M^2 \left(1 + \frac{\gamma - 1}{2} M^2\right)^{-\frac{\gamma}{\gamma-1}}$$

ONE-DIMENSIONAL FLOW OF A PERFECT GAS

Isentropic flow

$$\frac{A}{A^*} = \frac{1}{M} \left\{ \frac{2}{\gamma+1} \left(1 + \frac{\gamma-1}{2} M^2 \right) \right\}^{\frac{1}{2} \left(\frac{\gamma+1}{\gamma-1} \right)}$$

Adiabatic constant area flow

$$\frac{4c_f L_{\max}}{D} = \frac{1 - M^2}{\gamma M^2} + \frac{\gamma + 1}{2\gamma} \ln \left(\frac{(\gamma + 1)M^2}{2 \left(1 + \frac{\gamma - 1}{2} M^2 \right)} \right)$$

Normal shock waves in perfect gases

$$VV_s = a^*{}^2$$

$$M_s = \left(\frac{1 + \frac{\gamma-1}{2} M^2}{\frac{\gamma M^2 - \frac{\gamma-1}{2}}{2}} \right)^{\frac{1}{2}}$$

$$\frac{p_{0s}}{p_0} = \left(\frac{\frac{\gamma+1}{2} M^2}{1 + \frac{\gamma-1}{2} M^2} \right)^{\frac{\gamma}{\gamma-1}} \left(\frac{2\gamma}{\gamma+1} M^2 - \frac{\gamma-1}{\gamma+1} \right)^{\frac{1}{1-\gamma}}$$

$$\frac{p_s}{p} = 1 + \frac{2\gamma}{\gamma+1} \left(M^2 - 1 \right)$$

$$\frac{p_{0s}}{p} = \left(\frac{\gamma+1}{2} M^2 \right)^{\frac{\gamma}{\gamma-1}} \left(\frac{2\gamma}{\gamma+1} M^2 - \frac{\gamma-1}{\gamma+1} \right)^{\frac{1}{1-\gamma}}$$

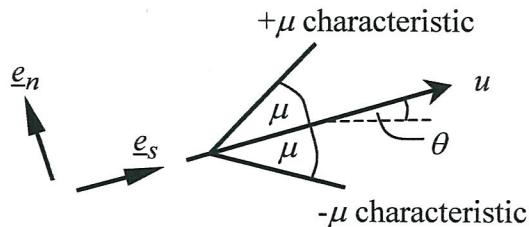
$$\frac{T_s}{T} = \frac{\gamma-1}{(\gamma+1)^2} \frac{2}{M^2} \left(1 + \frac{\gamma-1}{2} M^2 \right) \left(\frac{2\gamma}{\gamma-1} M^2 - 1 \right)$$

$$\frac{\rho_s}{\rho} = \frac{(\gamma+1)M^2}{2 \left(1 + \frac{\gamma-1}{2} M^2 \right)}$$

TWO DIMENSIONAL SUPERSONIC FLOW

Method of Characteristics for 2-D supersonic flow

Applicable to adiabatic ($h_0 = \text{constant}$), isentropic flow



Mach Number

$$M = u/c$$

Mach angle

$$\mu = \sin^{-1} \left(\frac{1}{M} \right)$$

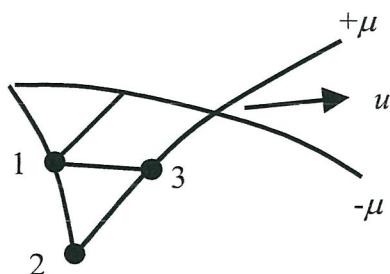
Prandtl-Meyer function

$$\nu = \int_1^M \sqrt{M^2 - 1} \frac{du}{u}$$

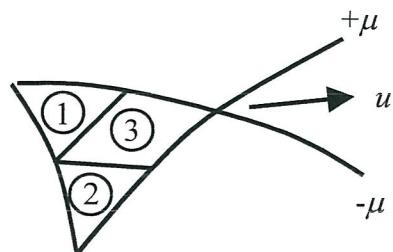
$$\nu = \sqrt{\frac{\gamma + 1}{\gamma - 1}} \tan^{-1} \sqrt{\frac{\gamma - 1}{\gamma + 1} (M^2 - 1)} - \tan^{-1} \sqrt{M^2 - 1} \quad \text{for a perfect gas}$$

Calculations

Lattice Method



Field (or wave) method



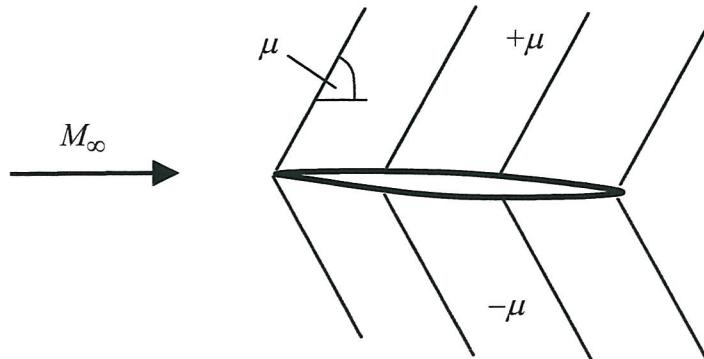
$$v_3 - \theta_3 = v_2 - \theta_2 \quad \text{along } +μ$$

$$v_3 + \theta_3 = v_1 + \theta_1 \quad \text{along } -μ$$

$$v_3 + \theta_3 = v_1 + \theta_1 \quad \text{across } +μ$$

$$v_3 - \theta_3 = v_2 - \theta_2 \quad \text{across } -μ$$

Linearised Method of Characteristics (thin film theory)

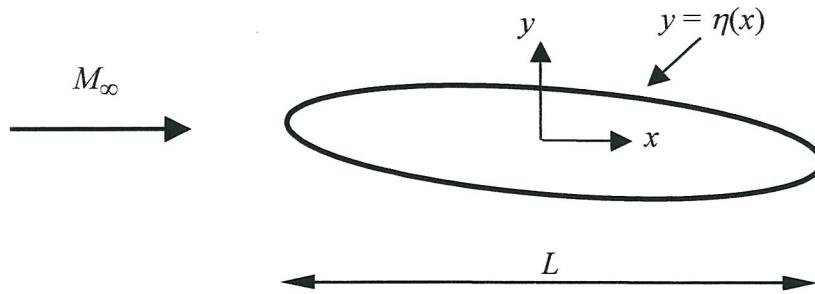


$$\mu \approx \sin^{-1}(1/M_\infty)$$

$$\Delta p \approx \pm \frac{\rho_\infty u_\infty^2 \Delta \theta}{\sqrt{M_\infty^2 - 1}} \quad \text{across } \pm \mu \text{ waves}$$

Pressure coefficient $c_p = \frac{p - p_\infty}{\frac{1}{2} \rho_\infty u_\infty^2} = \pm \frac{2\theta}{\sqrt{M_\infty^2 - 1}}$ on upper/lower surface

Prandtl-Glauert rule for linearised potential flow past geometrically similar bodies



Pressure coefficient $c_p = \frac{p - p_\infty}{\frac{1}{2} \rho_\infty u_\infty^2}$

For geometrically similar bodies with $\frac{\eta}{L} = f\left(\frac{x}{L}\right)$ and $c_p(M_\infty = 0) = c_{p0}$,

$$c_p = \frac{c_{p0}}{\sqrt{1 - M_\infty^2}} \quad \text{in subsonic flow}$$

$$c_p \propto \frac{1}{\sqrt{M_\infty^2 - 1}} \quad \text{in supersonic flow}$$

Oblique Shock Relations (see tables)

$$\frac{p_2}{p_1} = 1 + \frac{2\gamma}{\gamma+1} \left(M_1^2 \sin^2 \beta - 1 \right)$$

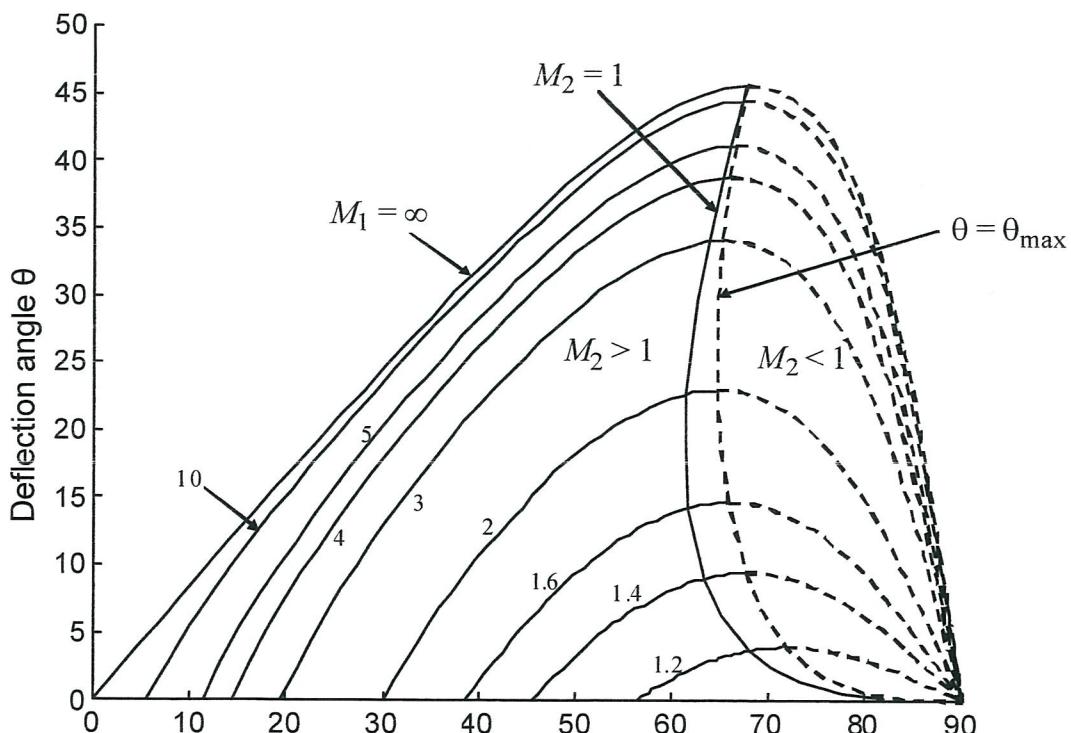
$$\frac{T_2}{T_1} = \frac{\gamma-1}{(\gamma+1)^2} \frac{2}{M_1^2 \sin^2 \beta} \left(1 + \frac{\gamma-1}{2} M_1^2 \sin^2 \beta \right) \left(\frac{2\gamma}{\gamma-1} M_1^2 \sin^2 \beta - 1 \right)$$

$$\frac{\rho_2}{\rho_1} = \frac{(\gamma+1)M_1^2 \sin^2 \beta}{2 \left[1 + \frac{\gamma-1}{2} M_1^2 \sin^2 \beta \right]}$$

$$M_2 \sin(\beta - \theta) = \left[\frac{1 + \frac{\gamma-1}{2} M_1^2 \sin^2 \beta}{\gamma M_1^2 \sin^2 \beta - \frac{\gamma-1}{2}} \right]^{\frac{1}{2}}$$

$$\frac{p_{02}}{p_{01}} = \left(\frac{\frac{\gamma+1}{2} M_1^2 \sin^2 \beta}{1 + \frac{\gamma-1}{2} M_1^2 \sin^2 \beta} \right)^{\frac{\gamma}{\gamma-1}} \left(\frac{2\gamma}{\gamma+1} M_1^2 \sin^2 \beta - \frac{\gamma-1}{\gamma+1} \right)^{\frac{1}{1-\gamma}}$$

$$\tan \theta = \frac{2 \cot \beta (M_1^2 \sin^2 \beta - 1)}{(\gamma+1)M_1^2 - 2(M_1^2 \sin^2 \beta - 1)}$$



Shock angle β

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GAS FLOW TABLES ($\gamma=1.400$): SUBSONIC FLOW

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
0.010	1.0000	0.9999	1.0000	0.0063	0.0221	0.0221	45.1813	7134.405	0.0001
0.020	0.9999	0.9997	0.9998	0.0126	0.0443	0.0443	22.5994	1778.450	0.0003
0.030	0.9998	0.9994	0.9996	0.0190	0.0664	0.0664	15.0761	787.0814	0.0006
0.040	0.9997	0.9989	0.9992	0.0253	0.0885	0.0886	11.3173	440.3522	0.0011
0.050	0.9995	0.9983	0.9988	0.0316	0.1105	0.1107	9.0644	280.0203	0.0017
0.060	0.9993	0.9975	0.9982	0.0379	0.1325	0.1329	7.5645	193.0311	0.0025
0.070	0.9990	0.9966	0.9976	0.0443	0.1545	0.1550	6.4947	140.6550	0.0034
0.080	0.9987	0.9955	0.9968	0.0506	0.1764	0.1772	5.6939	106.7182	0.0045
0.090	0.9984	0.9944	0.9960	0.0569	0.1983	0.1994	5.0723	83.4961	0.0056
0.100	0.9980	0.9930	0.9950	0.0632	0.2200	0.2216	4.5762	66.9216	0.0070
0.110	0.9976	0.9916	0.9940	0.0695	0.2417	0.2438	4.1714	54.6879	0.0084
0.120	0.9971	0.9900	0.9928	0.0758	0.2633	0.2660	3.8350	45.4080	0.0100
0.130	0.9966	0.9883	0.9916	0.0821	0.2849	0.2883	3.5513	38.2070	0.0117
0.140	0.9961	0.9864	0.9903	0.0884	0.3063	0.3105	3.3089	32.5113	0.0135
0.150	0.9955	0.9844	0.9888	0.0947	0.3276	0.3328	3.0996	27.9320	0.0155
0.160	0.9949	0.9823	0.9873	0.1009	0.3488	0.3551	2.9172	24.1978	0.0176
0.170	0.9943	0.9800	0.9857	0.1072	0.3699	0.3774	2.7569	21.1152	0.0198
0.180	0.9936	0.9776	0.9840	0.1135	0.3908	0.3997	2.6151	18.5427	0.0222
0.190	0.9928	0.9751	0.9822	0.1197	0.4116	0.4221	2.4889	16.3752	0.0246
0.200	0.9921	0.9725	0.9803	0.1260	0.4323	0.4445	2.3758	14.5333	0.0272
0.210	0.9913	0.9697	0.9783	0.1322	0.4528	0.4669	2.2740	12.9560	0.0299
0.220	0.9904	0.9668	0.9762	0.1385	0.4731	0.4893	2.1820	11.5961	0.0328
0.230	0.9895	0.9638	0.9740	0.1447	0.4933	0.5118	2.0985	10.4161	0.0357
0.240	0.9886	0.9607	0.9718	0.1509	0.5133	0.5343	2.0225	9.3865	0.0387
0.250	0.9877	0.9575	0.9694	0.1571	0.5332	0.5568	1.9530	8.4834	0.0419
0.260	0.9867	0.9541	0.9670	0.1633	0.5528	0.5794	1.8892	7.6876	0.0451
0.270	0.9856	0.9506	0.9645	0.1695	0.5723	0.6020	1.8306	6.9832	0.0485
0.280	0.9846	0.9470	0.9619	0.1757	0.5915	0.6246	1.7766	6.3572	0.0520
0.290	0.9835	0.9433	0.9592	0.1819	0.6106	0.6473	1.7267	5.7989	0.0555
0.300	0.9823	0.9395	0.9564	0.1881	0.6295	0.6700	1.6805	5.2993	0.0592
0.310	0.9811	0.9355	0.9535	0.1942	0.6481	0.6928	1.6377	4.8507	0.0629
0.320	0.9799	0.9315	0.9506	0.2003	0.6666	0.7156	1.5978	4.4467	0.0668
0.330	0.9787	0.9274	0.9476	0.2065	0.6848	0.7384	1.5608	4.0821	0.0707
0.340	0.9774	0.9231	0.9445	0.2126	0.7027	0.7613	1.5262	3.7520	0.0747
0.350	0.9761	0.9188	0.9413	0.2187	0.7205	0.7842	1.4939	3.4525	0.0788
0.360	0.9747	0.9143	0.9380	0.2248	0.7380	0.8072	1.4637	3.1801	0.0829
0.370	0.9733	0.9098	0.9347	0.2309	0.7553	0.8302	1.4354	2.9320	0.0872
0.380	0.9719	0.9052	0.9313	0.2369	0.7723	0.8532	1.4090	2.7054	0.0915
0.390	0.9705	0.9004	0.9278	0.2430	0.7891	0.8763	1.3841	2.4983	0.0959
0.400	0.9690	0.8956	0.9243	0.2490	0.8056	0.8995	1.3608	2.3085	0.1003
0.410	0.9675	0.8907	0.9207	0.2551	0.8219	0.9227	1.3388	2.1344	0.1048
0.420	0.9659	0.8857	0.9170	0.2611	0.8379	0.9460	1.3182	1.9744	0.1094
0.430	0.9643	0.8807	0.9132	0.2671	0.8536	0.9693	1.2988	1.8272	0.1140
0.440	0.9627	0.8755	0.9094	0.2730	0.8691	0.9927	1.2804	1.6915	0.1186
0.450	0.9611	0.8703	0.9055	0.2790	0.8843	1.0161	1.2632	1.5664	0.1234
0.460	0.9594	0.8650	0.9016	0.2850	0.8992	1.0396	1.2469	1.4509	0.1281
0.470	0.9577	0.8596	0.8976	0.2909	0.9138	1.0631	1.2315	1.3441	0.1329
0.480	0.9559	0.8541	0.8935	0.2968	0.9282	1.0867	1.2170	1.2453	0.1378
0.490	0.9542	0.8486	0.8894	0.3027	0.9423	1.1104	1.2033	1.1539	0.1426
0.500	0.9524	0.8430	0.8852	0.3086	0.9561	1.1341	1.1903	1.0691	0.1475

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
0.510	0.9506	0.8374	0.8809	0.3145	0.9696	1.1579	1.1781	0.9904	0.1525
0.520	0.9487	0.8317	0.8766	0.3203	0.9828	1.1818	1.1665	0.9174	0.1574
0.530	0.9468	0.8259	0.8723	0.3262	0.9958	1.2057	1.1556	0.8496	0.1624
0.540	0.9449	0.8201	0.8679	0.3320	1.0084	1.2297	1.1452	0.7866	0.1674
0.550	0.9430	0.8142	0.8634	0.3378	1.0208	1.2538	1.1354	0.7281	0.1724
0.560	0.9410	0.8082	0.8589	0.3436	1.0328	1.2779	1.1261	0.6736	0.1774
0.570	0.9390	0.8022	0.8544	0.3493	1.0446	1.3021	1.1173	0.6229	0.1825
0.580	0.9370	0.7962	0.8498	0.3551	1.0561	1.3264	1.1090	0.5757	0.1875
0.590	0.9349	0.7901	0.8451	0.3608	1.0672	1.3507	1.1011	0.5317	0.1925
0.600	0.9328	0.7840	0.8405	0.3665	1.0781	1.3751	1.0937	0.4908	0.1976
0.610	0.9307	0.7778	0.8357	0.3722	1.0887	1.3996	1.0867	0.4527	0.2026
0.620	0.9286	0.7716	0.8310	0.3779	1.0990	1.4242	1.0800	0.4172	0.2076
0.630	0.9265	0.7654	0.8262	0.3835	1.1090	1.4489	1.0737	0.3841	0.2127
0.640	0.9243	0.7591	0.8213	0.3891	1.1186	1.4736	1.0678	0.3533	0.2177
0.650	0.9221	0.7528	0.8164	0.3948	1.1280	1.4984	1.0621	0.3246	0.2226
0.660	0.9199	0.7465	0.8115	0.4003	1.1371	1.5233	1.0568	0.2979	0.2276
0.670	0.9176	0.7401	0.8066	0.4059	1.1459	1.5483	1.0518	0.2730	0.2326
0.680	0.9153	0.7338	0.8016	0.4115	1.1544	1.5733	1.0471	0.2498	0.2375
0.690	0.9131	0.7274	0.7966	0.4170	1.1626	1.5984	1.0426	0.2282	0.2424
0.700	0.9107	0.7209	0.7916	0.4225	1.1705	1.6237	1.0384	0.2081	0.2473
0.710	0.9084	0.7145	0.7865	0.4280	1.1782	1.6490	1.0344	0.1895	0.2521
0.720	0.9061	0.7080	0.7814	0.4335	1.1855	1.6744	1.0307	0.1721	0.2569
0.730	0.9037	0.7016	0.7763	0.4389	1.1925	1.6999	1.0272	0.1561	0.2617
0.740	0.9013	0.6951	0.7712	0.4443	1.1993	1.7254	1.0239	0.1411	0.2664
0.750	0.8989	0.6886	0.7660	0.4497	1.2058	1.7511	1.0208	0.1273	0.2711
0.760	0.8964	0.6821	0.7609	0.4551	1.2119	1.7768	1.0179	0.1145	0.2758
0.770	0.8940	0.6756	0.7557	0.4605	1.2178	1.8027	1.0152	0.1026	0.2804
0.780	0.8915	0.6691	0.7505	0.4658	1.2234	1.8286	1.0126	0.0917	0.2849
0.790	0.8890	0.6625	0.7452	0.4711	1.2288	1.8547	1.0103	0.0816	0.2894
0.800	0.8865	0.6560	0.7400	0.4764	1.2338	1.8808	1.0081	0.0723	0.2939
0.810	0.8840	0.6495	0.7347	0.4817	1.2386	1.9070	1.0060	0.0638	0.2983
0.820	0.8815	0.6430	0.7295	0.4869	1.2431	1.9333	1.0041	0.0559	0.3026
0.830	0.8789	0.6365	0.7242	0.4921	1.2474	1.9598	1.0024	0.0488	0.3069
0.840	0.8763	0.6300	0.7189	0.4973	1.2514	1.9863	1.0008	0.0423	0.3112
0.850	0.8737	0.6235	0.7136	0.5025	1.2551	2.0129	0.9993	0.0363	0.3153
0.860	0.8711	0.6170	0.7083	0.5077	1.2585	2.0396	0.9979	0.0310	0.3195
0.870	0.8685	0.6106	0.7030	0.5128	1.2617	2.0665	0.9967	0.0261	0.3235
0.880	0.8659	0.6041	0.6977	0.5179	1.2646	2.0934	0.9956	0.0218	0.3275
0.890	0.8632	0.5977	0.6924	0.5230	1.2673	2.1204	0.9946	0.0179	0.3314
0.900	0.8606	0.5913	0.6870	0.5280	1.2698	2.1476	0.9937	0.0145	0.3352
0.910	0.8579	0.5849	0.6817	0.5331	1.2719	2.1748	0.9929	0.0115	0.3390
0.920	0.8552	0.5785	0.6764	0.5381	1.2739	2.2021	0.9922	0.0089	0.3427
0.930	0.8525	0.5721	0.6711	0.5431	1.2756	2.2296	0.9916	0.0067	0.3464
0.940	0.8498	0.5658	0.6658	0.5481	1.2770	2.2572	0.9911	0.0048	0.3499
0.950	0.8471	0.5595	0.6604	0.5530	1.2783	2.2848	0.9907	0.0033	0.3534
0.960	0.8444	0.5532	0.6551	0.5579	1.2793	2.3126	0.9903	0.0021	0.3569
0.970	0.8416	0.5469	0.6498	0.5628	1.2800	2.3405	0.9901	0.0011	0.3602
0.980	0.8389	0.5407	0.6445	0.5677	1.2806	2.3685	0.9899	0.0005	0.3635
0.990	0.8361	0.5345	0.6392	0.5725	1.2809	2.3966	0.9898	0.0001	0.3667
1.000	0.8333	0.5283	0.6339	0.5774	1.2810	2.4249	0.9897	0.0000	0.3698

