

NASA TECHNICAL NOTE



NASA TN D-5054

EXPERIMENTAL PRESSURE DISTRIBUTIONS
ON A 120° CONE AT MACH NUMBERS
FROM 2.96 TO 4.63 AND
ANGLES OF ATTACK FROM 0° TO 20°

by Robert L. Stallings, Jr., and Dorothy H. Tudor

Langley Research Center

Langley Station, Hampton, Va.

EXPERIMENTAL PRESSURE DISTRIBUTIONS ON A
120° CONE AT MACH NUMBERS FROM 2.96 TO 4.63 AND
ANGLES OF ATTACK FROM 0° TO 20°

By Robert L. Stallings, Jr., and Dorothy H. Tudor

Langley Research Center
Langley Station, Hampton, Va.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

EXPERIMENTAL PRESSURE DISTRIBUTIONS ON A
120° CONE AT MACH NUMBERS FROM 2.96 TO 4.63 AND
ANGLES OF ATTACK FROM 0° TO 20°

By Robert L. Stallings, Jr., and Dorothy H. Tudor
Langley Research Center

SUMMARY

Pressure distributions have been experimentally determined on both a sharp and a blunt 120° cone configuration. The blunt-cone configuration consisted of a spherical segment which had a radius of 1/8 the base diameter and which faired into a 120° cone frustum. The tests were conducted at Mach numbers of 2.96, 3.95, and 4.63 over a range of angles of attack from 0° to 20°.

Pressure distributions and shock shapes obtained on both the sharp and blunt cones at an angle of attack (α) of 0° were in good agreement with an approximate theoretical solution based on the one-strip method of integral relations. Mach number had no effect on pressure distributions expressed in the form of local measured pressures divided by the free-stream pitot pressure ($p_l/p_{t,2}$) for either the sharp or blunt configurations at $\alpha = 0^\circ$. At $\alpha > 0^\circ$, the Mach number effect was confined to the leeward side of both configurations and consisted of a decrease in $p_l/p_{t,2}$ with increasing Mach number. The measured pressure distributions on the cone frustum of the blunt configuration were essentially the same as those obtained within the same region on the sharp-cone configuration throughout the range of test variables of this investigation.

An approximate technique involving a tangent-cone concept is presented for predicting the windward and leeward pressures for $\alpha > 0^\circ$. Results from this method are in fair agreement with experimental results both in the form of pressure distributions and force coefficients. For $\alpha > 0^\circ$, the local pressures around the circumference of both the sharp- and blunt-cone configurations, nondimensionalized by the pressure measured along the windward ray, were in good agreement with an empirically derived second-order polynomial. Force and moment coefficients obtained from integrated pressure measurements along the windward and leeward meridians together with this empirical equation for the circumferential distributions were in excellent agreement with balance measurements.

INTRODUCTION

The use of unmanned probes for exploring low-density planetary atmospheres, such as that of Mars, has recently stimulated interest in the aerodynamics of vehicles with a low ballistic coefficient. A configuration satisfying this requirement and one that is being considered for such missions is a 120° cone. Since the bow shock for a 120° cone is detached for all Mach numbers, the governing partial differential equations for the flow field are of the elliptic type, and no exact analytical solutions are yet available. Several experimental investigations have been conducted to determine the aerodynamic characteristics of such a cone (see refs. 1 to 4); however, very little experimental pressure data exist that enable determination in detail of the local flow properties. Such flow properties are required in order that the designer might determine local aerodynamic heating rates and local structural loading.

The purpose of this investigation was to experimentally determine detailed pressure distributions over a 120° cone through a range of angles of attack from 0° to 20° and Mach numbers from 2.96 to 4.63. The model had interchangeable nose tips and the ratios of nose radius to afterbody radius were 0 and 0.25.

SYMBOLS

C_A	forebody axial-force coefficient, $\frac{\text{Forebody axial force}}{\pi q_{\infty} r_b^2}$
C_m	pitching-moment coefficient, $\frac{\text{Pitching moment}}{2\pi q_{\infty} r_b^3}$
C_N	normal-force coefficient, $\frac{\text{Normal force}}{\pi q_{\infty} r_b^2}$
C_p	pressure coefficient, $\frac{p_l - p_{\infty}}{q_{\infty}}$
$C_{p,b}$	base pressure coefficient, $\frac{p_b - p_{\infty}}{q_{\infty}}$
d	base diameter
l	axial length of cone
M_l	local Mach number at outer edge of boundary layer
M_{∞}	free-stream Mach number

p_b	base pressure
p_L	local static pressure along leeward meridian ($\theta = 0^\circ$; $\phi = 0^\circ$)
p_l	local static pressure
p_t	free-stream stagnation pressure
$p_{t,2}$	stagnation pressure behind normal shock
p_W	local static pressure along windward meridian ($\theta = 180^\circ$; $\phi = 0^\circ$)
p_∞	free-stream static pressure
q_∞	free-stream dynamic pressure
r	radial distance from axis of symmetry
r_b	base radius
r_n	nose radius
s	surface length (see fig. 1)
s'	surface length from most forward station on model to shoulder corner
$(\frac{s}{s'})_{s.p.}$	nondimensionalized stagnation-point location
x	axial distance from most forward station on model (see fig. 1)
α	angle of attack
η	nondimensionalized angle of attack, $\frac{\alpha}{90^\circ - \sigma_c}$
θ	meridian angle (see fig. 1)
θ_f	final circumferential integration limit
θ_i	initial circumferential integration limit

σ_c	cone semiapex angle
$\sigma_{c,e}$	equivalent cone semiapex angle
ϕ	roll angle (see fig. 1)

APPARATUS AND TEST CONDITIONS

Wind Tunnel

This investigation was conducted in the high Mach number test section of the Langley Unitary Plan wind tunnel described in reference 5. This variable-pressure, continuous-flow tunnel has an asymmetric sliding-block nozzle that permits a continuous variation in the test-section Mach number from 2.30 to 4.63.

Models and Instrumentation

The 120° cone model was constructed of aluminum and had interchangeable nose tips, as illustrated in figure 1, such that pressure distributions could be obtained for both a blunt cone and a sharp cone with minimum time required for model change. The base diameter of the model was 8.0 inches (203.2 mm) and the nose radius of the blunt cone was 1.0 inch (25.4 mm). The sting used had a diameter of 1.50 inches (38.1 mm) and was 31.0 inches (787.4 mm) in length.

The cone frustum was instrumented with 58 pressure orifices of 0.050-inch (1.27-mm) internal diameter, located as shown in figure 1. The blunt nose tip, which was a spherical segment, was instrumented with five orifices, orifice 1 being located at the axis of symmetry. The sharp nose tip was instrumented with only four orifices since one was not located at the stagnation point in order to retain a sharp apex. The pressure tubing from all orifices was routed through a slot in the sting assembly to minimize sting effects on the base-pressure measurements. A typical model installation in the test section is shown in figure 2.

Pressures were recorded by using three 48-channel pressure-sampling valves. Each valve sequentially transmits each channel of pressure information to a single electrical pressure transducer. This electrical information is fed to a strip-chart recorder and an analog-to-digital converter. The output in digital form is then recorded on punch-cards suitable for machine computation of final data. The tunnel stagnation pressure was measured with a precision mercury manometer.

Accuracy

Accuracy of the pressure-sampling valves is better than 1 percent of the full-scale range of the gage; this includes all errors of linearity, hysteresis, and repeatability. Gages with a maximum range of 7.5 lb/in^2 (5.17 N/cm^2) and 5.0 lb/in^2 (3.45 N/cm^2) were used for orifices on the model nose and base, respectively. The accuracy of the precision mercury manometer with which the stagnation pressure was measured is 0.0035 lb/in^2 (0.0024 N/cm^2).

The results of a test-section calibration indicate that the variation in a free-stream Mach number of 2.96 was ± 0.02 , of 3.95 was ± 0.06 , and of 4.63 was ± 0.05 .

Test Conditions

This investigation was conducted at Mach numbers of 2.96, 3.95, and 4.63 for a nominal Reynolds number of 2×10^6 based on model base diameter. Angle of attack was varied from 0° to 20° with an accuracy of $\pm 0.1^\circ$ relative to the tunnel center line. The tunnel stagnation temperature was held constant at 610° R (339° K) for $M_\infty = 2.96$ and at 635° R (353° K) for $M_\infty = 3.95$ and 4.63.

RESULTS AND DISCUSSION

A complete tabulation of the experimental data is presented in tables I to VI. Local flow properties included in this tabulation are pressures and Mach numbers.

Pressures

Experimental forebody pressures. - Pressure distributions obtained through the ranges of angles of attack and Mach numbers are presented in figure 3 for the blunt cone at $\phi = 0^\circ$. The local measured pressures have been nondimensionalized by the free-stream pitot pressure and are plotted as a function of the ratio of local surface length to base diameter. For $\alpha = 0^\circ$, the experimental data are compared with an approximate theoretical solution obtained by using the one-strip method of integral relations as described in reference 6.

For all Mach numbers tested the experimental data as shown in figure 3 at $\alpha = 0^\circ$ are in good agreement with the theoretical values. The maximum disagreement occurs in the vicinity of $\frac{s}{d} = 0.45$ where the theoretical value is approximately 3 percent less than the experimental value. Increasing the angle of attack results in an increase in the pressures on the windward side of the model and a decrease on the leeward side, as would be expected. The stagnation point, as indicated by maximum pressure measurements, is located on the cone frustum ($\frac{s}{d} > 0.065$) for $\alpha \geq 10^\circ$ throughout the test range

of Mach numbers. For all angles of attack greater than 0° , the overexpanding flow on the leeward side of the spherical segment part of the nose results in pressures below those obtained on the forward part of the cone frustum. In this region an adverse pressure gradient, the magnitude of which increases with increasing angle of attack throughout the range of this investigation, occurs.

The results shown in figure 3 are replotted in figure 4 to more clearly illustrate the effect of Mach number. For $\alpha = 0^\circ$ (fig. 4(a)) the variation in pressure with Mach number is negligible. This result should be expected since the sonic point is fixed at the sharp corner of the cone frustum for all test Mach numbers. For $\alpha = 10^\circ$ (fig. 4(b)) and $\alpha = 20^\circ$ (fig. 4(c)), the Mach number effect on the pressures is also negligible windward of the measured stagnation point. Leeward of the stagnation point a Mach number effect does occur which generally consists of a decrease in pressure with increasing Mach number. The magnitude of this effect increases with increasing α .

Pressure distributions obtained for the blunt cone are compared with those obtained for the sharp cone in figure 5 in order to assess the extent of bluntness effects, the blunt-cone data being the same data shown previously in figure 4. For $\alpha = 0^\circ$, the pressure distributions on the two configurations are essentially the same although the pressures obtained for the sharp cone appear to be slightly greater than those for the blunt cone at the larger values of s/d . It should be noted that the values of s for orifices located on the cone frustum of the sharp cone are slightly greater than those for the same orifices on the blunt cone inasmuch as the surface length of the sharp cone tip is slightly greater (0.0053 inch (1.35 mm)) than that of the blunt cone tip. If a common coordinate system for the orifice locations on the cone frustum of the two configurations had been used, the measured pressures would have been even closer than indicated in figure 5. Pressure distributions obtained on the windward side of the two configurations for $\alpha > 0^\circ$ indicate the same trends as shown for $\alpha = 0^\circ$. On the leeward side of the model, pressures associated with the flow expanding around the spherical nose segment of the blunt cone are somewhat lower than those obtained for the sharp cone. The pressures obtained downstream of the adverse pressure gradient occurring on the leeward side of the blunt cone are of approximately the same magnitude as those obtained for the sharp cone.

Analytical forebody pressures.— The pressure distributions for the sharp cone at angles of attack were approximated by a method similar to that suggested in reference 6 for blunt cones. The sharp cone was selected for this comparison since measured and empirical pressures will later be used for computing force coefficients and most of the large-angle-cone force measurements are for sharp cones. The method of reference 6 simply assumes that the windward pressures correspond to those for a tangent cone of angle $\sigma_{c,e} = \sigma_c + \alpha$ and that the leeward pressures correspond to a tangent cone of angle $\sigma_{c,e} = \sigma_c - \alpha$. The one-strip method of integral relations is used to determine

the pressure distributions for the various cone angles $\sigma_{c,e}$. It was shown in reference 6 that better agreement with experimental data was obtained by shifting the stagnation point to the most forward point of the nose and forcing the sonic points to occur at the cone shoulder by a linear transformation. For a sharp cone this method indicates that the stagnation point would remain at the apex for angles of attack less than $90^\circ - \sigma_c$ but, as shown in figure 5, this does not occur.

To more accurately define the stagnation-point locations, an attempt was made to correlate these locations for large-angle cones with other published data (ref. 4). One might expect the stagnation-point location for a cone at such an angle of attack that the windward surface is normal to the flow to be relatively insensitive to cone angle. Also, since at an angle of attack of 0° the stagnation point is located at the cone apex and independent of cone angle, a correlation parameter is suggested in the form of stagnation-point location s/s' as a function of a nondimensional angle of attack η . The experimental stagnation points for this investigation together with those of reference 4 were plotted in this form and, as shown in figure 6, a good correlation of these results is obtained through a wide range of test conditions. By using the method of least squares, a third-order polynomial was determined from these data points and the following equation resulted:

$$\left(\frac{s}{s'}\right)_{s.p.} = -0.399\eta^3 + 0.714\eta^2 + 0.174\eta \quad (1)$$

As shown in figure 6, a good approximation of the stagnation-point location is given by equation (1) for the range $0 \leq \eta \leq 1$. The validity of equation (1) for greater values of this parameter is questionable. These results are, of course, only applicable to large cone angles where detached flow occurs.

Analytical pressure distributions determined for the windward side of the sharp cone by using the tangent-cone concept together with measured stagnation-point locations are in good agreement with measured distributions as shown in figure 7, the maximum disagreement being less than 10 percent. The pressures between the measured stagnation point and cone apex are assumed to be their mirror image about the stagnation point. The pressure distributions over the leeward ray were approximated by the methods of references 6 and 7, the method used depending upon whether the shock wave for a cone angle equal to the leeward surface relative to the free-stream velocity vector was attached or detached. For a detached shock wave the pressures were calculated for a tangent cone from the method of reference 6 whereas if the shock wave was attached, the cone solutions of reference 7 were used. Also for this latter case, if the predicted conical pressure ratio $p_l/p_{t,2}$ was greater than 0.5283, a linear expansion initiating at $\frac{s}{s'} = 0.9$ to this value was assumed to occur. Results from this method are in fair agreement with experimental results, as shown in figure 7.

Circumferential pressure distributions, obtained by rolling the model at a constant angle of attack, are presented in figure 8 for the blunt cone at angles of attack of 10° and 20° and the three test Mach numbers. For simplification, these data are presented as a function of θ only, that is, as if they had been obtained on a model with instrumentation located at each value of θ . In the tables, however, the data are presented as they were actually tested, that is, as a function of both ϕ and θ .

The local measured pressures at a given value of θ and s/d have been non-dimensionalized by the pressure along the windward ray ($\theta = 180^\circ$) at the same value of s/d . In order to facilitate the use of these data for determining force coefficients, an attempt was made to fit a polynomial of the form

$$\frac{p_l}{p_W} = A \cos^2 \theta + B \cos \theta + C \quad (2)$$

to the data. The following conditions are assumed, the third condition being implied by the experimental results:

at $\theta = 0^\circ$,

$$\frac{p_l}{p_W} = \frac{p_L}{p_W}$$

at $\theta = 180^\circ$,

$$\frac{p_l}{p_W} = 1$$

and at $\theta = 0^\circ$,

$$\frac{d^2}{d\theta^2} \left(\frac{p_l}{p_W} \right) = 0$$

Equation (2) then becomes

$$\frac{p_l}{p_W} = \frac{1}{4} \left(1 - \frac{p_L}{p_W} \right) (\cos^2 \theta - 2 \cos \theta - 3) + 1 \quad (3)$$

As shown in figure 8 good approximations of the circumferential pressure distributions are obtained by using equation (3) through the range of test variables.

Base pressures.- Pressure coefficients obtained on the base of the blunt cone at $\alpha = 0^\circ$ are presented in figure 9 as a function of radial distance from the axis of symmetry. These measurements are compared with the empirical relation

$$C_{p,b} = - \frac{1}{M_\infty^2} \quad (4)$$

which, as discussed in reference 8, gives a good approximation of the base pressures for a hemisphere-cylinder configuration within the test range of Mach numbers of this

investigation. The values of $C_{p,b}$ determined from equation (4) are generally less than the measured values of this investigation (see fig. 9); however, this difference is within the accuracy of the pressure instrumentation. This inaccuracy is due to the very low pressures that occur in the base region. Increasing the angle of attack results in a slight increase in the base pressure coefficients as indicated in figure 10.

Circumferential base pressure distributions obtained by rolling the model are presented in figure 11 for both the sharp and blunt cones. The base pressures remain essentially constant with θ even at an angle of attack of 20° . A comparison of the flagged and unflagged symbols also indicates that nose bluntness has no effect on the base pressures within the range of variables of this investigation.

Schlieren Photographs

Schlieren photographs for both the blunt- and sharp-nose configurations at $\alpha = 0^\circ$ are presented in figure 12 for the test range of Mach number. Measured shock shapes from these schlieren photographs are presented in figure 13 and are compared with theoretical shapes determined by the computer program described in reference 6. The theoretical shape for the sharp cone is actually based on a cone with $r_n = 0.020$ inch (0.51 mm); however, as discussed in reference 6, this small nose radius gives a good approximation for the sharp-nose cone with a detached shock wave. The theoretical shock shapes are generally in good agreement with the experimental shapes for both configurations. For $M_\infty = 2.96$, the theoretical shock position is slightly closer to the body than that obtained experimentally for both configurations.

Schlieren photographs for both the sharp and blunt cones are presented in figure 14 for angles of attack up to 20° .

Force Coefficients

As a result of the partially successful attempt to predict pressure distributions over a 120° cone both at $\alpha = 0^\circ$ and at $\alpha > 0^\circ$, it was decided to explore further the validity of the method by comparing force coefficients determined from empirical pressure distributions with those obtained by force balance measurements. Since such force data are in the literature (ref. 9) for cone angles other than 120° , the accuracy of the method for different cone angles can also be assessed.

From reference 10 the equations for normal force, axial force, and pitching moment for a conic body can be written as

$$C_N = \frac{1}{\pi r_b^2} \int_0^l \int_{\theta_i}^{\theta_f} C_p x \tan \sigma_c \cos \theta d\theta dx \quad (5)$$

$$C_A = \frac{1}{\pi r_b^2} \int_0^l \int_{\theta_i}^{\theta_f} C_p x \tan^2 \sigma_c d\theta dx \quad (6)$$

$$C_m = \frac{1}{2\pi r_b^3} \left[\int_0^l \int_{\theta_i}^{\theta_f} C_p x (-l + x) \tan \sigma_c \cos \theta d\theta dx + \int_0^{-l} \int_{\theta_i}^{\theta_f} C_p x^2 \tan^3 \sigma_c \cos \theta d\theta dx \right] \quad (7)$$

By using the empirical relation, equation (3), to describe the circumferential pressure distributions, the force and moment coefficient equations after considerable rearranging can be written as

$$C_N = \frac{1}{2r_b^2} \frac{p_\infty}{q_\infty} \tan \sigma_c \cos^2 \sigma_c \int_0^{s'} s \left(\frac{p_W}{p_\infty} - \frac{p_L}{p_\infty} \right) ds \quad (8)$$

$$C_A = \frac{2}{r_b^2} \tan^2 \sigma_c \cos^2 \sigma_c \frac{p_\infty}{q_\infty} \int_0^{s'} s \left(0.375 \frac{p_W}{p_\infty} + 0.625 \frac{p_L}{p_\infty} - 1 \right) ds \quad (9)$$

$$C_m = - \frac{1}{4r_b^3} \tan \sigma_c \cos^3 \sigma_c \frac{p_\infty}{q_\infty} \left[- \int_0^{s'} s(s' - s) \left(\frac{p_W}{p_\infty} - \frac{p_L}{p_\infty} \right) ds + \tan^2 \sigma_c \int_0^{s'} s^2 \left(\frac{p_W}{p_\infty} - \frac{p_L}{p_\infty} \right) ds \right] \quad (10)$$

A comparison of analytically and experimentally determined force and moment coefficients is presented in figure 15 for $M_\infty = 4.63$. The force and moment coefficients were determined from equations (8), (9), and (10) by using measured values of p_W and p_L (method 1) and by using the empirical values of p_W and p_L shown in figure 7 (method 2). The experimental data shown are balance measurements from reference 9. The axial force data from reference 9 have been adjusted to a base pressure coefficient corresponding to free-stream static pressure by using equation (4). The force coefficients obtained by method 1 are in excellent agreement with the balance measurement data and those obtained by method 2 are in fair agreement with these data. However, the empirical values of method 2 indicate the possibility of an inflection point in the pitching-moment curve for $5^\circ \leq \alpha \leq 10^\circ$ which is contrary to the trend shown for the balance measurements. This discrepancy is due to the fact that when α increases from 5° to 10° , the tangent cone corresponding to the leeward surface goes from a detached shock condition to an attached shock condition; therefore, as discussed previously, a different theory is used to determine the empirical pressures for these two conditions. Since these theories are applied only as approximations, some discontinuity in slope would be expected.

In order to test the validity of applying the methods used herein to other large-angle cones, force coefficients were calculated from equations (8), (9), and (10) for cones with half-angles of 50° , 70° , and 80° by using empirical pressure distributions based on the same methods used for computing the distributions shown in figure 7. These results are shown in figure 16 and are compared with the experimental values of reference 9. In general, fair agreement is obtained between the experimental and empirical values for all cone angles.

CONCLUSIONS

Pressure distributions have been experimentally determined on both a sharp and a blunt 120° cone configuration. The blunt-cone configuration consisted of a spherical segment which had a radius $1/8$ of the base diameter and which faired into a 120° cone frustum. The tests were conducted at Mach numbers of 2.96, 3.95, and 4.63 over a range of angles of attack from 0° to 20° . The results are summarized as follows:

1. Pressure distributions and shock shapes obtained on both the sharp and blunt cones at an angle of attack (α) of 0° were in good agreement with an approximate theoretical solution based on the one-strip method of integral relations.
2. Mach number had no effect on pressure distributions expressed in the form of local measured pressures divided by the free-stream pitot pressure ($p_l/p_{t,2}$) for either the sharp or blunt configurations at $\alpha = 0^\circ$. At $\alpha > 0^\circ$, the Mach number effect was confined to the leeward side of both configurations and consisted of a decrease in $p_l/p_{t,2}$ with increasing Mach number.
3. The measured pressure distributions on the cone frustum of the blunt configuration were essentially the same as those obtained within the same region on the sharp-cone configuration throughout the range of test variables of this investigation.
4. A correlation parameter is presented which successfully correlates the stagnation-point locations for the bodies of this investigation with other existing results for a wide range of Mach numbers, bluntness, cone angle, angle of attack, and free-stream test conditions.
5. An approximate technique involving a tangent-cone concept is presented for predicting the windward and leeward pressures for $\alpha > 0^\circ$. Results from this method are in fair agreement with experimental results both in the form of pressure distributions and force coefficients.
6. For $\alpha > 0^\circ$, the local pressures around the circumference of both the sharp- and blunt-cone configurations, nondimensionalized by the pressure measured along the windward ray, were in good agreement with an empirically derived second-order

polynomial. Force and moment coefficients obtained from integrated pressure measurements along the windward and leeward meridians together with this empirical equation for the circumferential distributions were in excellent agreement with balance measurements.

7. Nose bluntness had no effect on measured base pressure coefficients ($C_{p,b}$). These coefficients were in fair agreement with the empirical relation $C_{p,b} = -\frac{1}{M_\infty^2}$ (where M_∞ is the free-stream Mach number) throughout the range of variables of this investigation.

Langley Research Center,

National Aeronautics and Space Administration,

Langley Station, Hampton, Va., December 4, 1968,

124-07-02-44-23.

REFERENCES

1. Nichols, James O.; and Nierengarten, Edward A.: Aerodynamic Characteristics of Blunt Bodies. Tech. Rep. No. 32-677 (Contract NAS 7-100), Jet Propulsion Lab., California Inst. Technol., Nov. 19, 1964.
2. Campbell, James F.: Longitudinal Aerodynamic Characteristics of Several High-Drag Bodies at Mach Numbers From 1.50 to 4.63. NASA TN D-3915, 1967.
3. McLellan, Charles H.; and Pritchard, E. Brian: Use of Lift to Increase Payload on Unmanned Martian Landers. J. Spacecraft, vol. 3, no. 9, Sept. 1966.
4. Ashby, George C., Jr.; and Goldberg, Theodore J.: Application of Generalized Newtonian Theory for Three-Dimensional Sharp-Nose Shock-Detached Bodies at Mach 6 for Angles of Attack up to 25°. NASA TN D-2550, 1965.
5. Anon.: Manual for Users of the Unitary Plan Wind Tunnel Facilities of the National Advisory Committee for Aeronautics. NACA, 1956.
6. South, Jerry C., Jr.: Calculation of Axisymmetric Supersonic Flow Past Blunt Bodies With Sonic Corners, Including a Program Description and Listing. NASA TN D-4563, 1968.
7. Staff of Comput. Section, Center of Anal. (Under dir. of Zdeněk Kopal): Tables of Supersonic Flow Around Cones. Tech. Rep. No. 1 (NOrd Contract No. 9169), Massachusetts Inst. Technol., 1947.
8. Stallings, Robert L., Jr.: Experimentally Determined Local Flow Properties and Drag Coefficients for a Family of Blunt Bodies at Mach Numbers From 2.49 to 4.63. NASA TR R-274, 1967.
9. Campbell, James F.; and Howell, Dorothy T.: Supersonic Aerodynamics of Large-Angle Cones. NASA TN D-4719, 1968.
10. Wells, William R.; and Armstrong, William O.: Tables of Aerodynamic Coefficients Obtained From Developed Newtonian Expressions for Complete and Partial Conic and Spheric Bodies at Combined Angles of Attack and Sideslip With Some Comparisons With Hypersonic Experimental Data. NASA TR R-127, 1962.

TABLE I.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 2.96$ (a) $\alpha = 0^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 3254.3$ psf					$\phi = 22.5^\circ$, $p_t = 3256.0$ psf					$\phi = 45.0^\circ$, $p_t = 3256.4$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	1101.3	1.745	.99589	11.70530	.07669	1100.1	1.742	.99429	11.68646	.09047	1101.3	1.744	.99527	11.69800	.08230
2	0	.200	.026	1092.9	1.731	.98831	11.6144	.1293	1091.7	1.728	.98671	11.59734	.13839	1094.1	1.732	.98877	11.62155	.12713
3	0	.400	.050	1087.7	1.687	.96555	11.48666	.24235	1067.7	1.686	.96505	11.34274	.20202	1070.1	1.690	.96709	11.36669	.21918
4	0	.600	.076	1055.7	1.667	.95471	11.22129	.24846	1054.5	1.664	.95313	11.20270	.24267	1054.9	1.667	.95516	11.22652	.25685
5	0	.800	.100	1046.1	1.650	.04605	11.16670	.2561	1044.9	1.647	.04550	11.14886	.24886	1044.1	1.649	.04640	11.16933	.26255
6	0	1.000	.125	1035.4	1.631	.93629	11.00476	.3111	1031.0	1.626	.93364	10.97356	.31417	1030.5	1.632	.93673	10.9989	.30700
7	0	1.200	.150	1023.4	1.611	.92546	10.87739	.33452	1023.4	1.610	.92497	10.87171	.33566	1025.7	1.613	.92697	10.89520	.30393
8	0	1.400	.175	1015.0	1.596	.91787	10.76823	.35205	1013.8	1.593	.91631	10.76987	.35558	1016.1	1.597	.91830	10.79326	.31018
9	0	1.600	.200	1006.6	1.581	.91028	10.69908	.36992	1006.6	1.581	.90981	10.69349	.34996	1007.7	1.582	.91071	10.70406	.36799
10	0	1.800	.225	997.0	1.565	.90161	10.59718	.38751	997.0	1.564	.90114	10.59165	.38850	999.3	1.568	.90312	10.61486	.38433
11	0	2.000	.250	988.6	1.550	.89403	10.50802	.40325	988.6	1.549	.89356	10.50253	.40421	990.9	1.553	.89553	10.52566	.40017
12	0	2.200	.275	981.4	1.538	.88753	10.43160	.41640	980.2	1.535	.88598	10.43142	.41949	982.5	1.539	.88794	10.43645	.41558
13	0	2.400	.300	971.8	1.521	.87886	10.39270	.43350	970.7	1.518	.87732	10.31158	.43649	972.9	1.522	.87927	10.33451	.43270
14	0	2.600	.325	961.1	1.503	.86910	10.21507	.45220	962.3	1.504	.86973	10.22247	.45101	963.3	1.505	.87059	10.23257	.44938
15	0	2.800	.350	951.5	1.486	.86044	10.11317	.46842	952.7	1.487	.86107	10.12062	.46725	952.5	1.487	.86084	10.11788	.44768
16	0	3.000	.375	938.3	1.463	.84851	9.97037	.49017	938.3	1.462	.84807	9.95786	.49996	940.5	1.466	.84999	9.99045	.44750
17	0	3.200	.400	925.1	1.440	.83659	9.83296	.51136	925.1	1.439	.83616	9.82783	.51213	927.3	1.443	.83807	9.85028	.50877
18	0	3.400	.425	911.9	1.417	.82467	9.69285	.53708	910.7	1.416	.82316	9.67506	.53468	912.9	1.418	.82506	9.67937	.53142
19	0	3.600	.450	895.2	1.388	.80950	9.51453	.55786	895.2	1.387	.80908	9.50957	.55857	897.4	1.391	.81096	9.53171	.55540
20	0	3.800	.475	874.8	1.353	.79108	9.29801	.58844	873.6	1.350	.78958	9.29042	.59089	875.8	1.354	.79145	9.30233	.58783
21	0	4.000	.500	852.0	1.314	.77049	9.05600	.62185	850.8	1.311	.76901	9.03854	.62632	853.0	1.314	.77085	9.06022	.62127
22	0	4.200	.525	832.5	1.275	.75931	8.87200	.66965	805.3	1.237	.72785	8.55479	.68693	804.6	1.237	.73073	8.58873	.68472
23	0	4.400	.550	784.8	1.222	.67079	7.84420	.77732	734.2	1.116	.66719	7.84189	.78285	741.4	1.121	.67002	7.87513	.77851
24	180	.000	.026	1022.9	1.721	.98866	11.61676	.12943	1093.0	1.730	.98786	11.61086	.13222	1019.7	1.728	.98664	11.59649	.13877
25	180	.000	.050	1046.1	1.687	.95550	11.34009	.16767	1067.6	1.686	.96499	11.34203	.20262	1065.5	1.684	.96370	11.32799	.23714
26	180	.000	.075	1054.4	1.664	.95353	11.07736	.21612	1054.2	1.663	.95301	11.07730	.21413	1054.1	1.664	.95283	11.07375	.24552
27	180	.000	.100	1043.6	1.646	.94373	11.09222	.22882	1043.4	1.645	.94360	11.08600	.20423	1042.4	1.642	.94204	11.07289	.23331
28	180	.000	.125	1032.9	1.627	.93394	10.97707	.31400	1032.7	1.626	.93340	10.97079	.31533	1031.6	1.624	.93235	10.96721	.31918
29	180	.000	.150	1024.3	1.612	.92632	10.88752	.33248	1024.3	1.611	.92578	10.88118	.33376	1023.1	1.609	.92463	10.86771	.33646
30	180	.000	.175	1013.5	1.593	.91652	10.77237	.35810	1013.4	1.592	.91598	10.76956	.35632	1012.3	1.590	.91484	10.75264	.35886
31	180	.000	.200	1003.9	1.577	.90781	10.67002	.37429	1003.8	1.576	.90726	10.66355	.37548	1003.9	1.576	.90723	10.66314	.37556
32	180	.000	.225	995.4	1.562	.90019	10.50847	.39050	996.6	1.563	.90073	10.49674	.39493	995.4	1.561	.89961	10.57364	.39171
33	180	.000	.250	984.6	1.543	.89040	10.44552	.41064	985.7	1.544	.88992	10.44715	.40957	985.8	1.544	.89091	10.47136	.40960
34	180	.000	.275	978.6	1.533	.88495	10.40135	.42153	979.7	1.534	.88548	10.40753	.42048	978.6	1.532	.88438	10.39465	.42266
35	180	.000	.300	969.6	1.512	.87407	10.27342	.44275	968.4	1.513	.87568	10.29231	.43966	969.0	1.515	.87568	10.29236	.43965
36	180	.000	.325	955.7	1.493	.86427	10.15827	.46129	958.0	1.496	.86587	10.17110	.45829	956.9	1.494	.86480	10.16451	.46030
37	180	.000	.350	946.1	1.477	.85556	10.05592	.47738	947.1	1.478	.85607	10.01689	.47645	946.1	1.476	.85501	10.04944	.47839
38	180	.000	.375	934.1	1.456	.84648	9.97978	.49704	935.1	1.457	.84518	9.93387	.49615	936.5	1.459	.84631	9.94715	.49412
39	180	.000	.400	923.2	1.437	.83488	9.81284	.51436	924.3	1.438	.83538	9.81866	.51349	924.4	1.438	.83543	9.81930	.51340
40	180	.000	.425	905.2	1.406	.81856	9.62093	.52555	906.2	1.407	.81904	9.62664	.51472	908.8	1.411	.82129	9.65308	.53788
41	180	.000	.450	888.3	1.376	.80332	9.44182	.56221	890.5	1.379	.80488	9.46022	.56560	891.9	1.382	.80606	9.47409	.56363
42	180	.000	.475	870.3	1.345	.78699	9.24991	.59513	871.2	1.346	.78746	9.25540	.59437	872.7	1.348	.78866	9.24952	.59241
43	180	.000	.500	850.0	1.301	.76413	9.08124	.63203	864.7	1.300	.76349	9.07377	.63305	868.6	1.307	.76690	9.01381	.62760
44	180	.000	.525	795.6	1.216	.71950	8.45670	.70222	796.5	1.217	.71933	8.44172	.70155	800.4	1.223	.72339	8.50239	.69617
45	180	.000	.550	741.5	1.122	.67052	7.80908	.77775	741.1	1.121	.66983	7.87285	.77881	742.7	1.123	.67117	7.88868	.77764
46	0	1.000	.225	1036.6	1.633	.93738	11.01750	.30536	1035.4	1.630	.93580	10.99902	.30934	1077.7	1.634	.93818	11.02263	.30425
47	0	1.000	.250	991.1	1.564	.90400	10.47660	.40644	991.0	1.561	.90370	10.49566	.40923	1053.3	1.562	.90523	10.50566	.40417
48	90	3.000	.375	940.7	1.567	.85068	9.98954	.48626	939.5	1.564	.84915	9.98059	.48491	935.3	1.564	.84891	9.97771	.49495
49	90	4.000	.500	898.6	1.309	.76632	9.03053	.62552	894.6	1.309	.76792	9.02581	.62597	894.2	1.306	.76651	9.02952	.62822
50	270	1.000	.125	1035.2	1.631	.93611	11.02666	.30856	1034.5	1.630	.93558	10.96439	.31990	1035.2	1.630	.93551	10.99557	.31008
51	270	2.000	.250	949.4	1.552	.89475	10.51650	.41178	949.3	1.551	.89419	10.59994	.41292	988.2	1.548	.89309	10.49693	.40518
52	270	3.000	.375	937.7	1.462	.84794	9.94636	.49119	937.5	1.461	.84736	9.95948	.49224	936.5	1.459	.84631	9.94715	.49412
53	270	4.000	.500	847.4	1.306	.76631	9.00683	.62955	847.1	1.304	.75567	9.09937	.62957	846.2	1.302	.76472	9.08824	.63108
54	0	4.877	.610	38.4	-100	.03295	.38729	.287345	36.3	-100	.03281	.38567	.287622	36.6	-100	.03310	.38900	.287055
55	0	5.402	.675	32.9	-106	.02979	.35008	.294021	32.6	-107	.02950	.34676	.294654	33.1	-106	.02993	.	

TABLE I.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 2.96$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 3258.6$ psf					$\phi = 90.0^\circ, p_t = 3258.2$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	1100.1	1.741	.99350	11.67713	.09658	1101.3	1.743	.99470	11.69129	.08714
2	0	.200	.025	1092.9	1.724	.98700	11.60081	.13683	1092.9	1.729	.98713	11.60223	.13618
3	0	.400	.050	1068.9	1.687	.96536	11.34641	.22499	1070.1	1.689	.96656	11.36052	.22096
4	0	.600	.075	1055.7	1.664	.95345	11.20648	.26183	1056.9	1.666	.95465	11.22058	.25833
5	0	.800	.100	1046.1	1.648	.94480	11.10472	.28598	1046.1	1.648	.94491	11.10609	.28567
6	0	1.000	.125	1036.6	1.631	.93614	11.00296	.30849	1036.6	1.631	.93625	11.00431	.30820
7	0	1.200	.150	1025.9	1.612	.92640	10.88848	.33229	1025.8	1.613	.92651	10.88982	.33202
8	0	1.400	.175	1017.4	1.598	.91882	10.79944	.34989	1017.4	1.598	.91894	10.80076	.34963
9	0	1.600	.200	1007.8	1.581	.91017	10.69768	.34918	1009.0	1.583	.91136	10.71171	.36557
10	0	1.800	.225	999.4	1.567	.90259	10.61864	.38545	1000.6	1.569	.90378	10.62266	.38293
11	0	2.000	.250	991.0	1.552	.89501	10.51959	.40123	991.0	1.552	.89512	10.52089	.40101
12	0	2.200	.275	982.6	1.538	.88744	10.43055	.41658	982.6	1.538	.88755	10.43183	.41636
13	0	2.400	.300	974.2	1.523	.87986	10.34151	.43154	975.4	1.525	.88105	10.35550	.42921
14	0	2.600	.325	963.5	1.504	.87012	10.22703	.45028	964.7	1.507	.87131	10.24101	.44802
15	0	2.800	.350	952.7	1.486	.86038	10.11255	.46852	953.9	1.488	.86157	10.12651	.46632
16	0	3.000	.375	940.7	1.465	.84956	9.94535	.48828	941.9	1.467	.85075	9.99929	.48614
17	0	3.200	.400	927.5	1.442	.83766	9.84542	.50949	928.7	1.445	.83884	9.85936	.50740
18	0	3.400	.425	913.1	1.417	.82467	9.69278	.53209	915.5	1.422	.82693	9.71942	.52818
19	0	3.600	.450	897.6	1.390	.81060	9.52742	.55602	898.8	1.393	.81178	9.54131	.55403
20	0	3.800	.475	876.0	1.353	.79112	9.29846	.58837	877.2	1.355	.79230	9.31232	.58644
21	0	4.000	.500	853.2	1.314	.77056	9.05677	.62174	854.4	1.316	.77173	9.07061	.61985
22	0	4.200	.525	807.7	1.235	.72943	8.57341	.68676	810.1	1.239	.73169	8.59990	.68324
23	0	4.400	.550	741.8	1.121	.66991	8.07380	.77868	743.0	1.123	.67107	7.88748	.77690
24	180	.200	.025	1092.9	1.729	.98706	11.60143	.13655	1094.1	1.731	.98827	11.61564	.12996
25	180	.400	.050	1066.5	1.683	.96314	11.32034	.23225	1068.9	1.687	.96543	11.34729	.22474
26	180	.600	.075	1054.4	1.662	.95227	11.19257	.26255	1055.6	1.664	.95348	11.20673	.26177
27	180	.800	.100	1043.6	1.643	.94249	11.07758	.29213	1044.8	1.645	.94369	11.09172	.28894
28	180	1.000	.125	1034.0	1.626	.93379	10.97537	.31436	1034.0	1.627	.93391	10.97671	.31408
29	180	1.200	.150	1025.5	1.612	.92618	10.88593	.33280	1025.5	1.612	.92630	10.88726	.33253
30	180	1.400	.175	1014.7	1.593	.91640	10.77094	.35537	1014.7	1.593	.91651	10.77226	.35512
31	180	1.600	.200	1005.1	1.576	.90770	10.66872	.37453	1006.3	1.579	.90890	10.64281	.37194
32	180	1.800	.225	996.6	1.562	.90009	10.57928	.39071	997.8	1.564	.90129	10.59336	.38820
33	180	2.000	.250	987.0	1.545	.89140	10.47707	.40861	987.0	1.545	.89150	10.47835	.40839
34	180	2.200	.275	981.0	1.535	.88596	10.41318	.41953	982.2	1.537	.88716	10.42724	.41714
35	180	2.400	.300	969.0	1.514	.87509	10.29541	.44079	970.2	1.516	.87628	10.29945	.43848
36	180	2.600	.325	958.1	1.495	.86531	10.17042	.45935	959.3	1.498	.86650	10.18445	.45711
37	180	2.800	.350	948.5	1.479	.85661	10.06821	.47546	949.7	1.481	.85780	10.04222	.47328
38	180	3.000	.375	937.4	1.460	.84683	9.95321	.49320	938.9	1.462	.84802	9.96721	.49106
39	180	3.200	.400	926.8	1.441	.83704	9.83822	.51057	928.0	1.443	.83823	9.85221	.50848
40	180	3.400	.425	910.0	1.412	.82182	9.65934	.53697	911.2	1.414	.82301	9.67331	.53493
41	180	3.600	.450	894.3	1.385	.80769	9.49324	.56090	895.5	1.387	.80888	9.50719	.55891
42	180	3.800	.475	875.1	1.351	.79303	9.28881	.58972	876.3	1.354	.79149	9.30273	.58778
43	180	4.000	.500	849.8	1.308	.76747	9.02050	.62669	851.0	1.310	.76865	9.03438	.62480
44	180	4.200	.525	800.4	1.222	.72290	8.49665	.69693	802.9	1.227	.72516	8.52325	.69341
45	180	4.400	.550	745.1	1.126	.67289	7.90891	.77410	747.5	1.131	.67515	7.93544	.77063
46	90	1.000	.125	1035.4	1.629	.93506	10.99024	.31121	1035.4	1.629	.93517	10.99159	.31092
47	90	2.000	.250	989.8	1.550	.89393	10.50687	.40345	989.8	1.550	.89404	10.50816	.40323
48	90	3.000	.375	938.3	1.461	.86740	9.95991	.49218	937.1	1.459	.86462	9.94841	.49393
49	90	4.000	.500	847.2	1.303	.76514	8.99317	.63041	846.0	1.301	.76416	8.98155	.63199
50	270	1.000	.125	1036.4	1.631	.93597	11.00092	.30893	1036.4	1.631	.93608	11.00227	.30864
51	270	2.000	.250	988.2	1.547	.89248	10.48984	.40641	989.4	1.550	.89368	10.5391	.40397
52	270	3.000	.375	936.5	1.458	.84574	9.94044	.49515	937.7	1.460	.84693	9.95444	.49301
53	270	4.000	.500	843.8	1.297	.76203	8.95661	.63538	845.0	1.300	.76322	8.97049	.63349
54	0	4.877	.610	36.8	-.099	.03325	.39086	.286741	37.0	-.099	.03339	.39244	.286475
55	0	5.402	.675	33.3	-.105	.03009	.35364	.293352	33.6	-.105	.03037	.35692	.292741
56	0	5.927	.741	33.6	-.105	.03038	.35702	.292721	33.9	-.104	.03065	.36030	.292116
57	0	6.452	.807	33.6	-.105	.03038	.35702	.292721	33.6	-.105	.03037	.35692	.292741
58	0	6.977	.872	32.5	-.107	.02937	.34518	.294958	32.7	-.107	.02950	.34677	.294653
59	180	6.977	.872	31.6	-.108	.02850	.33502	.295940	31.7	-.108	.02864	.33662	.294625
60	180	6.452	.807	32.2	-.107	.02908	.34179	.295612	32.5	-.107	.02936	.34508	.294977
61	180	5.927	.741	31.2	-.109	.02822	.33164	.297616	31.4	-.109	.02835	.33324	.297296
62	180	5.402	.675	31.1	-.109	.02807	.32995	.297956	31.2	-.109	.02821	.33154	.297635
63	180	4.877	.610	31.7	-.108	.02865	.33672	.296606	31.9	-.108	.02878	.33831	.296292

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE I.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_{\infty} = 2.96$ - Continued(b) $\alpha = 10^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 3256.7 \text{ psf}$					$\phi = 22.5^\circ, p_t = 3259.2 \text{ psf}$					$\phi = 45.0^\circ, p_t = 3255.3 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
1	0	.000	.000	1028.1	1.617	.92905	10.91968	.32595	1027.0	1.614	.92731	10.89919	.33012	1028.0	1.618	.92937	10.92336	.32519
2	0	.200	.025	974.1	1.524	.88027	10.63630	.43074	976.6	1.527	.88186	10.35050	.42762	988.8	1.543	.89033	10.46451	.41078
3	0	.400	.050	899.7	1.395	.81306	9.56631	.55187	904.3	1.409	.82019	9.64013	.53976	927.3	1.443	.83827	9.85270	.50840
4	0	.600	.075	812.9	1.18	.82498	9.69647	.53155	917.9	1.425	.82884	9.74187	.52488	929.7	1.448	.84044	9.87819	.50457
5	0	.800	.100	716.5	1.124	.82823	9.73470	.52594	915.5	1.421	.82664	9.71643	.52862	924.9	1.439	.83610	9.82720	.51222
6	0	1.000	.125	604.1	1.10	.82065	9.64550	.53998	907.1	1.407	.81911	9.62741	.54161	916.5	1.425	.82851	9.73798	.52545
7	0	1.200	.150	893.8	1.395	.80764	9.42260	.56099	897.6	1.390	.81045	9.52567	.55627	905.7	1.406	.81875	9.62327	.54221
8	0	1.400	.175	890.2	1.378	.80438	9.45438	.56643	891.6	1.380	.80504	9.44208	.56534	902.1	1.400	.81550	9.58503	.54776
9	0	1.600	.200	883.0	1.366	.79788	9.37793	.57723	885.6	1.369	.79963	9.39849	.57434	897.3	1.391	.81116	9.53404	.55557
10	0	1.800	.225	877.0	1.356	.79246	9.31422	.54617	878.4	1.357	.79314	9.32218	.54505	890.1	1.379	.79666	9.45347	.56598
11	0	2.000	.250	869.8	1.343	.78596	9.23777	.59482	872.4	1.347	.78773	9.25859	.59393	884.1	1.369	.79923	9.35384	.53599
12	0	2.200	.275	865.0	1.335	.78162	9.18680	.61388	867.6	1.338	.78340	9.20772	.60098	878.1	1.358	.78830	9.26638	.50284
13	0	2.400	.300	859.0	1.324	.77620	9.12309	.61265	860.4	1.326	.77691	9.13141	.61151	872.1	1.348	.78839	9.26638	.50284
14	0	2.600	.325	851.8	1.312	.76969	9.04664	.62312	855.6	1.318	.77256	9.04080	.61375	874.9	1.335	.78198	9.19900	.60345
15	0	2.800	.350	844.6	1.300	.76319	8.97019	.63353	846.0	1.301	.77592	8.94880	.63237	857.7	1.323	.77538	9.11343	.61398
16	0	3.000	.375	835.0	1.293	.75452	8.86826	.64733	837.6	1.286	.77635	8.94977	.64442	849.3	1.308	.76778	9.02420	.62619
17	0	3.200	.400	825.4	1.266	.74584	8.76632	.65803	826.9	1.264	.74661	8.77531	.65983	838.5	1.290	.75802	8.90949	.61716
18	0	3.400	.425	817.0	1.252	.73826	8.67713	.67296	818.5	1.253	.73903	8.68429	.67173	827.7	1.271	.74826	8.79477	.65721
19	0	3.600	.450	806.2	1.233	.72850	8.56246	.68821	805.3	1.230	.72713	8.54439	.69034	814.5	1.248	.73634	8.65457	.67596
20	0	3.800	.475	796.0	1.206	.71441	8.39681	.71010	787.7	1.203	.71307	8.38106	.71220	794.9	1.221	.72224	8.48887	.69796
21	0	4.000	.500	776.2	1.181	.70100	8.24391	.7124	774.1	1.177	.69900	8.21573	.73394	780.9	1.190	.70597	8.29768	.72317
22	0	4.200	.525	740.0	1.169	.69288	7.86167	.78027	741.8	1.121	.66979	7.87235	.77887	746.1	1.130	.67452	7.92804	.77160
23	0	4.400	.550	688.5	1.029	.62226	7.3776	.85193	690.2	1.031	.62326	7.32548	.85039	693.3	1.038	.62681	7.36722	.84492
24	180	.200	.025	1073.7	1.594	.9724	11.440372	.20421	1072.5	1.493	.96839	11.38205	.21470	1056.7	1.668	.95532	11.22846	.25563
25	180	.400	.050	1093.3	1.734	.94979	11.63359	.21115	1089.3	1.722	.98362	11.56109	.15376	1062.4	1.678	.96076	11.29240	.23981
26	180	.600	.075	1093.3	1.738	.99197	11.65913	.10741	1090.5	1.724	.98471	11.57388	.14851	1060.3	1.674	.95859	11.26683	.24655
27	180	.800	.100	1093.5	1.734	.98979	11.63359	.12115	1084.9	1.718	.98145	11.53551	.14378	1054.3	1.664	.95315	11.20288	.26272
28	180	1.000	.125	1091.7	1.728	.98653	11.59526	.13931	1080.9	1.707	.97601	11.47157	.16856	1048.3	1.653	.94771	11.13994	.27006
29	180	1.200	.150	1086.9	1.719	.98219	11.55420	.16044	1078.5	1.703	.97383	11.45499	.19500	1043.5	1.645	.94336	11.08778	.24983
30	180	1.400	.175	1079.7	1.707	.97567	11.46757	.17972	1070.1	1.689	.96622	11.35647	.22212	1037.5	1.634	.93792	11.02384	.30399
31	180	1.600	.200	1074.9	1.698	.97132	11.41649	.20430	1064.6	1.678	.96078	11.29252	.23978	1032.7	1.626	.93356	10.97269	.31332
32	180	1.800	.225	1068.9	1.688	.96589	11.35264	.22322	1058.0	1.668	.95533	11.22858	.25533	1026.6	1.616	.92812	10.90874	.32818
33	180	2.000	.250	1060.5	1.673	.95828	11.26325	.24748	1050.9	1.655	.94881	11.15185	.27503	1019.4	1.603	.91331	10.83131	.34353
34	180	2.200	.275	1054.5	1.663	.95285	11.19940	.26357	1044.8	1.645	.94337	11.08790	.24890	1013.4	1.593	.91615	10.84807	.35592
35	180	2.400	.300	1046.0	1.648	.94925	11.11001	.28477	1036.3	1.630	.93757	10.99838	.30767	1004.7	1.585	.90854	10.87655	.37272
36	180	2.600	.325	1037.6	1.634	.93764	11.02062	.30649	1026.7	1.614	.93267	10.96655	.34851	986.9	1.547	.89222	10.44672	.46959
37	180	2.800	.350	1029.2	1.619	.93004	10.93123	.32357	1018.4	1.599	.90664	10.91415	.37034	977.3	1.530	.88351	10.38441	.42438
38	180	3.000	.375	1017.2	1.598	.90931	10.67583	.37322	1007.4	1.580	.89875	10.56356	.43925	966.5	1.511	.87372	10.29391	.44432
39	180	3.200	.400	1005.2	1.578	.89831	10.67583	.37322	992.1	1.536	.88679	10.42288	.41788	950.8	1.484	.85957	10.10306	.47001
40	180	3.400	.425	990.7	1.553	.89527	10.52259	.40716	982.1	1.524	.87046	10.23105	.44693	935.2	1.457	.84543	9.93680	.49570
41	180	3.600	.450	973.9	1.523	.88006	10.34380	.44116	964.0	1.505	.87046	10.023105	.48393	914.7	1.422	.82693	9.71940	.52199
42	180	3.800	.475	952.3	1.486	.86505	10.14146	.44430	943.5	1.470	.85197	10.01364	.52917	888.2	1.376	.80299	9.43804	.56875
43	180	4.000	.500	924.6	1.438	.84923	9.87233	.51256	915.8	1.422	.82694	9.71950	.56217	876.1	1.328	.75947	8.92650	.63946
44	180	4.200	.525	874.1	1.351	.79898	9.23988	.59541	865.2	1.334	.78124	9.18237	.60449	840.1	1.292	.75947	8.92650	.72961
45	180	4.400	.550	868.6	1.324	.73016	9.04933	.61387	849.6	1.314	.74399	8.91992	.649827	817.9	1.247	.74826	9.75073	.52357
46	90	1.000	.125	939.3	1.304	.84883	9.97679	.68960	904.7	1.403	.78232	9.19500	.60274	846.5	1.304	.76562	8.99871	.62966
47	90	2.000	.200	899.1	1.305	.81306	9.55631	.55187	866.4	1.336	.78107	9.27.2	.116	.02454	.78645	.304627	.02446	.82437
48	90	3.000	.375	819.1	1.254	.74042	8.70262	.66595	797.9	1.203	.78307	8.38106	.71220	776.1	1.182	.70163	.82466	.72987
49	90	4.000	.500	756.7	1.251	.73554	10.26718	.44376	1011.0	1.588	.91290	10.77982	.36317	1051.9	1.659	.95097	11.17730	.26895
50	270	1.000	.125	966.7	1.251	.84746	9.96070	.649206	982.1	1.536	.88679	10.42288	.41788	1019.4	1.603	.92150	10.83201	.34353
51	270	2.000	.250	937.8	1.451	.84746	9.96070	.649206	933.7	1.461	.84761	9.96249	.49178	976.1	1.528	.88242	10.37162	.41652
52	270	3.000	.375	896.9	1.390	.81052	9.52652	.55615	850.7	1.309	.76818	9.02890	.62555	887.0	1.374	.80191	.94256	.57056
53	270	4.000	.500	815.2	1.249	.73664	8.65815	.67549	850.7	1.207	.702942	9.34580	.31.5	.0108	.749438	.304627	.33.62	.24702
54	0	4.877	.510	33.4	-1.105	.03016	.30555	.281	-1.116	.02540	.29857	.304627	.27.5	.0115	.02454	.28645	.27.0	.02446
55	0	5.402	.675	28.8	-1.113	.02600	.30555	.281	-1.116	.02425	.28587	.304627	.26.9	.0116	.02454	.28561	.30.	

TABLE I.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_{\infty} = 2.96$ - Continued(b) $\alpha = 10^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 3258.6$ psf					$\phi = 90.0^\circ, p_t = 3257.4$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
1	0	.000	.000	1025.8	1.612	.92640	10.889848	.33229	1025.8	1.613	.92674	10.89249	.33148
2	0	.200	.025	999.4	1.567	.90259	10.60864	.38545	1014.6	1.601	.92024	10.81614	.34664
3	0	.400	.050	957.5	1.494	.86471	10.16343	.46047	993.4	1.557	.89751	10.54892	.39609
4	0	.600	.075	951.5	1.484	.85930	10.09983	.47052	983.8	1.540	.88885	10.44712	.41375
5	0	.800	.100	944.3	1.471	.85281	10.02351	.48240	977.8	1.530	.88343	10.38350	.42453
6	0	1.000	.125	937.1	1.459	.84631	9.94719	.49412	970.7	1.518	.87694	10.30715	.43722
7	0	1.200	.150	927.5	1.442	.83766	9.84542	.50949	961.1	1.501	.86828	10.20535	.45377
8	0	1.400	.175	923.9	1.436	.83441	9.80726	.51519	958.7	1.497	.86611	10.17990	.45784
9	0	1.600	.200	916.7	1.424	.82791	9.73094	.52649	951.5	1.484	.85962	10.10355	.46993
10	0	1.800	.225	910.7	1.413	.82250	9.66734	.53580	945.5	1.474	.85420	10.03992	.47986
11	0	2.000	.250	904.7	1.403	.81709	9.61374	.54504	934.3	1.462	.84771	9.96358	.49162
12	0	2.200	.275	898.8	1.392	.81168	9.54014	.55419	933.5	1.453	.84338	9.91268	.49936
13	0	2.400	.300	892.9	1.382	.80627	9.47654	.56328	926.3	1.441	.83688	9.83633	.51086
14	0	2.600	.325	884.4	1.368	.79869	9.38750	.57589	919.1	1.428	.83039	9.75998	.52221
15	0	2.800	.350	879.6	1.359	.79437	9.33662	.58304	909.5	1.412	.82172	9.65818	.53714
16	0	3.000	.375	875.7	1.339	.78354	9.20942	.60075	901.1	1.397	.81415	9.56910	.55003
17	0	3.200	.400	856.8	1.320	.77380	9.04943	.61652	888.0	1.374	.80224	9.42913	.57001
18	0	3.400	.425	844.8	1.299	.76298	9.06773	.63387	876.0	1.354	.79141	9.30188	.58789
19	0	3.600	.450	831.6	1.276	.75108	8.92781	.65277	861.6	1.329	.77842	9.14918	.60907
20	0	3.800	.475	813.7	1.245	.73484	8.63701	.67830	842.4	1.296	.76110	8.94559	.63687
21	0	4.000	.500	794.5	1.212	.71753	8.43348	.70528	820.9	1.258	.74161	8.71654	.66769
22	0	4.200	.525	757.3	1.148	.68398	8.03916	.75707	781.3	1.190	.70588	8.29662	.72331
23	0	4.400	.550	699.8	1.048	.63203	7.42859	.83687	717.8	1.080	.64850	7.62220	.81155
24	180	.200	.025	1038.8	1.635	.93818	11.02696	.30331	1017.1	1.598	.91891	10.80047	.34969
25	180	.400	.050	1030.4	1.620	.93058	10.93762	.32225	988.2	1.548	.89281	10.49371	.40574
26	180	.600	.075	1020.8	1.604	.92189	10.83552	.34284	977.4	1.529	.88302	10.37867	.42534
27	180	.800	.100	1013.6	1.591	.91538	10.75994	.35766	970.2	1.517	.87650	10.30198	.43807
28	180	1.000	.125	1010.0	1.585	.91212	10.72065	.36489	965.4	1.508	.87215	10.25086	.44642
29	180	1.200	.150	1004.0	1.575	.90669	10.65684	.37671	960.5	1.500	.86780	10.19973	.45467
30	180	1.400	.175	997.9	1.564	.90126	10.59303	.39825	953.3	1.488	.86127	10.12304	.46686
31	180	1.600	.200	990.7	1.552	.89475	10.51645	.40178	948.5	1.479	.85692	10.07191	.47489
32	180	1.800	.225	945.9	1.543	.89040	10.46540	.41062	943.7	1.471	.85258	10.02079	.48282
33	180	2.000	.250	977.5	1.529	.88280	10.37606	.42578	935.3	1.456	.84496	9.93132	.49653
34	180	2.200	.275	973.9	1.523	.87954	10.33777	.43216	930.4	1.448	.84061	9.88019	.50427
35	180	2.400	.300	964.3	1.506	.87086	10.23567	.44888	922.0	1.433	.83300	9.79072	.51765
36	180	2.600	.325	955.9	1.491	.86326	10.14633	.46318	912.4	1.417	.82430	9.68847	.53272
37	180	2.800	.350	947.4	1.477	.85566	10.05699	.47721	905.2	1.404	.81778	9.61178	.54388
38	180	3.000	.375	939.0	1.462	.84805	9.94765	.49099	896.5	1.387	.80908	9.50952	.55858
39	180	3.200	.400	924.2	1.443	.83828	9.85279	.50839	887.1	1.373	.80146	9.42005	.57129
40	180	3.400	.425	913.8	1.418	.82525	9.69964	.53108	873.9	1.350	.78950	9.27945	.59102
41	180	3.600	.450	898.1	1.391	.81114	9.53372	.55511	858.2	1.323	.77536	9.11329	.61400
42	180	3.800	.475	880.1	1.360	.79485	9.34228	.58224	841.4	1.294	.76014	8.93435	.63839
43	180	4.000	.500	853.7	1.314	.77094	9.06150	.62109	817.3	1.252	.73839	8.67872	.67274
44	180	4.200	.525	808.0	1.235	.72970	8.57652	.68635	775.2	1.179	.70033	8.23136	.73189
45	180	4.400	.550	749.1	1.133	.67649	7.95115	.76858	719.8	1.083	.65031	7.64341	.80878
46	90	1.000	.125	907.1	1.407	.81926	9.62918	.54135	905.9	1.405	.81848	9.62000	.54268
47	90	2.000	.250	873.6	1.349	.78895	9.27302	.59192	871.2	1.345	.78708	9.25098	.59499
48	90	3.000	.375	837.6	1.287	.75649	8.89141	.64420	835.2	1.283	.75460	8.86924	.64719
49	90	4.000	.500	770.5	1.171	.69588	8.17908	.73875	770.5	1.171	.69614	8.18209	.73835
50	270	1.000	.125	1084.5	1.714	.97944	11.51194	.17251	1094.1	1.731	.98851	11.61849	.12860
51	270	2.000	.250	1054.5	1.662	.95230	11.19287	.26517	1065.3	1.681	.96241	11.31173	.23460
52	270	3.000	.375	1008.8	1.583	.91103	10.70789	.36728	1020.7	1.604	.92217	10.83881	.34219
53	270	4.000	.500	917.4	1.425	.82851	9.73793	.52546	928.0	1.444	.83844	9.85463	.50811
54	0	4.877	.610	30.4	-110	.02747	.32282	.299410	30.3	-111	.02733	.32125	2.99735
55	0	5.402	.675	26.8	-117	.02416	.28395	.307994	26.6	-117	.02402	.28236	3.08371
56	0	5.927	.741	26.4	-117	.02387	.28057	.304799	26.3	-118	.02374	.27898	3.09181
57	0	6.452	.807	26.3	-118	.02373	.27888	.309206	26.3	-118	.02374	.27898	3.09181
58	0	6.977	.872	26.3	-118	.02373	.27888	.309206	26.1	-118	.02359	.27729	3.09590
59	180	6.977	.872	26.3	-118	.02373	.27888	.309206	26.1	-118	.02359	.27729	3.09590
60	180	6.452	.807	26.4	-117	.02387	.28057	.308799	26.3	-118	.02374	.27898	3.09181
61	180	5.927	.741	26.6	-117	.02401	.28226	.304395	26.3	-118	.02374	.27898	3.09181
62	180	5.402	.675	26.8	-117	.02416	.28395	.307994	26.3	-118	.02374	.27898	3.09181
63	180	4.877	.610	26.9	-116	.02430	.28564	.307596	26.4	-117	.02388	.28067	3.08774

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE I - TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 2.96$ - Continued(c) $\alpha = 20^\circ$