GAS FLOW TABLES ($\gamma=1.400$): SUPERSONIC FLOW

M	$\frac{T}{T_0}$	$\frac{\rho}{\rho_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{A p_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{A p}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4 c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
								$\frac{4 c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$							
1.010	0.8306	0.52221	0.6287	0.5821	1.2809	2.4532	0.9898	0.0001	0.3728	0.9901	1.0000	1.0235	1.9152	1.0066	0.04	1.010
1.020	0.8278	0.5160	0.6234	0.5869	1.2806	2.4817	0.9899	0.0005	0.3758	0.9805	1.0000	1.0471	1.9379	1.0132	0.13	1.020
1.030	0.8250	0.5099	0.6181	0.5917	1.2801	2.5103	0.9900	0.0010	0.3787	0.9712	1.0000	1.0711	1.9610	1.0198	0.23	1.030
1.040	0.8222	0.5039	0.6129	0.5964	1.2793	2.5390	0.9903	0.0018	0.3815	0.9620	0.9999	1.0952	1.9844	1.0263	0.35	1.040
1.050	0.8193	0.4979	0.6077	0.6011	1.2784	2.5678	0.9905	0.0027	0.3842	0.9531	0.9999	1.1196	2.0083	1.0328	0.49	1.050
1.060	0.8165	0.4919	0.6024	0.6058	1.2773	2.5967	0.9909	0.0038	0.3869	0.9444	0.9998	1.1442	2.0325	1.0393	0.64	1.060
1.070	0.8137	0.4860	0.5972	0.6104	1.2760	2.6258	0.9913	0.0051	0.3895	0.9360	0.9996	1.1691	2.0570	1.0458	0.80	1.070
1.080	0.8108	0.4800	0.5920	0.6151	1.2745	2.6549	0.9917	0.0066	0.3919	0.9277	0.9994	1.1941	2.0819	1.0522	0.97	1.080
1.090	0.8080	0.4742	0.5869	0.6197	1.2728	2.6842	0.9922	0.0082	0.3944	0.9196	0.9992	1.2195	2.1072	1.0586	1.15	1.090
1.100	0.8052	0.4684	0.5817	0.6243	1.2709	2.7136	0.9928	0.0099	0.3967	0.9118	0.9989	1.2450	2.1328	1.0649	1.34	1.100
1.110	0.8023	0.4626	0.5766	0.6288	1.2689	2.7432	0.9934	0.0118	0.3990	0.9041	0.9996	1.2708	2.1588	1.0713	1.53	1.110
1.120	0.7994	0.4568	0.5714	0.6333	1.2667	2.7728	0.9940	0.0138	0.4011	0.8966	0.9982	1.2968	2.1851	1.0776	1.74	1.120
1.130	0.7966	0.4511	0.5663	0.6379	1.2643	2.8026	0.9947	0.0159	0.4032	0.8892	0.9978	1.3231	2.2118	1.0840	1.94	1.130
1.140	0.7937	0.4455	0.5612	0.6423	1.2618	2.8325	0.9954	0.0182	0.4052	0.8820	0.9973	1.3495	2.2388	1.0903	2.16	1.140
1.150	0.7908	0.4398	0.5562	0.6468	1.2590	2.8626	0.9961	0.0205	0.4072	0.8750	0.9967	1.3763	2.2661	1.0966	2.38	1.150
1.160	0.7879	0.4343	0.5511	0.6512	1.2562	2.8927	0.9969	0.0230	0.4090	0.8682	0.9961	1.4032	2.2937	1.1029	2.61	1.160
1.170	0.7851	0.4287	0.5461	0.6556	1.2531	2.9230	0.9978	0.0255	0.4108	0.8615	0.9953	1.4304	2.3217	1.1092	2.84	1.170
1.180	0.7822	0.4232	0.5411	0.6600	1.2500	2.9534	0.9986	0.0281	0.4125	0.8549	0.9946	1.4578	2.3500	1.1154	3.07	1.180
1.190	0.7793	0.4178	0.5361	0.6644	1.2466	2.9840	0.9995	0.0309	0.4141	0.8485	0.9937	1.4855	2.3786	1.1217	3.31	1.190
1.200	0.7764	0.4124	0.5311	0.6687	1.2432	3.0147	1.0004	0.0336	0.4157	0.8422	0.9928	1.5133	2.4075	1.1280	3.56	1.200
1.210	0.7735	0.4070	0.5252	0.6730	1.2396	3.0455	1.0014	0.0365	0.4171	0.8360	0.9918	1.5415	2.4367	1.1343	3.81	1.210
1.220	0.7706	0.4017	0.5213	0.6773	1.2358	3.0764	1.0024	0.0394	0.4185	0.8300	0.9907	1.5698	2.4663	1.1405	4.06	1.220
1.230	0.7677	0.3964	0.5164	0.6816	1.2319	3.1075	1.0034	0.0424	0.4198	0.8241	0.9896	1.5984	2.4961	1.1468	4.31	1.230
1.240	0.7648	0.3912	0.5115	0.6858	1.2279	3.1387	1.0045	0.0455	0.4211	0.8183	0.9884	1.6272	2.5263	1.1531	4.57	1.240
1.250	0.7619	0.3861	0.5067	0.6901	1.2238	3.1700	1.0055	0.0486	0.4223	0.8126	0.9871	1.6563	2.5568	1.1594	4.83	1.250

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{\rho}{\rho_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m}}{\dot{m} \sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2}\rho V^2}{p_0}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
1.260	0.7590	0.3809	0.5019	0.6943	1.2195	3.2015	1.0066	0.0517	0.4233	0.8071	0.9857	1.6855	2.5875	1.1657	5.09	1.260
1.270	0.7561	0.3759	0.4971	0.6984	1.2152	3.2331	1.0077	0.0549	0.4244	0.8016	0.9842	1.7151	2.6186	1.1720	5.36	1.270
1.280	0.7532	0.3708	0.4923	0.7026	1.2107	3.2648	1.0089	0.0582	0.4253	0.7963	0.9827	1.7448	2.6500	1.1783	5.63	1.280
1.290	0.7503	0.3658	0.4876	0.7067	1.2061	3.2967	1.0100	0.0615	0.4262	0.7911	0.9811	1.7748	2.6816	1.1846	5.90	1.290
1.300	0.7474	0.3609	0.4829	0.7108	1.2014	3.3287	1.0112	0.0648	0.4270	0.7860	0.9794	1.8050	2.7136	1.1909	6.17	1.300
1.310	0.7445	0.3560	0.4782	0.7149	1.1955	3.3608	1.0124	0.0682	0.4277	0.7809	0.9776	1.8355	2.7459	1.1972	6.44	1.310
1.320	0.7416	0.3512	0.4736	0.7189	1.1916	3.3931	1.0136	0.0716	0.4283	0.7760	0.9758	1.8661	2.7784	1.2035	6.72	1.320
1.330	0.7387	0.3464	0.4690	0.7229	1.1866	3.4255	1.0149	0.0750	0.4289	0.7712	0.9738	1.8971	2.8112	1.2099	7.00	1.330
1.340	0.7358	0.3417	0.4644	0.7270	1.1815	3.4581	1.0161	0.0785	0.4294	0.7664	0.9718	1.9282	2.8444	1.2162	7.28	1.340
1.350	0.7329	0.3370	0.4598	0.7309	1.1763	3.4907	1.0174	0.0820	0.4299	0.7618	0.9697	1.9596	2.8778	1.2226	7.56	1.350
1.360	0.7300	0.3323	0.4553	0.7349	1.1710	3.5236	1.0187	0.0855	0.4303	0.7572	0.9676	1.9912	2.9115	1.2290	7.84	1.360
1.370	0.7271	0.3277	0.4508	0.7388	1.1656	3.5566	1.0200	0.0890	0.4306	0.7527	0.9653	2.0231	2.9455	1.2354	8.13	1.370
1.380	0.7242	0.3232	0.4463	0.7427	1.1601	3.5897	1.0213	0.0926	0.4308	0.7483	0.9630	2.0551	2.9798	1.2418	8.41	1.380
1.390	0.7213	0.3187	0.4418	0.7466	1.1546	3.6229	1.0226	0.0962	0.4310	0.7440	0.9607	2.0875	3.0144	1.2482	8.70	1.390
1.400	0.7184	0.3142	0.4374	0.7505	1.1490	3.6563	1.0240	0.0997	0.4311	0.7397	0.9582	2.1200	3.0492	1.2547	8.99	1.400
1.410	0.7155	0.3098	0.4330	0.7543	1.1433	3.6899	1.0253	0.1033	0.4312	0.7355	0.9557	2.1528	3.0844	1.2612	9.28	1.410
1.420	0.7126	0.3055	0.4287	0.7581	1.1375	3.7236	1.0267	0.1069	0.4312	0.7314	0.9531	2.1858	3.1198	1.2676	9.57	1.420
1.430	0.7097	0.3012	0.4244	0.7619	1.1317	3.7574	1.0281	0.1106	0.4311	0.7274	0.9504	2.2191	3.1555	1.2741	9.86	1.430
1.440	0.7069	0.2969	0.4201	0.7657	1.1258	3.7914	1.0295	0.1142	0.4310	0.7235	0.9476	2.2525	3.1915	1.2807	10.15	1.440
1.450	0.7040	0.2927	0.4158	0.7694	1.1198	3.8255	1.0308	0.1178	0.4308	0.7196	0.9448	2.2863	3.2278	1.2872	10.44	1.450
1.460	0.7011	0.2886	0.4116	0.7732	1.1138	3.8598	1.0323	0.1215	0.4306	0.7157	0.9420	2.3202	3.2643	1.2938	10.73	1.460
1.470	0.6982	0.2845	0.4074	0.7769	1.1077	3.8942	1.0337	0.1251	0.4303	0.7120	0.9390	2.3544	3.3011	1.3003	11.02	1.470
1.480	0.6954	0.2804	0.4032	0.7805	1.1016	3.9287	1.0351	0.1288	0.4299	0.7083	0.9360	2.3888	3.3382	1.3069	11.32	1.480
1.490	0.6925	0.2764	0.3991	0.7842	1.0954	3.9634	1.0365	0.1324	0.4295	0.7047	0.9329	2.4235	3.3756	1.3136	11.61	1.490
1.500	0.6897	0.2724	0.3950	0.7878	1.0891	3.9983	1.0379	0.1361	0.4290	0.7011	0.9298	2.4583	3.4133	1.3202	11.91	1.500

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2}\rho V^2}{p_0}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
1.510	0.6868	0.26885	0.3909	0.7914	1.0829	4.0333	0.1397	0.4285	0.6976	0.9266	2.4935	3.4512	1.3269	12.20	1.510	
1.520	0.6840	0.26466	0.3869	0.7950	1.0765	4.0684	1.0408	0.1433	0.4279	0.6941	0.9233	2.5288	3.4894	1.3336	12.49	1.520
1.530	0.6811	0.26083	0.3829	0.7986	1.0702	4.1037	1.0423	0.1470	0.4273	0.6907	0.9200	2.5644	3.5279	1.3403	12.79	1.530
1.540	0.6783	0.2570	0.3789	0.8021	1.0638	4.1392	1.0437	0.1506	0.4266	0.6874	0.9166	2.6002	3.5667	1.3470	13.09	1.540
1.550	0.6754	0.25333	0.3750	0.8057	1.0573	4.1748	1.0452	0.1543	0.4259	0.6841	0.9132	2.6363	3.6057	1.3538	13.38	1.550
1.560	0.6726	0.2496	0.3710	0.8092	1.0508	4.2105	1.0467	0.1579	0.4252	0.6809	0.9097	2.6725	3.6450	1.3606	13.68	1.560
1.570	0.6698	0.2459	0.3672	0.8126	1.0443	4.2464	1.0481	0.1615	0.4243	0.6777	0.9062	2.7091	3.6846	1.3674	13.97	1.570
1.580	0.6670	0.2423	0.3633	0.8161	1.0378	4.2825	1.0496	0.1651	0.4235	0.6746	0.9026	2.7458	3.7244	1.3742	14.27	1.580
1.590	0.6642	0.2388	0.3595	0.8195	1.0312	4.3187	1.0511	0.1688	0.4226	0.6715	0.8989	2.7828	3.7646	1.3811	14.56	1.590
1.600	0.6614	0.2353	0.3557	0.8230	1.0246	4.3551	1.0526	0.1724	0.4216	0.6684	0.8952	2.8200	3.8050	1.3880	14.86	1.600
1.610	0.6586	0.2318	0.3520	0.8263	1.0180	4.3916	1.0541	0.1760	0.4206	0.6655	0.8915	2.8575	3.8456	1.3949	15.16	1.610
1.620	0.6558	0.2284	0.3483	0.8297	1.0114	4.4282	1.0555	0.1795	0.4196	0.6625	0.8877	2.8951	3.8866	1.4018	15.45	1.620
1.630	0.6530	0.2250	0.3446	0.8331	1.0047	4.4651	1.0570	0.1831	0.4185	0.6596	0.8838	2.9331	3.9278	1.4088	15.75	1.630
1.640	0.6502	0.2217	0.3409	0.8364	0.9980	4.5020	1.0585	0.1867	0.4174	0.6568	0.8799	2.9712	3.9693	1.4158	16.04	1.640
1.650	0.6475	0.2184	0.3373	0.8397	0.9913	4.5392	1.0600	0.1902	0.4162	0.6540	0.8760	3.0096	4.0110	1.4228	16.34	1.650
1.660	0.6447	0.2151	0.3337	0.8430	0.9846	4.5765	1.0615	0.1938	0.4150	0.6512	0.8720	3.0482	4.0531	1.4299	16.63	1.660
1.670	0.6419	0.2119	0.3302	0.8462	0.9779	4.6139	1.0630	0.1973	0.4138	0.6485	0.8690	3.0871	4.0953	1.4369	16.93	1.670
1.680	0.6392	0.2088	0.3266	0.8495	0.9712	4.6515	1.0645	0.2008	0.4125	0.6458	0.8639	3.1261	4.1379	1.4440	17.22	1.680
1.690	0.6364	0.2057	0.3232	0.8527	0.9644	4.6892	1.0660	0.2043	0.4112	0.6431	0.8599	3.1655	4.1807	1.4512	17.52	1.690
1.700	0.6337	0.2026	0.3197	0.8559	0.9577	4.7272	1.0674	0.2078	0.4098	0.6405	0.8557	3.2050	4.2238	1.4583	17.81	1.700
1.710	0.6310	0.1996	0.3163	0.8591	0.9509	4.7652	1.0689	0.2113	0.4085	0.6380	0.8516	3.2448	4.2672	1.4655	18.10	1.710
1.720	0.6283	0.1966	0.3129	0.8622	0.9442	4.8035	1.0704	0.2147	0.4071	0.6355	0.8474	3.2848	4.3108	1.4727	18.40	1.720
1.730	0.6256	0.1936	0.3095	0.8654	0.9374	4.8418	1.0719	0.2182	0.4056	0.6330	0.8431	3.3251	4.3547	1.4800	18.69	1.730
1.740	0.6229	0.1907	0.3062	0.8685	0.9307	4.8804	1.0734	0.2216	0.4041	0.6305	0.8389	3.3655	4.3989	1.4873	18.98	1.740
1.750	0.6202	0.1878	0.3029	0.8716	0.9239	4.9191	1.0749	0.2250	0.4026	0.6281	0.8346	3.4063	4.4433	1.4946	19.27	1.750

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{\rho}{\rho_0}$	$\frac{\rho}{\sqrt{c_p T_0}}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap \sqrt{c_p T_0}}$	$\frac{F}{D}$	$\frac{4c_f L_{\max}}{2 \rho V^2}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	v	M	
1.760	0.6175	0.1850	0.2996	0.8747	0.9172	4.9580	1.0764	0.2284	0.4011	0.6257	0.8302	3.4472	4.4880	1.5019	19.56	1.760
1.770	0.6148	0.1822	0.2964	0.8777	0.9104	4.9970	1.0779	0.2318	0.3996	0.6234	0.8259	3.4884	4.5330	1.5093	19.86	1.770
1.780	0.6121	0.1794	0.2931	0.8808	0.9037	5.0362	1.0793	0.2352	0.3980	0.6210	0.8215	3.5298	4.5782	1.5167	20.15	1.780
1.790	0.6095	0.1767	0.2900	0.8838	0.8970	5.0755	1.0808	0.2385	0.3964	0.6188	0.8171	3.5715	4.6237	1.5241	20.44	1.790
1.800	0.6068	0.1740	0.2868	0.8868	0.8902	5.1150	1.0823	0.2419	0.3947	0.6165	0.8127	3.6133	4.6695	1.5316	20.73	1.800
1.810	0.6041	0.1714	0.2837	0.8898	0.8835	5.1547	1.0838	0.2452	0.3931	0.6143	0.8082	3.6555	4.7155	1.5391	21.01	1.810
1.820	0.6015	0.1688	0.2806	0.8927	0.8768	5.1945	1.0852	0.2485	0.3914	0.6121	0.8038	3.6978	4.7618	1.5466	21.30	1.820
1.830	0.5989	0.1662	0.2776	0.8957	0.8701	5.2345	1.0867	0.2518	0.3897	0.6099	0.7993	3.7404	4.8084	1.5541	21.59	1.830
1.840	0.5963	0.1637	0.2745	0.8986	0.8634	5.2747	1.0882	0.2551	0.3879	0.6078	0.7948	3.7832	4.8552	1.5617	21.88	1.840
1.850	0.5936	0.1612	0.2715	0.9015	0.8568	5.3150	1.0896	0.2583	0.3862	0.6057	0.7902	3.8263	4.9023	1.5693	22.16	1.850
1.860	0.5910	0.1587	0.2686	0.9044	0.8501	5.3555	1.0911	0.2616	0.3844	0.6036	0.7857	3.8695	4.9497	1.5770	22.45	1.860
1.870	0.5884	0.1563	0.2656	0.9072	0.8435	5.3962	1.0926	0.2648	0.3826	0.6016	0.7811	3.9131	4.9973	1.5847	22.73	1.870
1.880	0.5859	0.1539	0.2627	0.9101	0.8368	5.4370	1.0940	0.2680	0.3808	0.5996	0.7765	3.9568	5.0452	1.5924	23.02	1.880
1.890	0.5833	0.1516	0.2598	0.9129	0.8302	5.4780	1.0955	0.2712	0.3790	0.5976	0.7720	4.0008	5.0934	1.6001	23.30	1.890
1.900	0.5807	0.1492	0.2570	0.9157	0.8237	5.5191	1.0969	0.2743	0.3771	0.5956	0.7674	4.0450	5.1418	1.6079	23.59	1.900
1.910	0.5782	0.1470	0.2542	0.9185	0.8171	5.5604	1.0984	0.2775	0.3753	0.5937	0.7627	4.0895	5.1905	1.6157	23.87	1.910
1.920	0.5756	0.1447	0.2514	0.9213	0.8106	5.6019	1.0998	0.2806	0.3734	0.5918	0.7581	4.1341	5.2394	1.6236	24.15	1.920
1.930	0.5731	0.1425	0.2486	0.9240	0.8041	5.6435	1.1012	0.2837	0.3715	0.5899	0.7535	4.1791	5.2886	1.6314	24.43	1.930
1.940	0.5705	0.1403	0.2459	0.9268	0.7976	5.6853	1.1027	0.2868	0.3696	0.5880	0.7488	4.2242	5.3381	1.6394	24.71	1.940
1.950	0.5680	0.1381	0.2432	0.9295	0.7911	5.7273	1.1041	0.2899	0.3677	0.5862	0.7442	4.2696	5.3878	1.6473	24.99	1.950
1.960	0.5655	0.1360	0.2405	0.9322	0.7846	5.7695	1.1055	0.2929	0.3657	0.5844	0.7395	4.3152	5.4378	1.6553	25.27	1.960
1.970	0.5630	0.1339	0.2378	0.9349	0.7782	5.8118	1.1069	0.2960	0.3638	0.5826	0.7349	4.3611	5.4881	1.6633	25.55	1.970
1.980	0.5605	0.1318	0.2352	0.9375	0.7718	5.8542	1.1084	0.2990	0.3618	0.5808	0.7302	4.4071	5.5386	1.6713	25.83	1.980
1.990	0.5580	0.1298	0.2326	0.9402	0.7655	5.8969	1.1098	0.3020	0.3598	0.5791	0.7255	4.4535	5.5894	1.6794	26.10	1.990
2.000	0.5556	0.1278	0.2300	0.9428	0.7591	5.9397	1.1112	0.3050	0.3579	0.5774	0.7209	4.5000	5.6404	1.6875	26.38	2.000

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{4p_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{1}{2} \rho V^2$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
											$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
2.010	0.5531	0.1258	0.2275	0.9454	0.7528	5.9827	1.1126	0.3080	0.3559	0.5757	0.7162	4.5468	5.6918	1.6956	26.66	2.010
2.020	0.5506	0.1239	0.2250	0.9480	0.7465	6.0258	1.1140	0.3109	0.3539	0.5740	0.7115	4.5938	5.7433	1.7038	26.93	2.020
2.030	0.5482	0.1220	0.2225	0.9506	0.7403	6.0692	1.1154	0.3138	0.3518	0.5723	0.7069	4.6411	5.7952	1.7120	27.20	2.030
2.040	0.5458	0.1201	0.2200	0.9531	0.7340	6.1126	1.1167	0.3168	0.3498	0.5707	0.7022	4.6885	5.8473	1.7203	27.48	2.040
2.050	0.5433	0.1182	0.2176	0.9557	0.7279	6.1563	1.1181	0.3197	0.3478	0.5691	0.6975	4.7363	5.8996	1.7285	27.75	2.050
2.060	0.5409	0.1164	0.2152	0.9582	0.7217	6.2001	1.1195	0.3225	0.3458	0.5675	0.6928	4.7842	5.9523	1.7369	28.02	2.060
2.070	0.5385	0.1146	0.2128	0.9607	0.7156	6.2441	1.1209	0.3254	0.3437	0.5659	0.6882	4.8324	6.0051	1.7452	28.29	2.070
2.080	0.5361	0.1128	0.2104	0.9632	0.7095	6.2883	1.1222	0.3282	0.3417	0.5643	0.6835	4.8808	6.0583	1.7536	28.56	2.080
2.090	0.5337	0.1111	0.2081	0.9657	0.7034	6.3326	1.1236	0.3310	0.3396	0.5628	0.6789	4.9295	6.1117	1.7620	28.83	2.090
2.100	0.5313	0.1094	0.2058	0.9681	0.6974	6.3772	1.1250	0.3339	0.3376	0.5613	0.6742	4.9783	6.1654	1.7705	29.10	2.100
2.110	0.5290	0.1077	0.2035	0.9706	0.6914	6.4218	1.1263	0.3366	0.3355	0.5598	0.6696	5.0275	6.2193	1.7789	29.36	2.110
2.120	0.5266	0.1060	0.2013	0.9730	0.6854	6.4667	1.1276	0.3394	0.3334	0.5583	0.6649	5.0768	6.2735	1.7875	29.63	2.120
2.130	0.5243	0.1043	0.1990	0.9754	0.6795	6.5117	1.1290	0.3422	0.3314	0.5568	0.6603	5.1264	6.3280	1.7960	29.90	2.130
2.140	0.5219	0.1027	0.1968	0.9778	0.6736	6.5569	1.1303	0.3449	0.3293	0.5554	0.6557	5.1762	6.3827	1.8046	30.16	2.140
2.150	0.5196	0.1011	0.1946	0.9802	0.6677	6.6023	1.1317	0.3476	0.3272	0.5540	0.6511	5.2263	6.4377	1.8132	30.43	2.150
2.160	0.5173	0.0996	0.1925	0.9825	0.6619	6.6478	1.1330	0.3503	0.3252	0.5525	0.6464	5.2765	6.4929	1.8219	30.69	2.160
2.170	0.5150	0.0980	0.1903	0.9849	0.6561	6.6936	1.1343	0.3530	0.3231	0.5511	0.6419	5.3271	6.5484	1.8306	30.95	2.170
2.180	0.5127	0.0965	0.1882	0.9872	0.6503	6.7395	1.1356	0.3556	0.3210	0.5498	0.6373	5.3778	6.6042	1.8393	31.21	2.180
2.190	0.5104	0.0950	0.1861	0.9895	0.6446	6.7855	1.1369	0.3583	0.3189	0.5484	0.6327	5.4288	6.6602	1.8481	31.47	2.190
2.200	0.5081	0.0935	0.1841	0.9918	0.6389	6.8318	1.1382	0.3609	0.3169	0.5471	0.6281	5.4800	6.7165	1.8569	31.73	2.200
2.210	0.5059	0.0921	0.1820	0.9941	0.6333	6.8782	1.1395	0.3635	0.3148	0.5457	0.6236	5.5315	6.7730	1.8657	31.99	2.210
2.220	0.5036	0.0906	0.1800	0.9964	0.6277	6.9248	1.1408	0.3661	0.3127	0.5444	0.6191	5.5831	6.8298	1.8746	32.25	2.220
2.230	0.5014	0.0892	0.1780	0.9986	0.6221	6.9715	1.1421	0.3687	0.3106	0.5431	0.6145	5.6351	6.8869	1.8835	32.51	2.230
2.240	0.4991	0.0878	0.1760	1.0009	0.6165	7.0185	1.1434	0.3712	0.3085	0.5418	0.6100	5.6872	6.9442	1.8924	32.76	2.240
2.250	0.4969	0.0865	0.1740	1.0031	0.6110	7.0656	1.1446	0.3738	0.3065	0.5406	0.6055	5.7396	7.0018	1.9014	33.02	2.250