Orifice	θ, deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 3258.7 \text{ psf}$					$\phi = 22.5^\circ, p_t = 3258.8 \text{ psf}$					$\phi = 45.0^\circ, p_t = 3256.9 \text{ psf}$				
				$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	843.4	1.297	.76164	8.95195	.63601	841.2	1.293	.75969	8.92902	.63912	837.7	1.288	.75695	8.89688	.64366
2	0	.200	.025	571.0	1.137	.67422	7.97144	.76542	757.4	1.137	.67852	7.97507	.7634	1.159	.68981	8.10774	.74089	
3	0	.400	.050	598.6	.473	.54062	6.35423	.98007	849.0	.473	.55047	6.51234	.98556	654.7	.974	.59343	6.97495	.89661
4	0	.600	.075	649.0	.960	.5863	6.84906	.98082	659.1	.978	.59520	6.99567	.89387	679.5	1.014	.61401	7.21678	.86468
5	0	.800	.100	711.4	1.074	.6102	7.01212	.81717	722.4	1.053	.6207	7.45397	.89380	683.9	1.039	.62700	7.36952	.84462
6	0	1.000	.125	711.4	1.074	.64246	7.56122	.82083	701.0	1.040	.63307	7.44485	.83527	697.7	1.045	.63025	7.46770	.83961
7	0	1.200	.150	695.8	1.041	.62838	7.38568	.84250	692.6	1.036	.62556	7.38182	.84094	692.7	1.042	.62592	7.35679	.84629
8	0	1.400	.175	698.2	1.045	.63055	7.41115	.83916	693.8	1.038	.62658	7.34454	.84527	696.3	1.043	.62617	7.39497	.84128
9	0	1.600	.200	694.6	1.039	.62729	7.37295	.84417	691.4	1.034	.62442	7.33910	.84861	693.9	1.039	.62700	7.33492	.84462
10	0	1.800	.225	692.2	1.035	.62513	7.36748	.84751	690.2	1.032	.62333	7.32638	.85028	693.9	1.039	.62700	7.36495	.84622
11	0	2.000	.250	691.0	1.033	.62404	7.33474	.84918	687.8	1.027	.62117	7.30094	.84362	692.7	1.036	.62592	7.35406	.84629
12	0	2.200	.275	689.8	1.031	.62294	7.32201	.85085	685.4	1.023	.61900	7.27550	.85696	691.5	1.034	.62484	7.34406	.84796
13	0	2.400	.300	688.6	1.029	.62188	7.30928	.85252	683.1	1.019	.61684	7.25006	.84030	690.3	1.032	.62375	7.33133	.84063
14	0	2.600	.325	687.4	1.027	.62079	7.29654	.85149	681.9	1.017	.61576	7.23734	.84197	687.9	1.028	.62159	7.30588	.85297
15	0	2.800	.350	681.4	1.016	.61538	7.23287	.84256	679.5	1.013	.61359	7.21190	.84532	685.5	1.024	.61942	7.28042	.85631
16	0	3.000	.375	679.0	1.012	.61321	7.20740	.84591	674.7	1.005	.60926	7.16103	.87202	681.9	1.018	.61617	7.24224	.86133
17	0	3.200	.400	675.4	1.006	.60996	7.16920	.87094	671.1	.998	.60602	7.12827	.87705	677.1	1.009	.61184	7.19132	.86603
18	0	3.400	.425	674.2	1.004	.60888	7.15647	.87262	668.7	.994	.60385	7.09743	.88041	673.5	1.003	.60859	7.15314	.87306
19	0	3.600	.450	671.8	1.000	.60471	7.13100	.87598	665.1	.988	.60061	7.05927	.88545	676.5	.993	.60318	7.08950	.88146
20	0	3.800	.475	666.4	.987	.60021	7.05460	.88607	659.1	.978	.59520	6.99567	.89387	659.1	.978	.59560	7.00040	.89324
21	0	4.000	.500	664.6	.987	.60021	7.04460	.88607	654.3	.969	.59087	6.94460	.90061	653.2	.968	.59018	6.93676	.90168
22	0	4.200	.525	664.2	.952	.58179	6.83812	.91480	639.9	.944	.57788	6.79216	.92093	634.0	.935	.57286	6.73311	.92883
23	0	4.400	.550	614.2	.900	.55471	6.51977	.95755	610.0	.893	.55083	6.47418	.94373	602.8	.881	.54470	6.40219	.97353
24	0	4.600	.575	643.1	.904	.48674	10.22259	.45099	952.1	1.485	.48982	10.10592	.44956	923.1	1.435	.83414	9.80406	.51567
25	180	4.00	.050	103.1	1.622	.31364	10.94005	.31967	101.4	1.593	.91634	10.77027	.35550	964.1	1.506	.87116	10.23923	.44830
26	180	4.00	.060	107.9	1.706	.31677	11.46054	.31967	100.2	1.564	.95349	11.21744	.29512	98.7	1.544	.89185	10.4241	.40769
27	180	4.00	.070	109.2	1.728	.98701	11.6092	.31782	107.8	1.600	.91637	11.33242	.22941	99.4	1.561	.89497	10.57200	.39200
28	180	1.000	.125	109.4	1.739	.92446	11.64473	.31616	107.5	1.693	.98852	11.33833	.21426	100.0	1.569	.90383	10.42320	.38283
29	180	1.200	.150	110.3	1.747	.99679	11.51578	.31578	107.3	1.701	.97287	11.47463	.19863	100.4	1.570	.90927	10.58719	.37113
30	180	1.400	.175	110.2	1.745	.99570	11.57302	.31784	107.3	1.701	.97287	11.47463	.19863	100.3	1.575	.90710	10.66159	.37584
31	180	1.600	.200	110.2	1.745	.99570	11.57302	.31784	107.3	1.701	.97287	11.47463	.19863	100.3	1.574	.90710	10.66159	.37584
32	180	1.800	.225	110.1	1.743	.99461	11.49026	.30786	107.3	1.701	.97287	11.47463	.19863	100.3	1.575	.90492	10.6300	.38051
33	180	2.000	.250	109.9	1.739	.99244	11.64673	.30416	107.4	1.597	.97069	11.49098	.26168	100.1	1.571	.90274	10.61040	.38134
34	180	2.200	.275	109.6	1.735	.99027	11.63921	.31182	107.1	1.591	.96743	11.37075	.21801	99.9	1.567	.89838	10.55920	.39427
35	180	2.400	.300	109.2	1.728	.98701	11.60092	.31378	106.6	1.583	.96304	11.31965	.23244	99.2	1.559	.89843	10.50801	.40326
36	180	2.600	.325	108.9	1.722	.98374	11.52624	.31534	106.2	1.576	.95942	11.29132	.24275	98.9	1.550	.89403	10.50801	.40326
37	180	2.800	.350	108.4	1.714	.97941	11.51159	.31726	105.6	1.566	.95439	11.21744	.25912	98.4	1.542	.88967	10.44681	.41210
38	180	3.000	.375	107.7	1.701	.97299	11.45350	.319851	105.0	1.554	.94895	11.15356	.27462	97.7	1.529	.88314	10.39002	.42512
39	180	3.200	.400	106.9	1.687	.96530	11.35658	.29251	104.2	1.639	.94026	11.05135	.29797	97.1	1.519	.87769	10.31602	.43576
40	180	3.400	.425	105.8	1.668	.95552	11.20382	.25577	103.3	1.620	.93047	10.93636	.32251	95.9	1.498	.86680	10.18803	.45654
41	180	3.600	.450	104.3	1.643	.94250	11.07767	.29211	101.7	1.597	.91852	10.79583	.35058	94.7	1.477	.85591	10.04004	.47747
42	180	3.800	.475	102.6	1.614	.92729	10.89900	.33016	99.9	1.566	.90221	10.60418	.38625	92.9	1.446	.83958	9.86805	.50610
43	180	4.000	.500	100.0	1.568	.90341	10.61823	.34373	97.3	1.522	.87938	10.33589	.43247	90.6	1.406	.81889	9.62487	.54198
44	180	4.200	.525	95.1	1.483	.85889	10.09497	.47128	92.4	1.437	.83482	9.81206	.51448	86.2	1.331	.77969	9.16411	.60701
45	180	4.400	.550	87.7	1.356	.79265	9.31647	.58582	85.2	1.312	.79696	9.04550	.62328	79.4	2	.71762	8.43456	.70514
46	90	1.000	.125	799.0	1.220	.72155	8.48080	.69903	724.0	1.092	.65472	7.69524	.82000	695.1	1.041	.62809	7.38224	.84295
47	90	2.000	.250	781.4	1.147	.72372	8.24365	.69566	728.6	1.098	.65796	7.73340	.79702	693.9	1.039	.62700	7.36952	.84462
48	90	3.000	.375	786.4	1.070	.70653	8.34072	.71751	715.4	1.075	.64606	7.59349	.81530	681.9	1.018	.61617	7.24224	.86133
49	90	4.000	.500	790.6	1.010	.69200	8.75496	.74042	682.4	1.000	.60710	7.11559	.87537	649.6	.962	.58694	6.89858	.90675
50	270	1.000	.125	798.4	1.219	.72099	8.415	.69381	904.0	1.400	.61364	8.37347	.5432	1001.5	1.571	.90492	10.63600	.38051
51	270	2.000	.250	808.8	1.223	.72314	8.49699	.69483	904.0	1.401	.61364	8.35947	.5432	1002.3	1.569	.90383	10.62320	.38283
52	270	3.000	.375	781.9	1.194	.70796	8.32101	.72011	879.9	1.360	.79446	9.33925	.58265	977.4	1.529	.88414	10.38002	.42512
53	270	4.000	.500	728.6	1.098	.65801	7.76959	.81245	733.7	1.243	.84005	9.039	.1402	816.1	.9927	.54568		
54	0	4.877	.610	727.2	-1.114	.02457	.29881	.314854	26.6	-1.117	.02401	.28224	.308400	25.8	-1.18	.03238	.27365	3.11480
55	0	5.402	.675	22.3	-1.124	.02012	.292645	.312027	22.0	-1.125	.01984	.23232	.312016	21.3	-1.124	.01224	.22850	3.23348
56	0	5.927	.741	21.0	-1.127	.01897	.22294	.3124385	20.9	-1.127								

TABLE I.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_{\infty} = 2.96$ - Concluded(c) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 3257.5 \text{ psf}$					$\phi = 90.0^\circ, p_t = 3259.3 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
1	0	.000	.000	836.4	1.285	.75566	.88169	.64551	835.2	1.282	.75416	.88407	.64789
2	0	.200	.025	790.9	1.206	.71452	.83916	.70994	832.8	1.278	.75200	.83863	.65132
3	0	.400	.050	723.8	1.090	.65389	.76859	.80327	802.9	1.226	.72495	.852069	.69375
4	0	.600	.075	721.4	1.086	.65173	.766014	.80659	796.9	1.216	.71954	.845711	.70216
5	0	.800	.100	723.8	1.090	.65389	.768559	.80327	800.5	1.222	.72278	.849526	.69712
6	0	1.000	.125	725.0	1.092	.65498	.769831	.80160	798.1	1.218	.72062	.844983	.70048
7	0	1.200	.150	719.0	1.082	.64956	.763469	.80992	793.3	1.210	.71629	.841896	.70720
8	0	1.400	.175	727.4	1.096	.65714	.772376	.79828	800.5	1.222	.72278	.849526	.69712
9	0	1.600	.200	727.4	1.096	.65714	.772376	.79828	801.7	1.224	.72386	.850798	.69543
10	0	1.800	.225	727.4	1.096	.65714	.772376	.79828	801.7	1.224	.72386	.850798	.69543
11	0	2.000	.250	728.6	1.098	.65823	.773649	.79662	801.7	1.224	.72386	.850798	.69543
12	0	2.200	.275	727.4	1.096	.65714	.772376	.79828	801.7	1.224	.72386	.850798	.69543
13	0	2.400	.300	727.4	1.096	.65714	.772376	.79828	800.5	1.222	.72278	.849526	.69712
14	0	2.600	.325	723.8	1.090	.65389	.768559	.80327	796.9	1.216	.71954	.845711	.70216
15	0	2.800	.350	721.4	1.086	.65173	.766014	.80659	792.1	1.208	.71521	.840624	.70888
16	0	3.000	.375	716.6	1.078	.64740	.760924	.81324	787.3	1.199	.71088	.835537	.71558
17	0	3.200	.400	709.4	1.065	.64090	.753289	.82322	780.1	1.187	.70439	.827906	.72562
18	0	3.400	.425	704.6	1.057	.63657	.749200	.82988	772.9	1.174	.69790	.820276	.73564
19	0	3.600	.450	697.4	1.044	.63008	.740565	.83988	763.3	1.158	.68924	.810102	.74897
20	0	3.800	.475	686.6	1.026	.62033	.729113	.85490	749.0	1.133	.67626	.794841	.76893
21	0	4.000	.500	675.9	1.007	.61059	.717661	.86997	733.4	1.106	.66219	.778308	.79053
22	0	4.200	.525	669.5	.961	.58677	.689667	.90701	699.8	1.048	.63189	.742699	.83708
23	0	4.400	.550	611.2	.895	.55213	.648949	.96166	649.5	.961	.58645	.689286	.90751
24	180	.200	.025	880.1	1.361	.79512	.934544	.58180	831.7	1.276	.75100	.882695	.65289
25	180	.400	.050	889.7	1.377	.80381	.944757	.56739	802.9	1.226	.72492	.852037	.69379
26	180	.600	.075	890.9	1.379	.80489	.946034	.56558	793.2	1.210	.71622	.841818	.70730
27	180	.800	.100	893.3	1.384	.80706	.948587	.56195	790.8	1.205	.71405	.839263	.71067
28	180	1.000	.125	898.1	1.392	.81141	.953694	.55645	795.6	1.214	.71840	.844372	.70393
29	180	1.200	.150	903.0	1.400	.81575	.958801	.54731	798.0	1.218	.72057	.846927	.70055
30	180	1.400	.175	903.0	1.400	.81575	.958801	.54731	799.2	1.220	.72166	.848205	.69887
31	180	1.600	.200	903.0	1.400	.81575	.958801	.54731	799.2	1.220	.72166	.848205	.69887
32	180	1.800	.225	903.0	1.400	.81575	.958801	.54731	801.7	1.224	.72383	.857759	.69548
33	180	2.000	.250	899.3	1.394	.81250	.954971	.55282	799.2	1.220	.72166	.848205	.69887
34	180	2.200	.275	899.3	1.394	.81250	.954971	.55282	799.2	1.220	.72166	.848205	.69887
35	180	2.400	.300	892.1	1.382	.80598	.947311	.56377	792.0	1.207	.71514	.840540	.70899
36	180	2.600	.325	888.5	1.375	.80272	.943481	.56920	789.6	1.203	.71296	.837985	.71236
37	180	2.800	.350	886.1	1.371	.80055	.940927	.57282	790.8	1.205	.71405	.839263	.71067
38	180	3.000	.375	880.1	1.361	.79512	.934544	.58180	784.8	1.195	.70862	.83876	.71909
39	180	3.200	.400	874.1	1.350	.78968	.928160	.59072	778.8	1.185	.70318	.826489	.72748
40	180	3.400	.425	862.1	1.329	.77882	.915393	.60841	767.9	1.166	.69340	.814992	.74257
41	180	3.600	.450	850.1	1.309	.76796	.902626	.62591	760.7	1.153	.68688	.807327	.75261
42	180	3.800	.475	836.8	1.286	.75601	.888583	.64496	748.7	1.132	.67601	.794553	.76931
43	180	4.000	.500	814.0	1.246	.73537	.864325	.67747	730.6	1.101	.65971	.75392	.79434
44	180	4.200	.525	771.9	1.173	.69736	.819641	.73647	695.7	1.041	.62819	.738347	.84279
45	180	4.400	.550	716.6	1.078	.64739	.760913	.81326	648.8	.960	.58580	.688528	.90852
46	90	1.000	.125	701.0	1.051	.63333	.744382	.83488	710.6	1.067	.64163	.75145	.82210
47	90	2.000	.250	689.0	1.030	.62250	.731658	.85156	692.6	1.035	.62540	.735069	.84709
48	90	3.000	.375	678.3	1.011	.61276	.720206	.86662	679.5	1.013	.61350	.721080	.86547
49	90	4.000	.500	655.5	.972	.59219	.696029	.89856	657.9	.975	.59402	.698188	.89569
50	270	1.000	.125	1072.5	1.694	.96891	11.38816	.21289	1101.4	1.743	.99445	11.68836	.08918
51	270	2.000	.250	1072.5	1.694	.96891	11.38816	.21289	1102.6	1.745	.99554	11.70114	.07993
52	270	3.000	.375	1048.4	1.652	.94719	11.13282	.27949	1078.5	1.703	.97380	11.44565	.19511
53	270	4.000	.500	972.7	1.521	.87876	10.32850	.43370	1001.5	1.570	.90425	10.62811	.38194
54	0	4.877	.610	25.3	.119	.02285	.24853	3.11752	25.3	.119	.02283	.26838	.311790
55	0	5.402	.675	21.0	.127	.01897	.22293	3.24388	21.2	.126	.01910	.22450	.323910
56	0	5.927	.741	20.7	.127	.01868	.21955	3.25433	20.8	.127	.01881	.22112	.324946
57	0	6.452	.807	20.7	.127	.01868	.21955	3.25433	20.8	.127	.01881	.22112	.324946
58	0	6.977	.872	20.7	.127	.01868	.21955	3.25433	20.8	.127	.01881	.22112	.324946
59	180	6.977	.872	20.8	.127	.01882	.22124	3.24908	20.8	.127	.01881	.22112	.324946
60	180	6.452	.807	20.8	.127	.01882	.22124	3.24908	20.8	.127	.01881	.22112	.324946
61	180	5.927	.741	20.8	.127	.01882	.22124	3.24908	20.8	.127	.01881	.22112	.324946
62	180	5.402	.675	21.0	.127	.01897	.22293	3.24388	21.0	.127	.01896	.22281	.324426
63	180	4.877	.610	21.0	.127	.01897	.22293	3.24388	21.0	.127	.01896	.22281	.324426

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ (a) $\alpha = 0^\circ$

Orifice	Θ, deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 22.5^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 45.0^\circ, p_t = 5807.1 \text{ psf}$					
				$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	
1	0	.000	.000	835.7	1.780	.99381	20.43715	.09381	834.4	1.777	.99235	20.40593	.11482	834.3	1.777	.99225	20.40404	.10545	
2	0	.200	.025	826.1	1.758	.98246	20.20257	.115921	824.8	1.755	.98094	20.11338	.11603	824.8	1.755	.98085	20.14951	.16643	
3	0	.400	.050	800.9	1.702	.95251	19.58682	.24455	800.0	1.672	.95252	19.58501	.25481	799.6	1.679	.95091	19.55387	.24912	
4	0	.600	.075	799.1	1.678	.93968	19.32923	.29946	788.9	1.675	.93817	19.28882	.31335	790.0	1.677	.93951	19.31935	.29991	
5	0	.800	.100	781.7	1.650	.91760	19.11758	.32449	780.4	1.656	.92819	18.98459	.32803	780.4	1.656	.92810	19.08482	.32823	
6	0	1.000	.125	774.6	1.643	.92114	18.94165	.33557	773.3	1.640	.91963	18.91067	.33804	773.2	1.640	.91955	18.90892	.34824	
7	0	1.200	.150	767.4	1.627	.91259	18.76582	.36386	764.9	1.621	.90965	18.70544	.37030	764.8	1.621	.90957	18.70371	.37049	
8	0	1.400	.175	761.6	1.613	.90546	18.49221	.37936	760.1	1.610	.90395	18.58816	.38257	760.0	1.610	.90386	18.58644	.38275	
9	0	1.500	.200	756.6	1.602	.89775	18.50192	.39142	755.3	1.600	.89824	18.47089	.39456	754.0	1.597	.89674	18.43986	.37679	
10	0	1.800	.225	751.8	1.592	.89405	18.39464	.40321	749.3	1.586	.89112	18.32429	.44918	748.0	1.583	.88961	18.29328	.41223	
11	0	2.000	.250	745.8	1.578	.88692	18.23803	.41761	743.3	1.573	.88399	18.17770	.42344	744.4	1.575	.88533	18.20533	.42078	
12	0	2.200	.275	741.0	1.568	.88122	18.12074	.42888	738.5	1.562	.87820	18.06042	.43461	738.4	1.562	.87820	18.05875	.43477	
13	0	2.400	.300	735.0	1.554	.87409	17.97413	.44271	732.5	1.549	.87115	17.91383	.44831	732.5	1.548	.87107	17.91217	.44847	
14	0	2.500	.325	729.0	1.541	.86696	17.87253	.45625	726.5	1.535	.86403	17.76724	.46175	726.5	1.535	.86395	17.76559	.46190	
15	0	2.800	.350	721.8	1.525	.85840	17.61610	.47217	720.5	1.522	.85690	17.62064	.47494	720.5	1.522	.85682	17.61901	.47508	
16	0	3.000	.375	714.6	1.509	.84985	17.45767	.48776	712.1	1.503	.84692	17.41541	.49304	712.1	1.503	.84684	17.41380	.49318	
17	0	3.200	.400	706.2	1.490	.83987	17.20742	.50559	703.7	1.484	.83694	17.12018	.51076	703.7	1.484	.83686	17.20858	.51090	
18	0	3.400	.425	696.6	1.468	.82846	17.03584	.52555	694.2	1.463	.82553	16.97653	.53060	694.1	1.463	.82545	16.97405	.53574	
19	0	3.600	.450	685.8	1.444	.81562	16.77195	.54753	683.4	1.439	.81270	16.71176	.55248	682.1	1.436	.81269	16.63899	.55501	
20	0	3.800	.475	670.2	1.409	.79709	16.39777	.57854	669.0	1.406	.79559	16.35939	.58102	667.1	1.404	.79549	16.32910	.55349	
21	0	4.000	.500	653.5	1.372	.77713	15.94027	.61116	651.0	1.366	.77420	15.92015	.61588	650.9	1.366	.77413	15.91860	.55182	
22	0	4.200	.525	619.9	1.296	.73720	15.15926	.67461	617.4	1.291	.73428	15.09922	.67948	616.3	1.290	.73232	15.08650	.54886	
23	0	4.400	.550	571.9	1.189	.88016	13.98640	.76293	568.3	1.181	.87582	13.89715	.79152	567.0	1.179	.87433	13.86554	.77189	
24	180	.200	.025	826.5	1.759	.98288	20.21130	.15725	824.9	1.755	.98238	20.17319	.15857	823.9	1.753	.97984	20.14873	.77083	
25	180	.400	.050	802.4	1.705	.95247	19.62291	.25946	800.8	1.692	.95238	19.50109	.22493	799.9	1.699	.95123	19.56044	.26822	
26	180	.600	.075	790.4	1.678	.93996	19.38271	.2983	788.4	1.675	.93806	19.28959	.30362	788.0	1.675	.93836	19.29572	.32826	
27	180	.800	.100	782.0	1.659	.92995	19.12278	.32379	780.3	1.656	.92803	19.02344	.32839	779.4	1.654	.92691	19.06040	.33107	
28	180	1.000	.125	772.3	1.638	.91850	18.88822	.33062	770.4	1.637	.91801	18.77330	.35174	771.0	1.635	.91690	18.85450	.35424	
29	180	1.200	.150	766.3	1.624	.91135	18.64032	.36459	765.9	1.623	.91085	18.73005	.34769	765.0	1.621	.90975	18.70743	.37009	
30	180	1.400	.175	751.9	1.592	.89418	18.39728	.42995	752.7	1.594	.89509	18.40610	.41017	751.7	1.592	.89401	18.38388	.4328	
31	180	1.600	.200	745.9	1.579	.88703	18.24019	.41740	746.6	1.580	.88793	18.25885	.41559	745.7	1.578	.88686	18.23681	.41773	
32	180	1.800	.225	739.0	1.556	.87987	18.09390	.43152	741.4	1.569	.88220	18.14105	.42695	740.9	1.567	.88114	18.11191	.42904	
33	180	2.000	.250	729.0	1.535	.87415	17.97541	.44259	734.6	1.553	.87361	17.96435	.44362	733.7	1.551	.87256	17.94266	.44564	
34	180	2.200	.275	715.0	1.514	.86745	17.87541	.46745	717.4	1.509	.86359	17.75820	.46257	725.3	1.532	.86254	17.73676	.46451	
35	180	2.400	.300	707.8	1.493	.86557	17.79889	.48587	726.2	1.534	.86549	17.59151	.47842	714.1	1.516	.85396	17.56028	.48030	
36	180	2.600	.325	718.2	1.471	.85412	17.65635	.48001	718.9	1.518	.86460	17.40481	.49396	710.8	1.500	.84538	17.38379	.49579	
37	180	2.800	.350	712.2	1.503	.83695	17.21050	.51073	704.5	1.486	.83781	17.22811	.50922	703.6	1.484	.83686	17.20731	.51100	
38	180	3.000	.375	703.8	1.484	.82837	17.03398	.52570	694.8	1.464	.82635	16.99251	.52919	695.2	1.465	.82678	17.00141	.52884	
39	180	3.200	.400	696.5	1.468	.81406	16.73978	.55018	684.0	1.440	.81346	16.72746	.55119	684.4	1.441	.81391	16.73668	.55043	
40	180	3.400	.425	684.5	1.441	.80118	16.47501	.57176	673.2	1.416	.80057	16.46424	.57277	673.6	1.417	.80104	16.45975	.57200	
41	180	3.600	.450	673.7	1.417	.78781	16.21023	.59298	658.7	1.383	.78339	16.10902	.61010	657.9	1.382	.78264	16.09877	.61554	
42	180	3.800	.475	662.9	1.393	.76256	16.06808	.63455	640.7	1.343	.76190	15.66727	.63558	639.9	1.341	.76099	15.64836	.6105	
43	180	4.000	.500	661.2	1.344	.76256	15.86086	.63455	640.7	1.343	.76099	15.66727	.63558	639.9	1.341	.76099	15.64836	.6105	
44	180	4.200	.525	656.7	1.295	.72500	14.85693	.69756	656.7	1.176	.76731	14.81419	.65641	656.4	1.173	.76708	14.79526	.77721	
45	180	4.400	.550	656.6	1.177	.73835	15.77622	.69988	656.0	1.106	.73777	15.73999	.63777	774.4	1.642	.92097	18.93824	.34497	
46	90	1.000	.125	775.8	1.645	.82527	17.19393	.74343	743.3	1.533	.82399	16.97770	.82344	744.4	1.575	.82853	18.20533	.42078	
48	90	3.000	.375	708.6	1.495	.84272	17.32906	.50604	704.9	1.500	.84549	17.38690	.54219	.04595	713.3	1.506	.84826	17.44311	.49062
49	90	4.000	.500	645.1	1.353	.81414	16.511	.62721	644.1	1.358	.76992	15.83219	.62276	713.1	1.363	.77270	15.88936	.61829	
50	270	1.000	.125	773.5	1.640	.91933	16.91684	.53736	773.1	1.640	.91944	16.90675	.53488	772.2	1.637	.91833	18.8392	.35101	
51	270	2.000	.250	751.1	1.568	.88110	16.12251	.42872	740.6	1.567	.88077	16.11160	.42976	739.7	1.565	.87971	18.80973	.43184	
52	270	3.000	.375	707.6	1.492	.84124	17.29876	.50315	705.7	1.489	.83924	17.25756	.50670	703.6	1.484	.83680	17.20731	.51100	
53	270	4.000	.500	663.6	1.350	.76542	15.73952	.62998	661.9	1.346	.76334	15.69672	.63330	638.7	1.339	.75955	15.61894	.63933	
54	0	4.877	.610	19.4	.048	.02306	17.4718	.31128	18.9	.049	.02248	17.46229	.312840	19.2	.049	.02284	17.44631	.49062	
55	0	5.402	.575	14.4	.059	.01715	.35269	.31293	14.1	.060	.01677	.34476	.3						

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 90.0^\circ, p_t = 5807.1 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	834.3	1.777	.99225	20.40404	.10545	834.2	1.776	.99207	20.40026	.10670
2	0	.200	.025	824.8	1.755	.98085	20.16951	.16643	824.6	1.755	.98067	20.16578	.16723
3	0	.400	.050	802.0	1.704	.95376	19.61251	.26094	801.8	1.704	.95359	19.60887	.26145
4	0	.600	.075	790.0	1.677	.93951	19.31935	.29991	789.8	1.677	.93933	19.31576	.30036
5	0	.800	.100	781.6	1.659	.92953	19.11413	.32481	781.5	1.658	.92935	19.11059	.32522
6	0	1.000	.125	774.4	1.642	.92097	18.93824	.34497	773.1	1.639	.91938	18.90541	.34863
7	0	1.200	.150	766.0	1.624	.91099	18.73302	.36737	764.7	1.621	.90940	18.70024	.37085
8	0	1.400	.175	758.8	1.608	.90244	18.55713	.38577	759.9	1.610	.90370	18.58300	.38311
9	0	1.600	.200	754.0	1.597	.89674	18.43986	.39769	753.9	1.596	.89657	18.43644	.39803
10	0	1.800	.225	748.0	1.583	.88961	18.29328	.41223	747.9	1.583	.88944	18.28989	.41256
11	0	2.000	.250	742.0	1.570	.88248	18.14670	.42641	741.9	1.570	.88232	18.14334	.42673
12	0	2.200	.275	736.0	1.557	.87535	18.00012	.44028	735.9	1.556	.87519	17.99678	.44060
13	0	2.400	.300	731.3	1.546	.86965	17.88285	.45117	729.9	1.543	.86806	17.85023	.45417
14	0	2.600	.325	725.3	1.532	.86252	17.73627	.46455	723.9	1.529	.86093	17.70367	.46749
15	0	2.800	.350	718.1	1.516	.85397	17.56038	.48029	716.7	1.513	.85238	17.52781	.48317
16	0	3.000	.375	710.9	1.500	.84541	17.38448	.49573	708.3	1.495	.84240	17.32264	.50109
17	0	3.200	.400	701.3	1.479	.83041	17.14995	.51589	700.0	1.476	.83243	17.11746	.51865
18	0	3.400	.425	691.7	1.457	.82260	16.91542	.53564	690.4	1.454	.82102	16.88297	.53834
19	0	3.600	.450	680.9	1.433	.80977	16.65158	.55741	678.4	1.427	.80677	16.58987	.56244
20	0	3.800	.475	666.5	1.401	.79266	16.29978	.58584	664.0	1.395	.78967	16.23814	.59076
21	0	4.000	.500	648.5	1.361	.77128	15.86004	.62058	647.2	1.358	.76971	15.82779	.62310
22	0	4.200	.525	631.0	1.328	.75136	15.03919	.68375	612.5	1.280	.72837	14.97778	.68841
23	0	4.400	.550	565.8	1.175	.67291	13.83722	.77408	563.3	1.170	.66993	13.77604	.77864
24	180	.200	.025	823.9	1.753	.97984	20.14873	.17083	822.3	1.750	.97789	20.10859	.17902
25	180	.400	.050	799.9	1.699	.95123	19.56044	.26822	798.2	1.696	.94925	19.51976	.27378
26	180	.600	.075	787.8	1.672	.93693	19.26630	.30650	788.6	1.674	.93780	19.28423	.30429
27	180	.800	.100	779.4	1.654	.92691	19.06040	.33107	778.9	1.653	.92634	19.04870	.33242
28	180	1.000	.125	771.0	1.635	.91960	18.85450	.35424	770.5	1.634	.91632	18.84261	.35554
29	180	1.200	.150	765.0	1.621	.90975	18.70743	.37009	764.5	1.620	.90916	18.69540	.37137
30	180	1.400	.175	756.6	1.602	.89973	18.50153	.39146	757.3	1.604	.90057	18.51875	.38970
31	180	1.600	.200	751.7	1.592	.89401	18.38388	.40328	752.4	1.593	.89485	18.40098	.40158
32	180	1.800	.225	744.5	1.576	.88543	18.20739	.42058	746.4	1.580	.88769	18.25377	.41608
33	180	2.000	.250	737.3	1.559	.87685	18.03091	.43739	741.6	1.569	.88196	18.13601	.42743
34	180	2.200	.275	733.7	1.551	.87256	17.94266	.45654	734.4	1.553	.87337	17.95936	.44469
35	180	2.400	.300	725.3	1.532	.86254	17.73676	.46451	728.4	1.539	.86621	17.81215	.45766
36	180	2.600	.325	718.1	1.516	.85396	17.56028	.48030	718.7	1.518	.85476	17.57662	.47885
37	180	2.800	.350	712.0	1.503	.84681	17.41321	.49323	712.7	1.504	.84760	17.42941	.49182
38	180	3.000	.375	704.8	1.487	.83823	17.23672	.50849	704.3	1.485	.83758	17.22332	.50963
39	180	3.200	.400	696.4	1.468	.82821	17.03082	.52597	697.1	1.469	.82898	17.04667	.52464
40	180	3.400	.425	684.4	1.441	.81391	16.73668	.55043	686.2	1.445	.81610	16.78170	.54672
41	180	3.600	.450	673.6	1.417	.80104	16.47195	.57200	675.4	1.421	.80321	16.51672	.56838
42	180	3.800	.475	661.5	1.390	.78673	16.17781	.59555	662.1	1.391	.78746	16.19286	.59436
43	180	4.000	.500	641.1	1.344	.76241	15.67777	.63477	644.1	1.351	.76599	15.75124	.62906
44	180	4.200	.525	607.4	1.268	.72236	14.85417	.69777	608.0	1.270	.72303	14.86799	.69672
45	180	4.400	.550	565.3	1.174	.67230	13.82467	.77501	565.8	1.175	.67292	13.83754	.77405
46	90	1.000	.125	775.6	1.645	.92240	18.96755	.34167	774.3	1.642	.92080	18.93473	.34536
47	90	2.000	.250	745.6	1.578	.88676	18.23465	.41794	744.3	1.575	.88517	18.20196	.42110
48	90	3.000	.375	714.5	1.508	.84969	17.47243	.48805	714.3	1.508	.84953	17.46919	.48833
49	90	4.000	.500	652.1	1.369	.77556	15.94799	.61369	650.8	1.366	.77399	15.91572	.61622
50	270	1.000	.125	773.4	1.640	.91976	18.91333	.34775	774.1	1.642	.92062	18.93093	.34578
51	270	2.000	.250	739.7	1.565	.87971	18.08973	.43184	740.4	1.566	.88053	18.10657	.43024
52	270	3.000	.375	703.6	1.484	.83680	17.20731	.51100	704.3	1.485	.83758	17.22332	.50963
53	270	4.000	.500	638.7	1.339	.75955	15.61894	.63933	639.3	1.340	.76026	15.63347	.63820
54	0	4.877	.610	19.2	-.048	.02287	1.47033	3.11678	19.1	-.049	.02272	.46713	3.42128
55	0	5.402	.675	14.4	-.059	.01715	1.35275	3.31283	14.4	-.059	.01718	.35329	3.431176
56	0	5.927	.741	14.3	-.060	.01696	1.34883	3.32053	14.3	-.060	.01699	.34937	3.431946
57	0	6.452	.807	14.7	-.059	.01754	1.36058	3.29770	14.6	-.059	.01737	.35722	3.430415
58	0	6.977	.872	13.5	-.061	.01601	1.32923	3.36048	13.5	-.061	.01604	.32974	3.435941
59	180	6.977	.872	13.9	-.060	.01658	1.34099	3.33621	14.3	-.060	.01699	.34937	3.431946
60	180	6.452	.807	14.1	-.060	.01677	1.34491	3.32832	14.4	-.059	.01718	.35329	3.431176
61	180	5.927	.741	13.6	-.061	.01620	1.33315	3.35229	14.0	-.060	.01661	.34151	3.433514
62	180	5.402	.675	13.5	-.061	.01601	1.32923	3.36048	13.6	-.061	.01623	.33366	3.435122
63	180	4.877	.610	13.6	-.061	.01620	1.33315	3.35229	13.8	-.061	.01642	.33759	3.434313