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{\dot{m} \sqrt{c_p T_0}}$	$\frac{F}{D}$	$\frac{4c_f L_{\max}}{2\rho V^2}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M	
2.260	0.4947	0.0851	0.1721	1.0053	0.6056	7.1129	1.1459	0.3763	0.3044	0.5393	0.6011	5.7922	7.0597	1.9104	33.27	2.260
2.270	0.4925	0.0838	0.1702	1.0075	0.6002	7.1603	1.1472	0.3788	0.3023	0.5381	0.5966	5.8451	7.1178	1.9194	33.53	2.270
2.280	0.4903	0.0825	0.1683	1.0097	0.5948	7.2080	1.1484	0.3813	0.3003	0.5368	0.5921	5.8981	7.1762	1.9285	33.78	2.280
2.290	0.4881	0.0812	0.1664	1.0118	0.5894	7.2558	1.1497	0.3838	0.2982	0.5356	0.5877	5.9515	7.2348	1.9376	34.03	2.290
2.300	0.4859	0.0800	0.1646	1.0140	0.5841	7.3038	1.1509	0.3862	0.2961	0.5344	0.5833	6.0050	7.2937	1.9468	34.28	2.300
2.310	0.4837	0.0787	0.1628	1.0161	0.5788	7.3520	1.1521	0.3887	0.2941	0.5332	0.5789	6.0588	7.3528	1.9560	34.53	2.310
2.320	0.4816	0.0775	0.1609	1.0182	0.5736	7.4003	1.1534	0.3911	0.2920	0.5321	0.5745	6.1128	7.4122	1.9652	34.78	2.320
2.330	0.4794	0.0763	0.1592	1.0204	0.5684	7.4488	1.1546	0.3935	0.2900	0.5309	0.5702	6.1671	7.4719	1.9745	35.03	2.330
2.340	0.4773	0.0751	0.1574	1.0224	0.5632	7.4975	1.1558	0.3959	0.2879	0.5297	0.5658	6.2215	7.5319	1.9838	35.28	2.340
2.350	0.4752	0.0740	0.1556	1.0245	0.5581	7.5464	1.1570	0.3983	0.2859	0.5286	0.5615	6.2763	7.5920	1.9931	35.53	2.350
2.360	0.4731	0.0728	0.1539	1.0266	0.5530	7.5955	1.1582	0.4006	0.2839	0.5275	0.5572	6.3312	7.6525	2.0025	35.77	2.360
2.370	0.4709	0.0717	0.1522	1.0286	0.5480	7.6447	1.1595	0.4030	0.2818	0.5264	0.5529	6.3864	7.7132	2.0119	36.02	2.370
2.380	0.4688	0.0706	0.1505	1.0307	0.5430	7.6941	1.1606	0.4053	0.2798	0.5253	0.5486	6.4418	7.7742	2.0213	36.26	2.380
2.390	0.4668	0.0695	0.1488	1.0327	0.5380	7.7437	1.1618	0.4076	0.2778	0.5242	0.5444	6.4975	7.8354	2.0308	36.50	2.390
2.400	0.4647	0.0684	0.1472	1.0347	0.5331	7.7935	1.1630	0.4099	0.2758	0.5231	0.5401	6.5533	7.8969	2.0403	36.75	2.400
2.410	0.4626	0.0673	0.1456	1.0367	0.5282	7.8434	1.1642	0.4122	0.2738	0.5221	0.5359	6.6095	7.9587	2.0499	36.99	2.410
2.420	0.4606	0.0663	0.1439	1.0387	0.5233	7.8935	1.1654	0.4144	0.2718	0.5210	0.5317	6.6658	8.0207	2.0595	37.23	2.420
2.430	0.4585	0.0653	0.1424	1.0407	0.5185	7.9438	1.1665	0.4167	0.2698	0.5200	0.5276	6.7224	8.0830	2.0691	37.47	2.430
2.440	0.4565	0.0643	0.1408	1.0426	0.5137	7.9943	1.1677	0.4189	0.2678	0.5189	0.5234	6.7792	8.1455	2.0788	37.71	2.440
2.450	0.4544	0.0633	0.1392	1.0446	0.5090	8.0450	1.1689	0.4211	0.2658	0.5179	0.5193	6.8363	8.2083	2.0885	37.95	2.450
2.460	0.4524	0.0623	0.1377	1.0465	0.5043	8.0958	1.1700	0.4233	0.2639	0.5169	0.5152	6.8935	8.2713	2.0982	38.18	2.460
2.470	0.4504	0.0613	0.1362	1.0484	0.4996	8.1468	1.1712	0.4255	0.2619	0.5159	0.5111	6.9511	8.3346	2.1080	38.42	2.470
2.480	0.4484	0.0604	0.1346	1.0503	0.4950	8.1980	1.1723	0.4277	0.2599	0.5149	0.5071	7.0088	8.3982	2.1178	38.66	2.480
2.490	0.4464	0.0594	0.1332	1.0522	0.4904	8.2494	1.1734	0.4298	0.2580	0.5140	0.5030	7.0668	8.4620	2.1276	38.89	2.490
2.500	0.4444	0.0585	0.1317	1.0541	0.4858	8.3010	1.1746	0.4320	0.2561	0.5130	0.4990	7.1250	8.5261	2.1375	39.12	2.500

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{1}{2} \rho V^2}{p_0}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M
2.510	0.4425	0.0576	0.1302	1.0560	0.4813	8.3527	1.1757	0.4341	0.2541	0.5120	0.4950	7.1835	8.5905	2.1474	39.36	2.510
2.520	0.4405	0.0567	0.1288	1.0578	0.4768	8.4046	1.1768	0.4362	0.2522	0.5111	0.4911	7.2421	8.6551	2.1574	39.59	2.520
2.530	0.4386	0.0559	0.1274	1.0597	0.4724	8.4567	1.1779	0.4383	0.2503	0.5102	0.4871	7.3011	8.7200	2.1674	39.82	2.530
2.540	0.4366	0.0550	0.1260	1.0615	0.4680	8.5090	1.1790	0.4404	0.2484	0.5092	0.4832	7.3602	8.7851	2.1774	40.05	2.540
2.550	0.4347	0.0542	0.1246	1.0633	0.4636	8.5615	1.1801	0.4425	0.2465	0.5083	0.4793	7.4196	8.8505	2.1875	40.28	2.550
2.560	0.4328	0.0533	0.1232	1.0651	0.4593	8.6141	1.1812	0.4445	0.2446	0.5074	0.4754	7.4792	8.9161	2.1976	40.51	2.560
2.570	0.4309	0.0525	0.1218	1.0669	0.4550	8.6670	1.1823	0.4466	0.2427	0.5065	0.4715	7.5391	8.9820	2.2077	40.74	2.570
2.580	0.4289	0.0517	0.1205	1.0687	0.4507	8.7200	1.1834	0.4486	0.2409	0.5056	0.4677	7.5991	9.0482	2.2179	40.96	2.580
2.590	0.4271	0.0509	0.1192	1.0705	0.4465	8.7732	1.1844	0.4506	0.2390	0.5047	0.4639	7.6595	9.1146	2.2281	41.19	2.590
2.600	0.4252	0.0501	0.1179	1.0722	0.4423	8.8265	1.1855	0.4526	0.2371	0.5039	0.4601	7.7200	9.1813	2.2383	41.41	2.600
2.610	0.4233	0.0493	0.1166	1.0740	0.4382	8.8801	1.1866	0.4546	0.2353	0.5030	0.4564	7.7808	9.2483	2.2486	41.64	2.610
2.620	0.4214	0.0486	0.1153	1.0757	0.4341	8.9338	1.1876	0.4565	0.2335	0.5022	0.4526	7.8418	9.3155	2.2590	41.86	2.620
2.630	0.4196	0.0478	0.1140	1.0774	0.4300	8.9877	1.1887	0.4585	0.2317	0.5013	0.4489	7.9031	9.3829	2.2693	42.09	2.630
2.640	0.4177	0.0471	0.1128	1.0791	0.4260	9.0418	1.1897	0.4604	0.2298	0.5005	0.4452	7.9645	9.4506	2.2797	42.31	2.640
2.650	0.4159	0.0464	0.1115	1.0808	0.4220	9.0961	1.1908	0.4624	0.2280	0.4996	0.4416	8.0263	9.5186	2.2902	42.53	2.650
2.660	0.4141	0.0457	0.1103	1.0825	0.4180	9.1506	1.1918	0.4643	0.2262	0.4988	0.4379	8.0882	9.5869	2.3006	42.75	2.660
2.670	0.4122	0.0450	0.1091	1.0842	0.4141	9.2052	1.1928	0.4662	0.2245	0.4980	0.4343	8.1504	9.6554	2.3111	42.97	2.670
2.680	0.4104	0.0443	0.1079	1.0859	0.4102	9.2601	1.1939	0.4681	0.2227	0.4972	0.4307	8.2128	9.7241	2.3217	43.19	2.680
2.690	0.4086	0.0436	0.1067	1.0875	0.4063	9.3151	1.1949	0.4700	0.2209	0.4964	0.4271	8.2755	9.7931	2.3323	43.40	2.690
2.700	0.4068	0.0430	0.1056	1.0892	0.4025	9.3703	1.1959	0.4718	0.2192	0.4956	0.4236	8.3383	9.8624	2.3429	43.62	2.700
2.710	0.4051	0.0423	0.1044	1.0908	0.3987	9.4257	1.1969	0.4737	0.2174	0.4949	0.4201	8.4015	9.9319	2.3536	43.84	2.710
2.720	0.4033	0.0417	0.1033	1.0924	0.3949	9.4812	1.1979	0.4755	0.2157	0.4941	0.4166	8.4648	10.0017	2.3642	44.05	2.720
2.730	0.4015	0.0410	0.1022	1.0941	0.3912	9.5370	1.1989	0.4773	0.2140	0.4933	0.4131	8.5284	10.0718	2.3750	44.27	2.730
2.740	0.3998	0.0404	0.1010	1.0957	0.3875	9.5929	1.1999	0.4791	0.2123	0.4926	0.4097	8.5922	10.1421	2.3888	44.48	2.740
2.750	0.3980	0.0398	0.0999	1.0973	0.3838	9.6490	1.2009	0.4809	0.2106	0.4918	0.4062	8.6563	10.2127	2.3966	44.69	2.750

$\gamma=1.400$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{m \sqrt{c_p T_0}}$	$\frac{F}{D}$	$\frac{4c_f L_{\max}}{2\rho V^2}$	M_s	$\frac{P_{0s}}{P_0}$	$\frac{P_s}{P}$	$\frac{P_{0s}}{P}$	$\frac{T_s}{T}$	ν	M	
2.760	0.3963	0.0392	0.0989	1.0988	0.3802	9.7053	1.2019	0.4827	0.2089	0.4911	0.4028	8.7205	10.2835	2.4074	44.91	2.760
2.770	0.3945	0.0386	0.0978	1.1004	0.3766	9.7618	1.2029	0.4845	0.2072	0.4903	0.3994	8.7851	10.3546	2.4183	45.12	2.770
2.780	0.3928	0.0380	0.0967	1.1020	0.3730	9.8185	1.2038	0.4863	0.2055	0.4896	0.3961	8.8498	10.4259	2.4292	45.33	2.780
2.790	0.3911	0.0374	0.0957	1.1035	0.3695	9.8753	1.2048	0.4880	0.2039	0.4889	0.3928	8.9148	10.4975	2.4402	45.54	2.790
2.800	0.3894	0.0368	0.0946	1.1051	0.3660	9.9324	1.2058	0.4898	0.2022	0.4882	0.3895	8.9800	10.5694	2.4512	45.75	2.800
2.810	0.3877	0.0363	0.0936	1.1066	0.3625	9.9896	1.2067	0.4915	0.2006	0.4875	0.3862	9.0455	10.6415	2.4622	45.95	2.810
2.820	0.3860	0.0357	0.0926	1.1081	0.3591	10.0470	1.2077	0.4932	0.1990	0.4868	0.3829	9.1111	10.7139	2.4733	46.16	2.820
2.830	0.3844	0.0352	0.0916	1.1096	0.3557	10.1046	1.2086	0.4949	0.1973	0.4861	0.3797	9.1771	10.7865	2.4844	46.37	2.830
2.840	0.3827	0.0347	0.0906	1.1111	0.3523	10.1624	1.2095	0.4966	0.1957	0.4854	0.3765	9.2432	10.8594	2.4955	46.57	2.840
2.850	0.3810	0.0341	0.0896	1.1126	0.3490	10.2204	1.2105	0.4983	0.1941	0.4847	0.3733	9.3096	10.9326	2.5067	46.78	2.850
2.860	0.3794	0.0336	0.0886	1.1141	0.3457	10.2785	1.2114	0.5000	0.1926	0.4840	0.3701	9.3762	11.0060	2.5179	46.98	2.860
2.870	0.3777	0.0331	0.0877	1.1156	0.3424	10.3368	1.2123	0.5016	0.1910	0.4833	0.3670	9.4431	11.0797	2.5292	47.19	2.870
2.880	0.3761	0.0326	0.0867	1.1171	0.3392	10.3954	1.2132	0.5033	0.1894	0.4827	0.3639	9.5101	11.1536	2.5405	47.39	2.880
2.890	0.3745	0.0321	0.0858	1.1185	0.3359	10.4541	1.2142	0.5049	0.1879	0.4820	0.3608	9.5775	11.2278	2.5518	47.59	2.890
2.900	0.3729	0.0317	0.0849	1.1199	0.3328	10.5130	1.2151	0.5065	0.1863	0.4814	0.3577	9.6450	11.3022	2.5632	47.79	2.900
2.910	0.3712	0.0312	0.0840	1.1214	0.3296	10.5720	1.2160	0.5081	0.1848	0.4807	0.3547	9.7128	11.3770	2.5746	47.99	2.910
2.920	0.3696	0.0307	0.0831	1.1228	0.3265	10.6313	1.2169	0.5097	0.1833	0.4801	0.3517	9.7808	11.4519	2.5861	48.19	2.920
2.930	0.3681	0.0302	0.0822	1.1242	0.3234	10.6908	1.2178	0.5113	0.1818	0.4795	0.3487	9.8491	11.5271	2.5976	48.39	2.930
2.940	0.3665	0.0298	0.0813	1.1256	0.3203	10.7504	1.2187	0.5129	0.1803	0.4788	0.3457	9.9175	11.6026	2.6091	48.59	2.940
2.950	0.3649	0.0293	0.0804	1.1270	0.3173	10.8102	1.2195	0.5145	0.1788	0.4782	0.3428	9.9863	11.6784	2.6206	48.78	2.950
2.960	0.3633	0.0289	0.0796	1.1284	0.3143	10.8702	1.2204	0.5160	0.1773	0.4776	0.3398	10.0552	11.7544	2.6322	48.98	2.960
2.970	0.3618	0.0285	0.0787	1.1298	0.3113	10.9304	1.2213	0.5176	0.1758	0.4770	0.3369	10.1244	11.8306	2.6439	49.18	2.970
2.980	0.3602	0.0281	0.0779	1.1312	0.3083	10.9908	1.2222	0.5191	0.1744	0.4764	0.3340	10.1938	11.9072	2.6555	49.37	2.980
2.990	0.3587	0.0276	0.0770	1.1325	0.3054	11.0514	1.2230	0.5206	0.1729	0.4758	0.3312	10.2635	11.9839	2.6673	49.56	2.990
3.000	0.3571	0.0272	0.0762	1.1339	0.3025	11.1122	1.2239	0.5222	0.1715	0.4752	0.3283	10.3333	12.0610	2.6790	49.76	3.000

GAS FLOW TABLES ($\gamma=1.333$): SUBSONIC FLOW

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
0.010	1.0000	0.9999	1.0000	0.0058	0.0231	0.0231	43.2958	7493.200	0.0001
0.020	0.9999	0.9997	0.9998	0.0115	0.0462	0.0462	21.6560	1868.007	0.0003
0.030	0.9999	0.9994	0.9996	0.0173	0.0693	0.0693	14.4464	826.7890	0.0006
0.040	0.9997	0.9989	0.9992	0.0231	0.0923	0.0924	10.8442	462.6179	0.0011
0.050	0.9996	0.9983	0.9988	0.0288	0.1153	0.1155	8.6851	294.2161	0.0017
0.060	0.9994	0.9976	0.9982	0.0346	0.1383	0.1386	7.2475	202.8455	0.0024
0.070	0.9992	0.9967	0.9976	0.0404	0.1612	0.1618	6.2222	147.8292	0.0033
0.080	0.9989	0.9957	0.9968	0.0461	0.1841	0.1849	5.4546	112.1800	0.0042
0.090	0.9987	0.9946	0.9960	0.0519	0.2069	0.2080	4.8587	87.7848	0.0054
0.100	0.9983	0.9934	0.9950	0.0577	0.2297	0.2312	4.3831	70.3719	0.0066
0.110	0.9980	0.9920	0.9940	0.0634	0.2523	0.2544	3.9949	57.5186	0.0080
0.120	0.9976	0.9905	0.9928	0.0692	0.2749	0.2775	3.6724	47.7680	0.0095
0.130	0.9972	0.9888	0.9916	0.0749	0.2974	0.3007	3.4003	40.2012	0.0111
0.140	0.9967	0.9870	0.9903	0.0807	0.3197	0.3239	3.1678	34.2155	0.0129
0.150	0.9963	0.9851	0.9888	0.0864	0.3420	0.3471	2.9670	29.4027	0.0148
0.160	0.9958	0.9831	0.9873	0.0921	0.3641	0.3704	2.7920	25.4777	0.0168
0.170	0.9952	0.9810	0.9857	0.0979	0.3861	0.3936	2.6383	22.2372	0.0189
0.180	0.9946	0.9787	0.9840	0.1036	0.4080	0.4169	2.5022	19.5326	0.0211
0.190	0.9940	0.9763	0.9822	0.1093	0.4298	0.4402	2.3809	17.2536	0.0235
0.200	0.9934	0.9738	0.9803	0.1150	0.4514	0.4635	2.2724	15.3166	0.0260
0.210	0.9927	0.9711	0.9783	0.1207	0.4728	0.4869	2.1747	13.6578	0.0285
0.220	0.9920	0.9684	0.9762	0.1264	0.4941	0.5102	2.0863	12.2273	0.0312
0.230	0.9913	0.9655	0.9740	0.1321	0.5152	0.5336	2.0061	10.9859	0.0340
0.240	0.9905	0.9625	0.9717	0.1378	0.5362	0.5570	1.9330	9.9026	0.0370
0.250	0.9897	0.9594	0.9694	0.1435	0.5569	0.5805	1.8662	8.9522	0.0400
0.260	0.9889	0.9562	0.9669	0.1492	0.5775	0.6040	1.8049	8.1146	0.0431
0.270	0.9880	0.9529	0.9644	0.1549	0.5979	0.6275	1.7486	7.3731	0.0463
0.280	0.9871	0.9494	0.9618	0.1605	0.6181	0.6510	1.6966	6.7140	0.0496
0.290	0.9862	0.9459	0.9591	0.1662	0.6380	0.6746	1.6486	6.1261	0.0530
0.300	0.9852	0.9422	0.9563	0.1718	0.6578	0.6982	1.6042	5.5998	0.0565
0.310	0.9843	0.9384	0.9534	0.1775	0.6774	0.7218	1.5629	5.1272	0.0601
0.320	0.9832	0.9346	0.9505	0.1831	0.6967	0.7455	1.5245	4.7016	0.0638
0.330	0.9822	0.9306	0.9475	0.1887	0.7158	0.7692	1.4888	4.3173	0.0675
0.340	0.9811	0.9265	0.9444	0.1943	0.7347	0.7929	1.4555	3.9693	0.0714
0.350	0.9800	0.9224	0.9412	0.1999	0.7533	0.8167	1.4244	3.6535	0.0753
0.360	0.9789	0.9181	0.9379	0.2055	0.7717	0.8405	1.3953	3.3663	0.0793
0.370	0.9777	0.9137	0.9346	0.2111	0.7898	0.8644	1.3680	3.1046	0.0834
0.380	0.9765	0.9093	0.9311	0.2167	0.8077	0.8883	1.3425	2.8655	0.0875
0.390	0.9753	0.9047	0.9276	0.2223	0.8253	0.9122	1.3185	2.6469	0.0917
0.400	0.9741	0.9001	0.9241	0.2278	0.8427	0.9362	1.2959	2.4466	0.0960
0.410	0.9728	0.8954	0.9204	0.2334	0.8598	0.9603	1.2747	2.2627	0.1003
0.420	0.9715	0.8906	0.9167	0.2389	0.8766	0.9843	1.2548	2.0937	0.1047
0.430	0.9701	0.8857	0.9130	0.2444	0.8932	1.0085	1.2360	1.9382	0.1091
0.440	0.9688	0.8807	0.9091	0.2499	0.9095	1.0326	1.2183	1.7949	0.1136
0.450	0.9674	0.8757	0.9052	0.2554	0.9255	1.0569	1.2016	1.6627	0.1182
0.460	0.9660	0.8706	0.9012	0.2609	0.9412	1.0811	1.1858	1.5405	0.1228
0.470	0.9645	0.8654	0.8972	0.2664	0.9567	1.1055	1.1710	1.4276	0.1274
0.480	0.9631	0.8601	0.8931	0.2718	0.9718	1.1299	1.1569	1.3231	0.1321
0.490	0.9616	0.8548	0.8890	0.2773	0.9867	1.1543	1.1436	1.2263	0.1368
0.500	0.9600	0.8494	0.8847	0.2827	1.0012	1.1788	1.1310	1.1365	0.1415

$\gamma=1.333$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
0.510	0.9585	0.8439	0.8805	0.2881	1.0155	1.2033	1.1192	1.0532	0.1463
0.520	0.9569	0.8384	0.8761	0.2935	1.0295	1.2279	1.1079	0.9759	0.1511
0.530	0.9553	0.8328	0.8717	0.2989	1.0431	1.2526	1.0973	0.9041	0.1559
0.540	0.9537	0.8271	0.8673	0.3043	1.0565	1.2773	1.0872	0.8373	0.1608
0.550	0.9520	0.8214	0.8628	0.3097	1.0696	1.3021	1.0777	0.7752	0.1656
0.560	0.9504	0.8157	0.8583	0.3150	1.0823	1.3269	1.0687	0.7174	0.1705
0.570	0.9487	0.8099	0.8537	0.3204	1.0948	1.3518	1.0601	0.6636	0.1754
0.580	0.9470	0.8040	0.8490	0.3257	1.1069	1.3768	1.0520	0.6136	0.1803
0.590	0.9452	0.7981	0.8443	0.3310	1.1188	1.4018	1.0444	0.5669	0.1852
0.600	0.9434	0.7921	0.8396	0.3363	1.1303	1.4269	1.0371	0.5235	0.1901
0.610	0.9417	0.7861	0.8348	0.3416	1.1415	1.4521	1.0303	0.4830	0.1950
0.620	0.9398	0.7801	0.8300	0.3469	1.1524	1.4773	1.0238	0.4452	0.1999
0.630	0.9380	0.7740	0.8252	0.3521	1.1630	1.5026	1.0176	0.4101	0.2048
0.640	0.9362	0.7679	0.8203	0.3573	1.1733	1.5280	1.0118	0.3773	0.2096
0.650	0.9343	0.7618	0.8153	0.3626	1.1833	1.5534	1.0063	0.3467	0.2145
0.660	0.9324	0.7556	0.8104	0.3678	1.1930	1.5789	1.0011	0.3183	0.2194
0.670	0.9305	0.7494	0.8054	0.3729	1.2023	1.6045	0.9962	0.2918	0.2242
0.680	0.9285	0.7431	0.8003	0.3781	1.2114	1.6301	0.9916	0.2671	0.2290
0.690	0.9266	0.7368	0.7953	0.3833	1.2201	1.6559	0.9872	0.2441	0.2338
0.700	0.9246	0.7306	0.7902	0.3884	1.2285	1.6817	0.9831	0.2227	0.2386
0.710	0.9226	0.7242	0.7850	0.3935	1.2367	1.7075	0.9792	0.2028	0.2433
0.720	0.9205	0.7179	0.7799	0.3986	1.2445	1.7335	0.9755	0.1843	0.2480
0.730	0.9185	0.7116	0.7747	0.4037	1.2520	1.7595	0.9721	0.1671	0.2527
0.740	0.9164	0.7052	0.7695	0.4088	1.2592	1.7856	0.9688	0.1512	0.2574
0.750	0.9144	0.6988	0.7643	0.4139	1.2661	1.8118	0.9658	0.1364	0.2620
0.760	0.9123	0.6924	0.7590	0.4189	1.2727	1.8381	0.9629	0.1227	0.2666
0.770	0.9102	0.6860	0.7537	0.4239	1.2790	1.8644	0.9603	0.1100	0.2711
0.780	0.9080	0.6796	0.7484	0.4289	1.2850	1.8908	0.9578	0.0983	0.2756
0.790	0.9059	0.6732	0.7431	0.4339	1.2907	1.9174	0.9554	0.0875	0.2800
0.800	0.9037	0.6668	0.7378	0.4389	1.2961	1.9440	0.9533	0.0776	0.2844
0.810	0.9015	0.6603	0.7325	0.4438	1.3013	1.9706	0.9513	0.0685	0.2888
0.820	0.8993	0.6539	0.7271	0.4487	1.3061	1.9974	0.9494	0.0601	0.2930
0.830	0.8971	0.6475	0.7217	0.4536	1.3107	2.0243	0.9477	0.0524	0.2973
0.840	0.8949	0.6411	0.7164	0.4585	1.3149	2.0512	0.9461	0.0454	0.3015
0.850	0.8926	0.6346	0.7110	0.4634	1.3189	2.0782	0.9446	0.0391	0.3056
0.860	0.8904	0.6282	0.7056	0.4683	1.3226	2.1053	0.9433	0.0333	0.3097
0.870	0.8881	0.6218	0.7002	0.4731	1.3260	2.1326	0.9420	0.0281	0.3137
0.880	0.8858	0.6154	0.6948	0.4779	1.3292	2.1599	0.9409	0.0235	0.3176
0.890	0.8835	0.6090	0.6893	0.4827	1.3321	2.1873	0.9399	0.0193	0.3215
0.900	0.8812	0.6026	0.6839	0.4875	1.3347	2.2147	0.9390	0.0156	0.3253
0.910	0.8788	0.5963	0.6785	0.4923	1.3370	2.2423	0.9383	0.0124	0.3291
0.920	0.8765	0.5899	0.6731	0.4970	1.3391	2.2700	0.9376	0.0096	0.3328
0.930	0.8741	0.5836	0.6676	0.5018	1.3410	2.2978	0.9370	0.0072	0.3364
0.940	0.8717	0.5773	0.6622	0.5065	1.3425	2.3256	0.9365	0.0052	0.3400
0.950	0.8694	0.5710	0.6568	0.5111	1.3439	2.3536	0.9360	0.0035	0.3435
0.960	0.8670	0.5647	0.6514	0.5158	1.3449	2.3817	0.9357	0.0022	0.3469
0.970	0.8646	0.5585	0.6459	0.5205	1.3458	2.4098	0.9354	0.0012	0.3502
0.980	0.8621	0.5522	0.6405	0.5251	1.3464	2.4381	0.9353	0.0005	0.3535
0.990	0.8597	0.5460	0.6351	0.5297	1.3467	2.4664	0.9351	0.0001	0.3567
1.000	0.8573	0.5398	0.6297	0.5343	1.3468	2.4949	0.9351	0.0000	0.3598