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(b) $\alpha = 5^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 5807.1$ psf					$\phi = 22.5^\circ$, $p_t = 5807.1$ psf					$\phi = 45.0^\circ$, $p_t = 5807.1$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	821.3	1.747	.97675	20.04529	.18362	820.0	1.745	.97524	20.05411	.18960	818.8	1.742	.97372	20.02293	*19542
2	0	.200	.025	788.9	1.675	.93825	19.29361	.30312	787.7	1.672	.93674	19.26250	.30697	792.4	1.683	.94236	19.37798	*29447
3	0	.400	.050	741.0	1.568	.86122	14.12074	.42889	743.3	1.573	.86399	18.17770	.42344	752.8	1.594	.89531	18.41054	*40063
4	0	.600	.075	739.8	1.565	.87979	14.09142	.43168	740.9	1.567	.88114	18.11906	.42905	744.0	1.583	.88961	18.29388	*41223
5	0	.800	.100	736.2	1.557	.87551	14.00346	.43997	737.3	1.559	.87686	14.03111	.43738	742.0	1.570	.88248	18.14670	*42441
6	0	1.000	.125	731.4	1.546	.86981	17.88617	.45087	731.3	1.546	.86773	17.88451	.45102	730.0	1.557	.86745	17.88112	*43658
7	0	1.200	.150	724.2	1.530	.86125	17.71024	.46690	725.3	1.533	.86240	17.73242	.46600	728.9	1.540	.87260	17.89422	*45555
8	0	1.400	.175	720.6	1.522	.85949	17.56227	.47479	721.7	1.524	.85832	17.69766	.47323	725.3	1.532	.86252	17.73627	*46455
9	0	1.600	.200	710.1	1.511	.85127	17.56199	.48519	716.9	1.514	.85262	17.53269	.48274	720.5	1.522	.85682	17.61901	*47508
10	0	1.800	.225	712.2	1.503	.84699	17.41702	.49290	712.1	1.503	.84692	17.41541	.49304	716.9	1.514	.85254	17.53106	*48289
11	0	2.000	.250	707.4	1.492	.84129	17.20974	.50307	707.3	1.492	.84121	17.29913	.50321	712.1	1.503	.84684	17.41380	*49318
12	0	2.200	.275	703.8	1.484	.83701	17.21177	.51062	703.7	1.484	.83694	17.21018	.51076	707.3	1.492	.84114	17.29653	*50335
13	0	2.400	.300	699.0	1.474	.83131	17.09449	.52060	699.0	1.473	.83123	17.09290	.52073	702.5	1.481	.83543	17.17927	*51340
14	0	2.600	.325	696.2	1.463	.82561	16.97720	.53047	694.2	1.463	.82553	16.97563	.53060	697.7	1.471	.82973	17.06200	*52334
15	0	2.800	.350	689.4	1.452	.81990	16.85991	.54025	688.2	1.449	.81840	16.82903	.54281	691.7	1.457	.82260	16.91542	*53564
16	0	3.000	.375	682.2	1.436	.81135	16.69388	.55476	682.2	1.436	.81127	16.69244	.55488	685.7	1.444	.81547	16.76884	*54778
17	0	3.200	.400	675.0	1.420	.80279	16.50805	.56908	675.0	1.420	.80272	16.50562	.56921	677.3	1.425	.80549	16.56363	*56458
18	0	3.400	.425	666.6	1.401	.79281	16.30280	.58560	666.6	1.401	.79274	16.30129	.58572	668.9	1.406	.79551	16.35841	*58114
19	0	3.600	.450	658.3	1.382	.78283	16.09755	.60191	657.0	1.380	.78133	16.06674	.60435	659.3	1.385	.78411	16.12388	*59983
20	0	3.800	.475	645.1	1.353	.76714	15.77501	.62721	645.0	1.353	.76707	15.77355	.62733	646.1	1.355	.76843	15.80141	*62516
21	0	4.000	.500	631.9	1.323	.75146	15.45248	.65217	631.6	1.320	.74996	15.42173	.65543	630.6	1.320	.74989	15.42030	*65664
22	0	4.200	.525	620.7	1.293	.74138	14.69012	.70116	600.6	1.253	.71432	14.69875	.71026	600.6	1.253	.71425	14.68739	*71036
23	0	4.400	.550	558.7	1.160	.66448	13.66386	.78702	557.5	1.157	.66299	13.63328	.78930	556.2	1.154	.66150	13.60270	*79159
24	180	.200	.025	837.0	1.783	.99544	20.46948	.08086	833.3	1.774	.99105	20.37923	.11314	827.2	1.761	.98380	20.23011	*15295
25	180	.400	.050	833.4	1.775	.99114	20.38112	.11283	828.5	1.764	.98532	20.26143	.14551	818.8	1.742	.97377	20.02398	*19523
26	180	.600	.075	825.0	1.756	.98111	20.17495	.16152	819.0	1.742	.97386	20.02584	.19488	808.0	1.718	.96080	19.75696	*23943
27	180	.800	.100	815.3	1.734	.96966	19.93933	.21027	812.9	1.729	.96570	19.79549	.22494	808.7	1.701	.95229	19.58283	*26549
28	180	1.000	.125	808.1	1.718	.96106	19.76262	.23887	804.4	1.711	.95658	19.67244	.25234	793.3	1.691	.94952	19.52780	*29271
29	180	1.200	.150	803.3	1.707	.95533	19.64481	.25633	791.2	1.686	.95292	19.52919	.27155	788.7	1.674	.93797	19.47780	*32084
30	180	1.400	.175	796.1	1.691	.94674	19.46810	.28072	791.2	1.680	.94029	19.34849	.30243	779.1	1.653	.92652	19.05223	*33201
31	180	1.600	.200	786.0	1.677	.93916	19.25333	.32947	785.2	1.657	.93376	19.12124	.31444	774.3	1.642	.92079	18.93444	*34539
32	180	1.800	.225	784.0	1.664	.93242	19.17357	.31776	779.1	1.653	.92660	19.05399	.33181	768.2	1.629	.91363	18.79721	*36156
33	180	2.000	.250	779.0	1.650	.92525	19.02631	.34699	771.9	1.637	.91801	18.87730	.35174	762.2	1.615	.90647	18.63997	*37719
34	180	2.200	.275	772.0	1.637	.91809	18.87905	.35154	767.1	1.626	.91228	18.75950	.36454	756.2	1.602	.89931	18.49273	*39235
35	180	2.400	.300	766.8	1.621	.90950	18.70233	.37063	759.9	1.610	.90369	18.58202	.39313	749.0	1.585	.89072	18.31605	*40999
36	180	2.600	.325	756.3	1.602	.89947	18.49616	.39200	752.7	1.594	.89509	18.46160	.40107	741.7	1.569	.88212	18.13937	*42711
37	180	2.800	.350	750.3	1.588	.89231	18.34890	.40675	745.4	1.578	.88650	18.22940	.41845	735.7	1.556	.87492	17.99214	*44103
38	180	3.000	.375	740.7	1.567	.88085	18.11328	.42960	737.0	1.559	.87648	18.02325	.43911	728.5	1.540	.86637	17.81545	*45736
39	180	3.200	.400	731.0	1.545	.86940	17.88766	.45165	724.6	1.540	.86645	17.81710	.45721	718.9	1.518	.85491	17.57988	*47856
40	180	3.400	.425	720.2	1.521	.85651	17.61259	.47565	716.5	1.513	.85213	17.52621	.48363	706.8	1.491	.84059	17.28541	*50430
41	180	3.600	.450	707.0	1.491	.84075	17.28861	.50403	704.5	1.486	.83781	17.22811	.50922	694.8	1.464	.82627	16.99094	*52932
42	180	3.800	.475	692.5	1.459	.82356	16.95158	.53399	687.0	1.448	.81776	16.81581	.54391	680.3	1.432	.80909	16.63757	*55855
43	180	4.000	.500	672.0	1.413	.79921	16.43449	.57503	664.6	1.405	.79484	16.34462	.58225	659.9	1.386	.78475	16.13697	*59879
44	180	4.200	.525	634.7	1.330	.75481	15.52146	.64686	632.2	1.324	.75188	15.61122	.65150	624.9	1.308	.74322	15.29301	*66517
45	180	4.400	.550	588.9	1.227	.70039	14.40227	.73180	585.3	1.219	.69603	14.31258	.73852	579.2	1.205	.68880	14.16402	*74965
46	90	1.000	.125	763.8	1.619	.90831	18.67785	.37322	748.1	1.584	.88969	18.29498	.41206	737.2	1.559	.87678	18.02943	*43753
47	90	2.000	.250	737.4	1.560	.87694	18.03278	.43722	722.9	1.527	.85975	17.67928	.46969	713.3	1.506	.84826	17.44311	*49662
48	90	3.000	.375	706.2	1.490	.83987	17.27042	.50559	694.2	1.463	.82553	16.97563	.53060	685.7	1.444	.81547	16.76884	*54778
49	90	4.000	.500	642.7	1.347	.76429	15.71637	.63171	635.4	1.331	.75567	15.53900	.64550	630.6	1.320	.74988	15.42030	*56564
50	270	1.000	.125	759.9	1.610	.90377	18.58452	.38295	776.7	1.548	.88234	18.99509	.39360	792.3	1.683	.9227	19.37615	*29211
51	270	2.000	.250	734.7	1.553	.87659	17.9602	.44347	747.8	1.583	.86177	18.41010	.41271	761.2	1.615	.80647	18.04997	*31719
52	270	3.000	.375	705.8	1.469	.83932	17.59116	.50656	711.1	1.507	.84927	17.44371	.48881	729.7	1.542	.85870	17.84490	*45666
53	270	4.000	.500	660.7	1.423	.76197	15.66872	.63147	647.9	1.359	.77050	15.44397	.42194	658.7	1.383	.78331	16.10753	*60112
54	0	4.477	.675	611	2.17	.043	.02578	.53015	20.1	-0.047	.02390	.49151	.30472	19.4	+0.048	.02310	.47491	3-11024
55	0	5.402	.675	17.2	-0.053	.02043	.47019	.319310	1.5	-0.057	.01817							

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(b) $\alpha = 5^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 5807.1$ psf					$\phi = 90.0^\circ$, $p_t = 5807.1$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	820.0	1.744	.97515	20.05225	.18995	810.8	1.744	.97497	20.04853	.19066
2	0	.200	.025	800.8	1.701	.95234	19.58319	.26506	809.0	1.720	.96214	19.78474	.23547
3	0	.400	.050	768.4	1.629	.91384	18.79165	.36108	786.3	1.669	.93506	19.22783	.31121
4	0	.600	.075	760.0	1.610	.90386	18.58644	.38275	775.5	1.645	.92223	18.96404	.34207
5	0	.800	.100	752.8	1.594	.89531	18.41054	.40063	769.3	1.629	.91367	18.78817	.36146
6	0	1.000	.125	746.8	1.581	.88818	18.26396	.41509	759.9	1.610	.90370	18.58300	.38311
7	0	1.200	.150	739.6	1.565	.87963	18.08087	.43200	752.7	1.594	.89514	18.40713	.40097
8	0	1.400	.175	734.9	1.554	.87393	17.97080	.44302	749.1	1.586	.89087	18.31920	.40968
9	0	1.600	.200	731.3	1.546	.86965	17.88285	.45117	744.3	1.575	.88517	18.20196	.42110
10	0	1.800	.225	726.5	1.535	.86395	17.76559	.46190	739.5	1.564	.87946	18.08471	.43232
11	0	2.000	.250	721.7	1.524	.85824	17.64832	.47246	733.5	1.551	.87234	17.93816	.44606
12	0	2.200	.275	716.9	1.514	.85254	17.53106	.48289	728.7	1.540	.86664	17.82092	.45686
13	0	2.400	.300	712.1	1.503	.84684	17.41380	.49318	723.9	1.529	.86093	17.70367	.46749
14	0	2.600	.325	706.1	1.489	.83971	17.26721	.50587	717.9	1.516	.85381	17.55712	.48058
15	0	2.800	.350	700.1	1.476	.83258	17.12063	.51838	710.7	1.500	.84526	17.38126	.49601
16	0	3.000	.375	694.1	1.463	.82545	16.97405	.53074	703.6	1.484	.83670	17.20539	.51117
17	0	3.200	.400	684.5	1.441	.81405	16.73952	.55020	695.2	1.465	.82673	17.00022	.52854
18	0	3.400	.425	676.1	1.422	.80407	16.53431	.56696	685.6	1.444	.81532	16.76573	.54804
19	0	3.600	.450	666.5	1.401	.79266	16.29978	.58584	674.8	1.419	.80249	16.50194	.56958
20	0	3.800	.475	652.1	1.369	.77556	15.94799	.61369	660.4	1.387	.78539	16.15021	.59774
21	0	4.000	.500	636.6	1.334	.75702	15.56688	.64335	643.6	1.350	.76543	15.73986	.62995
22	0	4.200	.525	604.2	1.261	.71853	14.77534	.70373	610.1	1.274	.72552	14.91916	.69285
23	0	4.400	.550	558.6	1.159	.66435	13.66133	.78721	562.1	1.167	.66851	13.74673	.78083
24	180	.200	.025	820.0	1.745	.97520	20.05343	.18973	807.8	1.717	.96071	19.75529	.23999
25	180	.400	.050	802.0	1.704	.95372	19.61172	.26105	782.5	1.661	.93064	19.13702	.32211
26	180	.600	.075	791.1	1.680	.94084	19.34670	.29646	774.1	1.642	.92062	18.93093	.34578
27	180	.800	.100	783.9	1.664	.93224	19.17002	.31818	765.7	1.623	.91059	18.72484	.36824
28	180	1.000	.125	776.7	1.647	.92365	18.99333	.33876	759.7	1.609	.90344	18.57763	.38366
29	180	1.200	.150	771.8	1.637	.91792	18.87555	.35193	754.8	1.599	.89771	18.45987	.39567
30	180	1.400	.175	764.6	1.621	.90933	18.69886	.37100	747.6	1.582	.88912	18.28322	.41321
31	180	1.600	.200	758.6	1.607	.90217	18.55163	.38634	742.8	1.572	.88339	18.16545	.42462
32	180	1.800	.225	753.8	1.596	.89644	18.43384	.39829	740.4	1.566	.88053	18.10657	.43024
33	180	2.000	.250	746.6	1.580	.88785	18.25716	.41575	732.0	1.547	.87051	17.90048	.44955
34	180	2.200	.275	741.7	1.569	.88212	18.13937	.42711	728.4	1.539	.86621	17.81215	.45766
35	180	2.400	.300	735.7	1.556	.87496	17.99214	.44103	722.3	1.526	.85905	17.66494	.47097
36	180	2.600	.325	728.5	1.540	.86637	17.81545	.45736	713.9	1.507	.84903	17.45885	.48924
37	180	2.800	.350	722.5	1.526	.85921	17.66822	.47068	707.9	1.494	.84187	17.31164	.50204
38	180	3.000	.375	714.0	1.507	.84919	17.46209	.48896	699.5	1.475	.83185	17.10555	.51966
39	180	3.200	.400	705.6	1.488	.83916	17.25596	.50684	693.4	1.461	.82469	16.95835	.53205
40	180	3.400	.425	694.8	1.464	.82627	16.99094	.52932	682.6	1.437	.81180	16.69337	.55399
41	180	3.600	.450	682.7	1.437	.81195	16.69647	.55373	673.0	1.415	.80035	16.45784	.57314
42	180	3.800	.475	668.3	1.405	.79477	16.34310	.58237	658.5	1.383	.78317	16.10454	.60136
43	180	4.000	.500	650.2	1.364	.77329	15.90140	.61734	640.5	1.343	.76169	15.66292	.63592
44	180	4.200	.525	615.3	1.286	.73176	15.04743	.68312	608.0	1.270	.72303	14.86799	.69672
45	180	4.400	.550	572.0	1.189	.68021	13.98734	.76286	564.6	1.173	.67149	13.80810	.77625
46	90	1.000	.125	732.5	1.548	.87107	17.91217	.44847	729.9	1.543	.86806	17.85023	.45417
47	90	2.000	.250	708.5	1.495	.84256	17.32585	.50081	707.1	1.492	.84098	17.29332	.50362
48	90	3.000	.375	682.1	1.436	.81120	16.68089	.55501	680.8	1.433	.80962	16.64849	.55766
49	90	4.000	.500	629.4	1.318	.74847	15.39098	.65689	628.0	1.315	.74690	15.35882	.65936
50	270	1.000	.125	803.2	1.707	.95516	19.64117	.25686	807.8	1.717	.96071	19.75529	.23999
51	270	2.000	.250	773.1	1.639	.91936	18.90499	.34867	777.7	1.650	.92491	19.01926	.33580
52	270	3.000	.375	736.9	1.559	.87639	18.02158	.43827	741.6	1.569	.88196	18.13601	.42743
53	270	4.000	.500	668.3	1.405	.79477	16.34310	.58237	671.8	1.413	.79892	16.42840	.57552
54	0	4.877	.610	18.8	-.049	.02236	.45973	3.13216	18.6	-.050	.02216	.45574	3.13805
55	0	5.402	.675	13.8	-.061	.01643	.33792	3.34246	13.7	-.061	.01624	.33395	3.35063
56	0	5.927	.741	13.3	-.062	.01586	.32613	3.36703	13.0	-.062	.01548	.31823	3.38405
57	0	6.452	.807	14.0	-.060	.01662	.34185	3.33447	13.7	-.061	.01624	.33395	3.35063
58	0	6.977	.872	13.2	-.062	.01567	.32220	3.37544	12.7	-.063	.01509	.31037	3.40143
59	180	6.977	.872	12.7	-.063	.01510	.31041	3.40134	12.4	-.064	.01471	.30252	3.41929
60	180	6.452	.807	12.9	-.063	.01529	.31434	3.39259	12.7	-.063	.01509	.31037	3.40143
61	180	5.927	.741	13.0	-.062	.01548	.31827	3.38396	12.9	-.063	.01528	.31430	3.39268
62	180	5.402	.675	13.2	-.062	.01567	.32220	3.37544	13.0	-.062	.01548	.31823	3.38405
63	180	4.877	.610	13.5	-.061	.01605	.33006	3.35874	13.3	-.062	.01586	.32609	3.36712

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(c) $\alpha = 10^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 5807.1$ psf					$\phi = 22.5^\circ$, $p_t = 5807.1$ psf					$\phi = 45.0^\circ$, $p_t = 5807.1$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	780.5	1.656	.92827	19.04835	.32782	778.4	1.651	.92573	19.03612	.33387	774.8	1.648	.92382	18.99687	+33835
2	0	.200	.025	723.0	1.527	.85983	17.64092	.44619	724.5	1.531	.86164	17.71823	.44616	732.5	1.548	.80122	16.47568	+57170
3	0	.400	.050	647.5	1.358	.78500	15.43366	.62248	655.1	1.375	.77904	16.01962	.60806	673.7	1.417	.80549	16.56363	+56458
4	0	.600	.075	660.6	1.388	.78564	16.04220	.50727	655.8	1.390	.79184	16.29320	.58176	677.3	1.425	.80467	16.53431	+56496
5	0	.800	.100	671.4	1.412	.79851	16.42099	.57179	669.4	1.407	.79613	16.37106	.59013	676.1	1.422	.79979	16.44636	+57407
6	0	1.000	.125	681.8	1.436	.79424	16.33213	.58325	667.0	1.402	.79328	16.31249	.58842	672.5	1.414	.79409	16.32910	+58349
7	0	1.200	.150	660.6	1.388	.78564	16.15620	.59272	661.1	1.389	.78616	16.16605	.59649	667.7	1.404	.79266	16.29978	+58584
8	0	1.400	.175	659.4	1.386	.78425	16.12687	.59959	659.9	1.386	.78747	16.13677	.59881	666.5	1.401	.78981	16.24115	+59052
9	0	1.600	.200	657.1	1.380	.78140	16.06023	.60423	657.5	1.381	.78189	16.07820	.60344	664.1	1.395	.78487	16.15320	+59751
10	0	1.800	.225	653.5	1.372	.77713	15.98027	.61116	653.9	1.373	.77761	15.99034	.61037	660.5	1.387	.78268	16.09457	+60215
11	0	2.000	.250	651.1	1.366	.77427	15.92162	.61576	651.5	1.367	.77477	15.93176	.61497	655.1	1.382	.77983	16.03594	+60678
12	0	2.200	.275	649.9	1.364	.77285	15.92930	.61806	649.1	1.362	.77192	15.87319	.61955	655.7	1.377	.77556	15.94799	+61369
13	0	2.400	.300	647.5	1.358	.77000	15.83366	.62264	646.7	1.356	.76907	15.81662	.62413	652.1	1.369	.77556	15.94799	+61369
14	0	2.600	.325	645.1	1.353	.76714	15.77501	.62721	643.1	1.348	.76480	15.72676	.63097	648.5	1.361	.77128	15.86004	+62058
15	0	2.800	.350	641.5	1.345	.76287	15.68705	.63405	640.7	1.343	.76195	15.66819	.63551	644.9	1.353	.76700	15.77209	+62744
16	0	3.000	.375	636.7	1.334	.75716	15.54976	.64313	635.9	1.332	.75625	15.55104	.64458	640.1	1.342	.76130	15.65483	+63555
17	0	3.200	.400	631.9	1.323	.75146	15.45248	.65217	631.1	1.322	.75055	15.43390	.65360	634.2	1.328	.75417	15.50955	+64788
18	0	3.400	.425	627.1	1.313	.74575	15.33519	.66117	626.3	1.311	.74486	15.31675	.66258	629.4	1.318	.74847	15.28668	+6599
19	0	3.600	.450	622.3	1.302	.74005	15.21790	.67014	620.3	1.297	.73774	15.17032	.67377	622.2	1.302	.75210	15.21508	+67036
20	0	3.800	.475	613.9	1.283	.73007	15.01265	.68576	610.8	1.276	.72634	14.93603	.69151	614.2	1.277	.72708	14.95124	+69442
21	0	4.000	.500	605.5	1.264	.72009	14.88704	.70130	601.2	1.255	.71495	14.70174	.70328	600.6	1.253	.71425	14.87339	+71326
22	0	4.200	.525	581.5	1.211	.69157	14.22097	.74539	579.6	1.206	.68931	14.14588	.74666	574.6	1.200	.68574	14.10107	+75436
23	0	4.400	.550	545.5	1.130	.64879	13.3132	.81110	543.1	1.126	.64059	13.20799	.81449	537.1	1.111	.63869	13.13366	+82662
24	180	.200	.025	825.0	1.756	.98111	20.17495	.41526	819.2	1.743	.97421	20.02933	.19357	805.9	1.713	.95838	19.70752	+24718
25	180	.400	.050	804.6	1.791	.96973	20.43646	.00951	804.4	1.772	.98994	20.36561	.12025	809.5	1.721	.96267	19.79576	+23375
26	180	.600	.075	843.0	1.768	.98247	20.41674	.00090	831.2	1.770	.98851	20.32710	.12488	804.7	1.710	.95695	19.67810	+25151
27	180	.800	.100	807.0	1.785	.99687	20.49993	.06496	824.6	1.759	.98279	20.20943	.15167	799.9	1.699	.95123	19.56044	+26822
28	180	1.000	.125	832.2	1.772	.98971	20.31657	.12166	820.4	1.745	.97564	20.06234	.18804	795.0	1.689	.94551	19.44279	+28406
29	180	1.200	.150	827.4	1.761	.98398	20.23836	.19207	815.6	1.735	.96992	19.94466	.20935	790.2	1.678	.93979	19.32513	+29918
30	180	1.400	.175	821.4	1.748	.97682	20.08660	.19336	812.0	1.727	.95652	19.85643	.22411	784.2	1.664	.93263	19.17806	+31722
31	180	1.600	.200	816.6	1.737	.97109	19.96879	.20515	805.9	1.713	.95847	19.70934	.24691	781.8	1.659	.92977	19.11923	+32421
32	180	1.800	.225	818.1	1.731	.96822	19.99888	.21528	801.1	1.702	.95275	19.59167	.26387	777.0	1.648	.92405	19.00157	+33782
33	180	2.000	.250	805.7	1.713	.95820	19.73732	.24774	796.3	1.691	.94703	19.47401	.27993	772.2	1.637	.91833	18.84392	+35101
34	180	2.200	.275	800.9	1.702	.95247	19.58591	.24668	791.5	1.681	.94130	19.35634	.29523	767.4	1.627	.91261	18.76626	+36382
35	180	2.400	.300	793.7	1.686	.94387	19.40919	.28845	784.3	1.665	.93270	19.17984	.32372	761.4	1.613	.90546	18.61919	+37936
36	180	2.600	.325	790.1	1.677	.93958	19.32083	.29972	777.3	1.651	.92557	19.03275	.33425	754.1	1.597	.89687	18.44270	+39740
37	180	2.800	.350	780.4	1.656	.92812	19.05821	.32819	771.1	1.635	.91699	18.85625	.35405	749.3	1.586	.89115	18.32505	+40911
38	180	3.000	.375	772.0	1.637	.91809	18.87905	.39154	763.8	1.619	.90840	18.67975	.37302	740.9	1.567	.88114	18.11915	+42904
39	180	3.200	.400	766.0	1.624	.91093	18.73178	.36750	754.2	1.597	.89696	18.44441	.39723	732.5	1.549	.87113	17.91325	+44837
40	180	3.400	.425	752.7	1.594	.89518	18.40781	.40909	742.2	1.570	.88265	18.15024	.42667	721.7	1.524	.85825	17.64852	+46875
41	180	3.600	.450	747.0	1.567	.88085	18.11328	.42960	730.2	1.543	.86835	17.85608	.45364	709.6	1.497	.83395	17.35914	+49334
42	180	3.800	.475	732.8	1.529	.86808	17.70095	.46774	715.7	1.511	.85118	17.50307	.48536	680.0	1.462	.82345	16.47195	+51091
43	180	4.000	.500	702.1	1.481	.83502	17.17080	.51412	694.1	1.463	.82543	16.337	.53637	673.0	1.417	.80104	16.47195	+52700
44	180	4.200	.525	663.6	1.394	.78919	16.29832	.59154	655.6	1.376	.77655	16.02232	.61707	638.7	1.339	.75985	15.61894	+53933
45	180	4.400	.550	614.2	1.284	.73046	15.62077	.64515	617.5	1.269	.72243	14.86555	.69767	590.6	1.231	.70234	14.64237	+52879
46	90	1.000	.125	721.8	1.525	.85894	17.61560	.47217	691.0	1.456	.82177	16.69821	.57070	672.8	1.414	.79797	16.44636	+57407
47	90	2.000	.250	706.2	1.490	.83987	17.27042	.50559	647.6	1.423	.80467	16.54678	.56595	653.9	1.385	.78411	16.12388	+59983
48	90	3.000	.375	681.1	1.433	.83992	16.56656	.55116	656.3	1.378	.78046	16.04891	.68575	641.3	1.344	.76727	15.68146	+62428
49	90	4.000	.500	625.9	1.310	.74433	16.30587	.63432	607.2	1.268	.72207	14.64817	.69482	599.4	1.251	.71283	14.65808	+71257
50	270	1.000	.125	733.8	1.320	.86808	17.0095	.44774	716.4	1.613	.90554	18.62092	.37918	707.4	1.594	.94837	19.50162	+27624
51	270	2.000	.250	705.8	1.149	.83932	16.25916	.50656	739.8	1.565	.87979	18.09141	.43168	772.2	1.637	.91833	18.88392	+35101
52	270	3.000	.375	686.5	1.132	.80924	16.64066	.55830	709.7	1.498	.84403	17.35999	.49421	739.7	1.565	.87971	18.08973	+43184
53	270	4.000	.500	625.1	1.308	.74335	15.28584	.66495	647.2	1.358	.76964	15.82631	.62321	672.4	1.414	.79961	16.44254	+57438
54	0	4.877	.610	18.8	-.050	.02231	.45882	3.13349	1.1	-.051	.02156	.44332	3.15674	17.8	-.052	.02118	.43548	3.16884
55	0	5.402	.675	13.6	-.061	.01621	.33333	3.35191	1.3	-.062	.01545</td							