GAS FLOW TABLES ($\gamma=1.333$): SUPERSONIC FLOW

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
1.010	0.8548	0.5337	0.6243	0.5389	1.3467	2.5234	0.9351	0.0001	0.3628
1.020	0.8524	0.5276	0.6189	0.5434	1.3464	2.5521	0.9352	0.0005	0.3658
1.030	0.8499	0.5215	0.6136	0.5479	1.3458	2.5809	0.9354	0.0011	0.3687
1.040	0.8474	0.5154	0.6082	0.5525	1.3450	2.6097	0.9356	0.0019	0.3715
1.050	0.8449	0.5093	0.6028	0.5569	1.3440	2.6387	0.9359	0.0029	0.3743
1.060	0.8424	0.5033	0.5975	0.5614	1.3428	2.6678	0.9363	0.0042	0.3769
1.070	0.8399	0.4974	0.5922	0.5659	1.3414	2.6970	0.9367	0.0056	0.3795
1.080	0.8374	0.4914	0.5869	0.5703	1.3397	2.7263	0.9371	0.0071	0.3820
1.090	0.8349	0.4855	0.5816	0.5747	1.3379	2.7557	0.9376	0.0089	0.3845
1.100	0.8323	0.4796	0.5763	0.5791	1.3359	2.7852	0.9381	0.0108	0.3868
1.110	0.8298	0.4738	0.5710	0.5835	1.3337	2.8148	0.9387	0.0128	0.3891
1.120	0.8272	0.4680	0.5658	0.5878	1.3313	2.8446	0.9394	0.0150	0.3913
1.130	0.8247	0.4622	0.5605	0.5922	1.3287	2.8744	0.9401	0.0173	0.3934
1.140	0.8221	0.4565	0.5553	0.5965	1.3259	2.9043	0.9408	0.0197	0.3954
1.150	0.8195	0.4508	0.5501	0.6008	1.3229	2.9344	0.9415	0.0223	0.3974
1.160	0.8170	0.4452	0.5449	0.6050	1.3198	2.9646	0.9424	0.0250	0.3993
1.170	0.8144	0.4396	0.5398	0.6093	1.3165	2.9949	0.9432	0.0277	0.4011
1.180	0.8118	0.4340	0.5347	0.6135	1.3131	3.0253	0.9441	0.0306	0.4028
1.190	0.8092	0.4285	0.5295	0.6177	1.3094	3.0558	0.9450	0.0335	0.4044
1.200	0.8066	0.4230	0.5245	0.6219	1.3057	3.0864	0.9459	0.0366	0.4060
1.210	0.8040	0.4176	0.5194	0.6261	1.3017	3.1172	0.9469	0.0397	0.4075
1.220	0.8014	0.4122	0.5143	0.6302	1.2976	3.1481	0.9479	0.0429	0.4089
1.230	0.7988	0.4068	0.5093	0.6344	1.2934	3.1791	0.9489	0.0462	0.4102
1.240	0.7962	0.4015	0.5043	0.6385	1.2890	3.2102	0.9500	0.0495	0.4115
1.250	0.7936	0.3963	0.4994	0.6426	1.2845	3.2414	0.9511	0.0529	0.4127
1.260	0.7909	0.3911	0.4944	0.6466	1.2798	3.2727	0.9522	0.0564	0.4138
1.270	0.7883	0.3859	0.4895	0.6507	1.2751	3.3042	0.9533	0.0599	0.4148
1.280	0.7857	0.3808	0.4846	0.6547	1.2701	3.3358	0.9545	0.0634	0.4158
1.290	0.7830	0.3757	0.4798	0.6587	1.2651	3.3675	0.9557	0.0670	0.4167
1.300	0.7804	0.3706	0.4749	0.6627	1.2599	3.3993	0.9569	0.0707	0.4175
1.310	0.7778	0.3657	0.4701	0.6667	1.2547	3.4313	0.9581	0.0744	0.4182
1.320	0.7751	0.3607	0.4654	0.6706	1.2493	3.4633	0.9594	0.0781	0.4189
1.330	0.7725	0.3558	0.4606	0.6746	1.2438	3.4955	0.9606	0.0819	0.4195
1.340	0.7698	0.3510	0.4559	0.6785	1.2382	3.5279	0.9619	0.0857	0.4200
1.350	0.7672	0.3462	0.4512	0.6824	1.2325	3.5603	0.9632	0.0895	0.4205
1.360	0.7646	0.3414	0.4465	0.6862	1.2266	3.5929	0.9645	0.0934	0.4209
1.370	0.7619	0.3367	0.4419	0.6901	1.2207	3.6256	0.9659	0.0973	0.4212
1.380	0.7593	0.3320	0.4373	0.6939	1.2147	3.6584	0.9672	0.1012	0.4215
1.390	0.7566	0.3274	0.4328	0.6977	1.2086	3.6914	0.9686	0.1051	0.4216
1.400	0.7540	0.3229	0.4282	0.7015	1.2025	3.7245	0.9700	0.1091	0.4218
1.410	0.7513	0.3183	0.4237	0.7053	1.1962	3.7577	0.9714	0.1130	0.4218
1.420	0.7487	0.3139	0.4192	0.7090	1.1899	3.7910	0.9728	0.1170	0.4218
1.430	0.7460	0.3094	0.4148	0.7127	1.1835	3.8245	0.9742	0.1210	0.4217
1.440	0.7434	0.3051	0.4104	0.7164	1.1770	3.8581	0.9756	0.1250	0.4216
1.450	0.7407	0.3007	0.4060	0.7201	1.1704	3.8918	0.9771	0.1290	0.4214
1.460	0.7381	0.2965	0.4017	0.7238	1.1638	3.9257	0.9785	0.1331	0.4212
1.470	0.7354	0.2922	0.3974	0.7275	1.1571	3.9597	0.9800	0.1371	0.4209
1.480	0.7328	0.2880	0.3931	0.7311	1.1504	3.9938	0.9815	0.1411	0.4205
1.490	0.7301	0.2839	0.3888	0.7347	1.1435	4.0281	0.9829	0.1452	0.4201
1.500	0.7275	0.2798	0.3846	0.7383	1.1367	4.0625	0.9844	0.1492	0.4196

$\gamma=1.333$

M	$\frac{T}{T_0}$	$\frac{p}{p_0}$	$\frac{\rho}{\rho_0}$	$\frac{V}{\sqrt{c_p T_0}}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap_0}$	$\frac{\dot{m} \sqrt{c_p T_0}}{Ap}$	$\frac{F}{\dot{m} \sqrt{c_p T_0}}$	$\frac{4c_f L_{\max}}{D}$	$\frac{\frac{1}{2} \rho V^2}{p_0}$
1.510	0.7248	0.2758	0.3804	0.7419	1.1298	4.0970	0.9859	0.1532	0.4191
1.520	0.7222	0.2718	0.3763	0.7454	1.1228	4.1317	0.9874	0.1573	0.4185
1.530	0.7195	0.2678	0.3722	0.7489	1.1158	4.1665	0.9889	0.1613	0.4178
1.540	0.7169	0.2639	0.3681	0.7524	1.1087	4.2014	0.9905	0.1654	0.4171
1.550	0.7143	0.2600	0.3641	0.7559	1.1016	4.2365	0.9920	0.1694	0.4164
1.560	0.7116	0.2562	0.3600	0.7594	1.0945	4.2717	0.9935	0.1734	0.4156
1.570	0.7090	0.2524	0.3561	0.7629	1.0873	4.3070	0.9950	0.1775	0.4147
1.580	0.7064	0.2487	0.3521	0.7663	1.0801	4.3425	0.9966	0.1815	0.4138
1.590	0.7038	0.2450	0.3482	0.7697	1.0729	4.3782	0.9981	0.1855	0.4129
1.600	0.7011	0.2414	0.3443	0.7731	1.0656	4.4139	0.9997	0.1895	0.4119
1.610	0.6985	0.2378	0.3405	0.7765	1.0583	4.4498	1.0012	0.1935	0.4109
1.620	0.6959	0.2343	0.3367	0.7799	1.0510	4.4859	1.0028	0.1975	0.4098
1.630	0.6933	0.2308	0.3329	0.7832	1.0436	4.5220	1.0043	0.2015	0.4087
1.640	0.6907	0.2273	0.3291	0.7865	1.0363	4.5584	1.0059	0.2055	0.4075
1.650	0.6881	0.2239	0.3254	0.7898	1.0289	4.5948	1.0075	0.2094	0.4063
1.660	0.6855	0.2206	0.3217	0.7931	1.0215	4.6314	1.0090	0.2134	0.4051
1.670	0.6829	0.2172	0.3181	0.7964	1.0141	4.6682	1.0106	0.2173	0.4038
1.680	0.6803	0.2139	0.3145	0.7996	1.0066	4.7051	1.0122	0.2213	0.4025
1.690	0.6777	0.2107	0.3109	0.8028	0.9992	4.7421	1.0137	0.2252	0.4011
1.700	0.6751	0.2075	0.3074	0.8061	0.9918	4.7793	1.0153	0.2291	0.3997
1.710	0.6726	0.2044	0.3039	0.8093	0.9843	4.8166	1.0169	0.2330	0.3983
1.720	0.6700	0.2012	0.3004	0.8124	0.9769	4.8541	1.0184	0.2369	0.3968
1.730	0.6674	0.1982	0.2969	0.8156	0.9694	4.8917	1.0200	0.2407	0.3953
1.740	0.6649	0.1951	0.2935	0.8187	0.9620	4.9294	1.0216	0.2446	0.3938
1.750	0.6623	0.1922	0.2901	0.8218	0.9545	4.9673	1.0232	0.2484	0.3922
1.760	0.6597	0.1892	0.2868	0.8249	0.9471	5.0054	1.0247	0.2522	0.3906
1.770	0.6572	0.1863	0.2835	0.8280	0.9396	5.0435	1.0263	0.2560	0.3890
1.780	0.6546	0.1834	0.2802	0.8311	0.9322	5.0819	1.0279	0.2598	0.3874
1.790	0.6521	0.1806	0.2770	0.8341	0.9248	5.1204	1.0294	0.2636	0.3857
1.800	0.6496	0.1778	0.2737	0.8372	0.9173	5.1590	1.0310	0.2673	0.3840
1.810	0.6471	0.1751	0.2706	0.8402	0.9099	5.1978	1.0326	0.2711	0.3822
1.820	0.6445	0.1723	0.2674	0.8432	0.9025	5.2367	1.0341	0.2748	0.3805
1.830	0.6420	0.1697	0.2643	0.8461	0.8951	5.2758	1.0357	0.2785	0.3787
1.840	0.6395	0.1670	0.2612	0.8491	0.8878	5.3150	1.0373	0.2822	0.3769
1.850	0.6370	0.1644	0.2581	0.8521	0.8804	5.3544	1.0388	0.2858	0.3751
1.860	0.6345	0.1619	0.2551	0.8550	0.8731	5.3939	1.0404	0.2895	0.3732
1.870	0.6320	0.1593	0.2521	0.8579	0.8658	5.4336	1.0419	0.2931	0.3714
1.880	0.6295	0.1568	0.2491	0.8608	0.8585	5.4734	1.0435	0.2967	0.3695
1.890	0.6271	0.1544	0.2462	0.8636	0.8512	5.5134	1.0450	0.3003	0.3676
1.900	0.6246	0.1520	0.2433	0.8665	0.8439	5.5535	1.0466	0.3039	0.3656
1.910	0.6221	0.1496	0.2404	0.8693	0.8367	5.5938	1.0481	0.3074	0.3637
1.920	0.6197	0.1472	0.2376	0.8722	0.8295	5.6342	1.0497	0.3110	0.3617
1.930	0.6172	0.1449	0.2348	0.8750	0.8223	5.6748	1.0512	0.3145	0.3598
1.940	0.6148	0.1426	0.2320	0.8778	0.8152	5.7155	1.0527	0.3180	0.3578
1.950	0.6123	0.1404	0.2292	0.8805	0.8081	5.7564	1.0543	0.3215	0.3558
1.960	0.6099	0.1382	0.2265	0.8833	0.8010	5.7974	1.0558	0.3249	0.3537
1.970	0.6075	0.1360	0.2238	0.8860	0.7939	5.8386	1.0573	0.3284	0.3517
1.980	0.6051	0.1338	0.2212	0.8888	0.7869	5.8800	1.0588	0.3318	0.3497
1.990	0.6026	0.1317	0.2185	0.8915	0.7799	5.9215	1.0603	0.3352	0.3476
2.000	0.6002	0.1296	0.2159	0.8942	0.7729	5.9631	1.0619	0.3386	0.3455

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	
1.05	0.558	79.937	1.0803	1.0567	1.0223	0.9845	0.99995	1.40	8.000	75.893	1.9842	1.6163	1.2276	0.8184	0.96806	
1.10	1.515	76.297	1.1658	1.1157	1.0449	0.9711	0.99963		6.000	80.485	2.0575	1.6562	1.2423	0.7762	0.96286	
1.15	2.000	67.003	1.1408	1.0986	1.0384	1.0434	0.99977	1.45	2.000	46.004	48.679	1.2169	1.1503	1.0579	1.3091	0.99923
1.20	2.000	61.050	1.1197	1.0841	1.0329	1.1113	0.99985		6.000	51.755	1.3463	1.2357	1.0895	1.2325	0.99733	
1.25	2.000	56.844	1.1110	1.0780	1.0306	1.1696	0.99988	1.50	2.000	44.065	46.543	1.2165	1.1500	1.0578	1.3615	0.99923
1.30	2.000	53.474	1.1065	1.0749	1.0294	1.2244	0.99989		8.000	52.571	1.4887	1.3253	1.2337	1.0888	1.2879	0.99739
1.35	2.000	50.634	1.0945	1.0424	1.0042	1.2774	0.99991	1.55	2.000	42.315	44.642	1.2173	1.1505	1.0580	1.4130	0.99990
1.40	2.000	48.173	1.0803	1.0330	1.0733	1.2774	0.99990		6.000	47.214	6.000	47.3430	1.2336	1.0887	1.3414	0.99739
1.45	2.000	45.743	1.0660	1.0188	1.0424	1.3238	0.99991	1.55	2.000	40.985	40.985	1.2445	1.1515	1.2651	1.2651	0.99375
1.50	2.000	43.513	1.0513	1.0103	1.0449	1.3632	0.99992		8.000	40.985	10.000	53.598	1.6491	1.4243	1.1578	1.1804
1.55	2.000	41.463	1.0360	1.0046	1.0373	1.3709	0.99992	1.55	2.000	38.787	38.787	12.000	58.240	1.8597	1.5469	1.2022
1.60	2.000	39.513	1.0208	1.0008	1.0330	1.3774	0.99992		6.000	38.787	13.403	66.171	2.1787	1.7206	1.2663	0.95362
1.65	2.000	37.643	1.0053	1.0003	1.0364	1.3843	0.99992	1.55	2.000	37.688	37.688	12.000	73.688	2.4151	1.8408	1.3120
1.70	2.000	35.863	0.9898	0.9998	1.0393	1.3913	0.99992		8.000	37.688	10.000	77.804	2.5112	1.8877	1.3302	0.8014
1.75	2.000	34.173	0.9743	0.9993	1.0420	1.4042	0.99992	1.55	2.000	35.526	35.526	12.000	80.825	2.5650	1.9136	0.91995
1.80	2.000	32.573	0.9588	0.9993	1.0449	1.4145	0.99992		6.000	35.526	13.403	66.171	2.1787	1.7206	1.2663	0.95362
1.85	2.000	31.063	0.9433	0.9993	1.0474	1.4387	0.99992	1.55	2.000	33.385	33.385	12.000	73.688	2.4151	1.8408	1.3120
1.90	2.000	29.643	0.9278	0.9993	1.0503	1.4613	0.99992		8.000	33.385	10.000	77.804	2.5112	1.8877	1.3302	0.8014
1.95	2.000	28.313	0.9123	0.9993	1.0532	1.4843	0.99992	1.55	2.000	31.207	31.207	12.000	73.688	2.4151	1.8408	1.3120
2.00	2.000	27.063	0.8968	0.9993	1.0561	1.5073	0.99992		6.000	31.207	13.403	66.171	2.1787	1.7206	1.2663	0.95362
2.05	2.000	25.893	0.8813	0.9993	1.0590	1.5303	0.99992	1.55	2.000	29.040	29.040	12.000	73.688	2.4151	1.8408	1.3120
2.10	2.000	24.793	0.8658	0.9993	1.0619	1.5533	0.99992		8.000	29.040	10.000	77.804	2.5112	1.8877	1.3302	0.8014
2.15	2.000	23.763	0.8503	0.9993	1.0648	1.5763	0.99992	1.55	2.000	26.875	26.875	12.000	73.688	2.4151	1.8408	1.3120
2.20	2.000	22.793	0.8348	0.9993	1.0677	1.5993	0.99992		6.000	26.875	13.403	66.171	2.1787	1.7206	1.2663	0.95362
2.25	2.000	21.893	0.8193	0.9993	1.0706	1.6223	0.99992	1.55	2.000	24.718	24.718	12.000	73.688	2.4151	1.8408	1.3120
2.30	2.000	21.063	0.8038	0.9993	1.0735	1.6453	0.99992		8.000	24.718	10.000	77.804	2.5112	1.8877	1.3302	0.8014
2.35	2.000	20.293	0.7883	0.9993	1.0764	1.6683	0.99992	1.55	2.000	22.561	22.561	12.000	73.688	2.4151	1.8408	1.3120
2.40	2.000	19.513	0.7728	0.9993	1.0793	1.6913	0.99992		6.000	22.561	13.403	66.171	2.1787	1.7206	1.2663	0.95362
2.45	2.000	18.793	0.7573	0.9993	1.0822	1.7143	0.99992	1.55	2.000	20.404	20.404	12.000	73.688	2.4151	1.8408	1.3120
2.50	2.000	18.063	0.7418	0.9993	1.0851	1.7373	0.99992		8.000	20.404	10.000	77.804	2.5112	1.8877	1.3302	0.8014
2.55	2.000	17.393	0.7263	0.9993	1.0880	1.7603	0.99992	1.55	2.000	18.247	18.247	12.000	73.688	2.4151	1.8408	1.3120
2.60	2.000	16.763	0.7108	0.9993	1.0909	1.7833	0.99992		6.000	18.247	13.403	66.171	2.1787	1.7206	1.2663	0.95362
2.65	2.000	16.163	0.6953	0.9993	1.0938	1.8063	0.99992	1.55	2.000	16.090	16.090	12.000	73.688	2.4151	1.8408	1.3120
2.70	2.000	15.593	0.6798	0.9993	1.0967	1.8293	0.99992		8.000	16.090	10.000	77.804	2.5112	1.8877	1.3302	0.8014
2.75	2.000	15.013	0.6643	0.9993	1.1000	1.8523	0.99992	1.55	2.000	13.933	13.933	12.000	73.688	2.4151	1.8408	1.3120
2.80	2.000	14.443	0.6488	0.9993	1.1034	1.8753	0.99992		6.000	13.933	13.933	12.000	73.688	2.4151	1.8408	1.3120
2.85	2.000	13.873	0.6333	0.9993	1.1063	1.9083	0.99992	1.55	2.000	11.876	11.876	12.000	73.688	2.4151	1.8408	1.3120
2.90	2.000	13.303	0.6178	0.9993	1.1092	1.9413	0.99992		8.000	11.876	10.000	77.804	2.5112	1.8877	1.3302	0.8014
2.95	2.000	12.733	0.5923	0.9993	1.1121	1.9743	0.99992	1.55	2.000	9.820	9.820	12.000	73.688	2.4151	1.8408	1.3120
3.00	2.000	12.163	0.5668	0.9993	1.1150	2.0073	0.99992		6.000	9.820	9.820	12.000	73.688	2.4151	1.8408	1.3120
3.05	2.000	11.603	0.5413	0.9993	1.1179	2.0403	0.99992	1.55	2.000	7.863	7.863	12.000	73.688	2.4151	1.8408	1.3120
3.10	2.000	11.033	0.5158	0.9993	1.1208	2.0733	0.99992		8.000	7.863	6.000	77.804	2.5112	1.8877	1.3302	0.8014
3.15	2.000	10.463	0.4903	0.9993	1.1237	2.1063	0.99992	1.55	2.000	5.906	5.906	12.000	73.688	2.4151	1.8408	1.3120
3.20	2.000	9.893	0.4648	0.9993	1.1266	2.1393	0.99992		6.000	5.906	4.000	77.804	2.5112	1.8877	1.3302	0.8014
3.25	2.000	9.323	0.4393	0.9993	1.1295	2.1723	0.99992	1.55	2.000	3.949	3.949	12.000	73.688	2.4151	1.8408	1.3120
3.30	2.000	8.753	0.4138	0.9993	1.1324	2.2053	0.99992		8.000	3.949	2.000	77.804	2.5112	1.8877	1.3302	0.8014
3.35	2.000	8.183	0.3883	0.9993	1.1353	2.2383	0.99992	1.55	2.000	2.892	2.892	12.000	73.688	2.4151	1.8408	1.3120
3.40	2.000	7.613	0.3628	0.9993	1.1382	2.2713	0.99992		6.000	2.892	1.000	77.804	2.5112	1.8877	1.3302	0.8014
3.45	2.000	7.043	0.3373	0.9993	1.1411	2.3043	0.99992	1.55	2.000	1.835	1.835	12.000	73.688	2.4151	1.8408	1.3120
3.50	2.000	6.473	0.3118	0.9993	1.1440	2.3373	0.99992		8.000	1.835	0.000	77.804	2.5112	1.8877	1.3302	0.8014
3.55	2.000	5.903	0.2863	0.9993	1.1469	2.3703	0.99992	1.55	2.000	0.778	0.778	12.000	73.688	2.4151	1.8408	1.3120
3.60	2.000	5.333	0.2608	0.9993	1.1498	2.4033	0.99992		6.000	0.778	0.000	77.804	2.5112	1.8877	1.3302	0.8014
3.65	2.000	4.763	0.2353	0.9993	1.1527	2.4363	0.99992	1.55	2.000	0.312	0.312	12.000	73.688	2.4151	1.8408	1.3120
3.70	2.000	4.193	0.2108	0.9993	1.1556	2.4693	0.99992		8.000	0.312	0.000	77.804	2.5112	1.8877	1.3302	0.8014
3.75	2.000	3.623	0.1853	0.9993	1.1585	2.5023	0.99992	1.55	2.000	0.056	0.056	12.000	73.688	2.4151	1.8408	1.3120
3.80	2.000	3.053	0.1608	0.9993	1.1614	2.5353	0.99992		6.000	0.056	0.000	77.804	2.5112	1.8877	1.3302	0.8014
3.85	2.000	2.483	0.1353	0.9993	1.1643	2.5683	0.99992	1.55	2.000	-0.223	-0.223	12.000	73.688	2.4151	1.8408	1.3120
3.90	2.000	1.9														