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_{\infty} = 3.95$ - Continued(c) $\alpha = 10^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 5807.1 \text{ psf}$						$\phi = 90.0^\circ, p_t = 5807.1 \text{ psf}$					
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l		
1	0	.000	.000	776.4	1.647	.92334	18.98689	.33949	777.9	1.650	.92516	19.02442	.33521		
2	0	.200	.025	747.6	1.582	.88909	18.28259	.41327	768.3	1.629	.91376	18.78991	.36127		
3	0	.400	.050	705.6	1.488	.83914	17.25547	.50688	743.2	1.572	.88382	18.17433	.42376		
4	0	.600	.075	700.8	1.478	.83343	17.13809	.51690	733.6	1.551	.87242	17.93982	.44590		
5	0	.800	.100	696.0	1.467	.82772	17.02071	.52682	728.8	1.540	.86672	17.82257	.45671		
6	0	1.000	.125	691.2	1.456	.82201	16.90332	.53664	722.8	1.527	.85959	17.67600	.46998		
7	0	1.200	.150	686.4	1.445	.81631	16.78594	.54637	716.8	1.513	.85246	17.52944	.48303		
8	0	1.400	.175	685.2	1.443	.81488	16.75659	.54879	715.6	1.511	.85104	17.50012	.48562		
9	0	1.600	.200	682.8	1.437	.81202	16.69790	.55362	713.2	1.505	.84819	17.44150	.49076		
10	0	1.800	.225	679.2	1.429	.80774	16.60986	.56081	709.6	1.497	.84391	17.35355	.49842		
11	0	2.000	.250	676.8	1.424	.80489	16.55117	.56559	706.0	1.489	.83963	17.26561	.50601		
12	0	2.200	.275	673.2	1.416	.80061	16.46313	.57272	702.4	1.481	.83536	17.17767	.51353		
13	0	2.400	.300	669.6	1.408	.79633	16.37509	.57980	697.6	1.470	.82965	17.06042	.52348		
14	0	2.600	.325	664.8	1.397	.79062	16.25771	.58920	692.8	1.460	.82395	16.94317	.53332		
15	0	2.800	.350	661.2	1.389	.78634	16.19697	.59620	688.0	1.449	.81825	16.82591	.54307		
16	0	3.000	.375	655.2	1.376	.77920	16.02294	.60780	682.0	1.436	.81112	16.67935	.55514		
17	0	3.200	.400	648.0	1.359	.77064	15.84686	.62161	673.7	1.417	.80114	16.47415	.57183		
18	0	3.400	.425	642.0	1.346	.76350	15.70013	.63304	665.3	1.398	.79116	16.26896	.58830		
19	0	3.600	.450	633.6	1.327	.75351	15.49471	.64892	655.7	1.377	.77976	16.03445	.60689		
20	0	3.800	.475	621.6	1.300	.73924	15.20125	.67141	642.5	1.347	.76408	15.71200	.63211		
21	0	4.000	.500	608.4	1.271	.72354	14.87844	.69593	626.9	1.312	.74555	15.33093	.66150		
22	0	4.200	.525	580.8	1.209	.69072	14.20349	.74670	595.7	1.242	.70848	14.56878	.71929		
23	0	4.400	.550	538.8	1.115	.64077	13.17637	.82343	549.0	1.138	.65289	13.42555	.80481		
24	180	.200	.025	786.2	1.669	.93502	19.22713	.31130	766.1	1.624	.91109	18.73511	.36715		
25	180	.400	.050	776.6	1.647	.92357	18.99157	.33895	734.8	1.554	.87391	17.97041	.44306		
26	180	.600	.075	765.8	1.623	.91068	18.72658	.36806	727.6	1.538	.86532	17.79394	.45932		
27	180	.800	.100	759.7	1.610	.90352	18.57935	.38348	721.6	1.524	.85817	17.64689	.47259		
28	180	1.000	.125	754.9	1.599	.89779	18.46158	.39550	716.8	1.513	.85245	17.52924	.48305		
29	180	1.200	.150	752.5	1.593	.89493	18.40269	.40141	715.6	1.511	.85102	17.49983	.48564		
30	180	1.400	.175	748.9	1.585	.89063	18.31436	.41016	710.8	1.500	.84530	17.38218	.49593		
31	180	1.600	.200	744.1	1.575	.88490	18.19658	.42162	707.2	1.492	.84101	17.29395	.50357		
32	180	1.800	.225	741.7	1.569	.88204	18.13769	.42727	704.8	1.486	.83815	17.23512	.50862		
33	180	2.000	.250	736.9	1.558	.87631	18.01991	.43843	700.0	1.476	.83243	17.11748	.51865		
34	180	2.200	.275	733.2	1.550	.87202	17.93158	.44667	698.8	1.473	.83100	17.08807	.52114		
35	180	2.400	.300	726.0	1.534	.86343	17.75491	.46286	692.7	1.460	.82385	16.94101	.53350		
36	180	2.600	.325	720.0	1.521	.85627	17.60769	.47609	686.7	1.446	.81669	16.79395	.54571		
37	180	2.800	.350	716.4	1.513	.85197	17.51936	.48392	683.1	1.438	.81240	16.70572	.55298		
38	180	3.000	.375	708.0	1.494	.84195	17.31325	.50190	677.1	1.425	.80525	16.55866	.56498		
39	180	3.200	.400	700.7	1.477	.83336	17.13658	.51703	669.9	1.408	.79667	16.38219	.57923		
40	180	3.400	.425	689.9	1.453	.82047	16.87158	.53928	661.5	1.390	.78666	16.17631	.59567		
41	180	3.600	.450	680.3	1.432	.80902	16.63603	.55868	650.6	1.365	.77379	15.91161	.61654		
42	180	3.800	.475	665.8	1.399	.79183	16.28270	.58720	638.6	1.338	.75948	15.61749	.63944		
43	180	4.000	.500	646.6	1.356	.76892	15.81159	.62436	623.0	1.303	.74089	15.23514	.66882		
44	180	4.200	.525	614.0	1.283	.73026	15.01659	.68546	591.7	1.233	.70370	14.47045	.72668		
45	180	4.400	.550	567.1	1.178	.67442	13.86827	.77176	549.6	1.139	.65364	13.44104	.80365		
46	90	1.000	.125	664.8	1.397	.79062	16.25771	.58920	664.1	1.395	.78974	16.23964	.59064		
47	90	2.000	.250	651.6	1.367	.77492	15.93490	.61472	649.7	1.363	.77263	15.88788	.61840		
48	90	3.000	.375	636.0	1.333	.75637	15.55340	.64439	635.3	1.331	.75553	15.53612	.64573		
49	90	4.000	.500	598.8	1.249	.71213	14.64368	.71365	600.5	1.253	.71419	14.68603	.71046		
50	270	1.000	.125	824.8	1.755	.98084	20.16935	.16647	831.0	1.769	.98833	20.32333	.12961		
51	270	2.000	.250	795.9	1.690	.94648	19.46268	.28144	804.6	1.710	.95686	19.67628	.25178		
52	270	3.000	.375	760.9	1.612	.90495	18.60880	.38044	769.7	1.632	.91538	18.82334	.35764		
53	270	4.000	.500	693.5	1.461	.82477	16.95992	.53192	701.2	1.478	.83386	17.14689	.51615		
54	0	4.877	.610	17.0	-.053	.02023	.41604	3.19986	16.8	-.054	.02003	.41188	3.20668		
55	0	5.402	.675	12.2	-.064	.01451	.29829	3.42911	11.9	-.065	.01412	.29028	3.44813		
56	0	5.927	.741	11.7	-.065	.01393	.28652	3.45727	11.5	-.066	.01373	.28244	3.46733		
57	0	6.452	.807	12.4	-.064	.01470	.30222	3.41999	12.4	-.064	.01469	.30205	3.42037		
58	0	6.977	.872	11.6	-.066	.01374	.28259	3.46694	11.4	-.066	.01354	.27851	3.47714		
59	180	6.977	.872	11.6	-.066	.01374	.28259	3.46694	11.4	-.066	.01354	.27851	3.47714		
60	180	6.452	.807	11.6	-.066	.01374	.28259	3.46694	11.4	-.066	.01354	.27851	3.47714		
61	180	5.927	.741	11.6	-.066	.01374	.28259	3.46694	11.4	-.066	.01354	.27851	3.47714		
62	180	5.402	.675	11.4	-.066	.01355	.27867	3.47675	11.4	-.066	.01354	.27851	3.47714		
63	180	4.877	.610	11.6	-.066	.01374	.28259	3.46694	11.5	-.066	.01373	.28244	3.46733		

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(d) $\alpha = 15^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 5807.1$ psf						$\phi = 22.5^\circ, p_t = 5807.1$ psf						$\phi = 45.0^\circ, p_t = 5807.1$ psf					
				p_l , psf	c_p	$p_l/p_{t,2}$	p_l/p_∞	M_l		p_l , psf	c_p	$p_l/p_{t,2}$	p_l/p_∞	M_l		p_l , psf	c_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	
1	0	.000	.000	711.0	1.500	.84557	17.38770	.49545	707.8	1.493	.84170	17.30822	.5n234	704.9	1.487	.83828	17.23790	.50839			
2	0	.200	.025	634.3	1.329	.75431	15.51112	.64765	635.9	1.332	.75265	15.55104	.64458	644.9	1.353	.7670.0	15.77209	.67244			
3	0	.400	.050	520.4	1.074	61885	12.72557	.85720	532.9	1.102	.63377	13.03242	.83419	565.8	1.175	.67291	13.83722	.77408			
4	0	.600	.075	544.3	1.127	.64737	13.31200	.81329	553.3	1.147	.65798	13.53029	.79699	573.0	1.191	.68146	14.01312	.76093			
5	0	.800	.100	582.7	1.213	.69300	14.25029	.74319	573.6	1.193	.68219	14.02815	.75981	575.6	1.200	.68574	14.10107	.75436			
6	0	1.000	.125	580.3	1.208	.69014	14.19165	.74758	576.0	1.198	.68504	14.08673	.75543	577.8	1.202	.68716	14.13039	.75217			
7	0	1.200	.150	571.9	1.189	.68016	13.98640	.76293	572.4	1.190	.68077	13.99887	.76200	575.4	1.197	.68431	14.07175	.75655			
8	0	1.400	.175	574.3	1.194	.68301	14.04504	.75955	572.4	1.190	.68077	13.99887	.76200	577.8	1.202	.68716	14.13039	.75217			
9	0	1.600	.200	573.1	1.192	.68159	14.01572	.76074	572.4	1.190	.68077	13.99887	.76200	576.6	1.200	.68574	14.10107	.75436			
10	0	1.800	.225	571.9	1.189	.68016	13.98640	.76293	571.2	1.188	.67934	13.96958	.76119	576.6	1.200	.68574	14.10107	.75436			
11	0	2.000	.250	570.7	1.186	.67874	13.95708	.76512	571.2	1.188	.67934	13.96958	.76419	575.4	1.197	.68431	14.07175	.75655			
12	0	2.200	.275	570.7	1.186	.67874	13.95708	.76512	570.0	1.185	.67792	13.94029	.76638	575.4	1.197	.68431	14.07175	.75655			
13	0	2.400	.300	570.7	1.186	.67874	13.95708	.76512	568.4	1.182	.67650	13.91101	.76857	575.4	1.197	.68431	14.07175	.75655			
14	0	2.600	.325	569.5	1.184	.67731	13.92775	.76731	567.6	1.179	.67507	13.88172	.77075	573.0	1.191	.68146	14.01312	.76093			
15	0	2.800	.350	569.5	1.184	.67731	13.92775	.76731	566.4	1.177	.67365	13.85243	.77294	571.8	1.189	.68004	13.94381	.76313			
16	0	3.000	.375	567.1	1.178	.67446	13.86911	.77169	565.2	1.174	.67222	13.82315	.77513	569.4	1.183	.67719	13.92517	.76751			
17	0	3.200	.400	564.7	1.173	.67161	13.81047	.77607	564.0	1.171	.67080	13.79386	.77731	567.0	1.178	.67513	13.86654	.77189			
18	0	3.400	.425	563.5	1.170	.67018	13.78115	.77826	562.5	1.163	.66653	13.76060	.78387	563.0	1.170	.67056	13.84559	.77445			
19	0	3.500	.450	562.3	1.168	.66876	13.75183	.78045	561.5	1.158	.66876	13.64733	.78225	559.8	1.162	.66578	13.69056	.78502			
20	0	3.800	.475	559.7	1.160	.66448	13.66386	.78702	553.0	1.147	.65978	13.51229	.79499	552.6	1.146	.65723	13.51475	.79815			
21	0	4.000	.500	556.3	1.154	.66163	13.60522	.79161	549.7	1.139	.65371	13.44243	.80355	546.6	1.132	.65010	13.38417	.80910			
22	0	4.200	.525	554.2	1.151	.65901	13.54177	.80444	534.1	1.104	.63519	13.06170	.83200	527.5	1.089	.62729	12.88991	.84418			
23	0	4.400	.550	509.4	1.049	.60601	12.44168	.87706	506.6	1.043	.60244	12.39812	.88261	497.5	1.022	.59165	12.16620	.89940			
24	180	.200	.025	788.0	1.673	.93710	19.26987	.30606	781.9	1.659	.92986	19.21200	.32400	759.8	1.610	.90360	18.58108	.38331			
25	180	.400	.050	825.3	1.756	.98145	20.19188	.16377	815.6	1.735	.96992	19.94646	.20935	780.3	1.656	.92795	19.01168	.32860			
26	180	.600	.075	844.9	1.799	1.00434	20.45260	.00000	832.4	1.772	.98994	20.35651	.12025	786.3	1.669	.93511	19.22891	.31108			
27	180	.800	.100	848.1	1.807	1.00863	20.74086	.00000	833.6	1.775	.99137	20.38593	.11132	786.3	1.669	.93511	19.22891	.31108			
28	180	1.000	.125	845.7	1.802	1.00577	20.69202	.00000	833.6	1.775	.99137	20.38593	.11132	786.3	1.669	.93511	19.22891	.31108			
29	180	1.200	.150	845.7	1.802	1.00577	20.69202	.00000	832.4	1.772	.98994	20.35651	.12025	785.1	1.666	.93366	19.19946	.31465			
30	180	1.400	.175	842.1	1.794	1.00148	20.59375	.00000	828.8	1.764	.98565	20.26826	.14384	782.7	1.661	.93081	19.14057	.32169			
31	180	1.600	.200	839.7	1.789	.99862	20.53942	.04443	826.4	1.759	.98279	20.20943	.15767	779.1	1.653	.92652	19.05223	.33201			
32	180	1.800	.225	836.1	1.781	.99433	20.44666	.09019	824.0	1.753	.97993	20.15060	.17043	777.9	1.650	.92508	19.02278	.33540			
33	180	2.000	.250	831.3	1.770	.98860	20.32898	.12066	819.2	1.743	.97421	20.03293	.19357	773.1	1.639	.91936	18.94949	.34867			
34	180	2.200	.275	827.7	1.762	.98431	20.24072	.15047	815.6	1.735	.96992	19.94646	.20935	770.6	1.634	.91649	18.84610	.35516			
35	180	2.400	.300	824.1	1.754	.98002	20.15246	.17004	809.6	1.721	.96276	19.79759	.23347	764.6	1.621	.90933	18.69886	.37100			
36	180	2.600	.325	816.8	1.737	.97144	19.79759	.20389	803.5	1.708	.95561	19.65051	.25551	759.8	1.610	.90360	18.58108	.38331			
37	180	2.800	.350	812.0	1.727	.96571	19.85827	.22381	797.9	1.697	.94989	19.53248	.27201	750.5	1.599	.89788	18.46329	.39533			
38	180	3.000	.375	803.6	1.708	.95570	19.65233	.25525	791.5	1.681	.94130	19.35634	.29523	747.8	1.583	.88928	18.28661	.41288			
39	180	3.200	.400	796.4	1.692	.94711	19.47581	.29696	784.3	1.665	.93107	19.17884	.31701	747.0	1.567	.87780	18.09494	.42282			
40	180	3.400	.425	785.5	1.667	.93424	19.21034	.31325	773.5	1.640	.91985	19.01508	.34755	729.4	1.522	.86780	17.86946	.45466			
41	180	3.600	.450	773.5	1.640	.91933	18.94464	.34755	761.6	1.613	.90554	18.65292	.37388	719.9	1.518	.85491	17.57988	.47786			
42	180	3.800	.475	769.4	1.625	.90133	18.53438	.38811	755.9	1.578	.88694	18.30550	.41757	704.4	1.486	.83773	17.22651	.50936			
43	180	4.000	.500	736.5	1.557	.87588	18.04083	.43984	724.1	1.520	.86119	17.07899	.446702	685.1	1.443	.81482	16.75536	.54890			
44	180	4.200	.525	697.7	1.471	.82980	17.63400	.52323	685.7	1.444	.81542	16.76765	.54788	649.0	1.362	.77186	15.87195	.61965			
45	180	4.400	.550	643.6	1.350	.76542	15.79352	.62998	633.9	1.328	.75390	15.50722	.64830	595.8	1.248	.71711	14.63517	.71429			
46	90	1.000	.125	656.3	1.382	.78283	16.09755	.60191	606.0	1.265	.72065	14.81888	.70044	577.8	1.202	.68716	14.13039	.75217			
47	90	2.000	.250	653.5	1.372	.77713	15.98027	.61116	636.3	1.260	.71780	14.76031	.70486	577.8	1.202	.68716	14.13039	.75217			
48	90	3.000	.375	636.7	1.334	.75716	15.56976	.594.0	1.238	.70640	14.52602	.72251	570.6	1.186	.67861	13.95449	.76532				
49	90	4.000	.500	592.3	1.235	.70440	14.88686	.72560	560.5	1.163	.66653	13.70600	.78387	545.4	1.130	.64867	13.33885	.81129			
50	270	1.000	.125	654.0	1.382	.78259	16.09255	.60231	725.3	1.533	.88262	17.73841	.46436	786.3	1.669	.93511	19.22891	.31108			
51	270	2.000	.250	653.2	1.371	.77686	15.97487	.61158	718.1	1.516	.85404	17.56191	.48016	776.7	1.647	.92365	18.99333	.33876			
52	270	3.000	.375	637.6	1.336	.75826	15.59242	.64138	696.5	1.468	.82829	17.03240	.52584	750.2	1.588	.89215	18.34550	.40709			
53	270	4.000	.500	591.9	1.234	.70390	14.74474	.72838	639.9	1.341	.76105	15.64981	.63694	687.6	1.448	.81768	16.81425	.54404			
54	0	4.877	.610	17.3	-.053	.02058	.42323	3.18R20	17.0	-.054	.02021	.41569	.320043	16.9	-.054	.02004	.41211	.32063			
55	0	5.402	.675	12.3	-.064	.01467	.30175	.3+2106	12.0	-.0											

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(d) $\alpha = 15^\circ$ - Concluded

Orifice	θ, deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 90.0^\circ, p_t = 5807.1 \text{ psf}$				
				$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	703.6	1.484	.83678	17.20699	.51103	707.1	1.492	.84098	17.29332	.50362
2	0	.200	.025	667.7	1.403	.79402	16.32758	.58361	697.6	1.470	.82958	17.05884	.52361
3	0	.400	.050	613.7	1.283	.72987	15.00848	.68608	672.4	1.414	.79964	16.44331	.57431
4	0	.600	.075	608.9	1.272	.72416	14.89123	.69497	664.0	1.395	.78967	16.23814	.59076
5	0	.800	.100	606.5	1.267	.72131	14.83260	.69940	660.4	1.387	.78539	16.15021	.59774
6	0	1.000	.125	605.3	1.264	.71989	14.80329	.70162	658.0	1.382	.78254	16.09159	.60238
7	0	1.200	.150	600.5	1.253	.71419	14.68603	.71046	654.4	1.374	.77826	16.00365	.60932
8	0	1.400	.175	604.1	1.261	.71846	14.77397	.70383	655.6	1.376	.77969	16.03296	.60701
9	0	1.600	.200	602.9	1.258	.71706	14.74466	.70604	655.6	1.376	.77969	16.03296	.60701
10	0	1.800	.225	602.9	1.258	.71704	14.74466	.70604	654.4	1.374	.77826	16.00365	.60932
11	0	2.000	.250	601.7	1.256	.71561	14.71535	.70825	653.2	1.371	.77684	15.97434	.61162
12	0	2.200	.275	601.7	1.256	.71561	14.71535	.70825	652.0	1.368	.77541	15.94503	.61392
13	0	2.400	.300	600.5	1.253	.71419	14.68603	.71046	649.6	1.363	.77256	15.88641	.61852
14	0	2.600	.325	598.1	1.248	.71134	14.62741	.71488	646.0	1.355	.76828	15.79848	.62539
15	0	2.800	.350	595.7	1.242	.70848	14.56878	.71929	643.6	1.350	.76543	15.73986	.62995
16	0	3.000	.375	593.3	1.237	.70563	14.51015	.72370	638.8	1.339	.75973	15.62261	.63904
17	0	3.200	.400	587.3	1.224	.69851	14.36358	.73470	632.8	1.325	.75261	15.47606	.65035
18	0	3.400	.425	583.8	1.216	.69423	14.27564	.74129	626.8	1.312	.74548	15.32951	.66161
19	0	3.600	.450	579.0	1.205	.68853	14.15839	.75007	618.5	1.293	.73550	15.12433	.67727
20	0	3.800	.475	569.4	1.183	.67712	13.92388	.76760	606.5	1.266	.72125	14.83122	.69950
21	0	4.000	.500	561.0	1.165	.66714	13.71869	.78293	594.5	1.240	.70699	14.53812	.72160
22	0	4.200	.525	537.0	1.111	.63863	13.13242	.82671	565.7	1.175	.67278	13.83466	.77427
23	0	4.400	.550	502.2	1.033	.59729	12.28233	.89060	523.8	1.081	.62289	12.80878	.85095
24	180	.200	.025	729.6	1.542	.86772	17.84325	.45481	697.5	1.470	.82949	17.05707	.52376
25	180	.400	.050	729.4	1.539	.86629	17.81380	.45751	667.4	1.403	.79374	16.32186	.58407
26	180	.600	.075	723.6	1.529	.86056	17.69602	.46818	657.8	1.381	.78230	16.08659	.62278
27	180	.800	.100	721.2	1.523	.85770	17.63714	.47346	653.0	1.371	.77657	15.96895	.61205
28	180	1.000	.125	720.0	1.521	.85627	17.60769	.47609	653.0	1.371	.77657	15.96895	.61205
29	180	1.200	.150	720.0	1.521	.85627	17.60769	.47609	653.0	1.371	.77657	15.96895	.61205
30	180	1.400	.175	718.8	1.518	.85484	17.57825	.47871	653.0	1.371	.77657	15.96895	.61205
31	180	1.600	.200	716.4	1.513	.85197	17.51936	.48392	650.6	1.365	.77371	15.91013	.61666
32	180	1.800	.225	716.4	1.513	.85197	17.51936	.48392	650.6	1.365	.77371	15.91013	.61666
33	180	2.000	.250	711.6	1.502	.84624	17.40158	.49424	648.2	1.360	.77085	15.85132	.62126
34	180	2.200	.275	709.2	1.496	.84338	17.34269	.49936	648.2	1.360	.77085	15.85132	.62126
35	180	2.400	.300	704.4	1.486	.83765	17.22492	.50950	643.4	1.349	.76513	15.73368	.63043
36	180	2.600	.325	699.5	1.475	.83193	17.10714	.51953	639.8	1.341	.76084	15.64454	.63728
37	180	2.800	.350	697.1	1.469	.82906	17.04825	.52450	638.6	1.338	.75941	15.61605	.63955
38	180	3.000	.375	692.3	1.459	.82333	16.93047	.53438	633.8	1.327	.75369	15.49841	.64863
39	180	3.200	.400	685.1	1.442	.81474	16.75381	.54902	632.5	1.325	.75226	15.46900	.65090
40	180	3.400	.425	675.5	1.421	.80329	16.51825	.56826	621.7	1.301	.73939	15.20432	.67118
41	180	3.600	.450	665.8	1.399	.79183	16.28270	.58720	614.5	1.284	.73081	15.02787	.68461
42	180	3.800	.475	652.6	1.370	.77608	15.95881	.61284	604.9	1.263	.71937	14.79260	.70242
43	180	4.000	.500	636.9	1.335	.75747	15.57604	.64265	590.5	1.231	.70221	14.43970	.72899
44	180	4.200	.525	603.2	1.259	.71737	14.75159	.70552	564.0	1.171	.67074	13.79270	.77740
45	180	4.400	.550	559.9	1.162	.66583	13.69160	.78495	524.3	1.082	.62355	12.82221	.84994
46	90	1.000	.125	574.2	1.194	.66282	14.04114	.75884	582.5	1.213	.69274	14.24501	.74359
47	90	2.000	.250	570.6	1.186	.67855	13.95320	.76541	571.7	1.189	.67991	13.98121	.76332
48	90	3.000	.375	565.8	1.175	.67285	13.83594	.77417	566.9	1.178	.67421	13.86397	.77208
49	90	4.000	.500	547.8	1.135	.65146	13.39624	.80700	551.3	1.143	.65568	13.48293	.80053
50	270	1.000	.125	830.8	1.769	.98800	20.31657	.13144	845.4	1.801	.100540	20.67435	.00000
51	270	2.000	.250	813.6	1.736	.97082	19.96324	.26013	831.0	1.769	.98824	20.32145	.13012
52	270	3.000	.375	789.8	1.677	.93932	19.31546	.30039	802.1	1.704	.95391	19.61564	.26050
53	270	4.000	.500	723.6	1.529	.86056	17.69602	.46818	736.0	1.556	.87526	17.99815	.44047
54	0	4.877	.610	19.1	-.049	.02277	.46818	3.11986	16.4	-.055	.01948	.40057	3.22567
55	0	5.402	.675	14.3	-.060	.01698	.34922	3.31975	11.2	-.066	.01337	.27490	3.48632
56	0	5.927	.741	13.8	-.061	.01642	.33771	3.34290	10.8	-.067	.01280	.26312	3.51716
57	0	6.452	.807	14.6	-.059	.01736	.35689	3.30478	11.6	-.066	.01375	.28275	3.46654
58	0	6.977	.872	13.8	-.061	.01642	.33771	3.34290	10.6	-.068	.01260	.25919	3.52778
59	180	6.977	.872	13.7	-.061	.01624	.33387	3.35080	10.6	-.068	.01260	.25919	3.52778
60	180	6.452	.807	13.7	-.061	.01624	.33387	3.35080	10.8	-.067	.01280	.26312	3.51716
61	180	5.927	.741	13.7	-.061	.01624	.33387	3.35080	10.8	-.067	.01280	.26312	3.51716
62	180	5.402	.675	13.7	-.061	.01624	.33387	3.35080	10.6	-.068	.01260	.25919	3.52778
63	180	4.877	.610	13.8	-.061	.01642	.33771	3.34290	10.8	-.067	.01280	.26312	3.51716

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Continued(e) $\alpha = 20^\circ$

Orifice	θ, deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 22.5^\circ, p_t = 5807.1 \text{ psf}$					$\phi = 45.0^\circ, p_t = 5807.1 \text{ psf}$				
				$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	$p_l, \text{ psf}$	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	642.6	1.347	.76422	15.71492	.63189	639.0	1.339	.75994	15.62696	.63871	634.9	1.330	.75501	15.52550	.64655
2	0	.200	.025	559.9	1.162	.66584	13.69191	.78493	585.7	1.159	.66442	13.66259	.78711	567.7	1.179	.67508	13.88197	.77073
3	0	.400	.050	402.8	.810	.47906	9.45114	1.08167	428.0	.867	.50901	10.46684	1.03153	471.6	.965	.56090	11.53406	.94771
4	0	.600	.075	417.2	.843	.49617	10.20297	1.05284	432.8	.878	.51471	10.58411	1.02215	468.0	.956	.55662	11.44602	.95450
5	0	.800	.100	49.3	1.006	.58315	11.99142	.91268	472.4	.966	.56176	11.55164	.94635	474.0	.970	.56376	11.59276	.94319
6	0	1.000	.125	495.1	1.017	.58885	12.10869	.90376	482.0	.988	.57317	11.78619	.92834	478.8	.978	.56947	11.71016	.93417
7	0	1.200	.150	482.0	.988	.57317	11.78619	.92834	474.6	.982	.57031	11.72755	.93284	477.6	.978	.56804	11.68081	.93652
8	0	1.400	.175	485.5	.996	.57744	11.88144	.92162	484.8	.995	.5774	11.75687	.93059	483.6	.991	.57518	11.69745	.92518
9	0	1.600	.200	404.4	.993	.57602	11.84492	.95586	479.8	.982	.57031	11.72755	.93284	483.3	.991	.57518	11.82755	.9318
10	0	1.800	.225	483.2	.990	.5759	11.81551	.95610	480.8	.985	.57174	11.75687	.93059	484.8	.994	.57660	11.85690	.9294
11	0	2.000	.250	443.2	.990	.57459	11.81551	.92610	480.8	.985	.57174	11.75687	.93059	484.8	.994	.57660	11.85690	.9294
12	0	2.200	.275	484.4	.993	.57602	11.84482	.92936	480.8	.985	.57174	11.75687	.93059	486.0	.997	.57803	11.88625	.92070
13	0	2.400	.300	484.4	.993	.57602	11.84482	.92936	480.8	.985	.57174	11.75687	.93059	486.0	.997	.57803	11.88625	.92070
14	0	2.600	.325	483.2	.990	.57459	11.81551	.92610	480.8	.985	.57174	11.75687	.93059	486.0	.997	.57803	11.88625	.92070
15	0	2.800	.350	483.2	.990	.57459	11.81551	.92610	479.6	.982	.57031	11.72755	.93284	486.0	.997	.57803	11.88625	.92070
16	0	3.000	.375	482.0	.988	.57317	11.78619	.92834	479.6	.982	.57031	11.72755	.93284	484.8	.994	.57660	11.85690	.92294
17	0	3.200	.400	480.8	.985	.57174	11.75687	.93059	477.2	.977	.56746	11.66891	.93733	483.6	.991	.57518	11.82755	.92518
18	0	3.400	.425	480.8	.985	.57174	11.75687	.93059	477.2	.977	.56746	11.66891	.93733	481.2	.986	.57232	11.76885	.92967
19	0	3.600	.450	480.8	.985	.57174	11.75687	.93059	476.0	.974	.56604	11.63959	.93959	480.0	.983	.57090	11.73951	.93192
20	0	3.800	.475	479.6	.982	.57031	11.72755	.93284	473.6	.969	.56319	11.58095	.94410	475.2	.973	.56519	11.62211	.94093
21	0	4.000	.500	480.8	.985	.57174	11.75687	.93059	472.4	.966	.56176	11.55164	.94635	472.8	.967	.56233	11.56341	.94545
22	0	4.200	.525	470.0	.961	.55891	11.49300	.95088	465.2	.950	.55320	11.37572	.95994	468.0	.940	.54806	11.26993	.96815
23	0	4.400	.550	455.6	.929	.54180	11.41117	.97818	447.2	.910	.53182	10.93594	.99427	446.1	.897	.52522	10.80035	.100497
24	180	.200	.025	741.0	1.568	.88122	18.12083	.42888	732.6	1.549	.87121	18.19419	.44821	706.0	1.489	.83966	17.26614	.55956
25	180	.400	.050	793.3	1.691	.94703	19.47401	.27993	783.1	1.662	.93129	19.15042	.32052	739.7	1.565	.87971	18.08973	.43184
26	180	.600	.075	836.0	1.780	.99423	20.44477	.09092	815.6	1.735	.96992	19.94468	.20935	755.4	1.600	.89830	18.47212	.39444
27	180	.800	.100	845.6	1.802	1.00568	20.68010	.00000	820.4	1.745	.97564	20.62324	.18804	762.0	1.511	.90403	18.58978	.38241
28	180	1.000	.125	849.2	1.810	1.01400	20.76835	.00000	825.2	1.756	.98136	20.18001	.16161	738.8	1.619	.90832	18.67802	.37320
29	180	1.200	.150	850.4	1.813	1.01140	20.79777	.00000	827.6	1.762	.9842	20.23885	.15091	765.0	1.621	.90975	18.77043	.3709
30	180	1.400	.175	856.4	1.813	1.01140	20.79777	.00000	827.6	1.762	.9842	20.23885	.15091	762.6	1.624	.91118	18.83685	.36896
31	180	1.600	.200	850.4	1.813	1.00977	20.76835	.00000	826.6	1.759	.98279	20.23843	.15077	765.0	1.621	.90975	18.70743	.3709
32	180	1.800	.225	849.2	1.810	1.00977	20.76835	.00000	826.6	1.753	.97993	20.15060	.17033	743.4	1.619	.90832	18.67802	.37320
33	180	2.000	.250	849.2	1.810	1.00977	20.76835	.00000	826.6	1.753	.97993	20.15060	.17033	743.4	1.619	.90832	18.67802	.37320
34	180	2.200	.275	845.6	1.802	1.00568	20.68010	.00000	821.6	1.748	.97707	20.09176	.18235	761.4	1.613	.90546	18.61919	.37936
35	180	2.400	.300	838.2	1.797	1.00282	20.62127	.00000	819.2	1.743	.97421	20.03293	.19357	757.8	1.605	.90117	18.53095	.38846
36	180	2.600	.325	839.6	1.788	.99853	20.53202	.04590	815.6	1.735	.96992	19.94468	.20935	754.1	1.597	.89667	18.44270	.37740
37	180	2.800	.350	836.0	1.780	.99423	20.44477	.09092	812.0	1.727	.96562	19.85643	.22411	751.7	1.592	.89401	18.3388	.44328
38	180	3.000	.375	830.0	1.767	.98708	20.29768	.13641	807.1	1.716	.95990	19.73786	.24250	746.9	1.581	.88820	18.26622	.41487
39	180	3.200	.400	824.0	1.753	.97993	20.15060	.17043	801.1	1.702	.95275	19.59167	.26387	740.9	1.567	.88114	18.11915	.42904
40	180	3.400	.425	815.6	1.735	.96992	19.94468	.20935	793.9	1.686	.94117	19.41517	.28767	731.3	1.546	.86970	17.88383	.4108
41	180	3.600	.450	804.7	1.710	.95704	19.67992	.25124	783.1	1.662	.93129	19.15042	.32052	722.9	1.527	.85968	17.67794	.44981
42	180	3.800	.475	791.5	1.681	.94130	19.35634	.25923	769.9	1.632	.91555	18.82683	.35726	710.8	1.500	.84538	17.38379	.49579
43	180	4.000	.500	772.3	1.638	.91842	18.88567	.35081	749.4	1.586	.89124	18.32675	.40894	692.8	1.460	.82392	16.94258	.53337
44	180	4.200	.525	735.0	1.554	.87407	17.97474	.44275	712.1	1.503	.84689	17.41482	.49309	657.9	1.382	.78244	16.08957	.62545
45	180	4.400	.550	679.6	1.430	.80826	16.62056	.55994	667.6	1.393	.78108	16.06164	.60475	607.4	1.268	.72236	14.85417	.67777
46	90	1.000	.125	588.7	1.227	.70006	14.39557	.73230	515.5	1.063	.61309	12.70711	.86610	477.6	.978	.56804	11.60801	.93642
47	90	2.000	.250	592.3	1.235	.70434	14.48352	.72570	520.3	1.073	.61879	12.72439	.85729	486.0	.997	.57803	11.88625	.92070
48	90	3.000	.375	583.9	1.216	.69436	14.27829	.74109	516.7	1.065	.61451	12.63643	.86390	483.6	.991	.57518	11.82755	.92518
49	90	4.000	.500	547.9	1.135	.65158	13.39872	.80681	493.9	1.014	.58742	12.07938	.90599	470.4	.962	.55948	11.50472	.94997
50	270	1.000	.125	589.4	1.228	.70097	14.41429	.73090	679.6	1.0430	.60826	16.62056	.55994	765.0	1.621	.90975	18.70743	.37009
51	270	2.000	.250	593.0	1.236	.70526	14.50255	.72427	682.0	1.036	.60812	16.67940	.55513	765.0	1.621	.90975	18.70743	.37009
52	270	3.000	.375	585.8	1.220	.69648	14.33454	.73752	667.6	1.033	.60394	16.3280	.58317	746.9	1.518	.88829	18.46622	.41367
53	270	4.000	.500	519.1	1.194	.6054	1.01987	.321216	619.5	1.026	.61290	1.6372	.63634	692.4	1.460	.8729	16.94258	.53337
54	0	4.407	.610	16.7	1.054	.01356	.27894	3.47607	11.4	1.054	.01987	.44859	3.21216	16.4	1.055	.01947	.40034	3.22606
55	0	5.402	.675	11.4	1.066	.01356	.27894	3.47607	11.4	1.066	.01356	.27894	3.47607	11.4	1.066	.01336	.27474	3.44672
56	0	5.9																