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	
1.60	2.000	40.724	1.1046	1.0736	1.0289	1.5323	0.99990	1.70	6.000	84.848	3.1778	2.1865	1.4534	0.6547
	4.000	42.931	1.2189	1.0584	1.4638	0.99921	0.99921		4.000	86.619	3.1933	2.1929	1.4562	0.6467
	6.000	45.344	1.3446	1.2346	1.0891	1.3934	0.99736		2.000	88.325	3.2021	2.1965	1.4578	0.6421
	8.000	48.030	1.4843	1.3236	1.1215	1.395	0.99376							
	10.000	51.116	1.6430	1.4207	1.1565	1.2397	0.98766							
	12.000	54.889	1.8320	1.5311	1.1965	1.483	0.97781							
	14.000	60.537	2.0974	1.6777	1.2502	1.0232	0.95990							
	14.652	65.828	2.3792	1.7929	1.2936	0.94204	0.94204							
	14.000	70.895	2.5000	1.8824	1.3281	0.8820	0.92598							
	12.000	75.900	2.6428	1.9504	1.3550	0.7611	0.91256							
	10.000	79.102	2.7132	1.9831	1.3682	0.7230	0.90574							
	8.000	81.691	2.7576	2.0035	1.3764	0.7018	0.90139							
	6.000	83.967	2.7870	2.0168	1.3819	0.6682	0.89848							
	4.000	86.061	2.8059	2.0254	1.3854	0.6761	0.89660							
	2.000	88.054	2.8166	2.0302	1.3873	0.6703	0.89554							
	1.65	2.000	39.267	1.1058	1.0744	1.0292	1.5623	0.99990	14.000	76.988	3.2251	2.2060	1.4620	0.55362
	4.000	41.377	1.2212	1.1531	1.0590	1.5140	0.99919	12.000	79.465	3.2868	2.2312	1.4731	0.6878	0.84714
	6.000	43.665	1.3475	1.2365	1.0898	1.4444	0.99730	10.000	81.570	3.3295	2.2484	1.4808	0.6669	0.84266
	8.000	46.181	1.4869	1.3252	1.1221	1.3720	0.99367	8.000	83.451	3.3598	2.2606	1.4862	0.6518	0.83947
	10.000	49.007	1.6429	1.4206	1.1565	1.2552	0.98766	6.000	85.190	3.3811	2.2691	1.4901	0.6409	0.83722
	12.000	52.312	1.8224	1.5257	1.1945	1.2104	0.97837	4.000	86.838	3.3954	2.2748	1.4926	0.6337	0.83571
	14.000	56.541	2.0441	1.6490	1.2396	1.1090	0.96384	2.000	88.432	3.4036	2.2780	1.4941	0.6295	0.83485
	15.855	65.547	2.4653	1.8655	1.3215	0.9184	0.92915							
	14.000	73.864	2.7642	2.0065	1.3776	0.7782	0.90073							
	12.000	77.411	2.8587	2.0491	1.3951	0.7317	0.89132							
	10.000	80.102	2.9157	2.0744	1.4056	0.7029	0.88557							
	8.000	82.389	2.9539	2.0911	1.4126	0.6833	0.88169							
	6.000	84.446	2.9798	2.1024	1.4174	0.6697	0.87904							
	4.000	86.364	2.9968	2.1097	1.4205	0.6607	0.87730							
	2.000	88.200	3.0065	2.1139	1.4222	0.6556	0.87631							
	1.70	2.000	37.927	1.1058	1.0744	1.0292	1.5623	0.99990	1.80	2.000	35.538	1.1104	1.0776	1.7312
	4.000	39.957	1.2239	1.1550	1.0597	1.5338	0.99916	0.88557	4.000	37.444	1.2306	1.1594	1.0613	1.6624
	6.000	42.145	1.3514	1.2390	1.0907	1.4946	0.99722	0.86333	6.000	39.481	1.3615	1.2455	1.0931	1.5932
	8.000	44.528	1.4914	1.3280	1.1231	1.4232	0.99353	0.84169	8.000	41.673	1.5044	1.3360	1.1260	1.5225
	10.000	47.167	1.6466	1.4228	1.1573	1.3482	0.98750	0.82094	10.000	44.057	1.6611	1.4315	1.1604	1.4494
	12.000	50.168	1.8216	1.5252	1.1943	1.2674	0.97841	0.80777	12.000	46.886	1.8345	1.5326	1.1970	1.3725
	14.000	53.771	2.0273	1.6399	1.2362	1.1757	0.96504	0.78773	14.000	49.661	2.0295	1.6411	1.2367	1.2896
	16.000	58.794	2.2999	1.7831	1.2898	1.0569	0.94369	0.76539	16.000	53.198	2.2568	1.7611	1.2815	1.1958
	17.012	65.319	2.6171	1.9383	1.3502	0.9185	0.91502	0.74750	17.000	58.020	3.4505	2.2965	1.5025	0.6958
	16.000	71.426	2.8629	2.0510	1.3959	0.8077	0.89090	0.72841	12.000	80.214	3.5041	2.3174	1.5121	0.6703
	14.000	75.670	2.9984	2.1104	1.4208	0.7439	0.87713	0.70804	10.000	82.128	3.5424	2.3322	1.5189	0.6518
	12.000	78.555	3.0722	2.1421	1.4342	0.7080	0.86953	0.68338	8.000	83.865	3.5702	2.3428	1.5239	0.6381
	10.000	80.906	3.1208	2.1626	1.4431	0.68450	0.86450	0.66667	6.000	85.485	3.5899	2.3503	1.5274	0.6283
	8.000	82.965	3.1544	2.1767	1.4492	0.66100	0.86100		2.000	87.028	3.6032	2.3554	1.5298	0.6216

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
1.85	2.000	34.466	1.1121	1.0788	1.0309	0.99988	1.95	2.000	32.528	1.1160	1.0815	1.0319	1.8790
	4.000	36.323	1.2343	1.1619	1.0623	0.99905		4.000	34.304	1.2424	1.1674	1.0643	1.8085
	6.000	38.302	1.3672	1.2492	1.0945	0.99689		6.000	36.191	1.3801	1.2575	1.0975	1.7380
	8.000	40.424	1.5123	1.3409	1.1278	0.99284		8.000	38.204	1.5302	1.3521	1.1318	1.6666
	10.000	42.717	1.6709	1.4373	1.1625	0.98638		10.000	40.360	1.6938	1.4509	1.1674	1.5938
	12.000	45.223	1.8453	1.5388	1.1992	0.97701		12.000	42.688	1.8726	1.5542	1.2049	1.5185
	14.000	48.014	2.0395	1.6465	1.2387	0.96417		14.000	45.230	2.0693	1.6625	1.2446	1.4396
	16.000	51.232	2.2607	1.7631	1.2822	0.94697		16.000	48.059	2.2879	1.7770	1.2875	1.3553
	18.000	55.227	2.5275	1.8956	1.3333	0.92345		18.000	51.320	2.5368	1.9001	1.3351	1.2622
	20.000	62.099	2.9519	2.0902	1.4123	0.98189		20.000	55.381	2.8378	2.0397	1.3913	1.1520
	20.198	64.872	3.1062	2.1565	1.4404	0.9205		22.000	62.860	3.3464	2.2553	1.4838	0.9655
	20.000	67.544	3.2437	2.2136	1.4653	0.8648		22.092	64.716	3.4603	2.3003	1.5043	0.9229
	18.000	73.440	3.5019	2.3165	1.5117	0.7560		22.000	66.523	3.5655	2.3410	1.5231	0.8829
	16.000	76.511	3.6090	2.3576	1.5308	0.7085		20.000	72.926	3.8872	2.4601	1.5801	0.7555
	14.000	78.861	3.6772	2.3833	1.5429	0.6773		18.000	75.964	4.0086	2.5030	1.6015	0.7045
	12.000	80.844	3.7252	2.4011	1.5514	0.6548		16.000	78.253	4.0857	2.5297	1.6151	0.6710
	10.000	82.606	3.7601	2.4140	1.5576	0.6381		14.000	80.165	4.1401	2.5484	1.6246	0.6467
	8.000	84.222	3.7858	2.4234	1.5622	0.6257		12.000	81.849	4.1804	2.5620	1.6317	0.6283
	6.000	85.740	3.8042	2.4301	1.5635	0.6166		10.000	83.381	4.2106	2.5722	1.6370	0.6142
	4.000	87.193	3.8167	2.4346	1.5677	0.6105		8.000	84.808	4.2333	2.5798	1.6409	0.6036
	2.000	88.606	3.8239	2.4373	1.5689	0.70048		6.000	86.163	4.2497	2.5853	1.6438	0.5957
1.90	2.000	33.466	1.1140	1.0801	1.0633	1.1646	1.0959	2.000	4.000	8.7467	4.2609	2.5890	1.6458
	4.000	35.279	1.2382	1.3735	1.2533	1.3463	1.1297		33.390	31.647	1.1180	1.0829	1.9280
	6.000	37.209	1.39272	1.5209	1.4438	1.6818	1.1649		35.241	33.390	1.2468	1.1702	1.0654
	8.000	41.490	43.898	1.8582	1.5460	1.2019	1.4709		8.000	37.210	1.3871	1.2620	1.0991
	12.000	46.550	46.550	2.0530	1.6538	1.2414	1.96319		10.000	39.314	1.5400	1.3581	1.1339
	14.000	49.544	49.544	2.2718	1.7688	1.2844	1.3052		12.000	41.575	1.7066	1.4584	1.1702
	16.000	53.095	53.095	2.5263	1.8951	1.3331	1.2077		14.000	44.029	2.0876	1.5631	1.2081
	20.000	57.900	2.8557	2.0477	1.3946	1.0835	0.89162		16.000	46.731	2.3076	1.7870	1.2483
	21.167	64.783	3.2805	2.2286	1.4720	0.9216	0.84781		18.000	49.785	2.5546	1.9086	1.3131
	20.000	71.057	3.6012	2.3546	1.5294	0.7935	0.81397		20.000	53.423	2.8429	2.0420	1.3922
	18.000	74.861	3.7578	2.4131	1.5572	0.7274	0.79744		22.000	58.457	3.2228	2.2051	1.4616
	16.000	77.463	3.8466	2.4455	1.5729	0.6884	0.78810		22.974	64.669	3.6458	2.3715	1.5373
	14.000	79.565	3.9068	2.4671	1.5836	0.6611	0.78178		22.000	70.332	3.9714	2.4899	1.5950
	12.000	81.383	3.9504	2.4826	1.5913	0.6409	0.77721		20.000	74.270	4.1570	2.5541	1.6276
	10.000	83.020	3.9828	2.4940	1.5970	0.6257	0.77383		18.000	76.862	4.2589	2.5883	1.6454
	8.000	84.534	4.0068	2.5024	1.6012	0.6142	0.77133		16.000	78.921	4.3277	2.6110	1.6574
	6.000	85.965	4.0241	2.5084	1.6042	0.6058	0.76953		14.000	80.684	4.3777	2.6274	1.6662
	4.000	87.338	4.0359	2.5125	1.6063	0.6001	0.76830		12.000	82.257	4.4153	2.6396	1.6727
	2.000	88.677	4.0428	2.5149	1.6075	0.5967	0.76759		10.000	83.700	4.4438	2.6487	1.6777
	0.000								8.000	85.052	4.4653	2.6556	1.6815
									6.000	86.339	4.4810	2.6606	1.6842
									4.000	87.582	4.4917	2.6640	1.6861
									2.000	88.798	4.4979	2.6660	1.6871

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	$\frac{\rho_2}{\rho_1}$	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
2.05	2.000	30.816	1.1200	1.0843	1.0330	0.99985	1.9771	0.99985	1.0330	1.0843	1.0341	0.99984
	4.000	32.532	1.2512	1.1732	1.0665	1.9050	0.99885	1.0665	1.1732	1.0665	1.0688	0.99874
	6.000	34.350	1.3943	1.2666	1.1008	1.8330	0.99627	1.1008	1.2666	1.1008	1.1043	0.99590
	8.000	36.281	1.5502	1.3644	1.1362	1.7605	0.99148	1.1362	1.5502	1.1362	1.1410	0.99065
	10.000	38.341	1.7201	1.46664	1.1730	1.6868	0.98396	1.1730	1.7201	1.1730	1.1794	0.98246
	12.000	40.547	1.9053	1.5726	1.2116	1.6111	0.97330	1.2116	1.9053	1.2116	1.2606	0.97093
	14.000	42.928	2.1076	1.6831	1.2522	1.5326	0.95914	1.2522	2.1076	1.2522	1.2763	0.95574
	16.000	45.528	2.3300	1.7983	1.2956	1.4500	0.94112	1.2956	2.3300	1.2956	1.3777	0.93666
	18.000	48.428	2.5774	1.9195	1.3427	1.3614	0.91878	1.3427	2.5774	1.3427	1.4833	0.91343
	20.000	51.785	2.8600	2.0497	1.3953	1.2630	0.89120	1.3953	20.000	1.3953	1.7490	1.7778
	22.000	56.032	3.2057	2.1980	1.4585	1.1444	0.85565	1.4585	22.000	1.4585	1.9417	1.5929
	23.814	64.638	3.8367	2.4419	1.5712	0.9257	0.78913	1.5712	23.814	1.5712	2.1518	1.7065
	22.000	72.193	4.2777	2.5946	1.6487	0.7626	0.74336	1.6487	22.000	1.6487	43.422	1.8241
	20.000	75.324	4.4215	2.6416	1.6738	0.7056	0.72876	1.6738	20.000	1.6738	46.104	1.9461
	18.000	77.614	4.5107	2.6700	1.6894	0.6688	0.71981	1.6894	18.000	1.6894	49.106	2.9150
	16.000	79.498	4.5734	2.6898	1.7003	0.6422	0.71356	1.7003	16.000	1.7003	52.618	3.2384
	14.000	81.138	4.6199	2.7043	1.7084	0.6219	0.70894	1.7084	14.000	1.7084	57.217	3.6452
	12.000	82.617	4.65553	2.7152	1.7145	0.6062	0.70545	1.7145	12.000	1.7145	64.616	4.2352
	10.000	83.983	4.6824	2.7236	1.7192	0.5939	0.70278	1.7192	10.000	1.7192	74.164	4.6641
	8.000	85.269	4.7029	2.7299	1.7228	0.5846	0.70077	1.7228	8.000	1.7228	74.564	4.8442
	6.000	86.497	4.7179	2.7344	1.7254	0.5776	0.69930	1.7254	6.000	1.7254	76.920	4.9500
	4.000	87.685	4.7283	2.7376	1.7272	0.5728	0.69829	1.7272	4.000	1.7272	78.817	5.0234
	2.000	88.849	4.7343	2.7394	1.7282	0.5700	0.69770	1.7282	2.000	1.7282	80.444	5.0776
2.10	2.000	30.033	1.1222	1.0858	1.0335	0.99984	0.99884	1.0335	2.000	0.99884	14.000	81.896
	4.000	31.723	1.2558	1.1763	1.0676	1.9530	0.99880	1.1763	4.000	1.1763	12.000	83.224
	6.000	33.513	1.4017	1.2714	1.1025	1.8801	0.99609	1.2714	6.000	1.2714	84.464	5.1761
	8.000	35.412	1.5608	1.3709	1.1386	1.8069	0.99108	1.3709	8.000	1.3709	10.000	85.639
	10.000	37.433	1.7342	1.4746	1.1760	1.7325	0.98324	1.7342	10.000	1.7342	5.1951	2.8736
	12.000	39.592	1.9330	1.5825	1.2152	1.6564	0.97216	1.9330	12.000	1.9330	2.8523	1.7160
	14.000	41.912	2.1290	1.6944	1.2565	1.5777	0.95750	1.6944	14.000	1.6944	2.8775	1.7794
	16.000	44.430	2.3547	1.8107	1.3004	1.4954	0.93899	1.8107	16.000	1.8107	3.8613	2.0455
	18.000	47.210	2.6041	1.9322	1.3478	1.4078	0.91626	1.9322	18.000	1.9322	5.1512	2.7725
	20.000	50.365	2.8032	2.8848	2.0607	1.3999	0.88870	2.8848	20.000	2.8848	5.1761	2.8037
	22.000	54.169	3.2152	2.2019	1.4209	1.2019	0.84666	3.2152	22.000	3.2152	10.000	35.785
	24.000	59.767	3.6739	2.3820	1.5424	1.093	0.80628	3.6739	24.000	3.6739	12.000	37.869
	24.614	64.621	4.0332	2.5116	1.6058	0.9273	0.76858	4.0332	24.614	4.0332	14.000	40.095
	24.000	69.104	4.3238	2.6098	1.6568	0.8245	0.73867	4.3238	24.000	4.3238	16.000	42.489
	22.000	73.521	4.5644	2.6870	1.6987	0.7345	0.71445	4.5644	22.000	4.5644	18.000	45.092
	20.000	76.189	4.68852	2.7244	1.7197	0.6870	0.70251	4.68852	20.000	4.68852	20.000	47.975
	18.000	78.257	4.7652	2.7488	1.7336	0.6543	0.69468	4.7652	18.000	4.7652	22.000	51.277
	16.000	80.001	4.8232	2.7662	1.7436	0.6299	0.68906	4.8232	16.000	4.8232	24.000	55.356
	14.000	81.539	4.8669	2.7792	1.7512	0.6111	0.68484	4.8669	14.000	4.8669	26.000	62.695
	12.000	82.938	4.9006	2.7892	1.7570	0.5864	0.68162	4.9006	12.000	4.9006	26.103	64.620
	10.000	84.237	4.9264	2.7968	1.7615	0.6543	0.67914	4.9264	10.000	4.9264	26.000	66.480
	8.000	85.463	4.9461	2.8025	1.7649	0.5760	0.67726	4.9461	8.000	4.9461	24.000	72.560
	6.000	86.638	4.9606	2.8068	1.7674	0.5694	0.67588	4.9606	6.000	4.9606	22.000	75.420

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
2.20	20.000	77.549	5.2175	2.8799	1.8117	0.6568	0.65185	2.30	16.000	40.816	2.4701	1.8678	1.3224
	18.000	79.308	5.2856	2.8987	1.8234	0.6296	0.64562		18.000	43.299	2.7360	1.9936	1.3724
	16.000	80.839	5.3369	2.9127	1.8323	0.6086	0.64096		20.000	46.007	3.0276	2.1230	1.4261
	14.000	82.216	5.3764	2.9235	1.8391	0.5921	0.63739		22.000	49.026	3.3514	2.2573	1.4847
	12.000	83.483	5.4073	2.9318	1.8444	0.5789	0.63462		24.000	52.536	3.7216	2.3998	1.5508
	10.000	84.670	5.4313	2.9382	1.8485	0.5686	0.63247		26.000	57.077	4.1819	2.5625	1.6319
	8.000	85.798	5.4497	2.9431	1.8517	0.5605	0.63083		27.454	64.653	4.8739	2.7813	1.7524
	6.000	86.883	5.4653	2.9468	1.8540	0.5545	0.62962		26.000	71.264	5.3682	2.9212	1.8377
	4.000	87.938	5.4727	2.9493	1.8556	0.5503	0.62879		24.000	74.512	5.6449	2.9736	1.8714
	2.000	88.973	5.4782	2.9507	1.8565	0.5479	0.62830		22.000	76.770	5.6817	3.0039	1.8915
2.25	2.000								20.000	78.582	5.7631	3.0246	1.9054
	4.000	29.555	1.2703	1.1859	1.0712	2.1725	0.9982		18.000	80.133	5.8238	3.0399	1.9158
	6.000	31.277	1.4254	1.2864	1.1080	2.0962	0.99861		16.000	81.509	5.8238	3.0495	1.9238
	8.000	33.102	1.5949	1.3916	1.1461	2.0203	0.99548		14.000	82.764	5.9071	3.0606	1.9301
	10.000	35.034	1.7798	1.5011	1.1856	1.9443	0.98973		12.000	83.928	5.9360	3.0677	1.9350
	12.000	37.088	1.9812	1.6147	1.2270	1.9443	0.98973		10.000	85.026	5.9586	3.0732	1.9389
	14.000	39.277	2.2004	1.7319	1.2705	1.8674	0.98079		8.000	86.074	5.9761	3.0775	1.9419
	16.000	41.623	2.4392	1.8527	1.3166	1.8674	0.98079		6.000	87.085	5.9890	3.0807	1.9441
	18.000	44.161	2.7000	1.9770	1.3657	1.6257	0.93152		4.000	88.070	5.9980	3.0828	1.9456
	20.000	46.948	2.9871	2.1055	1.4187	1.4466	0.87829		2.000	89.039	6.0033	3.0841	1.9465
	22.000	50.091	3.3085	2.2400	1.4770	1.3464	0.84486						
	24.000	53.837	3.6830	2.3854	1.5440	1.2318	0.80532						
	26.000	59.122	4.1839	2.5632	1.6323	1.0792	0.75298						
	26.795	64.633	4.6556	2.7153	1.7145	0.9321	0.70542						
	26.000	69.627	5.0238	2.8250	1.7783	0.8115	0.66991						
	24.000	73.634	5.2707	2.8946	1.8209	0.7294	0.64698						
	22.000	76.145	5.4009	2.9301	1.8433	0.6775	0.63519						
	20.000	78.098	5.4884	2.9534	1.8583	0.6441	0.62739						
	18.000	79.744	5.5523	2.9703	1.8693	0.61715	0.62175						
	16.000	81.192	5.6011	2.9830	1.8776	0.5993	0.61749						
	14.000	82.504	5.6391	2.9929	1.8842	0.5836	0.61418						
	12.000	83.716	5.6668	3.0006	1.8893	0.5711	0.61161						
	10.000	84.856	5.6921	3.0065	1.8932	0.5612	0.60960						
	8.000	85.942	5.7100	3.0111	1.8963	0.5535	0.60806						
	6.000	86.988	5.7233	3.0145	1.8986	0.5477	0.60692						
	4.000	88.007	5.7324	3.0168	1.9002	0.5437	0.60614						
	2.000	89.008	5.7378	3.0182	1.9011	0.5413	0.60568						
2.30	2.000												
	4.000	27.294	1.1311	1.0919	1.0359	2.2212	0.9981						
	6.000	28.906	1.2753	1.1892	1.0724	2.1437	0.99854						
	8.000	32.415	1.4336	1.2916	1.1099	2.0667	0.99526						
	10.000	34.326	1.6068	1.3988	1.1487	1.9896	0.98923						
	12.000	36.354	2.0019	1.7959	1.5104	1.890	1.9117						
	14.000	38.510	2.2261	1.6260	1.2311	1.8325	0.96684						