TABLE II.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 3.95$ - Concluded(e) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 5807.1$ psf					$\phi = 90.0^\circ$, $p_t = 5807.1$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	634.1	1.328	.75410	15.50681	.64799	635.3	1.331	.75553	15.53612	.64573
2	0	.200	.025	592.1	1.234	.70421	14.48084	.72590	628.1	1.315	.74697	15.36024	.65925
3	0	.400	.050	531.0	1.097	.63151	12.98585	.83768	600.5	1.253	.71419	14.68603	.71046
4	0	.600	.075	520.2	1.073	.61868	12.72203	.85746	592.1	1.234	.70421	14.48084	.72590
5	0	.800	.100	516.6	1.065	.61440	12.63409	.86407	589.7	1.229	.70136	14.42221	.73030
6	0	1.000	.125	514.2	1.060	.61155	12.57546	.86848	588.5	1.226	.69993	14.39290	.73250
7	0	1.200	.150	510.6	1.052	.60727	12.48752	.87511	583.8	1.216	.69423	14.27564	.74129
8	0	1.400	.175	517.8	1.068	.61583	12.66340	.86187	589.7	1.229	.70136	14.42221	.73030
9	0	1.600	.200	517.8	1.068	.61583	12.66340	.86187	590.9	1.232	.70278	14.45152	.72810
10	0	1.800	.225	520.2	1.073	.61868	12.72203	.85746	592.1	1.234	.70421	14.48084	.72590
11	0	2.000	.250	520.2	1.073	.61868	12.72203	.85746	592.1	1.234	.70421	14.48084	.72590
12	0	2.200	.275	521.4	1.076	.62010	12.75135	.85526	592.1	1.234	.70421	14.48084	.72590
13	0	2.400	.300	521.4	1.076	.62010	12.75135	.85526	592.1	1.234	.70421	14.48084	.72590
14	0	2.600	.325	521.4	1.076	.62010	12.75135	.85526	590.9	1.232	.70278	14.45152	.72810
15	0	2.800	.350	520.2	1.073	.61868	12.72203	.85746	588.5	1.226	.69993	14.39290	.73250
16	0	3.000	.375	519.0	1.071	.61725	12.69272	.85967	586.1	1.221	.69708	14.33427	.73690
17	0	3.200	.400	515.4	1.063	.61297	12.60478	.86628	582.6	1.213	.69280	14.24633	.74349
18	0	3.400	.425	514.2	1.060	.61155	12.57546	.86448	577.8	1.202	.68710	14.12908	.75226
19	0	3.600	.450	509.4	1.049	.60585	12.45821	.87732	571.8	1.189	.67997	13.99251	.76322
20	0	3.800	.475	503.4	1.036	.59872	12.31164	.88838	562.2	1.167	.66857	13.74800	.78074
21	0	4.000	.500	497.4	1.022	.59159	12.16508	.89948	551.4	1.143	.65574	13.48418	.80043
22	0	4.200	.525	480.7	.985	.57163	11.75469	.93076	526.2	1.087	.62580	12.86860	.84647
23	0	4.400	.550	454.3	.926	.54027	11.10979	.98064	490.3	1.006	.58304	11.98920	.91285
24	180	.200	.025	668.2	1.405	.79470	16.34159	.58249	631.4	1.320	.74971	15.41658	.65493
25	180	.400	.050	674.2	1.418	.80186	16.44881	.57064	600.3	1.253	.71388	14.67965	.71094
26	180	.600	.075	673.0	1.415	.80042	16.45936	.57302	588.2	1.226	.69954	14.38487	.73310
27	180	.800	.100	674.2	1.418	.80186	16.48881	.57064	584.6	1.217	.69524	14.29644	.73973
28	180	1.000	.125	675.5	1.421	.80329	16.51825	.56826	587.0	1.223	.69811	14.35540	.73531
29	180	1.200	.150	677.9	1.426	.80615	16.57714	.56348	588.2	1.226	.69594	14.38487	.73310
30	180	1.400	.175	680.3	1.432	.80902	16.63603	.55868	590.6	1.231	.70241	14.44383	.72868
31	180	1.600	.200	677.9	1.426	.80615	16.57714	.56348	588.2	1.226	.69954	14.38487	.73310
32	180	1.800	.225	680.3	1.432	.80902	16.63603	.55868	590.6	1.231	.70241	14.44383	.72868
33	180	2.000	.250	677.9	1.426	.80615	16.57714	.56348	588.2	1.226	.69954	14.38487	.73310
34	180	2.200	.275	676.7	1.424	.80472	16.54770	.56587	590.6	1.231	.70241	14.44383	.72868
35	180	2.400	.300	671.8	1.413	.79899	16.42992	.57539	585.8	1.220	.69667	14.32592	.73752
36	180	2.600	.325	669.4	1.407	.79613	16.37103	.58013	585.8	1.220	.69667	14.32592	.73752
37	180	2.800	.350	659.4	1.407	.79613	16.37103	.58013	585.8	1.220	.69667	14.32592	.73752
38	180	3.000	.375	664.6	1.397	.79040	16.25325	.58955	582.2	1.212	.69237	14.23749	.74415
39	180	3.200	.400	659.8	1.386	.78467	16.13548	.59891	579.8	1.207	.68951	14.17853	.74856
40	180	3.400	.425	651.4	1.367	.77465	15.92937	.61515	573.8	1.193	.68234	14.03115	.75959
41	180	3.600	.450	644.1	1.351	.76606	15.75270	.62895	567.7	1.180	.67517	13.88376	.77060
42	180	3.800	.475	633.3	1.327	.75317	15.48770	.64946	560.5	1.163	.66657	13.70690	.78381
43	180	4.000	.500	620.1	1.297	.73742	15.16381	.67427	548.4	1.136	.65224	13.41213	.80581
44	180	4.200	.525	586.4	1.221	.69733	14.33937	.73652	524.3	1.082	.62357	12.82258	.84992
45	180	4.400	.550	543.0	1.124	.64578	13.27938	.81573	490.6	1.007	.58343	11.99722	.91224
46	90	1.000	.125	481.9	.987	.57306	11.78400	.92851	495.0	0.017	.58874	12.10645	.90393
47	90	2.000	.250	481.9	.987	.57306	11.78400	.92851	484.3	.993	.57591	11.84263	.92403
48	90	3.000	.375	480.7	.985	.57163	11.75469	.93076	481.9	.987	.57306	11.78400	.92851
49	90	4.000	.500	471.1	.963	.56623	11.52018	.94878	477.1	.977	.56736	11.66675	.93750
50	270	1.000	.125	826.0	1.758	.98227	20.19879	.16005	849.8	1.811	1.01061	20.78143	.00000
51	270	2.000	.250	824.8	1.755	.98084	20.16935	.16647	849.8	1.811	1.01061	20.78143	.00000
52	270	3.000	.375	806.7	1.715	.95936	19.72768	.24417	830.5	1.768	.98767	20.30979	.13324
53	270	4.000	.500	750.1	1.588	.89206	18.34380	.40726	772.6	1.638	.91886	18.89488	.34979
54	0	4.877	.675	610	16.0	-.056	.01907	.39221	3.24006	16.1	-.056	.01910	.39276
55	0	5.402	.675	10.9	-.067	.01297	.26671	3.50761	10.9	-.067	.01299	.26708	.3.50663
56	0	5.927	.741	10.4	-.068	.01240	.25494	3.53947	10.6	-.068	.01261	.25922	.3.52769
57	0	6.452	.807	11.4	-.066	.01354	.27847	3.47725	11.4	-.066	.01356	.27886	.3.47626
58	0	6.977	.872	10.6	-.068	.01259	.25886	3.52868	10.6	-.068	.01261	.25922	.3.52769
59	180	6.977	.872	10.4	-.068	.01240	.25494	3.53947	10.4	-.068	.01242	.25530	.3.53848
60	180	6.452	.807	10.4	-.068	.01240	.25494	3.53947	10.4	-.068	.01242	.25530	.3.53848
61	180	5.927	.741	10.4	-.068	.01240	.25494	3.53947	10.4	-.068	.01242	.25530	.3.53848
62	180	5.402	.675	10.4	-.068	.01240	.25494	3.53947	10.4	-.068	.01242	.25530	.3.53848
63	180	4.877	.610	10.4	-.068	.01240	.25494	3.53947	10.4	-.068	.01242	.25530	.3.53848

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ (a) $\alpha = 0^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7923.4$ psf					$\phi = 22.5^\circ$, $p_t = 7923.4$ psf					$\phi = 45.0^\circ$, $p_t = 7914.7$ psf				
				p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_∞	M_L	p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_∞	M_L	p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_∞	M_L
1	0	.000	.000	660.5	1.822	1.00962	28.33495	.00000	661.8	1.825	1.01164	28.39165	.00000	664.1	1.834	1.01614	28.51793	.00000
2	0	.200	.025	649.7	1.791	.99313	27.87213	.01928	651.1	1.795	.99515	27.92874	.00339	653.3	1.803	.99963	28.05645	.02288
3	0	.400	.050	625.8	1.722	.95648	26.48364	.25291	625.9	1.723	.95666	26.48462	.25238	629.3	1.734	.96295	27.02512	.23287
4	0	.600	.075	614.2	1.695	.94182	26.43224	.29387	614.3	1.695	.94200	26.43715	.29341	620.9	1.710	.95011	26.66478	.27138
5	0	.800	.100	610.2	1.678	.93266	26.17512	.31715	610.3	1.678	.93284	26.17998	.31673	613.7	1.690	.93911	26.35592	.30094
6	0	1.000	.125	603.0	1.657	.92167	25.86657	.34336	604.3	1.661	.92367	25.92821	.33871	607.7	1.673	.92993	26.09854	.32382
7	0	1.200	.150	597.0	1.640	.91251	25.69495	.36404	598.1	1.644	.91451	25.65564	.35960	600.5	1.652	.91893	25.78968	.34954
8	0	1.400	.175	592.2	1.626	.90518	25.40375	.37995	593.5	1.630	.90718	25.45990	.37556	594.5	1.635	.90976	25.53230	.37007
9	0	1.600	.200	584.0	1.616	.89968	25.24948	.39157	584.9	1.620	.90168	25.30560	.38737	590.9	1.625	.91426	25.37787	.38192
10	0	1.800	.225	585.0	1.606	.89418	25.09520	.40294	585.1	1.605	.89435	25.09988	.40260	585.0	1.617	.89508	25.12649	.40199
11	0	2.000	.250	582.6	1.597	.88848	24.94151	.41375	584.5	1.596	.88881	24.91556	.41375	584.4	1.597	.88898	24.9506	.41228
12	0	2.200	.275	576.6	1.582	.88136	24.71523	.42662	577.0	1.585	.88335	24.70156	.42469	576.6	1.583	.88225	24.76015	.41287
13	0	2.400	.300	571.8	1.568	.87403	24.52953	.43983	573.1	1.572	.87602	24.58552	.43999	573.0	1.573	.87674	24.65973	.43760
14	0	2.600	.325	567.0	1.554	.86670	24.32384	.45674	568.3	1.558	.86869	24.37978	.45298	568.2	1.559	.86941	24.39982	.45163
15	0	2.800	.350	562.2	1.541	.86937	24.11814	.47039	563.5	1.544	.86136	24.17405	.46670	563.4	1.546	.86207	24.19391	.46339
16	0	3.000	.375	556.2	1.523	.85021	23.86101	.48711	558.7	1.531	.85403	23.96831	.48018	557.4	1.529	.85290	23.93653	.49224
17	0	3.200	.400	549.0	1.503	.83921	23.55247	.50675	551.5	1.510	.84303	23.65971	.49999	550.2	1.508	.84189	23.62767	.50200
18	0	3.400	.425	541.8	1.482	.82822	23.43932	.52596	544.3	1.489	.83204	23.35110	.51933	543.0	1.487	.83089	23.31882	.52133
19	0	3.600	.450	532.3	1.455	.81356	22.83252	.55102	536.0	1.466	.81921	22.99106	.54143	534.6	1.463	.81805	22.95848	.54341
20	0	3.800	.475	521.5	1.424	.79707	22.36970	.57457	524.0	1.431	.80088	22.47672	.57226	522.6	1.429	.79971	22.44372	.57421
21	0	4.000	.500	509.5	1.390	.77875	21.85546	.60854	512.0	1.397	.78256	21.96238	.60236	510.6	1.395	.78131	21.92895	.60429
22	0	4.200	.525	494.3	1.318	.74027	20.77554	.66980	486.1	1.325	.74407	20.88226	.66382	484.3	1.319	.74101	20.79647	.66863
23	0	4.400	.550	445.9	1.208	.68163	19.12995	.76067	448.4	1.215	.68542	19.23637	.75484	447.1	1.213	.68415	19.20070	.75680
24	180	.200	.025	653.1	1.800	.99829	28.01705	.04939	655.4	1.807	.00103	28.11639	.00000	656.2	1.811	.100409	28.17975	.00000
25	180	.400	.050	631.5	1.739	.96520	27.08931	.22551	633.7	1.745	.96862	27.18436	.21389	633.3	1.746	.96909	27.19734	.21228
26	180	.600	.075	623.0	1.714	.95233	26.77213	.26507	622.8	1.714	.95202	26.71834	.26597	623.7	1.718	.95435	26.78369	.25923
27	180	.800	.100	615.8	1.694	.94130	26.41755	.29524	615.8	1.697	.94279	26.45944	.29132	617.7	1.701	.94514	26.52516	.28507
28	180	1.000	.125	609.8	1.677	.93211	26.15957	.31852	610.8	1.679	.93357	26.20504	.31492	610.4	1.680	.93408	26.21492	.31364
29	180	1.200	.150	605.0	1.663	.92475	25.95318	.33617	605.9	1.666	.92619	25.99342	.33279	605.6	1.667	.92671	26.00810	.33155
30	180	1.400	.175	600.2	1.649	.91740	25.74679	.35311	599.9	1.648	.91969	25.73452	.35410	598.4	1.646	.91566	25.69786	.35703
31	180	1.600	.200	595.4	1.635	.91005	25.54041	.36944	597.1	1.645	.91512	25.68274	.35824	593.6	1.632	.90829	25.49104	.37326
32	180	1.800	.225	590.6	1.622	.90289	25.33492	.38352	591.9	1.624	.90405	25.37267	.38245	591.8	1.625	.90356	25.29268	.38648
33	180	2.000	.250	585.8	1.608	.89534	25.12763	.40575	586.6	1.610	.89747	25.16495	.39783	585.9	1.605	.89356	25.22739	.40423
34	180	2.200	.275	583.4	1.594	.88916	24.92444	.40674	583.7	1.593	.89113	25.05661	.40194	584.3	1.594	.88802	24.92227	.41541
35	180	2.400	.300	579.3	1.584	.88267	24.76645	.42643	577.0	1.583	.88191	24.75711	.42753	574.3	1.577	.87881	24.66374	.43359
36	180	2.600	.325	571.3	1.567	.87328	24.60847	.4226	574.6	1.576	.87822	24.64715	.43474	569.5	1.563	.87144	24.64562	.44777
37	180	2.800	.350	556.6	1.553	.86592	24.30208	.45820	560.1	1.552	.86530	24.29469	.45936	563.5	1.546	.86223	24.19839	.46509
38	180	3.000	.375	560.5	1.536	.85673	24.04410	.47524	561.3	1.539	.85799	24.07757	.47305	557.5	1.529	.85302	23.93986	.48202
39	180	3.200	.400	554.5	1.518	.84754	23.78612	.49192	555.2	1.521	.84870	23.81867	.48983	551.4	1.512	.84381	23.68133	.49860
40	180	3.400	.425	547.3	1.498	.83651	23.47656	.51511	548.8	1.496	.83578	23.45622	.51278	543.0	1.487	.83091	23.31939	.52130
41	180	3.600	.450	537.6	1.470	.82180	23.06376	.53701	538.3	1.472	.82287	23.09376	.53518	535.8	1.467	.81985	23.09115	.54033
42	180	3.800	.475	526.8	1.439	.80525	22.59393	.56498	527.5	1.441	.80626	22.62774	.56329	523.7	1.432	.80143	22.49209	.57135
43	180	4.000	.500	513.6	1.402	.78503	22.01383	.59833	513.0	1.400	.78412	22.06368	.59980	509.3	1.391	.77932	21.87162	.60760
44	180	4.200	.525	487.1	1.326	.74458	20.89670	.66302	487.7	1.327	.74538	20.91901	.66176	482.8	1.315	.73879	20.73409	.67212
45	180	4.400	.550	452.2	1.226	.69127	19.40393	.74585	452.6	1.227	.69187	19.41740	.74492	447.9	1.215	.68533	19.23462	.75424
46	90	1.000	.125	607.8	1.671	.92900	26.07227	.32608	605.5	1.664	.92551	25.97424	.33404	606.5	1.669	.92810	26.04707	.32823
47	90	2.000	.250	582.6	1.599	.89052	24.99236	.41039	581.5	1.596	.88885	24.94556	.41375	581.4	1.597	.88958	24.96606	.41228
48	90	3.000	.375	556.2	1.523	.85021	23.86101	.48711	555.1	1.520	.85215	23.91401	.49013	555.0	1.522	.84923	23.83358	.48888
49	90	4.000	.500	505.9	1.380	.77325	21.70118	.61741	504.8	1.376	.77156	21.65377	.62013	504.6	1.378	.77219	21.67157	.61911
50	270	1.000	.125	607.4	1.670	.92843	26.05637	.32744	610.8	1.679	.93357	26.20054	.31492	612.8	1.687	.93777	26.31833	.30437
51	270	2.000	.250	584.6	1.604	.89350	25.07604	.40433	586.6	1.610	.89667	25.16495	.39783	586.4	1.611	.89723	25.18080	.39666
52	270	3.000	.375	559.3	1.532	.85489	23.99250	.47670	561.3	1.538	.85792	24.07757	.47359	559.4	1.536	.85670	24.04327	.47530
53	270	4.000	.500	511.2	1.395	.78135	21.92863	.60431	511.8	1.396	.78228	21.95063	.60291	511.7	1.398	.78311	21.92033	.60162
54	0	4.877	.610	1.474	.02250	.63137	3.12474	.147	.0225	.63003	.03125	1.45	.025	.62215	.62164	.314943		
55	0	5.402	.625	9.5	.039	.0451	3.0734	.9	.040	.0424	.39970	3.194	.92	.				

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 7914.7$ psf						$\phi = 90.0^\circ$, $p_t = 7914.7$ psf					
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l		
1	0	.000	.000	663.9	1.833	1.01595	28.51265	.00000	663.9	1.833	1.01595	28.51265	.00000		
2	0	.200	.025	654.4	1.806	1.00128	28.10092	.00000	655.6	1.809	1.00312	28.15238	.00000		
3	0	.400	.050	630.4	1.737	.96461	27.07158	.22748	632.8	1.744	.96827	27.17451	.21511		
4	0	.600	.075	620.8	1.710	.94993	26.65984	.27187	623.2	1.717	.95360	26.76278	.26140		
5	0	.800	.100	613.6	1.689	.93893	26.35104	.30139	616.0	1.696	.94260	26.45398	.29183		
6	0	1.000	.125	607.6	1.672	.92976	26.09371	.32423	608.8	1.676	.93160	26.14518	.31977		
7	0	1.200	.150	600.4	1.652	.91876	25.78491	.35003	601.6	1.655	.92059	25.83637	.34584		
8	0	1.400	.175	596.8	1.641	.91326	25.63051	.36238	596.8	1.641	.91326	25.63051	.36238		
9	0	1.600	.200	593.2	1.631	.90776	25.47611	.37441	594.4	1.635	.90959	25.52757	.37044		
10	0	1.800	.225	587.2	1.614	.89859	25.21877	.39385	588.4	1.617	.90042	25.27024	.39002		
11	0	2.000	.250	581.2	1.597	.88942	24.96144	.41261	583.6	1.604	.89309	25.06437	.40518		
12	0	2.200	.275	577.7	1.587	.88392	24.80704	.42358	580.0	1.593	.88758	24.90997	.41629		
13	0	2.400	.300	572.9	1.573	.87658	24.60117	.43791	575.3	1.580	.88025	24.70410	.43079		
14	0	2.600	.325	568.1	1.559	.86925	24.39530	.45194	570.5	1.566	.87291	24.49824	.44496		
15	0	2.800	.350	562.1	1.542	.86008	24.13797	.46908	565.7	1.552	.86558	24.29237	.45584		
16	0	3.000	.375	556.1	1.525	.85091	23.88063	.48585	568.5	1.532	.85457	23.98357	.47919		
17	0	3.200	.400	550.1	1.508	.84174	23.62330	.50228	552.5	1.514	.84540	23.72623	.49574		
18	0	3.400	.425	541.7	1.484	.82890	23.26303	.52478	544.1	1.490	.83257	23.36596	.51841		
19	0	3.600	.450	533.3	1.460	.81606	22.90276	.54678	534.5	1.463	.81790	22.95423	.54367		
20	0	3.800	.475	521.3	1.425	.79772	22.38809	.57749	523.7	1.432	.80139	22.49103	.57141		
21	0	4.000	.500	509.3	1.391	.77939	21.87342	.60750	510.5	1.394	.78122	21.92489	.60452		
22	0	4.200	.525	485.4	1.322	.74271	20.84409	.66596	485.4	1.322	.74271	20.84409	.66596		
23	0	4.400	.550	447.0	1.213	.68403	19.19715	.75699	447.0	1.213	.68403	19.19715	.75699		
24	180	.200	.025	653.7	1.804	1.00022	28.07114	.00000	653.7	1.804	1.00022	28.07114	.00000		
25	180	.400	.050	633.2	1.745	.96891	27.19230	.21290	628.4	1.732	.96154	26.98551	.23737		
26	180	.600	.075	621.2	1.711	.95049	26.67534	.27032	620.0	1.708	.94864	26.62364	.27547		
27	180	.800	.100	613.9	1.690	.93943	26.36516	.30009	612.7	1.687	.93759	26.31346	.30481		
28	180	1.000	.125	607.9	1.673	.93022	26.10668	.32311	605.5	1.666	.92654	26.00328	.33195		
29	180	1.200	.150	601.9	1.656	.92101	25.84819	.34487	599.5	1.649	.91733	25.74480	.35327		
30	180	1.400	.175	597.1	1.642	.91365	25.64614	.36152	597.1	1.642	.91365	25.64141	.36152		
31	180	1.600	.200	591.1	1.625	.90444	25.38293	.38154	588.7	1.618	.90075	25.27953	.38933		
32	180	1.800	.225	586.2	1.611	.89707	25.17614	.39700	585.0	1.608	.89523	25.12444	.40080		
33	180	2.000	.250	581.4	1.597	.88970	24.96936	.41204	579.0	1.590	.88602	24.86596	.41942		
34	180	2.200	.275	577.8	1.587	.88417	24.81427	.42307	575.4	1.580	.88049	24.71087	.43032		
35	180	2.400	.300	571.8	1.570	.87496	24.55578	.44103	569.4	1.563	.87128	24.45239	.44808		
36	180	2.600	.325	564.6	1.549	.86391	24.24561	.46196	564.6	1.549	.86391	24.24561	.46196		
37	180	2.800	.350	559.8	1.535	.85654	24.03882	.47559	559.8	1.535	.85654	24.03882	.47559		
38	180	3.000	.375	553.7	1.518	.84733	23.78034	.49229	553.7	1.518	.84733	23.78034	.49229		
39	180	3.200	.400	547.7	1.501	.83812	23.52186	.50867	547.7	1.501	.83812	23.52186	.50867		
40	180	3.400	.425	540.5	1.480	.82707	23.21168	.52795	538.1	1.473	.82339	23.10829	.53429		
41	180	3.600	.450	530.9	1.453	.81233	22.79811	.55309	529.7	1.449	.81049	22.74641	.55620		
42	180	3.800	.475	521.2	1.425	.79760	22.38456	.57770	518.8	1.418	.79391	22.28114	.58378		
43	180	4.000	.500	506.8	1.384	.77549	21.76418	.61379	505.6	1.380	.77365	21.71248	.61676		
44	180	4.200	.525	481.5	1.311	.73681	20.67855	.67522	480.3	1.308	.73497	20.62686	.67810		
45	180	4.400	.550	446.6	1.211	.68339	19.17936	.75797	445.4	1.208	.68155	19.12766	.76080		
46	90	1.000	.125	605.2	1.665	.92609	25.99077	.33301	606.4	1.669	.92793	26.04224	.32865		
47	90	2.000	.250	581.2	1.597	.88942	24.96144	.41261	582.4	1.600	.89125	25.01290	.40891		
48	90	3.000	.375	556.1	1.525	.85091	23.88063	.44585	557.3	1.528	.85274	23.93210	.48252		
49	90	4.000	.500	508.1	1.388	.77755	21.82196	.61047	509.3	1.391	.77939	21.87342	.60750		
50	270	1.000	.125	612.7	1.587	.93759	26.31346	.30481	613.9	1.690	.93943	26.36516	.30009		
51	270	2.000	.250	587.4	1.615	.89891	25.22784	.39318	589.9	1.621	.90259	25.33123	.38545		
52	270	3.000	.375	562.2	1.542	.86023	24.14221	.46880	562.2	1.542	.86023	24.14221	.46880		
53	270	4.000	.500	512.8	1.401	.78470	22.02266	.59886	514.0	1.404	.78655	22.07436	.59586		
54	0	4.877	.610	14.5	-.025	.02214	.62190	3.13815	14.3	-.026	.02191	.61481	.314590		
55	0	5.402	.675	9.1	-.041	.01388	.38954	3.45996	8.9	-.041	.01363	.38255	.347266		
56	0	5.927	.741	8.8	-.042	.01339	.37587	3.48503	8.4	-.043	.01290	.36206	.351139		
57	0	6.452	.807	8.6	-.042	.01315	.36904	3.49793	8.3	-.043	.01266	.35522	.352483		
58	0	6.977	.872	8.4	-.043	.01291	.36220	3.51110	8.0	-.044	.01217	.34156	.355258		
59	180	6.977	.872	7.8	-.044	.01193	.33487	3.56661	8.0	-.044	.01217	.34156	.355258		
60	180	6.452	.807	7.8	-.044	.01193	.33487	3.56661	8.0	-.044	.01217	.34156	.355258		
61	180	5.927	.741	7.8	-.044	.01193	.33487	3.56661	8.0	-.044	.01217	.34156	.355258		
62	180	5.402	.675	7.8	-.044	.01193	.33487	3.56661	8.0	-.044	.01217	.34156	.355258		
63	180	4.877	.610	7.8	-.044	.01193	.33487	3.56661	8.0	-.044	.01217	.34156	.355258		