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{\rho_02}{\rho_01}$	M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_02}{p_01}$	
2.35	6.000	87.174	6.2606	3.1453	1.9904	0.5353	0.562772	2.45	26.000	53.045	4.3053	2.6037	1.6535	0.74055
	4.000	88.129	6.2694	3.1474	1.9919	0.5315	0.56203		28.000	57.780	4.8455	2.7729	1.7475	1.1385
	2.000	89.068	6.2745	3.1486	1.9928	0.5293	0.56162		29.253	64.744	5.5614	2.9727	1.8708	0.9386
2.40	8.000	31.149	1.1358	1.0951	1.0371	2.3184	0.99979	24.000	74.185	6.0810	3.1029	1.9598	0.7837	0.57709
	10.000	33.023	1.2856	1.1960	1.0749	2.2383	0.99839	22.000	76.446	6.4516	3.1891	2.0230	0.6623	0.54787
	12.000	35.007	1.4505	1.3023	1.1138	2.1589	0.99478	20.000	78.236	6.5451	3.2101	2.0389	0.6294	0.54076
2.45	2.000	26.120	1.6314	1.4137	1.1540	2.0794	0.98818	18.000	81.089	6.6682	3.2254	2.0508	0.6042	0.53555
	4.000	27.702	1.8292	1.5295	1.1959	1.994	0.97797	16.000	82.299	6.7105	3.2464	2.0671	0.5681	0.58485
	6.000	29.377	2.0450	1.6495	1.2398	1.981	0.96377	14.000	83.416	6.7442	3.2536	2.0728	0.5550	0.52599
2.50	14.000	37.112	2.2798	1.7729	1.2860	1.8350	0.94538	12.000	84.462	6.7710	3.2594	2.0774	0.5444	0.52403
	16.000	39.351	2.5351	1.8993	1.3348	1.7497	0.92274	10.000	85.455	6.7923	3.2640	2.0810	0.5359	0.52249
	18.000	41.748	2.8128	2.0285	1.3866	1.6613	0.89592	8.000	86.408	6.8088	3.2675	2.0838	0.5292	0.52129
2.60	20.000	44.336	3.1155	2.1604	1.4421	1.4421	1.5689	6.000	87.331	6.8211	3.2701	2.0859	0.5242	0.52041
	22.000	47.174	3.4480	2.2955	1.5021	1.4709	0.83015	4.000	88.232	6.8296	3.2719	2.0873	0.5207	0.51979
	24.000	50.371	3.8196	2.4357	1.5682	1.3644	0.79093	2.000	89.119	6.8346	3.2730	2.0882	0.5186	0.51943
2.70	26.000	54.184	4.2521	2.5861	1.6442	1.2426	0.74598	2.50	2.000	25.050	1.1405	1.0984	0.99977	0.99427
	28.000	59.656	4.8382	2.7707	1.7462	1.0779	0.68761		26.609	1.2961	1.0775	1.0775	1.0775	0.99822
	28.681	64.710	5.3269	2.9100	1.8305	0.9370	0.64187		28.259	1.4679	1.3133	1.1177	1.2505	0.99427
2.80	28.000	69.291	5.7130	3.0119	1.8968	0.8201	0.60781		4.000	1.6568	1.4289	1.1595	2.1685	0.98703
	26.000	73.400	6.0048	3.0845	1.9468	0.7260	0.58331		6.000	1.8639	1.5493	1.2031	2.0859	0.97589
	24.000	75.889	6.1539	3.1203	1.9722	0.6751	0.57121		8.000	2.0900	1.6737	1.2488	2.0022	0.96046
2.90	22.000	77.803	6.2534	3.1436	1.9892	0.6397	0.56329		10.000	31.851	2.3364	1.8015	1.9169	0.94057
	20.000	79.402	6.3260	3.1605	2.0016	0.6129	0.55758		12.000	33.802	2.3373	1.8015	1.9169	0.94057
	18.000	80.800	6.3816	3.1732	2.0111	0.5919	0.55326		14.000	35.866	2.3373	1.8015	1.9169	0.94057
3.00	16.000	82.059	6.4251	3.1831	2.0185	0.5751	0.54990		16.000	38.057	2.6042	1.9322	1.3478	0.91625
	14.000	83.217	6.4596	3.1909	2.0244	0.5615	0.54726		18.000	40.389	2.8949	2.0652	1.7394	0.88767
	12.000	84.299	6.4870	3.1971	2.0290	0.5505	0.54517		20.000	42.890	3.2109	2.2002	1.4594	1.6458
3.10	10.000	85.324	6.5087	3.2019	2.0327	0.5416	0.54352		22.000	45.602	3.5558	2.3373	1.5213	1.5475
	8.000	86.306	6.5254	3.2057	2.0356	0.5348	0.54225		24.000	48.600	3.9361	2.4775	1.5887	1.4426
	6.000	87.255	6.5379	3.2085	2.0377	0.5296	0.54131		26.000	52.036	4.3657	2.6235	1.6641	1.3266
3.20	4.000	88.182	6.5466	3.2104	2.0392	0.5260	0.54065		28.000	56.335	4.8844	2.7844	1.7542	1.1888
	2.000	89.094	6.5517	3.2115	2.0400	0.5238	0.54027		29.797	64.782	5.8014	3.0342	1.9120	0.9402
	2.45	25.572	1.1381	1.0368	1.0377	0.99978	0.99981		26.000	71.949	6.4249	3.1831	2.0185	0.7573
3.30	4.000	27.143	1.2908	1.1994	1.0762	2.2855	0.99831		24.000	74.856	6.6273	3.2282	2.0529	0.6928
	6.000	28.805	1.4591	1.3078	1.1157	2.2048	0.99453		22.000	76.939	6.7526	3.2555	2.0742	0.6509
	8.000	30.563	1.6440	1.4212	1.1567	2.1241	0.98761		20.000	78.625	6.8414	3.2744	2.0893	0.61894
3.40	10.000	32.422	1.8463	1.5933	1.1994	2.0428	0.97695		18.000	81.353	6.9602	3.2885	2.1007	0.5962
	12.000	34.388	2.0672	1.6615	1.2442	1.9603	0.96215		14.000	83.598	7.0343	3.3148	2.1221	0.5489
	14.000	36.472	2.3078	1.7871	1.2914	1.8762	0.94302		12.000	84.612	7.0607	3.3202	2.1266	0.5387
3.50	16.000	38.685	2.5692	1.9156	1.3412	1.7898	0.91985		10.000	85.576	7.0816	3.3245	2.1301	0.5304
	18.000	41.047	2.8532	2.0466	1.3941	1.7006	0.89187		8.000	86.502	7.0979	3.3278	2.1329	0.5240
	20.000	43.588	3.1623	2.1800	1.4506	1.6077	0.86018		6.000	87.400	7.1100	3.3303	2.1350	0.5191
3.60	22.000	46.358	3.5007	2.3160	1.5115	1.5040	0.82459		4.000	88.277	7.1184	3.3320	2.1364	0.5157
	24.000	49.445	3.8759	2.4560	1.5781	1.4042	0.78502		2.000	89.142	7.1234	3.3330	2.1372	0.5137

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{\rho_2}{\rho_1}$	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{\rho_2}{\rho_1}$	$\frac{p_2}{p_{01}}$
2.55	2.000	24.550	1.1429	1.0390	2.4639	0.99976	2.60	30.814	64.866	6.2972	3.1538
	4.000	26.099	1.3019	1.2065	2.3796	0.99814		30.000	69.778	6.7777	3.2609
	6.000	27.739	1.4768	1.3189	2.2961	0.99399		28.000	73.590	7.0906	3.3263
	8.000	29.474	1.6699	1.4367	2.2128	0.98642		26.000	75.955	7.2555	3.3596
	10.000	31.307	1.8817	1.5593	2.1288	0.97479		24.000	77.778	7.3665	3.3815
	12.000	33.244	2.1133	1.6861	2.0438	0.95871		22.000	79.299	7.4481	3.3974
	14.000	35.293	2.3656	1.8162	1.9573	0.93803		20.000	80.626	7.5108	3.4095
	16.000	37.463	2.6399	1.9490	1.3545	1.8687		18.000	81.815	7.5602	3.4189
	18.000	39.770	2.9378	2.0840	1.4097	1.7776		16.000	82.906	7.5997	3.4264
	20.000	42.236	3.2611	2.2207	1.4685	1.6832		14.000	83.922	7.6316	3.4324
	22.000	44.899	3.6130	2.3591	1.5315	1.5845		12.000	84.879	7.6572	3.4372
	24.000	47.822	3.9995	2.4998	1.5999	1.4797		10.000	85.792	7.6775	3.4411
	26.000	51.130	4.4319	2.6449	1.6756	1.3655		8.000	86.671	7.6934	3.4440
	28.000	55.131	4.9401	2.8007	1.7638	1.2334		6.000	87.524	7.7053	3.4462
	30.000	61.449	5.6866	3.0051	1.8923	1.0385		4.000	88.359	7.7135	3.4478
	30.317	64.823	6.0466	3.0946	1.9539	0.9418		2.000	89.183	7.7184	3.4487
	30.000	67.966	6.3519	3.1664	2.0060	0.8568					0.5045
	28.000	72.844	6.7595	3.2569	2.0754	0.7364					0.46022
	26.000	75.440	6.9402	3.2952	2.1061	0.6793					
	24.000	77.380	7.0575	3.3195	2.1260	0.6405					
	22.000	78.978	7.1423	3.3368	2.1404	0.6115					
	20.000	80.360	7.2068	3.3499	2.1514	0.5887					
	18.000	81.594	7.2575	3.3600	2.1600	0.5703					
	16.000	82.720	7.2978	3.3680	2.1668	0.5554					
	14.000	83.766	7.3301	3.3744	2.1723	0.5432					
	12.000	84.750	7.3561	3.3795	2.1767	0.5333					
	10.000	85.688	7.3767	3.3835	2.1802	0.5253					
	8.000	86.590	7.3927	3.3866	2.1829	0.5190					
	6.000	87.464	7.4047	3.3890	2.1849	0.5142					
	4.000	88.320	7.4131	3.3906	2.1864	0.5109					
	2.000	89.163	7.4180	3.3916	2.1872	0.5090					
2.60	2.000	24.071	1.1454	1.1017	1.0396	2.5123					
	4.000	25.611	1.3070	1.2100	1.0801	2.4265					
	6.000	27.241	1.4888	1.3245	1.1218	2.3416					
	8.000	28.966	1.6831	1.4445	1.1651	2.2568					
	10.000	30.789	1.8998	1.5695	1.2105	2.1715					
	12.000	32.714	2.1369	1.6986	1.2580	2.0852					
	14.000	34.749	2.3955	1.8311	1.3082	1.9973					
	16.000	36.901	2.6767	1.9662	1.3613	1.9075					
	18.000	39.185	2.9817	2.1032	1.4177	1.8152					
	20.000	41.621	3.3126	2.2417	1.4778	1.7199					
	22.000	44.242	3.6723	2.3814	1.5421	1.6205					
	24.000	47.102	4.0658	2.5229	1.6116	1.5157					
	26.000	50.305	4.5028	2.6675	1.6880	1.4025					
	28.000	54.088	5.0067	2.8201	1.7754	1.2744					
	30.000	59.352	5.6706	3.0010	1.8896	1.1062					

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
2.65	4.000	88.396	8.0198	3.5035	2.2891	0.44194	2.75	24.000	45.225	4.2794	2.5951	1.6490	0.74319
	2.000	89.200	8.0247	3.5044	2.2899	0.44165		26.000	48.206	4.7375	2.7404	1.7288	0.69739
2.70	2.000	23.173	1.1503	1.1051	1.0409	2.6090	0.99972	32.000	51.579	5.2490	2.8886	1.8171	1.3832
	4.000	24.696	1.3179	1.2172	1.0827	2.5201	0.99786	32.173	65.002	7.0807	3.3243	2.1300	0.9476
6.000	26.311	1.5042	1.3360	1.1260	2.4321	0.99311		32.000	67.323	7.3448	3.3773	2.1748	0.8812
8.000	28.019	1.7102	1.4605	1.1709	2.3444	0.98446		30.000	72.678	7.8741	3.4773	2.2644	0.7401
10.000	29.824	1.9369	1.5902	1.2180	2.2561	0.97125		28.000	75.285	8.0870	3.5154	2.3004	0.52329
12.000	31.728	2.1855	1.7241	1.2676	2.1669	0.95309		26.000	77.202	8.2233	3.5393	2.3235	0.43010
14.000	33.739	2.4569	1.8614	1.3199	2.0763	0.92991		24.000	78.766	8.3214	3.5561	2.3400	0.6071
16.000	35.862	2.7523	2.0010	1.3754	1.9838	0.90191		22.000	80.110	8.3960	3.5688	2.3526	0.5829
18.000	38.109	3.0727	2.1423	1.4343	1.8890	0.86948		20.000	81.303	8.4545	3.5786	2.3625	0.5634
20.000	40.496	3.4200	2.2845	1.4970	1.7915	0.83311		18.000	82.386	8.5014	3.5864	2.3704	0.5474
22.000	43.049	3.7964	2.4273	1.5641	1.6905	0.79337		16.000	83.387	8.5392	3.5927	2.3768	0.5343
24.000	45.809	4.2059	2.5706	1.6362	1.5848	0.75072		14.000	84.324	8.5699	3.5978	2.3820	0.5234
26.000	48.852	4.6560	2.7155	1.7146	1.4723	0.70538		12.000	85.212	8.5948	3.6019	2.3862	0.5145
28.000	52.334	5.1626	2.8645	1.8022	1.3488	0.65692		10.000	86.062	8.6146	3.6051	2.3895	0.5072
30.000	56.687	5.7730	3.0271	1.9071	1.2018	0.60268		8.000	86.882	8.6301	3.6077	2.3922	0.5015
31.741	64.956	6.8143	3.2687	2.0847	0.9462	0.52090		6.000	87.680	8.6418	3.6096	2.3941	0.4972
30.000	71.913	7.5186	3.4110	2.2042	0.7587	0.47286		4.000	88.462	8.6499	3.6109	2.3955	0.4942
28.000	74.790	7.529	3.4551	2.2439	0.6907	0.45808		2.000	89.234	8.6547	3.6117	2.3963	0.4924
26.000	76.828	7.8967	3.4814	2.2682	0.6468	0.44930							
24.000	78.466	7.9983	3.4997	2.2854	0.6145	0.44321							
22.000	79.862	8.0748	3.5133	2.2984	0.5893	0.43870							
20.000	81.095	8.1345	3.5238	2.3085	0.5691	0.43522							
18.000	82.210	8.1821	3.5321	2.3165	0.5527	0.43247							
16.000	83.238	8.2204	3.5388	2.3230	0.5391	0.43027							
14.000	84.199	8.26515	3.5444	2.3282	0.5279	0.42852							
12.000	85.109	8.2795	3.5484	2.3324	0.5188	0.42708							
10.000	85.978	8.2965	3.5518	2.3358	0.5114	0.42595							
8.000	86.816	8.3121	3.5545	2.3385	0.5056	0.42506							
6.000	87.631	8.3238	3.5565	2.3404	0.5012	0.42441							
4.000	88.430	8.3319	3.5579	2.3418	0.4981	0.42395							
2.000	89.218	8.3367	3.5587	2.3426	0.4962	0.42368							
2.75	2.000	22.750	1.1528	1.0415	2.6573	0.99971	28.000	50.887	65.050	7.3524	3.3788	2.1761	0.9490
	4.000	24.267	1.3236	1.0841	2.5667	0.99776	30.000	54.786	7.9387	3.0683	1.9355	1.2783	1.0909
6.000	25.873	1.5135	1.3417	1.1280	2.4772	0.99279	32.000	60.433	6.7529	3.2555	2.0743	1.5872	1.7578
8.000	27.575	1.7239	1.4686	1.1738	2.3879	0.98377	32.587						
10.000	29.372	1.9558	1.6007	1.2219	2.2982	0.96999	32.000	69.211	7.8278	3.4689	2.2566	1.8210	0.8307
12.000	31.269	2.2104	1.7371	1.2724	2.2074	0.95109	30.000	73.328	8.2272	3.5399	2.3241	0.7243	0.42988
14.000	33.269	2.4885	1.8768	2.1153	0.92704	0.92704	28.000	75.728	8.4241	3.5735	2.3574	0.6684	0.41882
16.000	35.381	2.7912	2.0188	1.3826	2.0213	0.89806	26.000	77.543	8.5544	3.5952	2.3794	0.6296	0.41169
18.000	37.612	3.1197	2.1622	1.4429	1.9523	0.86461	24.000	79.042	8.6495	3.6108	2.3954	0.6002	0.40659
20.000	39.980	3.4757	2.3063	1.5070	1.8285	0.82724	22.000	80.339	8.7224	3.6227	2.4077	0.5769	0.40273
22.000	42.504	3.8610	2.4506	1.7245	0.78659	0.78659	20.000	81.496	8.7800	3.6319	2.4174	0.5580	0.39971

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	M_2	$\frac{T_2}{T_1}$	$\frac{p_{02}}{p_{01}}$
2.80	18.000	82.550	8.8262	3.6393	2.4252	0.5425	0.39731	2.90	6.000	24.666	1.5421	1.3594	1.1344	2.6117
	16.000	83.525	8.8637	3.6453	2.4316	0.5297	0.39538		8.000	26.350	1.7663	1.4933	1.1828	2.5175
	14.000	84.440	8.8942	3.6501	2.4367	0.5191	0.39382		10.000	28.129	2.0143	1.6328	1.2336	2.4229
	12.000	85.308	8.9188	3.6540	2.4409	0.5103	0.39256		12.000	30.007	2.2873	1.7767	1.2874	2.3273
	10.000	86.140	8.9385	3.6571	2.4442	0.5033	0.39156		14.000	31.985	2.5883	1.9238	1.3444	2.2304
	8.000	86.943	8.9540	3.6595	2.4468	0.4977	0.39078		16.000	34.069	2.9123	2.0729	1.4050	2.1318
	6.000	87.725	8.9656	3.6613	2.4487	0.4935	0.39019		18.000	36.264	3.2663	2.2229	1.4694	2.0313
	4.000	88.492	8.9737	3.6626	2.4501	0.4905	0.38978		20.000	38.584	3.6496	2.3729	1.5380	1.9285
	2.000	89.248	8.9784	3.6633	2.4509	0.4887	0.38954		22.000	41.044	4.0638	2.5222	1.6112	1.8229
2.85	2.000	21.954	1.1579	1.1103	1.0429	2.7537	0.99968		24.000	43.672	4.5119	2.6704	1.6896	1.7138
	4.000	23.457	1.3349	1.2283	1.0868	2.6598	0.99755		26.000	46.515	4.9984	2.8177	1.7739	1.5999
	6.000	25.052	1.5325	1.3535	1.1323	2.5670	0.99213		28.000	49.655	5.5328	2.9652	1.8659	1.4788
	8.000	26.742	1.7520	1.4850	1.1798	2.4744	0.98230		30.000	53.274	6.1364	3.1161	1.9692	1.3453
	10.000	28.526	1.9946	1.6220	1.2297	2.3815	0.96735		32.000	57.931	6.8791	3.2824	2.0957	1.1827
	12.000	30.410	2.2613	1.7634	1.2824	2.2876	0.94692		33.363	65.145	7.9116	3.4841	2.2708	0.9516
	14.000	32.394	2.5532	1.9080	1.3382	2.1923	0.92105		24.000	79.533	8.6350	3.6085	2.3930	0.7771
	16.000	34.486	2.8712	2.0547	1.3974	2.0953	0.89006		22.000	71.287	8.9347	3.6565	2.4435	0.6985
	18.000	36.692	3.2165	2.2025	1.4604	1.9964	0.85451		20.000	74.392	9.1095	3.6836	2.4730	0.6500
	20.000	39.025	3.5904	2.3505	1.5275	1.8950	0.81511		28.000	76.490	9.4928	3.7020	2.4934	0.6149
	22.000	41.505	3.9948	2.4982	1.5991	1.7906	0.77258		26.000	78.142	9.9212	3.9321	2.5156	0.5775
	24.000	44.160	4.4325	2.6451	1.6757	1.6825	0.72766		24.000	79.533	9.9315	3.7260	2.5087	0.5660
	26.000	47.042	4.9089	2.7916	1.7585	1.5692	0.68081		22.000	80.750	9.9475	3.7343	2.5300	0.5482
	28.000	50.247	5.4345	2.9391	1.8490	1.4481	0.63219		20.000	81.845	9.9475	3.7449	2.5376	0.5335
	30.000	53.992	6.0344	3.0917	1.9518	1.3127	0.58089		18.000	82.845	9.9492	3.7462	2.5438	0.5212
	32.000	59.037	6.8013	3.2659	2.0825	1.1407	0.52183		16.000	83.775	9.9597	3.7506	2.5489	0.5111
	32.984	65.097	7.6294	3.4320	2.2230	0.9503	0.46580		14.000	84.651	9.9842	3.7541	2.5530	0.5027
	32.000	70.389	8.2421	3.5425	2.3266	0.8001	0.42903		12.000	85.484	9.9842	3.7541	2.5530	0.36680
	30.000	73.893	8.5802	3.5995	2.3837	0.7107	0.41030		20.000	86.283	9.6038	3.7570	2.5563	0.4959
	28.000	76.127	8.7648	3.6295	2.4149	0.6588	0.40050		18.000	87.055	9.6191	3.7592	2.5588	0.4906
	26.000	77.855	8.8902	3.6495	2.4360	0.6220	0.39402		16.000	87.808	9.6306	3.7608	2.5608	0.4865
	24.000	79.297	8.9827	3.6640	2.4516	0.5938	0.38933		14.000	88.546	9.6387	3.7620	2.5621	0.4836
	22.000	80.552	9.0543	3.6751	2.4637	0.5713	0.38574		12.000	89.275	9.6434	3.7626	2.5629	0.4819
	20.000	81.676	9.1110	3.6838	2.4733	0.5530	0.38294		10.000	90.000	9.6538	3.7636	2.5636	0.36049
	18.000	82.702	9.1567	3.6908	2.4810	0.5379	0.38069		8.000	91.754	9.6638	3.7646	2.5646	0.35960
	16.000	83.655	9.1938	3.6964	2.4872	0.5253	0.37888		6.000	92.500	9.6738	3.7655	2.5653	0.35890
	14.000	84.549	9.2241	3.7010	2.4923	0.5150	0.37741		10.000	93.247	9.6838	3.7668	2.5663	0.35838
	12.000	85.399	9.2486	3.7047	2.4964	0.5064	0.37623		12.000	94.000	9.6938	3.7675	2.5672	0.35802
	10.000	86.213	9.2683	3.7077	2.4998	0.4995	0.37528		14.000	94.753	9.7038	3.7682	2.5682	0.3572
	8.000	87.001	9.2836	3.7100	2.5023	0.4940	0.37454		16.000	95.500	9.7138	3.7691	2.5691	0.35640
	6.000	87.768	9.2952	3.7117	2.5043	0.4899	0.37399		18.000	96.250	9.7238	3.7700	2.5700	0.35544
	4.000	88.520	9.3033	3.7129	2.5057	0.4870	0.37360		20.000	97.000	9.7338	3.7709	2.5709	0.35449
	2.000	89.262	9.3080	3.7136	2.5065	0.4853	0.37338		22.000	97.607	9.7438	3.7718	2.5718	0.35348
2.90	2.000	21.578	1.1604	1.1120	1.0435	2.8019	0.99966		24.000	43.211	4.5930	2.6959	1.0442	2.8500
	4.000	23.076	1.3406	1.2320	1.0882	2.7062	0.99744		26.000	46.018	5.0902	2.8441	1.0442	2.7526

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
2.95	32.000	56.997	6.9741	3.3023	2.1119	1.2199	0.50950	3.00	14.000	84.837	10.2483
	33.726	65.193	8.1990	3.5350	2.3194	0.9528	0.43150		12.000	85.638	10.2726
	32.000	72.020	9.0188	3.6696	2.4577	0.7585	0.38752		10.000	86.408	10.2921
	30.000	74.838	9.2917	3.7112	2.5037	0.68777	0.37416		8.000	87.154	10.3074
	28.000	76.821	9.4585	3.7359	2.5318	0.64220	0.36628		6.000	87.881	10.3190
	26.000	78.407	9.5762	3.7530	2.5516	0.6084	0.36086		4.000	88.594	10.3270
	24.000	79.752	9.6649	3.7657	2.5666	0.5821	0.35684		2.000	89.299	10.3318
	22.000	80.935	9.7342	3.7755	2.5782	0.5610	0.35374			89.569	2.6787
	20.000	82.000	9.7896	3.7834	2.5875	0.5437	0.35128			3.8459	2.6647
	18.000	82.978	9.8345	3.7896	2.5951	0.5293	0.34931			3.8491	2.6688
	16.000	83.889	9.8712	3.7947	2.6013	0.5173	0.34771			3.8517	2.6721
	14.000	84.747	9.9012	3.7989	2.6063	0.5074	0.34641			3.8537	2.6747
	12.000	85.563	9.9255	3.8023	2.6104	0.4992	0.34536			3.8553	2.6766
	10.000	86.348	9.9450	3.8050	2.6137	0.4925	0.34452			3.8563	2.6779
	8.000	87.106	9.9604	3.8071	2.6163	0.4872	0.34386			3.8569	2.6777
	6.000	87.845	9.9719	3.8087	2.6182	0.4832	0.34336			3.8569	2.6777
	4.000	88.571	9.9799	3.8098	2.6196	0.4804	0.34302			3.8569	2.6777
	2.000	89.288	9.9847	3.8104	2.6204	0.4788	0.34282			3.8569	2.6777
3.00	2.000	20.867	1.1656	1.1155	1.0449	2.8981	0.99963	2.05	2.000	20.530	1.0455
	4.000	22.355	1.3522	1.2395	1.0909	2.7988	0.99721		22.000	22.014	22.014
	6.000	23.936	1.5616	1.3714	1.1387	2.7008	0.99105		23.591	23.591	23.591
	8.000	25.611	1.7953	1.5101	1.1888	2.6031	0.97993		30.000	31.455	31.455
	10.000	27.383	2.0545	1.6546	1.2417	2.5050	0.96308		32.000	35.456	35.456
	12.000	29.251	2.3404	1.8036	1.2977	2.4060	0.94022		34.000	61.505	61.505
	14.000	31.218	2.6540	1.9556	1.3571	2.3056	0.91148		34.407	65.288	65.288
	16.000	33.288	2.9964	2.1095	1.4204	2.2037	0.87734		34.000	68.742	68.742
	18.000	35.467	3.3685	2.2641	1.4878	2.1000	0.83855		32.000	73.184	73.184
	20.000	37.764	3.7713	2.4181	1.5596	1.9941	0.79602		30.000	75.604	75.604
	22.000	40.192	4.2064	2.5708	1.6362	1.8585	0.75068		28.000	77.406	77.406
	24.000	42.775	4.6761	2.7216	1.7181	1.7744	0.70340		26.000	78.880	78.880
	26.000	45.552	5.1844	2.8706	1.8060	1.6589	0.65491		24.000	80.145	80.145
	28.000	48.586	5.7388	3.0184	1.9012	1.5374	0.60560		22.000	81.267	81.267
	30.000	52.014	6.3559	3.1673	2.0067	1.4059	0.55526		20.000	82.284	82.284
	32.000	56.182	7.0810	3.3244	2.1300	1.2541	0.50205		18.000	83.221	83.221
	34.000	63.673	8.2682	3.5470	2.3310	1.0029	0.42755		16.000	84.095	84.095
	34.073	65.241	8.4917	3.5848	2.3688	0.9540	0.41510		14.000	84.921	10.6012
	34.000	66.749	8.6971	3.6186	2.4035	0.9083	0.40406		12.000	85.709	10.6255
	36.000	72.642	9.3988	3.7271	2.5217	0.7428	0.36908		10.000	86.466	10.6450
	38.000	75.239	9.6517	3.7638	2.5643	0.6779	0.35743		8.000	87.199	10.6603
	38.000	77.126	9.8121	3.7865	2.5913	0.6345	0.35029		6.000	87.914	10.6719
	38.000	78.652	9.9268	3.8024	2.6106	0.6022	0.34530		4.000	88.617	10.6799
	40.000	79.956	10.0139	3.8144	2.6253	0.5768	0.34157		2.000	89.310	10.6847
	42.000	81.106	10.0824	3.8237	2.6368	0.5563	0.33868			10.6847	2.7381
	44.000	82.147	10.1373	3.8311	2.6460	0.5394	0.33638			10.6847	2.7381
	48.000	83.103	10.1819	3.8371	2.6536	0.5253	0.33453			10.6847	2.7381
	46.000	83.996	10.2184	3.8442	2.6697	0.5136	0.33302			10.6847	2.7381