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(b) $\alpha = 5^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7923.4$ psf					$\phi = 22.5^\circ$, $p_t = 7923.4$ psf					$\phi = 45.0^\circ$, $p_t = 7914.7$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	661.3	1.767	.9830	27.51216	*16882	642.6	1.770	.98223	27.46614	*16026	642.6	1.775	.98487	27.44027	*14775
2	0	.200	.025	619.0	1.674	.93083	26.12370	*32164	611.4	1.681	.93458	26.22998	*1240	617.3	1.700	.94452	26.50790	*26672
3	0	.400	.050	563.4	1.544	.86120	24.14956	*44700	558.3	1.558	.86861	24.17752	*45314	576.0	1.590	.88583	24.84081	*19178
4	0	.600	.075	564.4	1.547	.86103	24.12099	*44360	568.3	1.558	.86861	24.17752	*45314	576.5	1.583	.88216	24.75786	*42703
5	0	.800	.100	563.4	1.544	.86120	24.14956	*44700	555.9	1.551	.86849	24.27466	*44003	574.1	1.574	.87850	24.65492	*4320
6	0	1.000	.125	559.8	1.534	.85570	24.01529	*47712	562.3	1.541	.85945	24.12038	*47024	566.9	1.556	.86749	24.34609	*45525
7	0	1.200	.150	553.8	1.517	.84654	23.75817	*49371	557.5	1.527	.85212	23.91466	*48365	564.5	1.549	.86382	24.24315	*46212
8	0	1.400	.175	550.2	1.506	.84105	23.63089	*50350	553.9	1.517	.84662	23.74037	*49357	559.7	1.535	.85649	24.03726	*47569
9	0	1.600	.200	547.8	1.499	.83738	23.50104	*50998	550.3	1.506	.84112	23.66060	*50337	557.3	1.524	.85282	23.93432	*46238
10	0	1.800	.225	545.4	1.493	.83372	23.39819	*51640	547.9	1.500	.83746	23.50322	*50984	553.7	1.518	.84732	23.77990	*49232
11	0	2.000	.250	541.8	1.482	.82822	23.24392	*52956	544.3	1.489	.83194	23.38493	*51946	550.1	1.508	.84182	23.62549	*50214
12	0	2.200	.275	538.3	1.472	.82272	23.09965	*53543	541.9	1.482	.82830	23.24608	*52583	546.5	1.497	.83631	23.47107	*51185
13	0	2.400	.300	535.9	1.465	.81906	22.98680	*51619	538.3	1.472	.82280	23.09179	*53530	542.9	1.487	.83081	23.31666	*52147
14	0	2.600	.325	532.3	1.455	.81356	22.83252	*55102	534.7	1.462	.81730	22.93750	*54468	539.4	1.477	.82531	23.16224	*53098
15	0	2.800	.350	528.7	1.445	.80806	22.67825	*56028	531.1	1.452	.81180	22.78321	*55399	534.6	1.463	.81797	22.95635	*54354
16	0	3.000	.375	523.9	1.431	.80073	22.47255	*57250	526.3	1.438	.80447	22.57749	*56628	528.6	1.446	.80880	22.69900	*55904
17	0	3.200	.400	519.1	1.417	.79340	22.26685	*58462	521.5	1.424	.79714	22.37178	*57845	523.8	1.432	.80147	22.49311	*57129
18	0	3.400	.425	514.3	1.404	.78608	22.06115	*59662	515.5	1.407	.78794	22.11463	*59351	517.8	1.415	.79720	22.23575	*58644
19	0	3.600	.450	508.3	1.386	.77691	21.80403	*61150	509.5	1.390	.77882	21.85748	*60842	510.6	1.395	.78129	21.92692	*60441
20	0	3.800	.475	499.9	1.362	.76409	21.44406	*63210	501.1	1.366	.76599	21.49748	*62905	501.0	1.367	.76662	21.51515	*62805
21	0	4.000	.500	491.5	1.338	.75126	21.08409	*65248	491.5	1.339	.75333	21.08604	*65237	491.4	1.340	.75195	21.10338	*65139
22	0	4.200	.525	469.9	1.277	.71826	20.45844	*70111	472.4	1.284	.72201	20.26317	*65932	471.0	1.281	.72077	20.22836	*70205
23	0	4.400	.550	436.4	1.181	.66667	18.71855	*83119	437.6	1.184	.66887	18.77172	*80288	436.3	1.182	.66758	18.73568	*78225
24	0	4.600	.575	413.3	1.093	.61029	20.21202	*80000	458.3	1.090	.60318	20.21202	*80000	458.3	1.090	.60318	20.21202	*80000
25	0	4.800	.600	651.3	1.009	.00309	28.15166	*60000	650.3	1.072	.99398	28.05958	*09292	644.4	1.078	.08612	27.68097	*14042
26	0	5.000	.625	647.4	1.075	.99021	27.97908	*11666	644.3	1.075	.98478	27.63768	*14820	635.0	1.071	.97160	27.26782	*20330
27	0	5.200	.650	645.4	1.078	.98653	27.66877	*13935	637.0	1.075	.97373	27.32773	*19538	627.7	1.070	.96056	26.95796	*24046
28	0	5.400	.675	635.4	1.075	.97180	27.27354	*20256	632.2	1.074	.96637	27.12109	*22161	621.7	1.073	.95136	26.9974	*26786
29	0	5.600	.700	633.4	1.071	.96812	27.17023	*21564	627.4	1.072	.95901	26.91446	*24527	618.1	1.070	.94584	26.54481	*29318
30	0	5.800	.725	627.4	1.072	.95898	26.91196	*24554	621.4	1.070	.94980	26.65616	*27224	612.1	1.068	.93663	26.28659	*30724
31	0	6.000	.750	622.5	1.073	.95156	26.70534	*26729	617.8	1.069	.94428	26.50118	*28736	608.5	1.065	.93111	26.13166	*32095
32	0	6.200	.775	621.3	1.070	.94972	26.65369	*27249	614.2	1.068	.93878	26.34620	*30183	604.9	1.064	.92559	26.97673	*33419
33	0	6.400	.800	614.1	1.069	.93867	26.34376	*30205	608.1	1.072	.92956	26.08791	*32473	598.9	1.067	.91639	25.71851	*35358
34	0	6.600	.825	599.3	1.075	.93131	26.13714	*32047	603.3	1.068	.92219	25.88127	*34215	595.6	1.060	.91271	25.61523	*36359
35	0	6.800	.850	604.5	1.061	.92395	25.93052	*33806	598.5	1.064	.91483	25.67463	*35889	590.5	1.063	.90351	25.35701	*38350
36	0	7.000	.875	598.5	1.044	.91974	25.67225	*35907	593.7	1.061	.90747	25.46800	*37504	584.4	1.066	.89431	25.09879	*40267
37	0	7.200	.900	593.6	1.030	.90738	25.46563	*37522	588.9	1.061	.90010	25.26136	*39068	578.4	1.059	.88511	24.84057	*42121
38	0	7.400	.925	586.4	1.010	.89634	25.15571	*39851	581.7	1.059	.88906	24.95141	*41333	572.4	1.057	.87591	24.58235	*43921
39	0	7.600	.950	580.4	1.053	.88714	24.89744	*41718	575.6	1.057	.87985	24.69311	*43155	565.2	1.051	.86487	24.27249	*46017
40	0	7.800	.975	572.0	1.056	.88242	24.61070	*44239	567.2	1.055	.86697	24.33149	*45623	556.8	1.057	.85199	23.91099	*48389
41	0	8.000	.500	562.3	1.041	.85953	24.12262	*47009	557.6	1.052	.85225	23.91822	*48342	548.4	1.053	.83911	23.54948	*50693
42	0	8.200	.475	550.3	1.056	.84112	23.66070	*50337	545.5	1.049	.83384	23.40163	*51619	536.3	1.048	.82071	23.03305	*53888
43	0	8.400	.450	535.8	1.045	.81904	23.28622	*54733	531.1	1.042	.82472	23.02742	*52162	524.7	1.042	.81700	22.47716	*54158
44	0	8.600	.425	525.9	1.038	.77486	21.74565	*61481	513.4	1.032	.76941	21.50356	*62277	515.1	1.031	.75814	19.62657	*37354
45	0	8.800	.400	516.0	1.026	.71299	19.90266	*61466	506.6	1.030	.70867	19.88800	*62090	507.0	1.024	.69296	19.62657	*37354
46	0	9.000	.375	506.6	1.026	.69968	19.524948	*30157	507.5	1.028	.70861	19.6610	*43204	506.9	1.026	.68749	24.34609	*44525
47	0	9.200	.350	506.4	1.026	.69736	19.42669	*44982	508.7	1.030	.68595	19.6609	*48032	508.9	1.024	.68399	23.57401	*50539
48	0	9.400	.325	505.0	1.026	.69427	19.30812	*50137	504.9	1.030	.68193	19.98983	*54156	527.4	1.023	.68697	22.64752	*56211
49	0	9.600	.300	497.5	1.026	.67602	21.34121	*62795	491.5	1.033	.67295	21.08604	*62327	487.8	1.029	.74665	20.94896	*66008
50	270	1.000	.125	591.2	1.024	.60370	25.36233	*38310	608.1	1.072	.62956	26.08791	*32473	624.1	1.020	.95504	26.80303	*25721
51	270	2.000	.250	572.0	1.056	.87425	24.53585	*44239	585.6	1.0610	.89642	25.15804	*39833	602.5	1.0558	.92191	25.87344	*34279
52	270	3.000	.375	547.9	1.050	.83744	23.50277	*50987	561.2	1.0538	.85777	24.07320	*47334	574.8	1.0578	.87959	24.68564	*43207
53	270	4.000	.500	502.1	1.036	.76750	21.53990	*62664	513.0	1.0400	.78414	22.00683	*59978	524.3	1.0434	.80230	22.51661	*56990
54	0	4.877	.610	15.8	-0.021	.02419	.67889	3.07907	15.0	-0.024	.02293	.64358	3.11502	14.5	-0.025	.02216	.62190	3.13815
55	0	5.402	.675	10.6	-0.036	.01621	.45486	3.35202	9.6	-0.039	.01472	.41325	3.41866	8.9</				

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(b) $\alpha = 5^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 7914.7$ psf						$\phi = 90.0^\circ$, $p_t = 7914.7$ psf					
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l		
1	0	.000	.000	642.4	1.772	.98294	27.58625	.15696	643.1	1.774	.98413	27.61946	.15136		
2	0	.200	.025	624.4	1.720	.95544	26.81424	.25603	633.5	1.746	.96944	27.20723	.21104		
3	0	.400	.050	593.2	1.631	.90776	25.47611	.37441	611.9	1.685	.93639	26.27971	.30786		
4	0	.600	.075	586.0	1.611	.89675	25.16730	.39765	602.3	1.657	.92170	25.86748	.34329		
5	0	.800	.100	581.2	1.597	.88942	24.96144	.41261	596.3	1.640	.91252	25.60983	.36401		
6	0	1.000	.125	575.3	1.580	.88025	24.70410	.43079	590.3	1.623	.90334	25.35219	.38386		
7	0	1.200	.150	570.5	1.566	.87291	24.49824	.44496	584.3	1.606	.89416	25.09454	.40298		
8	0	1.400	.175	566.9	1.556	.86741	24.34383	.45540	580.7	1.595	.88865	24.93996	.41415		
9	0	1.600	.200	564.5	1.549	.86374	24.24090	.46227	578.3	1.589	.88498	24.83690	.42147		
10	0	1.800	.225	560.9	1.539	.85824	24.08650	.47247	573.5	1.575	.87764	24.63078	.43587		
11	0	2.000	.250	557.3	1.528	.85274	23.93210	.48252	569.9	1.564	.87213	24.47620	.44646		
12	0	2.200	.275	553.7	1.518	.84724	23.77770	.49246	566.3	1.554	.86662	24.32161	.45689		
13	0	2.400	.300	548.9	1.504	.83990	23.57183	.50553	561.5	1.540	.85928	24.11550	.47056		
14	0	2.600	.325	545.3	1.494	.83440	23.41743	.51520	559.1	1.534	.85560	24.01244	.47731		
15	0	2.800	.350	540.5	1.480	.82707	23.21156	.52795	554.3	1.520	.84826	23.80632	.49063		
16	0	3.000	.375	535.7	1.466	.81973	23.00570	.54054	547.1	1.499	.83724	23.49715	.51022		
17	0	3.200	.400	528.5	1.446	.80873	22.69689	.55916	539.9	1.479	.82623	23.18798	.52940		
18	0	3.400	.425	522.5	1.429	.79956	22.43956	.57445	532.8	1.458	.81521	22.87880	.54823		
19	0	3.600	.450	515.3	1.408	.78856	22.13076	.59257	524.4	1.434	.80236	22.51810	.56981		
20	0	3.800	.475	504.5	1.377	.77205	21.66756	.61934	513.6	1.403	.78583	22.05434	.59702		
21	0	4.000	.500	495.0	1.350	.75738	21.25582	.64278	501.6	1.369	.76747	21.53905	.62669		
22	0	4.200	.525	472.2	1.285	.72254	20.27795	.69750	477.6	1.300	.73075	20.50848	.68470		
23	0	4.400	.550	436.2	1.182	.66752	18.73394	.78235	439.2	1.190	.67200	18.85955	.77547		
24	180	.200	.025	645.2	1.780	.98733	27.70926	.13510	633.3	1.746	.96900	27.19482	.21259		
25	180	.400	.050	626.0	1.725	.95785	26.88212	.24878	608.0	1.673	.93031	26.10909	.32291		
26	180	.600	.075	616.3	1.697	.94312	26.46855	.29046	598.3	1.646	.91557	25.69548	.35722		
27	180	.800	.100	609.1	1.677	.93207	26.15837	.31862	592.3	1.628	.90636	25.43698	.37742		
28	180	1.000	.125	603.1	1.659	.92286	25.89998	.34061	586.3	1.611	.89715	25.17847	.39683		
29	180	1.200	.150	598.3	1.646	.91549	25.69310	.35741	583.9	1.604	.89347	25.07507	.40440		
30	180	1.400	.175	593.5	1.632	.90812	25.48632	.37363	579.1	1.591	.88610	24.86827	.41925		
31	180	1.600	.200	589.9	1.621	.90259	25.33123	.38545	574.3	1.577	.87873	24.66146	.43375		
32	180	1.800	.225	586.2	1.611	.89707	25.17614	.39700	571.9	1.570	.87504	24.55806	.44087		
33	180	2.000	.250	581.4	1.597	.88970	24.96936	.41204	565.8	1.553	.86583	24.29955	.45836		
34	180	2.200	.275	577.8	1.587	.88417	24.81427	.42307	562.2	1.542	.86031	24.14445	.46866		
35	180	2.400	.300	571.8	1.570	.87496	24.55578	.44103	557.4	1.529	.85294	23.93764	.48217		
36	180	2.600	.325	567.0	1.556	.86760	24.34900	.45505	552.6	1.515	.84557	23.73084	.49545		
37	180	2.800	.350	562.2	1.542	.86023	24.14221	.46880	549.0	1.504	.84004	23.57574	.50528		
38	180	3.000	.375	556.2	1.525	.85102	23.89373	.48565	543.0	1.487	.83083	23.31723	.52143		
39	180	3.200	.400	550.1	1.508	.84181	23.62525	.50215	536.9	1.470	.82162	23.05872	.53732		
40	180	3.400	.425	541.7	1.484	.82891	23.26337	.52476	529.7	1.449	.81057	22.74852	.55607		
41	180	3.600	.450	533.3	1.460	.81602	22.90150	.54686	521.3	1.425	.79767	22.38661	.57758		
42	180	3.800	.475	523.6	1.432	.80128	22.48793	.57159	511.7	1.398	.78293	21.97300	.60174		
43	180	4.000	.500	508.0	1.387	.77734	21.81588	.61082	497.2	1.356	.76083	21.35259	.63730		
44	180	4.200	.525	482.7	1.315	.73865	20.73025	.67233	473.1	1.287	.72398	20.31856	.69525		
45	180	4.400	.550	445.4	1.208	.68155	19.12766	.76080	439.4	1.191	.67240	18.87093	.77485		
46	90	1.000	.125	560.9	1.539	.85824	24.08650	.67247	560.3	1.537	.85744	24.06397	.47394		
47	90	2.000	.250	542.9	1.487	.83073	23.31450	.52160	543.5	1.489	.83173	23.34256	.51986		
48	90	3.000	.375	523.7	1.432	.80139	22.49103	.57141	524.4	1.434	.80236	22.51810	.56981		
49	90	4.000	.500	486.6	1.326	.74454	20.89555	.66308	489.6	1.334	.74911	21.02377	.65588		
50	270	1.000	.125	633.2	1.745	.96891	27.19230	.21290	638.1	1.759	.97637	27.60162	.18517		
51	270	2.000	.250	610.3	1.680	.93931	26.21007	.31407	616.4	1.697	.94321	26.47100	.29023		
52	270	3.000	.375	583.8	1.604	.89338	25.07275	.40457	588.7	1.618	.90084	25.28187	.38915		
53	270	4.000	.500	530.9	1.453	.81233	22.79811	.55309	536.9	1.470	.82162	23.05872	.53732		
54	0	4.877	.610	14.5	-.025	.02215	.62164	3.13843	14.2	-.026	.02166	.60798	3.15347		
55	0	5.402	.675	8.9	-.041	.01363	.38255	3.47266	8.7	-.042	.01339	.37572	3.48532		
56	0	5.927	.741	8.4	-.043	.01290	.36206	3.51139	8.1	-.043	.01241	.34839	3.53856		
57	0	6.452	.807	8.3	-.043	.01266	.35522	3.52483	8.0	-.044	.01217	.34156	3.55258		
58	0	6.977	.872	8.3	-.043	.01266	.35522	3.52483	8.0	-.044	.01217	.34156	3.55258		
59	180	6.977	.872	8.1	-.043	.01241	.34839	3.53856	7.8	-.044	.01193	.33473	3.56690		
60	180	6.452	.807	8.1	-.043	.01241	.34839	3.53856	8.0	-.044	.01217	.34156	3.55258		
61	180	5.927	.741	8.1	-.043	.01241	.34839	3.53856	8.1	-.043	.01241	.34839	3.53856		
62	180	5.402	.675	8.3	-.043	.01266	.35522	3.52483	8.1	-.043	.01241	.34839	3.53856		
63	180	4.877	.610	8.4	-.043	.01290	.36206	3.51139	8.3	-.043	.01266	.35522	3.52483		

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(c) $\alpha = 10^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7923.4$ psf						$\phi = 22.5^\circ$, $p_t = 7923.4$ psf						$\phi = 45.0^\circ$, $p_t = 7914.7$ psf					
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l			
1	0	.000	.000	598.2	1.643	.91434	25.66088	.35998	598.2	1.644	.91442	25.66326	.35979	599.3	1.648	.91701	25.73582	*35399			
2	0	.200	.025	544.2	1.489	.83188	23.34677	.51960	547.9	1.500	.83746	23.50322	.50984	558.5	1.532	.85465	23.98579	*47904			
3	0	.400	.050	469.9	1.277	.71828	20.15844	.70411	479.6	1.304	.73301	20.57175	.68118	501.0	1.367	.76662	21.51515	*62805			
4	0	.600	.075	483.1	1.314	.73843	20.72411	.67268	489.6	1.332	.74767	20.98318	.65816	504.6	1.377	.77212	21.66956	*61922			
5	0	.800	.100	497.5	1.356	.76042	21.34121	.63795	496.3	1.352	.75866	21.29176	.64075	504.6	1.377	.77212	21.66956	*61922			
6	0	1.000	.125	496.3	1.352	.75859	21.28978	.64086	496.3	1.352	.75866	21.29176	.64075	503.4	1.374	.77025	21.61869	*62171			
7	0	1.200	.150	499.3	1.335	.74943	21.03266	.65538	492.7	1.342	.75316	21.13747	.68947	502.2	1.371	.77565	21.55662	*62511			
8	0	1.400	.175	499.3	1.335	.74943	21.03266	.65538	492.7	1.342	.75316	21.13747	.68947	498.8	1.366	.76879	21.46368	*63098			
9	0	1.600	.200	499.3	1.332	.74943	21.03266	.65538	492.7	1.342	.75316	21.13747	.68947	499.8	1.364	.76479	21.46368	*63098			
10	0	1.800	.225	487.9	1.298	.74576	20.29291	.66116	491.3	1.335	.74950	21.03461	.65527	498.6	1.360	.76295	21.41221	*63391			
11	0	2.000	.250	487.9	1.328	.74576	20.29291	.66116	492.1	1.332	.74767	20.98318	.65816	498.6	1.360	.76295	21.41221	*63391			
12	0	2.200	.275	486.7	1.325	.74393	20.87839	.66404	487.9	1.328	.74583	20.93175	.66105	496.2	1.353	.75928	21.30926	*63976			
13	0	2.400	.300	485.5	1.321	.74210	20.82696	.66492	486.7	1.325	.74400	20.88032	.66493	496.2	1.353	.75928	21.30926	*63976			
14	0	2.600	.325	484.3	1.318	.74027	20.77554	.66480	485.5	1.321	.74217	20.82890	.66682	491.4	1.340	.75195	21.10338	*65139			
15	0	2.800	.350	483.1	1.314	.73843	20.72411	.67268	484.4	1.318	.74034	20.77747	.66699	491.4	1.340	.75195	21.10338	*65139			
16	0	3.000	.375	480.7	1.308	.73477	20.62126	.67842	482.0	1.311	.73667	20.67461	.67544	486.6	1.326	.74461	20.89749	*66297			
17	0	3.200	.400	478.3	1.301	.73111	20.51842	.68615	479.6	1.304	.73301	20.57175	.68118	485.4	1.323	.74278	20.84602	*66586			
18	0	3.400	.425	475.9	1.294	.72744	20.41557	.68986	476.0	1.294	.72751	20.41746	.68976	478.2	1.302	.73177	20.53719	*68310			
19	0	3.600	.450	473.5	1.287	.72378	20.31272	.69557	473.6	1.287	.72384	20.31460	.69547	474.6	1.292	.72927	20.38277	*69168			
20	0	3.800	.475	468.7	1.273	.71645	20.10702	.70696	467.6	1.270	.71648	20.05746	.71970	467.4	1.271	.71927	20.07394	*70879			
21	0	4.000	.500	465.1	1.263	.71095	19.95274	.71548	462.8	1.256	.70733	19.85174	.72104	461.4	1.254	.70610	19.81658	*72298			
22	0	4.200	.525	464.9	1.218	.68713	19.28423	.75222	448.4	1.215	.68536	19.23459	.75494	445.9	1.209	.68226	19.14745	*75972			
23	0	4.400	.550	422.0	1.140	.64498	18.10146	.81895	420.8	1.136	.64321	18.01571	.81967	415.9	1.124	.63640	17.86066	*83014			
24	180	.200	.025	639.4	1.761	.97732	27.42850	.18132	635.9	1.751	.97189	27.27607	.20223	627.2	1.728	.95979	26.93631	*24286			
25	180	.400	.050	656.3	1.809	1.00309	28.15166	.00000	667.9	1.785	.99030	27.79266	.11809	632.0	1.742	.96715	27.14312	*21895			
26	180	.600	.075	656.3	1.809	1.00309	28.15166	.00000	669.1	1.789	.99214	27.44332	.11624	627.2	1.728	.95979	26.93631	*24286			
27	180	.800	.100	653.8	1.803	.99941	28.04836	.02905	645.5	1.779	.98662	27.64934	.13887	622.4	1.745	.95235	26.72951	*24883			
28	180	1.000	.125	655.7	1.792	.99389	27.89339	.03963	641.9	1.768	.98110	27.53437	.13741	617.6	1.701	.94866	26.52720	*28530			
29	180	1.200	.150	646.6	1.782	.98837	27.73843	.02987	639.4	1.761	.97741	27.43105	.10985	610.4	1.691	.93952	26.34760	*29987			
30	180	1.400	.175	642.6	1.755	.98469	27.6332	.04865	633.4	1.744	.96821	27.11755	.21533	610.4	1.680	.93399	26.21250	*31386			
31	180	1.600	.200	639.4	1.741	.97180	27.51242	.04860	629.2	1.731	.96637	27.11098	.21216	608.0	1.673	.93031	26.11909	*32291			
32	180	1.800	.225	635.8	1.751	.97180	27.27354	.02956	628.6	1.730	.96085	26.96611	.23955	604.4	1.663	.92478	25.95399	*33610			
33	180	2.000	.250	632.2	1.741	.96678	27.11858	.22191	625.0	1.720	.95533	26.81114	.25636	600.7	1.653	.91926	25.79889	*34890			
34	180	2.200	.275	628.6	1.730	.96076	26.94361	.23983	621.4	1.710	.94980	26.65616	.27224	597.1	1.642	.91373	25.64378	*36133			
35	180	2.400	.300	623.7	1.716	.95340	26.75700	.24200	615.4	1.693	.94060	26.39786	.29707	592.3	1.628	.90636	25.43698	*37742			
36	180	2.600	.325	620.1	1.706	.94787	26.60203	.22760	610.6	1.679	.93324	26.19123	.31574	587.5	1.615	.89899	25.23017	*39300			
37	180	2.800	.350	614.1	1.689	.93867	26.34376	.30205	605.7	1.665	.92587	25.98459	.33353	583.9	1.604	.89347	25.07507	*46440			
38	180	3.000	.375	608.1	1.672	.92947	26.05459	.32494	599.7	1.648	.91667	25.72629	.35476	576.7	1.584	.88241	24.76486	*42654			
39	180	3.200	.400	599.7	1.648	.91659	25.72931	.35495	593.7	1.631	.90747	25.46800	.37504	571.9	1.570	.87504	24.55806	*44087			
40	180	3.400	.425	591.2	1.624	.90370	25.36233	.38310	585.3	1.606	.89458	25.10638	.40212	562.2	1.542	.86031	24.14445	*48666			
41	180	3.600	.450	581.6	1.596	.88898	24.94909	.41349	574.4	1.575	.87802	24.64145	.43513	553.8	1.518	.84741	23.78254	*49215			
42	180	3.800	.475	569.6	1.562	.87057	24.63255	.44942	563.6	1.545	.86145	24.17652	.46554	541.8	1.484	.82899	23.26553	*52463			
43	180	4.000	.500	552.7	1.513	.84840	23.70938	.49682	547.9	1.500	.83752	23.50495	.50793	527.3	1.442	.80688	22.64511	*56225			
44	180	4.200	.525	523.8	1.431	.80683	22.46968	.52676	519.0	1.417	.79334	22.26513	.54872	499.6	1.363	.76451	21.45599	*63142			
45	180	4.400	.550	481.7	1.310	.73621	20.61717	.67616	478.1	1.300	.73076	20.50871	.68469	459.9	1.250	.70372	19.74985	*72665			
46	90	1.000	.125	553.3	1.421	.79526	22.31828	.58160	497.5	1.356	.76049	21.34319	.61257	562.2	1.344	.76662	21.51515	*62805			
47	90	2.000	.250	520.3	1.421	.79526	22.31828	.58160	497.5	1.356	.76049	21.34319	.61257	528.5	1.347	.75562	21.26332	*64647			
48	90	3.000	.375	520.3	1.421	.79526	22.31828	.58160	497.5	1.356	.76049	21.34319	.61257	528.5	1.347	.75562	21.26332	*64647			
49	90	4.000	.500	479.5	1.304	.73294	20.56984	.68128	465.2	1.263	.719.5	20.95450	.61567	457.8	1.244	.70060	19.66217	*73148			
50	270	1.000	.125	553.3	1.506	.84812	23.60607	.50337	595.3	1.606	.84958	25.16338	.42012	621.2	1.711	.95057	26.57778	*70707			
51	270	2.000	.250	504.7	1.470	.82640	23.19264	.52911	573.2	1.572	.87617	24.59079	.43970	603.2	1.660	.92294	25.90229	*34041			
52	270	3.000	.375	523.5	1.331	.80603	22.47968	.54267	552.0	1.517	.84672	23.76324	.49338	580.3	1.594	.88794	24.91997	*41558			
53	270	4.000	.500	500.9	1.314	.73805	20.71343	.50942	499.2	1.306	.77678	21.80019	.61172	528.5	1.446	.80873	22.69682	*55917			
54	0	4.877	.610	14.1	.0262	.02151	.03554	.315843	13.6	.028	.02078	.59326	.319161	13.7	.027	.02096	.58814	*371596			
55	0	5.402	.675	8.7	.0402	.01329	.03229	.315271													

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(c) $\alpha = 10^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 7924.2 \text{ psf}$					$\phi = 90.0^\circ, p_t = 7914.7 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	597.4	1.641	.91307	25.62515	.36280	598.7	1.647	.91611	25.71051	.35602
2	0	.200	.025	571.1	1.566	.87281	24.49538	.44516	589.1	1.619	.90142	25.29832	.38792
3	0	.400	.050	530.4	1.449	.81060	22.74938	.55602	566.3	1.554	.86654	24.31936	.45704
4	0	.600	.075	525.6	1.436	.80328	22.54397	.56827	557.9	1.530	.85369	23.95869	.48080
5	0	.800	.100	522.0	1.425	.79779	22.38991	.57738	553.1	1.516	.84634	23.75259	.49406
6	0	1.000	.125	520.8	1.422	.79596	22.33856	.58041	549.5	1.506	.84084	23.59802	.50387
7	0	1.200	.150	516.0	1.408	.78864	22.13315	.59243	545.9	1.496	.83533	23.44345	.51358
8	0	1.400	.175	516.0	1.408	.78864	22.13315	.59243	544.7	1.492	.83349	23.39193	.51679
9	0	1.600	.200	516.0	1.408	.78864	22.13315	.59243	543.5	1.489	.83166	23.34040	.51999
10	0	1.800	.225	513.6	1.401	.78498	22.03044	.59841	541.1	1.482	.82799	23.23735	.52637
11	0	2.000	.250	513.6	1.401	.78498	22.03044	.59841	537.5	1.472	.82248	23.08278	.53585
12	0	2.200	.275	510.0	1.391	.77949	21.87638	.60733	535.1	1.465	.81881	22.97973	.54212
13	0	2.400	.300	507.6	1.384	.77583	21.77368	.61325	531.5	1.454	.81330	22.82516	.55147
14	0	2.600	.325	505.2	1.378	.77217	21.67097	.61914	529.1	1.448	.80963	22.72211	.55765
15	0	2.800	.350	501.6	1.367	.76668	21.51691	.62795	526.7	1.441	.80595	22.61907	.56381
16	0	3.000	.375	498.0	1.357	.76119	21.36285	.63672	521.9	1.427	.79861	22.41297	.57602
17	0	3.200	.400	494.5	1.347	.75570	21.20879	.64544	515.9	1.410	.78943	22.15535	.59114
18	0	3.400	.425	489.7	1.333	.74839	21.00338	.65702	511.1	1.396	.78209	21.94925	.60312
19	0	3.600	.450	483.7	1.316	.73924	20.74662	.67142	502.7	1.372	.76924	21.58858	.62386
20	0	3.800	.475	476.5	1.295	.72826	20.43850	.68859	494.3	1.348	.75639	21.22792	.64436
21	0	4.000	.500	466.9	1.268	.71362	20.02767	.71134	482.3	1.314	.73803	20.71267	.67332
22	0	4.200	.525	449.0	1.217	.68617	19.25738	.75369	460.7	1.252	.70498	19.78524	.72471
23	0	4.400	.550	416.6	1.124	.63677	17.87085	.82958	424.7	1.149	.64990	18.23952	.80939
24	180	.200	.025	608.0	1.571	.92920	26.07782	.32560	589.9	1.621	.90259	25.33123	.38545
25	180	.400	.050	598.3	1.544	.91448	25.66471	.35967	562.2	1.542	.86023	24.14221	.46880
26	180	.600	.075	591.1	1.523	.90344	25.35488	.38366	553.7	1.518	.84733	23.78034	.49229
27	180	.800	.100	585.1	1.506	.89424	25.09668	.40283	548.9	1.504	.83996	23.57355	.50542
28	180	1.000	.125	583.9	1.502	.89240	25.04504	.40658	547.7	1.501	.83812	23.52186	.50867
29	180	1.200	.150	579.1	1.589	.88504	24.83848	.42136	545.3	1.494	.83444	23.41846	.51514
30	180	1.400	.175	575.5	1.578	.87952	24.648356	.43221	542.9	1.487	.83075	23.31507	.52156
31	180	1.600	.200	573.1	1.571	.87584	24.58029	.43935	539.3	1.477	.82523	23.15998	.53112
32	180	1.800	.225	571.9	1.568	.87400	24.52865	.44289	538.1	1.473	.82339	23.10829	.53429
33	180	2.000	.250	565.8	1.551	.86480	24.27045	.46031	535.7	1.466	.81970	23.00489	.54059
34	180	2.200	.275	563.4	1.544	.86112	24.16717	.46716	533.3	1.460	.81602	22.90150	.54686
35	180	2.400	.300	559.8	1.534	.85560	24.01225	.47732	529.7	1.449	.81049	22.74641	.55620
36	180	2.600	.325	555.0	1.520	.84824	23.80570	.49067	524.9	1.435	.80312	22.53962	.56853
37	180	2.800	.350	551.4	1.509	.84272	23.65078	.50054	523.6	1.432	.80128	22.48793	.57159
38	180	3.000	.375	547.8	1.499	.83720	23.49586	.51030	517.6	1.415	.79207	22.22945	.58681
39	180	3.200	.400	541.8	1.482	.82800	23.32376	.52635	514.0	1.404	.78655	22.07436	.59586
40	180	3.400	.425	533.3	1.458	.81512	23.18719	.54839	506.8	1.384	.77549	21.76418	.61379
41	180	3.600	.450	526.1	1.437	.80408	22.956636	.56694	499.6	1.363	.76444	21.45400	.63154
42	180	3.800	.475	515.3	1.406	.78752	22.10160	.55427	489.9	1.336	.74971	21.04043	.65494
43	180	4.000	.500	502.0	1.368	.76728	21.53357	.62700	477.9	1.301	.73129	20.52347	.68386
44	180	4.200	.525	475.5	1.293	.72680	20.39751	.69087	455.0	1.236	.69629	19.54123	.73812
45	180	4.400	.550	439.4	1.189	.67160	18.84833	.77609	422.5	1.143	.64655	18.14543	.81454
46	90	1.000	.125	496.8	1.354	.75936	21.31150	.63963	495.5	1.351	.75822	21.27944	.64145
47	90	2.000	.250	489.7	1.333	.74839	21.00338	.65702	489.5	1.334	.74904	21.02182	.65599
48	90	3.000	.375	481.3	1.309	.73558	20.64391	.67715	482.3	1.314	.73803	20.71267	.67332
49	90	4.000	.500	459.7	1.247	.70264	19.71956	.72832	463.1	1.259	.70865	19.88829	.71903
50	270	1.000	.125	644.1	1.774	.98440	27.62700	.15006	652.5	1.801	.99838	28.01944	.04814
51	270	2.000	.250	627.2	1.726	.95864	26.90405	.24640	635.6	1.752	.97259	27.29569	.19965
52	270	3.000	.375	602.0	1.654	.92000	25.81963	.34721	609.1	1.677	.93207	26.15837	.31862
53	270	4.000	.500	549.0	1.503	.83904	23.54750	.50706	556.2	1.525	.85102	23.88373	.48565
54	0	4.877	.610	13.4	=.028	.02044	.57377	3.19275	13.2	=.029	.02023	.56762	3.20008
55	0	5.402	.675	8.0	=.046	.01217	.34153	3.55264	7.6	=.045	.01170	.32826	3.58077
56	0	5.927	.741	7.5	=.045	.01144	.32104	3.59660	7.2	=.046	.01097	.30775	3.62678
57	0	6.452	.807	7.3	=.046	.01120	.31421	3.61194	7.0	=.047	.01072	.30091	3.64287
58	0	6.977	.872	7.5	=.045	.01144	.32104	3.59660	7.2	=.046	.01097	.30775	3.62678
59	180	6.977	.872	7.3	=.046	.01120	.31421	3.61194	7.0	=.047	.01072	.30091	3.64287
60	180	6.452	.807	7.5	=.045	.01144	.32104	3.59660	7.0	=.047	.01072	.30091	3.64287
61	180	5.927	.741	7.2	=.046	.01095	.30738	3.62764	7.0	=.047	.01072	.30091	3.64287
62	180	5.402	.675	7.2	=.046	.01095	.30738	3.62764	7.0	=.047	.01072	.30091	3.64287
63	180	4.877	.610	7.5	=.045	.01144	.32104	3.59660	7.2	=.046	.01097	.30775	3.62678