Oblique Shock Tables ($\gamma = 1.4$)

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
3.20	22.000	81.694	11.5307	4.0035	2.8802	0.5398	0.28438	3.30	2.000	19.009	1.1812	1.1262	0.99953
	20.000	82.649	11.5844	4.0096	2.8892	0.5243	0.28243		4.000	20.475	1.3880	1.2626	0.999642
	18.000	83.533	11.6285	4.0146	2.8966	0.5113	0.28115		6.000	22.039	1.6222	1.4082	0.998558
	16.000	84.363	11.6647	4.0187	2.9026	0.5004	0.27996		8.000	23.699	1.8859	1.5617	0.97453
	14.000	85.147	11.6945	4.0220	2.9076	0.4913	0.27899		10.000	25.457	2.1807	1.7216	0.95347
	12.000	85.897	11.7188	4.0247	2.9117	0.4837	0.27820		12.000	27.310	2.5078	1.8861	1.3296
	10.000	86.619	11.7385	4.0269	2.9150	0.4776	0.27757		14.000	29.261	2.8688	2.0536	1.2076
	8.000	87.320	11.7539	4.0286	2.9176	0.4727	0.27707		16.000	31.308	3.2640	2.2219	2.8563
	6.000	88.003	11.7685	4.0299	2.9196	0.4690	0.27669		18.000	33.456	3.6947	2.3898	2.7468
	4.000	88.675	11.7736	4.0308	2.9209	0.4664	0.27643		20.000	35.710	4.1617	2.5557	2.6364
	2.000	89.340	11.7784	4.0313	2.9217	0.4649	0.27628		22.000	38.077	4.6655	2.7184	2.5248
									24.000	40.573	5.2081	2.8773	2.4118
									26.000	43.222	5.7918	3.0318	2.84954
									28.000	46.062	6.4212	3.1822	2.7468
									30.000	49.163	7.1057	3.3294	2.6364
									32.000	52.667	7.8658	3.4758	2.5248
									34.000	56.963	8.7622	3.6291	2.4118
									35.882	65.518	10.3564	3.8602	2.3898
									34.000	72.501	11.3896	3.9873	2.27869
									32.000	75.148	11.7036	4.0230	2.1703
									30.000	77.029	11.8983	4.0445	2.0636
									28.000	78.535	12.0364	4.0595	1.9439
									26.000	79.812	12.1408	4.0706	1.8215
									24.000	80.932	12.2227	4.0793	1.7184
									22.000	81.938	12.2884	4.0862	1.6236
									20.000	82.859	12.3420	4.0918	1.5275
									18.000	83.714	12.3860	4.0964	1.4218
									16.000	84.517	12.4223	4.1001	1.3294
									14.000	85.278	12.4523	4.1032	1.2227
									12.000	86.007	12.4767	4.1057	1.1263
									10.000	86.708	12.4964	4.1077	1.0236
									8.000	87.390	12.5120	4.1093	0.9297
									6.000	88.056	12.5237	4.1105	0.8297
									4.000	88.710	12.5319	4.1114	0.7247
									2.000	89.357	12.5367	4.1119	0.62532
													0.99951
3.25	2.000	19.293	1.1786	1.1244	1.0482	3.1380	0.99955	3.0290	0.99656	34.000	72.501	11.3896	3.9873
	4.000	20.762	1.3818	1.2586	1.0979	2.9215	0.98902	2.4889	0.89402	32.000	52.667	11.7036	4.0230
	6.000	22.328	1.6119	1.4019	1.1498	1.2044	2.8445	0.97549	0.97547	34.000	56.963	11.8983	4.0445
	8.000	23.990	1.8704	1.5530	1.2624	2.7070	0.95158	2.5986	0.92789	34.000	65.518	12.0364	4.0595
	10.000	25.749	2.1590	1.7103	1.3242	2.4791	1.0707	0.90101	0.89402	32.000	75.148	12.1408	4.0706
	12.000	27.604	2.4889	2.8318	1.3901	2.0350	0.71232	0.71232	0.71232	30.000	77.029	12.2227	4.0793
	14.000	29.556	3.2179	2.2030	1.4607	2.3779	0.85437	0.85437	0.85437	28.000	78.535	12.2884	4.0862
	16.000	31.606	3.6384	2.3687	1.5360	2.2653	0.81004	0.81004	0.81004	26.000	79.812	12.3420	4.0918
	18.000	33.757	4.0940	2.5326	1.6165	2.1511	0.76227	0.76227	0.76227	24.000	80.932	12.4223	4.1001
	20.000	36.016	4.5858	2.6937	1.7024	2.0350	0.71232	0.71232	0.71232	22.000	81.938	12.4767	4.1057
	22.000	38.390	5.1156	2.8513	1.7941	1.9168	0.66129	0.66129	0.66129	20.000	82.859	12.4964	4.1077
	24.000	40.898	5.6858	3.0049	1.8922	1.7958	0.61015	0.61015	0.61015	18.000	83.714	12.3860	4.0964
	26.000	43.563	6.3015	3.1548	1.9974	1.6707	0.59590	0.59590	0.59590	16.000	84.517	12.4223	4.1001
	28.000	46.426	6.9727	3.3020	2.1116	1.5394	0.50960	0.50960	0.50960	14.000	85.278	12.4523	4.1032
	30.000	49.566	7.3223	3.4494	2.2387	1.3970	0.45998	0.45998	0.45998	12.000	86.007	12.4767	4.1057
	32.000	53.141	7.7223	3.6062	2.3907	1.2287	0.40809	0.40809	0.40809	10.000	86.708	12.4964	4.1077
	34.000	57.616	8.6213	3.6285	2.6285	0.9596	0.34078	0.34078	0.34078	8.000	87.390	12.5120	4.1093
	35.610	65.473	10.0327	3.8170	2.7875	0.7636	0.30361	0.30361	0.30361	6.000	88.056	12.5237	4.1105
	34.000	71.993	10.9786	3.9386	2.8434	0.6878	0.29180	0.29180	0.29180	4.000	88.710	12.5319	4.1114
	32.000	74.827	11.3120	3.9783	2.8771	0.6396	0.28499	0.28499	0.28499	2.000	89.357	12.5367	4.1119
	30.000	76.787	11.5124	4.0014	2.9007	0.6043	0.28035	0.28035	0.28035				
	28.000	78.339	11.6529	4.0173	2.9184	0.5767	0.27692	0.27692	0.27692				
	26.000	79.649	11.7584	4.0291	2.9322	0.5545	0.27429	0.27429	0.27429				
	24.000	80.793	11.8408	4.0382	2.9436	0.5362	0.27220	0.27220	0.27220				
	22.000	81.819	11.9067	4.0454	2.9523	0.5053	0.27052	0.27052	0.27052				
	20.000	82.757	11.9604	4.0560	2.9596	0.5082	0.26916	0.26916	0.26916				
	18.000	83.626	12.0044	4.0642	2.9657	0.4974	0.26804	0.26804	0.26804				
	16.000	84.442	12.0407	4.0599	2.9707	0.4885	0.26712	0.26712	0.26712				
	14.000	85.214	12.0705	4.0631	2.9748	0.4810	0.26637	0.26637	0.26637				
	12.000	85.953	12.0849	4.0658	2.9781	0.4750	0.26577	0.26577	0.26577				
	10.000	86.665	12.1145	4.0679	2.9807	0.4702	0.26530	0.26530	0.26530				
	8.000	87.356	12.1300	4.0695	2.9827	0.4665	0.26495	0.26495	0.26495				
	6.000	88.030	12.1417	4.0707	2.9840	0.4639	0.26470	0.26470	0.26470				
	4.000	88.693	12.1498	4.0716	2.9848	0.4624	0.26455	0.26455	0.26455				
	2.000	89.348	12.1547	4.0721									

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{P_{02}}{P_{01}}$	M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{P_{02}}{P_{01}}$
3.35	24.00	40.264	5.3024	1.8263	1.9704	0.64409	3.40	34.000	73.352	12.2131	4.0783	2.9946	0.7279
	26.00	42.898	5.8998	1.9288	1.8468	0.59200		32.000	75.717	12.4992	4.1080	3.0426	0.6653
	28.00	45.716	6.5433	3.2097	2.0386	0.54090		30.000	77.467	12.6849	4.1268	3.0738	0.6225
	30.00	48.782	7.2416	3.3568	2.1573	1.5874		28.000	78.891	12.8193	4.1402	3.0963	0.5902
32.00	52.225	8.0134	3.5024	2.2880	1.4458	0.44232		26.000	80.110	12.9221	4.1503	3.1135	0.5646
34.00	56.375	8.9114	3.6528	2.4396	1.2844	0.39294		24.000	81.185	13.0033	4.1582	3.1271	0.5437
36.00	63.380	10.2976	3.8524	2.6730	1.0339	0.32979		22.000	82.156	13.0688	4.1645	3.1381	0.5264
36.143	65.562	10.6853	3.9023	2.7382	0.9616	0.31454		20.000	83.047	13.1224	4.1697	3.1471	0.5119
36.00	67.623	11.0286	3.9446	2.7958	0.8957	0.30180		18.000	83.876	13.1665	4.1739	3.1545	0.4997
34.00	72.950	11.8006	4.0338	2.9255	0.7384	0.27557		16.000	84.656	13.2030	4.1774	3.1666	0.4894
32.00	75.444	12.0992	4.0662	2.9755	0.6723	0.26624		14.000	85.396	13.2381	4.1802	3.1657	0.4808
30.00	77.255	12.2891	4.0863	3.0074	0.6279	0.26053		12.000	86.105	13.2578	4.1826	3.1698	0.4736
28.00	78.719	12.4252	4.1004	3.0302	0.5946	0.25653		10.000	86.789	13.2777	4.1844	3.1731	0.4678
26.00	79.965	12.5287	4.1110	3.0476	0.5684	0.25355		8.000	87.453	13.2934	4.1859	3.1757	0.4632
24.00	81.062	12.6102	4.1193	3.0612	0.5471	0.25124		6.000	88.103	13.3052	4.1870	3.1777	0.4596
22.00	82.050	12.6758	4.1259	3.0722	0.5295	0.24939		4.000	88.741	13.3135	4.1878	3.1791	0.4572
20.00	82.956	12.7293	4.1313	3.0812	0.5148	0.24790		2.000	89.372	13.3184	4.1883	3.1799	0.4557
18.00	83.798	12.7734	4.1357	3.0886	0.5024	0.24668							
16.00	84.588	12.8098	4.1393	3.0947	0.4920	0.24568							
14.00	85.339	12.8398	4.1422	3.0997	0.4832	0.24486							
12.00	86.057	12.8644	4.1446	3.1038	0.4760	0.24420							
10.00	86.750	12.8842	4.1466	3.1072	0.4701	0.24386							
8.00	87.422	12.8998	4.1481	3.1098	0.4654	0.24324							
6.00	88.080	12.9116	4.1493	3.1118	0.4618	0.24292							
4.00	88.726	12.9198	4.1501	3.1131	0.4593	0.24270							
2.00	89.365	12.9246	4.1506	3.1140	0.4578	0.24256							
1.1866	18.467	1.9173	1.5793	1.2140	2.9395	0.97253	1.0502	3.000	21.226	1.65356	1.4270	1.1316	0.9947
1.1298	18.467	2.2245	1.7444	2.8260	0.94995	1.2704	3.1662	3.000	22.884	1.93331	1.5881	1.2743	0.9957
1.1298	18.467	26.755	1.9143	1.3407	2.7115	0.91981	3.1662	3.000	24.639	2.24668	1.75559	1.2748	0.9812
1.1298	18.467	37.489	4.8289	2.7679	1.7446	2.1195	0.68851	30.000	26.491	2.5962	1.9284	1.3463	0.9701
1.1298	18.467	39.967	2.9440	2.0868	1.4108	2.5958	0.88269	32.000	28.438	2.9823	2.1035	1.4178	0.87878
1.1298	18.467	39.967	3.3583	2.2600	1.4860	2.4788	0.83662	16.000	30.481	3.4063	2.2791	1.4946	0.83456
1.1298	18.467	39.967	3.3583	2.4322	1.5665	2.3604	0.79194	18.000	32.621	3.86688	2.4535	1.5769	0.83292
1.1298	18.467	39.967	3.3583	2.6019	1.6526	2.2407	0.74110	20.000	34.863	4.3706	2.6251	1.6649	0.83291
1.1298	18.467	39.967	3.3583	2.8130	1.7475	2.2779	0.7073	22.000	37.213	4.9123	2.7926	1.7590	0.83190
1.1298	18.467	39.967	3.3583	3.0527	0.9876	0.98613	0.99499	24.000	39.683	5.49561	2.9552	1.8595	0.82244
1.1298	18.467	39.967	3.3583	3.2814	1.0502	1.2704	0.99613	26.000	42.292	6.1211	3.1125	1.9666	0.82424
1.1298	18.467	39.967	3.3583	3.5290	1.6430	1.4207	1.1022	28.000	45.073	6.7941	3.2644	2.0813	0.82335
1.1298	18.467	39.967	3.3583	3.8289	1.8442	2.0868	1.4001	30.000	48.080	7.5215	3.4115	2.2047	0.82026
1.1298	18.467	39.967	3.3583	4.1408	2.4788	2.4788	1.4001	32.000	51.420	8.3194	3.5558	2.3397	0.81715
1.1298	18.467	39.967	3.3583	4.4207	2.8130	2.8130	1.4001	34.000	55.344	9.2294	3.7018	2.4932	0.81339
1.1298	18.467	39.967	3.3583	4.7140	3.2370	3.2370	1.4001	36.000	60.903	10.4358	3.8705	2.6962	0.81265
1.1298	18.467	39.967	3.3583	5.0062	3.6662	3.6662	1.4001	38.000	65.647	11.3584	3.9837	2.8512	0.80920
1.1298	18.467	39.967	3.3583	5.3000	4.0960	4.0960	1.4001	40.000	69.850	12.0718	4.0633	2.9709	0.80302
1.1298	18.467	39.967	3.3583	5.6000	4.4960	4.4960	1.4001	42.000	73.716	12.6278	4.1211	3.0642	0.79704
1.1298	18.467	39.967	3.3583	5.9000	4.8960	4.8960	1.4001	44.000	81.302	13.4020	4.1961	3.1104	0.79433
1.1298	18.467	39.967	3.3583	6.2000	5.2960	5.2960	1.4001	46.000	92.566	14.1662	4.2021	3.1410	0.78828
1.1298	18.467	39.967	3.3583	6.5000	5.6960	5.6960	1.4001	48.000	103.800	15.1789	4.2771	3.1633	0.78481
1.1298	18.467	39.967	3.3583	6.8000	6.0960	6.0960	1.4001	50.000	115.054	16.1885	4.3534	3.1804	0.77220
1.1298	18.467	39.967	3.3583	7.1000	6.4960	6.4960	1.4001	52.000	126.320	17.1985	4.4302	3.22113	0.76091
1.1298	18.467	39.967	3.3583	7.4000	6.8960	6.8960	1.4001	54.000	137.590	18.1885	4.50704	3.28611	0.75091
1.1298	18.467	39.967	3.3583	7.7000	7.2960	7.2960	1.4001	56.000	148.860	19.1789	4.5848	3.34211	0.74044
1.1298	18.467	39.967	3.3583	8.0000	7.6960	7.6960	1.4001	58.000	160.130	20.1685	4.6616	3.40211	0.73016
1.1298	18.467	39.967	3.3583	8.3000	8.0960	8.0960	1.4001	60.000	171.400	21.1585	4.7384	3.46211	0.72082
1.1298	18.467	39.967	3.3583	8.6000	8.4960	8.4960	1.4001	62.000	182.670	22.1485	4.8152	3.5234	0.71157
1.1298	18.467	39.967	3.3583	8.9000	8.8960	8.8960	1.4001	64.000	193.940	23.1385	4.8920	3.59091	0.70223
1.1298	18.467	39.967	3.3583	9.2000	9.2960	9.2960	1.4001	66.000	205.210	24.1285	4.9688	3.66711	0.69311
1.1298	18.467	39.967	3.3583	9.5000	9.6960	9.6960	1.4001	68.000	216.480	25.1185	5.0404	3.73221	0.68411
1.1298	18.467	39.967	3.3583	9.8000	10.0960	10.0960	1.4001	70.000	227.750	26.1085	5.1175	3.80211	0.67511
1.1298	18.467	39.967	3.3583	10.1000	10.4960	10.4960	1.4001	72.000	239.020	27.0985	5.1944	3.87113	0.66611
1.1298	18.467	39.967	3.3583	10.4000	10.8960	10.8960	1.4001	74.000	250.290	28.0885	5.2812	3.93887	0.65738
1.1298	18.467	39.967	3.3583	10.7000	11.2960	11.2960	1.4001	76.000	261.560	29.0785	5.3680	4.01621	0.64844
1.1298	18.467	39.967	3.3583	11.0000	11.6960	11.6960	1.4001	78.000	272.830	30.0685	5.4552	4.09344	0.63944
1.1298	18.467	39.967	3.3583	11.3000	12.1960	12.1960	1.4001	80.000	284.100	31.0585	5.5424	4.15121	0.63044
1.1298	18.467	39.967	3.3583	11.6000	12.6960	12.6960	1.4001	82.000	295.370	32.0485	5.6302	4.21939	0.62133
1.1298	18.467	39.967	3.3583	11.9000	13.1960	13.1960	1.4001	84.000	306.640	33.0385	5.7175	4.28621	0.61253
1.1298	18.467	39.967	3.3583	12.2000	13.6960	13.6960	1						

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	T_1	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	T_1	M_2	$\frac{p_{02}}{p_{01}}$
84.720	16.000	.45	13.6020	4.2145	3.2275	0.4869	0.22521	3.55	2.000	17.715	1.1353	3.4246	0.99943	1.0523	1.1353
85.451	14.000		13.6322	4.2172	3.2325	0.4784	0.22448		4.000	19.170	1.4187	1.2822	0.99566	1.1065	3.3029
86.151	12.000		13.6570	4.2195	3.2367	0.4714	0.22388		6.000	20.726	1.6748	1.4396	1.1634	3.1829	0.98619
86.826	10.000		13.6770	4.2213	3.2400	0.4656	0.22340		8.000	22.383	1.9653	1.6059	1.2238	3.0633	0.96935
87.482	8.000		13.6928	4.2227	3.2427	0.4610	0.22302		10.000	24.138	2.2920	1.7791	1.2883	2.9433	0.94435
88.125	6.000		13.7047	4.2238	3.2447	0.4575	0.22273		12.000	25.989	2.6566	1.5569	1.3576	2.8224	0.91123
88.756	4.000		13.7130	4.2245	3.2461	0.4551	0.22253		14.000	27.936	3.0603	2.1370	1.4321	2.7003	0.87077
89.379	2.000		13.7180	4.2250	3.2469	0.4536	0.22241		16.000	29.977	3.5040	2.3174	1.5121	2.5771	0.82424
17.958	2.000		1.1920	1.1335	1.0516	3.3769	0.99945		20.000	32.115	3.9887	2.4961	2.4526	0.77322	1.0523
19.415	4.000		1.4125	1.2783	1.1050	3.2574	0.99582		22.000	34.352	4.5148	2.6714	2.3271	0.71939	1.1353
20.972	6.000		1.6642	1.4333	1.1611	3.1396	0.98669		24.000	36.692	5.0827	2.8419	2.2005	0.66437	1.2822
8.000	22.629		1.5941	1.5930	1.2205	3.0222	0.97044		26.000	39.149	5.6937	3.0069	1.8985	2.0727	0.99566
10.000	24.384		2.2693	1.7675	1.2839	2.9044	0.94626		28.000	41.738	6.3495	3.1659	2.0056	1.8985	0.98619
12.000	26.236		2.6262	1.9426	1.3519	2.7856	0.91415		30.000	44.488	7.0535	3.3187	2.1370	1.4321	0.96935
14.000	28.182		3.0211	2.1202	1.4249	2.6657	0.87481		32.000	47.447	7.8120	3.4660	2.2539	1.6762	0.55675
16.000	30.225		3.4549	2.2982	1.5033	2.5445	0.82942		34.000	50.705	8.6392	3.6092	2.3937	1.5342	0.40714
18.000	32.363		3.9283	2.4147	1.5874	2.4222	0.77952		36.000	54.463	9.5691	3.7520	2.5504	1.3790	0.36118
20.000	34.602		4.4421	2.6482	1.6774	2.9886	0.72668		38.000	59.399	10.7262	3.9075	3.9075	1.1885	0.50395
22.000	36.947		4.9969	2.8173	1.7737	2.1739	0.67245		40.000	65.729	12.0520	4.0612	2.9676	0.45445	0.50395
24.000	39.410		5.5936	2.9811	1.8764	2.0478	0.61813		42.000	71.121	12.9969	4.1576	3.1261	0.7943	0.26763
26.000	42.009		6.2345	3.1392	1.9860	1.9199	0.56473		44.000	74.353	13.4667	4.2021	3.2048	0.7018	0.22854
28.000	44.774		6.9227	3.2916	2.1032	1.7894	0.51313		46.000	76.427	13.7265	4.2257	3.2483	0.6473	0.22222
30.000	47.755		7.6654	3.4368	2.2291	1.6549	0.46353		48.000	78.025	13.9033	4.2415	3.2779	0.6083	0.21803
32.000	51.053		8.4777	3.5825	2.3664	1.5131	0.41586		50.000	79.351	14.0342	4.2530	3.2998	0.5782	0.21501
34.000	54.888		9.3968	3.7288	2.5214	1.3570	0.36917		52.000	80.497	14.1355	4.2618	3.3168	0.5541	0.24063
36.000	60.090		10.8715	3.8879	2.7191	1.1594	0.31891		54.000	81.517	14.2163	4.2687	3.3303	0.5343	0.21090
36.867	65.689		11.7027	4.0229	2.9090	0.9643	0.27872		56.000	82.442	14.2819	4.2743	3.3413	0.5178	0.20944
36.000	70.545		12.5396	4.1121	3.0494	0.8105	0.25324		58.000	83.294	14.3358	4.2789	3.3503	0.5039	0.20826
34.000	74.048		13.0455	4.1623	3.1342	0.7098	0.23934		60.000	84.090	14.3804	4.2827	3.3578	0.4922	0.20729
32.000	76.207		13.3126	4.1877	3.1790	0.6529	0.23241		62.000	84.839	14.4173	4.2858	3.3640	0.4823	0.20649
30.000	77.851		13.4920	4.2044	3.2090	0.6128	0.22791		64.000	85.552	14.4478	4.2883	3.3691	0.4740	0.20583
28.000	79.207		13.6238	4.2165	3.2311	0.5820	0.22468		66.000	88.165	14.5212	4.2944	3.3814	0.4535	0.20425
26.000	80.375		13.7255	4.2256	3.2481	0.5574	0.22223		68.000	88.782	14.5296	4.2951	3.3828	0.4511	0.20407
24.000	81.413		13.8064	4.2339	3.2617	0.5373	0.22031		70.000	89.392	14.5346	4.2956	3.3836	0.4497	0.20397
22.000	82.352		13.8719	4.2387	3.2727	0.5205	0.21877		72.000	86.895	14.4931	4.2921	3.3767	0.4615	0.20485
20.000	83.216		13.9256	4.2435	3.2817	0.5065	0.21751		74.000	88.537	14.5091	4.2934	3.3794	0.4570	0.20451
18.000	84.022		13.9700	4.2474	3.2891	0.4946	0.21649		76.000	88.165	14.5212	4.2944	3.3814	0.4535	0.20425
16.000	84.781		14.0067	4.2506	3.2952	0.4846	0.21564		78.000	88.782	14.5296	4.2951	3.3828	0.4511	0.20407
14.000	85.503		14.0371	4.2532	3.3003	0.4762	0.21494		80.000	89.392	14.5346	4.2956	3.3836	0.4497	0.20397
12.000	86.194		14.0620	4.2554	3.3045	0.4692	0.21438		82.000	88.932	14.5346	4.2956	3.3836	0.4497	0.20397
10.000	86.862		14.0822	4.2572	3.3079	0.4635	0.21392		84.000	89.537	14.5509	4.2956	3.3836	0.4497	0.20397
8.000	87.510		14.0980	4.2585	3.3105	0.4590	0.21356		86.000	90.188	14.5509	4.2956	3.3836	0.4497	0.20397
6.000	88.145		14.1100	4.2596	3.3125	0.4555	0.21329		88.000	90.832	14.5509	4.2956	3.3836	0.4497	0.20397
4.000	88.769		14.1184	4.2663	3.3139	0.4531	0.21310		90.000	91.477	14.5509	4.2956	3.3836	0.4497	0.20397
2.000	89.386		14.1234	4.2667	3.3148	0.4516	0.21298		92.000	92.117	14.5509	4.2956	3.3836	0.4497	0.20397

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	M_2	$\frac{T_2}{T_1}$	$\frac{p_{02}}{p_{01}}$	
3.60	20.000	34.110	4.5883	2.6945	1.7029	2.3552	0.71207	3.65	37.513	65.808	12.7662	4.1349	3.0874	0.96668	
	22.000	36.448	5.1699	2.8666	1.8035	2.2267	0.65625		36.000	72.054	13.9006	4.2413	3.2775	0.7684	
	24.000	38.898	5.7953	3.0327	1.9109	2.0973	0.60079		34.000	74.894	14.3206	4.2776	3.3478	0.6877	
	26.000	41.478	6.4663	3.1924	2.0255	1.9664	0.54674		32.000	76.827	14.5690	4.2984	3.3894	0.6371	
	28.000	44.215	7.1862	3.3457	2.1479	1.8335	0.49483		30.000	78.345	14.7420	4.3126	3.4183	0.6000	
	30.000	47.153	7.9610	3.4930	2.2791	1.6971	0.44543		28.000	79.617	14.8713	4.3231	3.4400	0.5712	
	32.000	50.376	8.8038	3.6357	2.4215	1.5547	0.39847		26.000	80.723	14.9723	4.3311	3.4569	0.5480	
	34.000	54.066	9.7460	3.7772	2.5802	1.4002	0.35321		24.000	81.712	15.0633	4.3376	3.4705	0.5287	
	36.000	58.793	10.8943	3.9283	2.7733	1.2149	0.27733		22.000	82.610	15.1191	4.3427	3.4815	0.5127	
	37.306	65.769	12.4065	4.0985	3.0271	0.9660	0.25708		20.000	83.440	15.1734	4.3470	3.4906	0.4992	
	36.000	71.617	13.4496	4.2005	3.2019	0.7805	0.22897		18.000	84.215	15.2184	4.3505	3.4981	0.4877	
	34.000	74.634	13.8916	4.2405	3.2760	0.6945	0.21831		16.000	84.947	15.2567	4.3534	3.5043	0.4781	
	32.000	76.633	14.1452	4.2626	3.3184	0.6420	0.21249		14.000	85.644	15.2866	4.3558	3.5095	0.4699	
	30.000	78.190	14.3199	4.2776	3.3477	0.6041	0.20861		12.000	86.313	15.3120	4.3577	3.5137	0.4632	
	28.000	79.487	14.4500	4.2885	3.3695	0.5746	0.20578		10.000	86.959	15.3325	4.3593	3.5172	0.4576	
	26.000	80.614	14.5512	4.2969	3.3864	0.5510	0.20362		8.000	87.587	15.3487	4.3606	3.5199	0.4532	
	24.000	81.617	14.6320	4.3036	3.3999	0.5315	0.20191		6.000	88.201	15.3609	4.3615	3.5219	0.4499	
	22.000	82.528	14.6976	4.3090	3.4109	0.5152	0.20054		4.000	88.807	15.3695	4.3622	3.5234	0.4475	
	20.000	83.369	14.7517	4.3134	3.4200	0.5015	0.19942		2.000	89.405	15.3746	4.3625	3.5242	0.4461	
	18.000	84.154	14.7965	4.3170	3.4275	0.4899	0.19849								
	16.000	84.894	14.8336	4.3200	3.4337	0.4801	0.19774								
	14.000	85.599	14.8643	4.3225	3.4388	0.4719	0.19711								
	12.000	86.275	14.8895	4.3245	3.4430	0.4651	0.19660								
	10.000	86.928	14.9099	4.3262	3.4465	0.4595	0.19619								
	8.000	87.562	14.9260	4.3274	3.4491	0.4551	0.19586								
	6.000	88.184	14.9381	4.3284	3.4512	0.4517	0.19562								
	4.000	88.794	14.9466	4.3291	3.4526	0.4493	0.19545								
	2.000	89.398	14.9517	4.3295	3.4534	0.4479	0.19535								
3.65	2.000	17.250	1.2001	1.1390	1.0537	3.5198	0.99938	3.70	2.000	17.027	1.2029	1.1408	1.0544	3.5674	
	4.000	18.701	1.4312	1.2902	1.1094	3.3936	0.99532		4.000	18.478	1.4377	1.2942	1.1108	3.4388	0.99516
	6.000	20.256	1.6964	1.4524	1.1680	3.2691	0.98515		6.000	20.032	1.7073	1.4589	1.1703	3.3121	0.98461
	8.000	21.913	1.9980	1.6239	1.2304	3.1451	0.96710		8.000	21.688	2.0146	1.63330	1.2337	3.1858	0.96594
	10.000	23.668	2.3381	1.8024	1.2972	3.0207	0.94042		10.000	23.444	2.3615	1.8141	1.3017	3.0591	0.93840
	12.000	25.520	2.7183	1.9854	1.3691	2.8953	0.90525		12.000	25.297	2.7496	2.7496	1.3749	2.9315	0.90218
	14.000	27.468	3.1402	2.1707	1.4466	2.7688	0.86248		14.000	27.246	3.1808	2.1877	1.4539	2.8026	0.85825
	16.000	29.509	3.6043	2.3558	1.5300	2.6412	0.81364		16.000	29.287	3.6554	2.3751	1.5391	2.6728	0.80824
	18.000	31.645	4.1117	2.5387	1.6196	2.5125	0.76044		18.000	31.423	4.1745	2.5600	1.6306	2.5420	0.75395
	20.000	33.878	4.6628	2.7176	1.7158	2.3830	0.70470		20.000	33.663	4.7382	2.7406	1.7289	2.4105	0.69731
	22.000	36.212	5.2580	2.8911	1.8187	2.2527	0.64814		22.000	35.985	5.3474	2.9156	1.8341	2.2783	0.64401
	24.000	38.658	5.8984	3.0584	1.9286	2.1215	0.59212		24.000	38.426	6.0027	3.0840	1.9464	2.1453	0.58349
	26.000	41.230	6.5849	3.2189	2.0457	1.9891	0.53777		26.000	40.991	6.7053	3.2452	2.0662	2.0114	0.52883
	28.000	43.954	7.3210	3.3726	2.1707	1.8549	0.48578		28.000	43.704	7.4580	3.3993	2.1940	1.8758	0.47677
	30.000	46.873	8.1124	3.5199	2.3047	2.0457	0.70713		30.000	46.605	8.2664	3.5467	2.3307	1.7375	0.42765
	32.000	50.064	8.9714	3.6622	2.4497	1.5746	0.3890		32.000	49.768	9.1422	3.6886	2.4785	1.5940	0.38140
	34.000	53.694	9.9271	3.8025	2.6107	1.4207	0.34529		34.000	53.344	10.1123	3.8277	2.6418	1.4404	0.33742
	36.000	58.251	11.0727	3.2394	2.8033	1.2394	0.30022		36.000	57.760	11.2596	3.9721	2.8346	1.2623	0.29362

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{\rho_2}{\rho_1}$	$\frac{p_{02}}{p_{01}}$	
3.70	20.000	83.507	15.6008	4.3797	3.5621	0.4969	0.18289	3.75	2.000	89.416	16.2379	4.4261	3.6687	0.4428	
	18.000	84.274	15.6460	4.3831	3.5696	0.4886	0.18206								0.17169
	16.000	84.998	15.6836	4.3859	3.5759	0.4760	0.18138								0.99931
	14.000	85.687	15.7147	4.3882	3.5811	0.4680	0.18082								0.99479
	12.000	86.348	15.7402	4.3901	3.5854	0.4613	0.18035								0.98349
	10.000	86.988	15.7609	4.3916	3.5889	0.4558	0.17998								0.96355
	8.000	87.610	15.7772	4.3928	3.5916	0.4515	0.17969								0.93423
	6.000	88.219	15.7896	4.3937	3.5937	0.4481	0.17947								0.89586
	4.000	88.817	15.7982	4.3944	3.5951	0.4458	0.17932								0.84963
	2.000	89.411	15.8033	4.3947	3.5960	0.4444	0.17922								0.79728
3.75	2.000	16.810	1.2055		1.0551	1.1426	1.0551								0.74088
	4.000	18.260	1.4440		1.2982	1.1123	1.2982								0.68241
	6.000	19.814	1.7184		1.4654	1.1727	1.4654								0.62373
	8.000	21.470	2.0312		1.6420	1.2370	1.6420								0.56627
	10.000	23.227	2.3849		1.8258	1.3062	1.8258								0.51113
	12.000	25.081	2.7813		2.0142	1.3808	2.0142								0.45902
	14.000	27.030	3.2217		2.2046	1.4614	2.2046								0.41022
	16.000	29.072	3.7069		2.3943	1.5482	2.3943								0.36471
	18.000	31.207	4.2379		2.5813	1.6417	2.5813								0.32194
	20.000	33.438	4.8148		2.7637	1.7422	2.7637								0.28030
	22.000	35.767	5.4382		2.9401	1.8497	2.9401								0.22804
	24.000	38.204	6.1086		3.1095	1.9645	3.1095								0.21668
	26.000	40.762	6.8272		3.2714	2.0869	3.2714								0.19133
	28.000	43.464	7.5969		3.4259	2.2175	3.4259								0.17066
	30.000	46.350	8.4228		3.5733	2.3572	3.5733								0.15892
	32.000	49.486	9.3159		3.7148	2.5078	3.7148								0.14778
	34.000	53.014	10.3013		2.6736	1.4594	2.6736								0.13294
	36.000	57.310	11.4538		3.9947	2.8677	3.9947								0.11893
	37.906	65.884	13.5007		4.2052	3.2105	4.2052								0.10293
	36.000	72.794	14.8041		4.3176	3.4287	4.3176								0.09133
	34.000	75.361	15.1917		4.3484	3.4936	4.3484								0.08047
	32.000	77.180	15.4318		4.3669	3.5338	4.3669								0.07394
	30.000	78.631	15.6021		4.3798	3.5623	4.3798								0.06706
	28.000	79.856	15.7307		4.3894	3.5838	4.3894								0.06196
	26.000	80.927	15.8316		4.3968	3.6007	4.3968								0.05584
	24.000	81.887	15.9128		4.4028	3.6143	4.4028								0.04927
	22.000	82.762	15.9792		4.4076	3.6254	4.4076								0.04524
	20.000	83.572	16.0339		4.4115	3.6345	4.4115								0.04157
	18.000	84.330	16.0794		4.4148	3.6422	4.4148								0.03739
	16.000	85.045	16.1172		4.4175	3.6485	4.4175								0.03448
	14.000	85.727	16.1485		4.4198	3.6537	4.4198								0.03171
	12.000	86.382	16.1743		4.4216	3.6580	4.4216								0.02931
	10.000	87.016	16.1951		4.4231	3.6615	4.4231								0.02707
	8.000	87.632	16.2116		4.4242	3.6643	4.4242								0.02438
	6.000	88.235	16.2240		4.4251	3.6663	4.4251								0.02173
	4.000	88.829	16.2327		4.4257	3.6678	4.4257								0.01963

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	M_2	$\frac{T_2}{T_1}$	
3.85	10.000	22.812	2.4328	1.8495	1.3153	3.1734	0.93209	3.90	24.000	37.584	3.1853	2.2371	
	12.000	24.668	2.8456	2.0432	1.3927	3.0386	0.89664		26.000	40.126	7.2035	2.0201	
	14.000	26.619	3.3050	2.2386	1.4764	2.9028	0.84223		28.000	42.802	8.0258	2.0968	
	16.000	28.664	3.8121	2.4330	1.5668	2.7661	0.79172		30.000	45.646	8.9059	2.1508	
	18.000	30.799	4.3670	2.6239	1.6643	2.6287	0.73428		32.000	48.716	9.8536	2.3492	
	20.000	33.028	4.9706	2.8097	1.7691	2.4909	0.67493		34.000	52.126	10.8901	2.5046	
	22.000	35.353	5.6230	2.9887	1.8814	2.3529	0.61558		36.000	56.149	12.0723	2.5046	
	24.000	37.783	6.3245	3.1601	2.0013	2.2146	0.55770		38.000	62.087	13.6897	2.4387	
	26.000	40.330	7.0764	3.3234	2.1293	2.0760	0.50236		38.445	65.991	14.6407	2.3992	
	28.000	43.014	7.8808	3.4785	2.2656	1.9364	0.45026		38.000	69.501	15.4023	3.43647	
	30.000	45.871	8.7425	3.6259	2.4111	1.7948	0.40167		36.000	73.678	16.1768	4.4218	
	32.000	48.961	9.6715	3.7666	2.5677	1.6493	0.35554		34.000	75.956	16.5334	4.44668	
	34.000	52.407	10.6904	3.9030	2.7390	1.4957	0.31434		32.000	77.640	16.7653	3.7181	
	36.000	56.508	11.8605	4.0404	2.9355	1.3239	0.27366		30.000	79.006	16.9330	4.4738	
	38.000	62.939	13.5472	4.2095	3.2183	1.0767	0.22255		28.000	80.172	17.0613	4.4823	
	38.272	65.956	14.2556	4.2721	3.3369	0.9697	0.211003		26.000	81.199	17.1629	4.4890	
	38.000	68.733	14.8512	4.3214	3.4366	0.8764	0.19738		24.000	82.121	17.2449	4.4943	
	36.000	73.407	15.7160	4.3883	3.5814	0.7314	0.18079		22.000	82.966	17.3122	4.4986	
	34.000	75.770	16.0813	4.4150	3.6425	0.6649	0.17436		20.000	83.749	17.3680	4.5022	
	32.000	77.495	16.3155	4.4316	3.6816	0.6198	0.17039		18.000	84.483	17.4143	4.5052	
	30.000	78.888	16.4889	4.4433	3.7098	0.5859	0.16762		16.000	85.177	17.4529	4.5076	
	28.000	80.072	16.6122	4.4522	3.7313	0.5591	0.16555		14.000	85.840	17.4850	3.8772	
	26.000	81.112	16.7135	4.4591	3.7482	0.53772	0.16394		12.000	86.477	17.5113	4.5114	
	24.000	82.047	16.7952	4.4646	3.7619	0.5190	0.16266		10.000	87.093	17.5327	4.5127	
	22.000	82.901	16.8622	4.4691	3.7731	0.5037	0.16162		8.000	87.693	17.5496	4.5138	
	20.000	83.692	16.9175	4.4728	3.7823	0.4907	0.16076		6.000	88.280	17.5623	4.5146	
	18.000	84.434	16.9636	4.4758	3.7900	0.4798	0.16006		4.000	88.858	17.5713	4.5151	
	16.000	85.136	17.0019	4.4784	3.7964	0.4705	0.15947		2.000	89.430	17.5766	4.5155	
	14.000	85.804	17.0337	4.4805	3.8017	0.4627	0.15899						
	12.000	86.447	17.0598	4.4822	3.8061	0.4561	0.15659						
	10.000	87.068	17.0810	4.4836	3.8097	0.4508	0.15627	3.95	2.000	16.001	16.001	1.2166	
	8.000	87.674	17.0977	4.4847	3.8125	0.4465	0.15602		4.000	17.447	1.4697	1.3144	
	6.000	88.266	17.1104	4.4855	3.8146	0.4433	0.15783		6.000	19.001	1.7630	1.4915	
	4.000	88.849	17.1193	4.4861	3.8161	0.4410	0.15770		8.000	20.660	2.0992	1.6786	
	2.000	89.426	17.1245	4.4865	3.8169	0.4397	0.15762		10.000	22.422	2.4815	1.8734	
3.90	2.000	16.196	1.4633	1.7517	1.4849	1.1167	1.4830		12.000	24.280	2.9112	2.0724	
	4.000	17.642	1.4633	1.7517	1.4849	1.1167	1.4830		14.000	26.234	3.3902	2.2727	
	8.000	20.854	2.0821	1.6694	1.2472	3.3473	0.96105		18.000	30.417	3.9194	2.4716	
	10.000	22.614	2.4570	1.8614	1.3200	3.2111	0.92990		20.000	32.646	5.1304	2.4992	
	12.000	24.472	2.8783	2.0578	1.3987	3.0739	0.88335		22.000	34.969	5.8125	2.5046	
	14.000	26.424	3.3474	2.2557	1.4840	2.9357	0.84077		24.000	37.393	6.5462	3.2103	
	16.000	28.469	3.8655	2.4523	1.5763	2.7967	0.78611		26.000	39.929	7.3323	3.3748	
	18.000	30.605	4.4329	2.6452	1.6758	2.6570	0.72761		28.000	42.598	8.1726	3.5304	
	20.000	32.834	5.0501	2.8326	1.7828	2.5171	0.66743		30.000	45.431	9.0717	3.6778	
	22.000	35.157	5.7171	2.3771	1.8975	2.3771	0.60746		32.000	48.483	10.0386	3.8178	
										34.000	51.859	11.0931	3.9524
										36.000	55.812	12.2888	4.0863

Oblique Shock Tables ($\gamma = 1.4$)

M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$	M_1	θ	β	$\frac{p_2}{p_1}$	$\frac{\rho_2}{\rho_1}$	$\frac{T_2}{T_1}$	M_2	$\frac{p_{02}}{p_{01}}$
3.95	38.000	61.406	13.8667	4.2383	3.2718	1.1389	0.21889	4.00	28.000	80.359	17.9765	4.5402	3.9594	0.5513
	38.612	66.026	15.0309	4.3358	3.4667	0.9711	0.19376		26.000	81.359	18.0787	4.5464	3.9765	0.5302
	38.000	70.101	15.9275	4.4038	3.6167	0.8345	0.17703		24.000	82.261	18.1615	4.5514	3.9903	0.5126
	36.000	73.928	16.6412	4.4541	3.7361	0.7172	0.16509		22.000	83.087	18.2296	4.5555	4.0017	0.4978
	34.000	76.131	16.9904	4.4776	3.7945	0.6554	0.15965		20.000	83.854	18.2861	4.5588	4.0111	0.4852
	32.000	77.777	17.2203	4.4927	3.8330	0.6125	0.15620		18.000	84.574	18.3331	4.5616	4.0190	0.4746
	30.000	79.120	17.3877	4.5035	3.8609	0.5798	0.15375		16.000	85.256	18.3723	4.5639	4.0255	0.4665
	28.000	80.268	17.5161	4.5117	3.8824	0.5537	0.15191		14.000	85.907	18.4049	4.5659	4.0310	0.4579
	26.000	81.281	17.6179	4.5181	3.8994	0.5324	0.15047		12.000	86.533	18.4317	4.5674	4.0355	0.4515
	24.000	82.192	17.7003	4.5232	3.9132	0.5147	0.14932		10.000	87.139	18.4535	4.5687	4.0391	0.4463
	22.000	83.028	17.7680	4.5274	3.9245	0.4997	0.14838		8.000	87.730	18.4707	4.5697	4.0420	0.4421
	20.000	83.803	17.8241	4.5309	3.9339	0.4870	0.14761		6.000	88.307	18.4837	4.5705	4.0442	0.4390
	18.000	84.529	17.8708	4.5338	3.9417	0.4762	0.14698		4.000	88.876	18.4928	4.5710	4.0457	0.4367
	16.000	85.218	17.9097	4.5362	3.9482	0.4671	0.14645		2.000	89.439	18.4982	4.5713	4.0466	0.4354
	14.000	85.874	17.9420	4.5381	3.9536	0.4594	0.14601							
	12.000	86.505	17.9686	4.5398	3.9581	0.4530	0.14566							
	10.000	87.116	17.9902	4.5411	3.9617	0.4477	0.14537							
	8.000	87.711	18.0072	4.5421	3.9645	0.4435	0.14514							
	6.000	88.294	18.0201	4.5429	3.9667	0.4404	0.14497							
	4.000	88.868	18.0291	4.5434	3.9682	0.4381	0.14485							
	2.000	89.435	18.0345	4.5438	3.9691	0.4368	0.14478							
4.00	2.000	15.813	1.2194	1.1519	1.3185	1.196	0.1196	1.0586	3.8521	0.99920				
	4.000	17.258	1.4763	1.7743	1.4980	1.1844	0.1484		3.7089	0.99401				
	6.000	18.812	2.0471	2.1166	1.6879	1.2540	0.12540		3.5679	0.98110				
	8.000	22.234	2.5061	2.80853	1.8853	1.3293	0.18853		3.4273	0.95845				
	10.000	24.095	2.9445	3.0870	2.0870	1.4109	0.20870		3.2860	0.92542				
	12.000	26.050	3.4334	3.2898	2.2898	1.4994	0.22898		3.1439	0.88264				
	14.000	28.098	3.9741	2.4909	1.5954	2.8570	0.24909		3.0009	0.83170				
	16.000	30.236	4.5667	2.6877	1.6991	2.7128	0.26877		2.8570	0.77474				
	18.000	32.464	5.2116	2.8782	1.8107	2.5686	0.28782		2.6586	0.65240				
	20.000	34.786	5.9090	3.0611	1.9304	2.4246	0.30611		2.4246	0.59123				
	22.000	37.208	6.6592	3.2352	2.0583	2.2809	0.32352		2.2809	0.53224				
	24.000	39.740	7.4625	3.4002	2.1947	2.1374	0.34002		2.1374	0.47648				
	26.000	55.495	12.5100	4.1091	3.0444	1.3776	0.41091		1.935	0.42453				
	28.000	42.402	8.3215	3.5561	2.3401	1.3049	0.35561		1.8485	0.37666				
	30.000	45.224	9.2397	3.7034	2.4949	1.5329	0.37034		1.7006	0.33272				
	32.000	48.258	10.2259	3.8430	2.6609	1.7006	0.38430		1.6833	0.29223				
	34.000	51.605	11.2995	3.9768	2.8413	1.5463	0.39768		1.5463	0.29223				
	36.000	55.495	14.0647	4.2556	3.3049	1.1637	0.42556		1.495	0.21432				
	38.000	60.827	15.4261	4.3665	3.43665	1.0817	0.43665		1.3776	0.25409				
	38.774	66.059	16.4407	4.4403	3.7026	0.8196	0.4403		1.2137	0.18613				
	38.000	74.161	17.1095	4.4855	3.8144	0.7109	0.4855		1.0785	0.15282				
	34.000	76.297	17.4525	4.5076	3.8718	0.6511	0.5076		0.9651	0.14959				
	32.000	77.908	17.6808	4.5220	3.9099	0.6090	0.5220		0.8690	0.14729				
	30.000	79.227	17.8479	4.5324	3.9379	0.5769	0.5324		0.7579	0.14729				