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_{\infty} = 4.63$ - Continued(d) $\alpha = 15^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7923.4$ psf					$\phi = 22.5^\circ$, $p_t = 7923.4$ psf					$\phi = 45.0^\circ$, $p_t = 7914.7$ psf				
				p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_{∞}	M_L	p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_{∞}	M_L	p_L , psf	C_p	$p_L/p_{t,2}$	p_L/p_{∞}	M_L
1	0	.000	.000	543.1	1.486	.83013	23.29751	.52265	540.7	1.479	.82654	23.19680	.52886	541.7	1.484	.82898	23.26518	.52465
2	0	.200	.025	478.4	1.301	.73117	20.50232	.68404	479.7	1.304	.73037	20.50736	.68107	492.9	1.336	.75011	21.05190	.65429
3	0	.400	.050	374.1	1.003	.57174	16.04596	.93058	388.5	1.044	.59379	16.66466	.89606	420.7	1.137	.64374	18.06655	.81886
4	0	.600	.075	390.8	1.051	.59740	16.76598	.89044	400.5	1.078	.61212	17.17900	.86760	421.9	1.141	.64558	18.11802	.81604
5	0	.800	.100	424.4	1.147	.64871	18.20600	.81123	416.1	1.123	.63594	17.84765	.83085	425.5	1.151	.65108	18.27243	.80759
6	0	1.000	1.125	425.6	1.150	.65054	18.25743	.80841	419.6	1.133	.66144	18.00195	.82240	426.7	1.154	.65291	18.32391	.80478
7	0	1.200	1.150	418.4	1.129	.63955	17.94885	.82531	418.5	1.130	.63961	17.95052	.82522	425.5	1.151	.65108	18.27243	.80759
8	0	1.400	1.175	422.0	1.140	.64504	18.10314	.81686	419.6	1.133	.64144	18.00195	.82240	427.9	1.154	.65475	18.37538	.80196
9	0	1.600	1.200	419.6	1.133	.64138	18.00028	.82249	419.6	1.133	.64144	18.00195	.82240	427.9	1.154	.65475	18.37538	.80196
10	0	1.800	1.225	418.4	1.129	.63955	17.94885	.82531	419.6	1.133	.64144	18.00195	.82240	426.7	1.154	.65291	18.32391	.80478
11	0	2.000	1.250	418.4	1.129	.63955	17.94885	.82531	418.5	1.130	.63841	17.95052	.82522	426.7	1.154	.65108	18.27243	.80759
12	0	2.200	1.275	418.4	1.129	.63955	17.94885	.82531	418.5	1.130	.63961	17.95052	.82522	426.7	1.154	.65108	18.27243	.80759
13	0	2.400	1.300	418.4	1.129	.63955	17.94885	.82531	417.3	1.124	.63777	17.89098	.82033	425.5	1.151	.65108	18.27243	.80759
14	0	2.600	1.325	417.2	1.128	.63874	17.84765	.82531	416.1	1.123	.63504	17.84765	.82085	424.3	1.148	.64924	18.22096	.81041
15	0	2.800	.350	416.4	1.123	.63588	17.84599	.83094	416.1	1.123	.63594	17.84765	.83085	424.3	1.149	.64924	18.22096	.81041
16	0	3.000	.375	415.0	1.123	.63588	17.84599	.83094	414.9	1.119	.63411	17.79621	.83637	421.9	1.141	.64558	18.11802	.81604
17	0	3.200	.400	414.6	1.116	.63222	17.74313	.83659	412.5	1.112	.63044	17.69335	.87932	421.9	1.141	.64558	18.11802	.81604
18	0	3.400	.425	413.6	1.116	.63222	17.74313	.83659	412.5	1.112	.63044	17.69335	.87932	418.3	1.130	.64007	17.94360	.82450
19	0	3.600	.450	413.6	1.116	.63222	17.74313	.83659	410.1	1.106	.62678	17.59048	.84496	418.3	1.130	.64007	17.94360	.82450
20	0	3.800	.475	411.2	1.109	.62855	17.64027	.84223	407.7	1.099	.62311	17.48761	.85062	411.1	1.110	.62907	17.65477	.81443
21	0	4.000	.500	411.2	1.109	.62855	17.64027	.84223	405.3	1.092	.61945	17.38474	.85627	407.5	1.100	.62357	17.50036	.81992
22	0	4.200	.525	400.4	1.078	.61206	17.17741	.84769	398.1	1.071	.60845	17.07614	.87326	396.7	1.069	.60706	17.03712	.87543
23	0	4.400	.550	381.2	1.023	.58274	16.35454	.91332	377.7	1.013	.57730	16.20176	.92185	375.1	1.007	.57405	16.11063	.92696
24	180	.200	.025	604.5	1.662	.92403	25.93293	.33786	599.1	1.646	.91573	25.69997	.35687	585.1	1.608	.89531	25.16277	.40063
25	180	.400	.050	635.8	1.751	.91781	27.26707	.29223	626.8	1.725	.95803	26.88691	.24287	595.9	1.649	.91741	25.74719	.35308
26	180	.600	.075	651.5	1.796	.99582	27.94764	.07737	638.8	1.760	.97641	27.40298	.18497	603.2	1.660	.92294	25.90229	.34041
27	180	.800	.100	656.3	1.810	.10018	28.15428	.00000	641.2	1.766	.98009	27.59619	.16974	604.4	1.663	.92479	25.95399	.33610
28	180	1.000	.125	653.9	1.803	.99950	28.05096	.02667	641.2	1.766	.98009	27.59619	.16974	604.4	1.663	.92478	25.95399	.33610
29	180	1.200	.150	656.3	1.810	.10018	28.15428	.00000	641.2	1.766	.98009	27.59619	.16974	604.4	1.663	.92478	25.95399	.33610
30	180	1.400	.175	652.7	1.799	.99766	27.99930	.05784	638.8	1.760	.97641	27.40298	.18497	602.0	1.656	.92110	25.88559	.34467
31	180	1.600	.200	651.5	1.796	.99852	27.94764	.07737	638.8	1.760	.97641	27.40298	.18497	602.0	1.656	.92126	25.88559	.34467
32	180	1.800	.225	649.1	1.789	.99214	27.84432	.16024	636.4	1.753	.97474	27.14494	.23487	599.3	1.646	.91557	25.65548	.37522
33	180	2.000	.250	645.5	1.779	.98662	27.61934	.13207	632.8	1.742	.96722	27.14494	.23487	599.3	1.646	.91189	25.50208	.36550
34	180	2.200	.275	644.3	1.775	.98478	27.61760	.14820	632.8	1.742	.96538	27.09334	.22492	593.5	1.632	.90820	25.48868	.37345
35	180	2.400	.300	639.7	1.761	.98191	27.51305	.14095	626.8	1.725	.95803	26.88691	.24287	588.7	1.619	.90084	25.28187	.39915
36	180	2.600	.325	635.8	1.751	.97189	27.26707	.20223	622.0	1.711	.95067	26.69049	.24980	585.1	1.608	.89531	25.12677	.40063
37	180	2.800	.350	632.2	1.741	.96637	27.12109	.22161	619.6	1.704	.94969	26.57727	.28003	583.9	1.604	.89347	25.07507	.40440
38	180	3.000	.375	626.2	1.724	.95717	26.94280	.25087	613.5	1.687	.93780	26.31924	.30429	577.9	1.587	.88426	24.81656	.42291
39	180	3.200	.400	620.2	1.706	.94796	26.64050	.27736	608.7	1.674	.93044	26.11282	.32258	571.0	1.570	.87504	24.55806	.44087
40	180	3.400	.425	614.2	1.689	.93876	26.34620	.30183	601.5	1.653	.91941	25.80318	.34855	565.8	1.553	.86583	24.29955	.45836
41	180	3.600	.450	603.3	1.658	.92219	25.88127	.34215	593.1	1.629	.90654	25.44193	.37704	557.4	1.529	.85294	23.93764	.48217
42	180	3.800	.475	592.5	1.627	.90563	25.41634	.37899	581.1	1.594	.88815	24.92587	.41515	547.8	1.501	.83820	23.52403	.50853
43	180	4.000	.500	556.5	1.576	.87986	24.65311	.43155	565.4	1.550	.86425	24.25499	.46134	532.1	1.456	.81425	22.85192	.54985
44	180	4.200	.525	545.5	1.493	.83384	24.01632	.51619	536.5	1.467	.82011	23.01643	.53989	505.6	1.380	.77372	21.71449	.61665
45	180	4.400	.550	501.0	1.365	.76573	24.14024	.62947	493.2	1.343	.75392	21.15861	.64828	464.7	1.263	.77109	19.95665	.71526
46	90	1.000	.125	495.1	1.349	.75683	24.02333	.64366	494.6	1.219	.68726	19.28780	.75203	425.5	1.151	.65108	18.27243	.80759
47	90	2.000	.250	492.7	1.342	.75316	24.13747	.64947	492.4	1.215	.68582	19.23637	.75484	425.5	1.151	.65108	18.27243	.80759
48	90	3.000	.375	482.0	1.311	.73667	20.67461	.67544	442.4	1.198	.67626	18.97920	.76893	421.9	1.141	.64558	18.11802	.81604
49	90	4.000	.500	449.6	1.219	.68719	19.28601	.75212	419.6	1.133	.64144	18.00195	.82240	405.1	1.093	.61990	17.39742	.85558
50	270	1.000	.125	494.9	1.348	.75653	21.23194	.64413	549.8	1.505	.84034	23.58410	.59475	605.6	1.466	.82563	26.05569	.33175
51	270	2.000	.250	493.7	1.345	.75469	21.18028	.64705	547.4	1.498	.83666	23.44089	.51744	587.5	1.449	.91111	25.1119	.35108
52	270	3.000	.375	484.1	1.317	.73996	20.76701	.67128	532.9	1.457	.81060	22.48612	.5927	586.3	1.454	.88794	24.91997	.41558
53	270	4.000	.500	451.6	1.224	.76523	19.37232	.74740	493.3	1.343	.75392	21.15861	.64828	535.7	1.467	.81978	23.00702	.54046
54	0	5.477	.610	1.342	.028	.02025	.31826	.133	.020	.020	.02024	.319826	.134	.028	.02045	.57406	.319241	
55	0	5.472	.675	1.241	.043	.01255	.35213	.353101	.7.9	.044								

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(d) $\alpha = 15^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 7914.7$ psf					$\phi = 90.0^\circ$, $p_t = 7914.7$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	539.3	1.477	.82523	23.16010	.53112	538.7	1.475	.82431	23.13431	.53270
2	0	.200	.025	506.9	1.384	.77572	21.77049	.61343	530.3	1.451	.81146	22.77364	.55456
3	0	.400	.050	460.2	1.250	.70420	19.76328	.72591	507.5	1.386	.77658	21.79468	.61204
4	0	.600	.075	454.2	1.233	.69503	19.50595	.74006	499.1	1.362	.76373	21.43401	.63267
5	0	.800	.100	451.8	1.226	.69136	19.40301	.74571	496.7	1.355	.76006	21.33096	.63853
6	0	1.000	.125	450.6	1.223	.68953	19.35155	.74853	494.3	1.348	.75639	21.22792	.64436
7	0	1.200	.150	444.2	1.216	.68586	19.24861	.75417	490.7	1.338	.75088	21.07334	.65309
8	0	1.400	.175	451.8	1.226	.69136	19.40301	.74571	494.3	1.348	.75639	21.22792	.64436
9	0	1.600	.200	451.8	1.226	.68953	19.35155	.74853	493.1	1.345	.75455	21.17639	.64727
10	0	1.800	.225	450.6	1.223	.68769	19.30008	.75135	490.7	1.338	.75088	21.07334	.65309
11	0	2.000	.250	450.6	1.223	.68953	19.35155	.74853	490.7	1.338	.75088	21.07334	.65309
12	0	2.200	.275	449.4	1.220	.68769	19.30008	.75135	490.7	1.338	.75088	21.07334	.65309
13	0	2.400	.300	449.4	1.220	.68769	19.30008	.75135	489.5	1.334	.74904	21.02182	.65599
14	0	2.600	.325	447.0	1.213	.68403	19.19715	.75699	487.1	1.327	.74537	20.91877	.66178
15	0	2.800	.350	447.0	1.213	.68403	19.19715	.75699	485.9	1.324	.74353	20.86725	.66467
16	0	3.000	.375	443.4	1.202	.67852	19.04275	.76545	482.3	1.314	.73803	20.71267	.67332
17	0	3.200	.400	442.2	1.199	.67669	18.99128	.76827	477.5	1.300	.73068	20.50658	.64480
18	0	3.400	.425	437.4	1.185	.66936	18.78541	.77953	473.9	1.290	.72518	20.35201	.69339
19	0	3.600	.450	433.8	1.175	.66385	18.63101	.77978	467.9	1.272	.71600	20.09439	.70766
20	0	3.800	.475	427.8	1.158	.65468	18.37368	.80205	460.7	1.252	.70498	19.78524	.72471
21	0	4.000	.500	421.9	1.141	.64552	18.11634	.81614	451.1	1.224	.69029	19.37305	.74735
22	0	4.200	.525	406.3	1.096	.62168	17.44727	.85283	431.9	1.169	.66092	18.54866	.79248
23	0	4.400	.550	381.1	1.024	.58316	16.36647	.91265	400.7	1.080	.61319	17.42094	.86595
24	180	.200	.025	559.8	1.535	.85654	24.03882	.47559	530.9	1.453	.81233	22.79811	.55309
25	180	.400	.050	554.9	1.522	.84917	23.83203	.48898	503.2	1.373	.76997	21.60909	.62269
26	180	.600	.075	550.1	1.508	.84181	23.62525	.50215	494.8	1.349	.75707	21.24722	.64327
27	180	.800	.100	548.9	1.504	.83996	23.57355	.50542	491.1	1.339	.75155	21.09213	.65203
28	180	1.000	.125	548.9	1.504	.83996	23.57355	.50542	492.4	1.342	.75339	21.14382	.64911
29	180	1.200	.150	548.9	1.504	.83996	23.57355	.50542	491.1	1.339	.75155	21.09213	.65203
30	180	1.400	.175	548.9	1.504	.83996	23.57355	.50542	492.4	1.342	.75339	21.14382	.64911
31	180	1.600	.200	547.7	1.501	.83812	23.52186	.50867	489.9	1.336	.74971	21.04043	.65494
32	180	1.800	.225	547.7	1.501	.83812	23.52186	.50867	489.9	1.336	.74971	21.04043	.65494
33	180	2.000	.250	544.1	1.491	.83260	23.36677	.51836	488.7	1.332	.74786	20.99873	.65785
34	180	2.200	.275	542.9	1.487	.83075	23.31507	.52156	488.7	1.332	.74786	20.99873	.65785
35	180	2.400	.300	538.1	1.473	.82339	23.10829	.53429	485.1	1.322	.74234	20.83364	.66655
36	180	2.600	.325	535.7	1.466	.81970	23.00489	.54059	482.7	1.315	.73865	20.73025	.67233
37	180	2.800	.350	533.3	1.460	.81602	22.90150	.54686	482.7	1.315	.73865	20.73025	.67233
38	180	3.000	.375	529.7	1.449	.81049	22.74641	.55620	479.1	1.305	.73313	20.57516	.64099
39	180	3.200	.400	523.6	1.432	.80128	22.48793	.57159	476.7	1.298	.72944	20.47177	.68674
40	180	3.400	.425	517.6	1.415	.79207	22.22945	.58681	470.7	1.280	.72023	20.21329	.71018
41	180	3.600	.450	511.6	1.398	.78286	21.97096	.60186	465.9	1.267	.71286	20.00650	.71251
42	180	3.800	.475	502.0	1.370	.76813	21.55739	.62564	458.6	1.246	.70181	19.69632	.72960
43	180	4.000	.500	487.5	1.329	.74602	20.93704	.66075	449.0	1.218	.68708	19.28275	.75230
44	180	4.200	.525	463.5	1.260	.70918	19.90311	.71821	428.5	1.160	.65576	18.40391	.80040
45	180	4.400	.550	428.5	1.160	.65576	18.40391	.80040	398.5	1.074	.60971	17.11150	.87133
46	90	1.000	.125	419.5	1.134	.64185	18.01341	.82177	428.3	1.159	.65541	18.39409	.80094
47	90	2.000	.250	419.5	1.134	.64185	18.01341	.82177	418.7	1.132	.64072	17.98190	.82350
48	90	3.000	.375	415.9	1.123	.63635	17.85901	.83023	415.1	1.121	.63522	17.82733	.83197
49	90	4.000	.500	403.9	1.089	.61801	17.34343	.85850	406.7	1.097	.62237	17.46666	.85177
50	270	1.000	.125	641.6	1.770	.98180	27.55417	.16219	653.7	1.804	1.00022	28.07114	.00000
51	270	2.000	.250	634.4	1.749	.97075	27.24400	.20638	646.4	1.783	.98917	27.76096	.12483
52	270	3.000	.375	615.1	1.694	.94128	26.41685	.29531	626.0	1.725	.95785	26.88212	.24878
53	270	4.000	.500	567.0	1.556	.86760	24.34900	.45505	576.6	1.584	.88233	24.76257	.42670
54	0	4.877	.610	13.2	-.029	.02019	.56660	3.20131	13.0	-.029	.01996	.56016	3.20909
55	0	5.402	.675	7.5	-.045	.01143	.32085	3.59703	7.5	-.045	.01144	.32107	3.59654
56	0	5.927	.741	7.0	-.047	.01070	.30037	3.64416	7.0	-.047	.01071	.30057	3.64366
57	0	6.452	.807	7.0	-.047	.01070	.30037	3.64416	6.8	-.047	.01047	.29374	3.66015
58	0	6.977	.872	7.2	-.046	.01095	.30719	3.62807	7.0	-.047	.01071	.30057	3.64366
59	180	6.977	.872	7.0	-.047	.01070	.30037	3.64416	6.8	-.047	.01047	.29374	3.66015
60	180	6.452	.807	7.0	-.047	.01070	.30037	3.64416	6.8	-.047	.01047	.29374	3.66015
61	180	5.927	.741	7.0	-.047	.01070	.30037	3.64416	6.8	-.047	.01047	.29374	3.66015
62	180	5.402	.675	7.0	-.047	.01070	.30037	3.64416	6.8	-.047	.01047	.29374	3.66015
63	180	4.877	.610	7.2	-.046	.01095	.30719	3.62807	6.8	-.047	.01047	.29374	3.66015

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Continued(e) $\alpha = 20^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 7923.4$ psf					$\phi = 22.5^\circ, p_t = 7923.4$ psf					$\phi = 45.0^\circ, p_t = 7924.2$ psf						
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l		
				484.4	1.318	.74034	20.77747	.66969	480.4	1.308	.73484	20.62318	.67831	477.0	1.297	.72907	20.44118	.68733		
1	0	.000	.000	484.4	1.129	.63959	17.94885	.82531	41.6	1.123	.63588	17.94599	.83094	421.9	1.139	.66480	18.09632	.81723		
2	0	.200	.025	484.4	.055	296.1	.780	.45263	12.70305	1.123	.831	.48012	13.47450	.10798	34.8	.930	.53306	14.96031	.99226	
3	0	.400	.055	296.1	.100	335.7	.893	.45263	12.70305	1.073	.814	.47096	13.21735	.109553	33.9	.903	.51841	14.54903	1.01609	
4	0	.600	.075	296.1	.100	335.7	.893	.51310	14.00222	1.0242	.883	.50761	14.24594	.103384	34.0	.906	.52024	14.60044	1.01309	
5	0	.800	.100	335.7	.125	356.1	.951	.54242	15.21552	1.0242	.907	.52043	14.65594	.101277	34.2	.913	.52390	14.70326	1.00712	
6	0	1.000	.125	356.1	.125	356.1	.951	.52776	14.81146	1.00884	34.1	.910	.52227	14.65737	1.00978	34.1	.910	.52207	14.65185	1.01010
7	0	1.200	.150	356.1	.125	356.1	.951	.52776	14.81146	1.00884	34.1	.910	.52227	14.76023	1.00382	34.6	.923	.52940	14.85749	.99819
8	0	1.400	.175	347.7	.927	531.43	14.91452	.99490	34.4	.917	.52593	14.76023	1.00382	34.7	.927	.53123	14.90890	.99522		
9	0	1.600	.200	346.5	.924	.52960	14.84309	.99787	34.4	.917	.52593	14.76023	1.00382	34.8	.930	.53306	14.96031	.99226		
10	0	1.800	.225	346.5	.924	.52960	14.86309	.99787	34.4	.917	.52593	14.76023	1.00382	34.8	.930	.53489	15.01172	.98930		
11	0	2.000	.250	346.5	.924	.52960	14.86309	.99787	34.5	.920	.52776	14.81166	1.00084	35.0	.934	.53672	15.06313	.98635		
12	0	2.200	.275	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.1	.937	.53672	15.06313	.98635		
13	0	2.400	.300	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.1	.937	.53672	15.06313	.98635		
14	0	2.600	.325	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.1	.937	.53672	15.06313	.98635		
15	0	2.800	.350	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.1	.937	.53672	15.06313	.98635		
16	0	3.000	.375	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.1	.937	.53672	15.06313	.98635		
17	0	3.200	.400	346.5	.924	.52960	14.85309	.99787	34.5	.920	.52776	14.81166	1.00084	35.2	.941	.53856	15.11454	.98010		
18	0	3.400	.425	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.0	.934	.53489	15.01172	.98930		
19	0	3.600	.450	347.7	.927	531.43	14.91452	.99490	34.5	.920	.52776	14.81166	1.00084	35.0	.934	.53672	15.01172	.98930		
20	0	3.800	.475	346.5	.924	.52960	14.86309	.99787	34.4	.917	.52593	14.76023	1.00382	34.7	.927	.53123	14.99890	.99522		
21	0	4.000	.500	347.7	.927	531.43	14.91452	.99490	34.2	.914	.52410	14.70880	1.00680	34.0	.906	.52024	14.60044	1.01309		
22	0	4.200	.525	341.7	.910	.52227	14.65737	1.00978	33.8	.900	.51677	14.70308	1.00777	34.0	.904	.50009	14.03493	1.04631		
23	0	4.400	.550	332.1	.883	.50761	14.24594	1.00384	32.6	.866	.49444	13.9979	1.00495	32.7	.869	.48626	14.21881	.94637		
24	180	.200	.025	562.4	1.541	.85961	24.12486	.44695	556.4	1.540	.85129	24.80153	.40515	525.7	1.465	.81880	22.97947	.54214		
25	180	.400	.050	606.9	1.688	.92771	26.13625	.39944	565.6	1.536	.91013	24.54278	.36925	559.8	1.534	.85560	24.01225	.67732		
26	180	.600	.075	638.3	1.758	.92771	26.13625	.39944	565.6	1.536	.91013	24.54278	.36925	559.8	1.534	.85560	24.01225	.67732		
27	180	.800	.100	647.9	1.755	.99030	27.70266	.11090	629.1	1.711	.96161	26.98762	.23713	579.1	1.589	.88787	24.43196	.63579		
28	180	1.000	.125	650.3	1.792	.99398	27.80598	.09292	632.7	1.742	.96713	27.14242	.21903	543.9	1.602	.88787	24.43196	.63579		
29	180	1.200	.150	657.7	1.799	.99766	27.99930	.05784	633.9	1.746	.96897	27.19403	.21269	585.1	1.606	.89242	25.09668	.40283		
30	180	1.400	.175	656.3	1.810	1.00138	28.15428	.00000	635.1	1.749	.97081	27.24563	.20617	585.1	1.606	.89424	25.09668	.40283		
31	180	1.600	.200	655.1	1.806	1.00134	28.12626	.00000	634.3	1.752	.97265	27.29723	.19945	586.3	1.609	.89608	25.14832	.39905		
32	180	1.800	.225	655.1	1.806	1.00134	28.12626	.00000	635.1	1.749	.97081	27.24563	.20617	586.3	1.609	.89608	25.14832	.39905		
33	180	2.000	.250	652.7	1.799	.99766	27.99930	.05784	633.9	1.746	.96897	27.19403	.21269	585.1	1.606	.89424	25.09668	.40283		
34	180	2.200	.275	650.3	1.792	.99398	27.89598	.09292	632.7	1.742	.96713	27.14242	.21903	583.9	1.602	.89240	25.04504	.60558		
35	180	2.400	.300	649.1	1.789	.99214	27.84432	.10624	631.5	1.739	.96529	27.09082	.22521	581.5	1.595	.88872	24.94176	.41402		
36	180	2.600	.325	646.7	1.782	.98846	27.74100	.12889	627.9	1.728	.95977	25.93602	.24289	579.1	1.589	.88504	24.83848	.42136		
37	180	2.800	.350	644.3	1.775	.98478	27.63768	.14820	625.5	1.722	.95610	26.43822	.25407	576.7	1.582	.88136	24.73520	.42862		
38	180	3.000	.375	640.7	1.765	.97925	27.44271	.17332	621.9	1.711	.95058	26.47801	.27005	574.3	1.575	.87768	24.63193	.3379		
39	180	3.200	.400	637.0	1.755	.97373	27.32773	.19538	617.1	1.697	.94323	26.47160	.29017	569.4	1.561	.87032	24.53777	.30991		
40	180	3.400	.425	631.0	1.737	.96453	27.09643	.22773	611.1	1.680	.93043	26.21360	.31376	564.6	1.547	.86626	24.21881	.44374		
41	180	3.600	.450	622.6	1.713	.95164	26.70782	.26704	603.9	1.660	.92308	25.93039	.34027	554.4	1.537	.88102	23.90899	.49402		
42	180	3.800	.475	614.2	1.689	.93876	26.34620	.30183	595.4	1.636	.91013	25.54278	.34025	549.2	1.503	.81904	23.54750	.50706		
43	180	4.000	.500	598.5	1.644	.91483	25.67463	.35889	579.8	1.591	.88623	24.87496	.34025	545.7	1.465	.81880	22.97947	.54214		
44	180	4.200	.525	570.8	1.565	.87249	24.48647	.44456	550.0	1.508	.84210	23.43432	.50163	509.3	1.389	.77832	21.84431	.60923		
45	180	4.400	.550	555.1	1.434	.80256	22.52342	.50749	574.7	1.398	.77591	21.77586	.61312	466.3	1.272	.71576	20.08767	.70803		
46	90	1.000	.125	436.4	1.181	.68733	18.42029	.73309	376.5	1.110	.57541	16.14882	.92482	341.6	.910	.52207	14.65185	1.01010		
47	90	2.000	.250	436.4	1.186	.67002	18.80396	.77852	378.8	1.016	.57907	16.25168	.91906	350.0	.934	.53489	15.01172	.98930		
48	90	3.000	.375	433.5	1.173	.66265	18.59732	.77982	504.0	1.034	.77039	21.62106	.62200	574.3	1.575	.53672	15.06313	.98635		
49	90	4.000	.500	407.0	1.097	.62216	17.44082	.85209	469.1	1.274	.71707	20.12461	.70599	535.7	1.465	.81880	22.97947	.54214		
50	0	4.877	.872	13.3	-.029	.02029	.56947	3.19788	13.4	-.028	.02053	.57624	3.18983	13.2	-.029	.02019	.56655	3.20137		
51	270	2.000	.250	438.3	1.186	.67002	18.80396	.77852	378.4	1.038	.78326	21.98227	.61020	583.9	1.602	.89240	25.04504	.60658		
52	270	3.000	.375	433.5	1.173	.66265	18.59732	.77982	504.0	1.034	.78063	21.62106	.62200	574.3	1.575	.87668	24.63193	.43579		
53	270	4.000	.500	407.0	1.097	.62216	17.44082	.85209	469.1	1.274	.71707	20.12461	.70599	535.7	1.465	.81880	22.97947	.54214		
54	0	4.877	.872	7.1	-.046	.01087	.30507	3.63303	7.1	-.046	.01087	.30507	3.63303	7.2	-.046	.02019	.5			

TABLE III.- TABULAR LISTING OF DATA* FOR BLUNT CONE; $M_\infty = 4.63$ - Concluded(e) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 7914.7 \text{ psf}$					$\phi = 90.0^\circ, p_t = 7914.7 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
1	0	.000	.000	477.0	1.298	.72987	20.48382	.68607	477.0	1.298	.72987	20.48382	.68607
2	0	.200	.025	441.0	1.196	.67486	18.93981	.77108	468.6	1.274	.71704	20.12355	.70504
3	0	.400	.050	394.3	1.062	.60334	16.93260	.88121	447.0	1.213	.68403	19.19715	.75699
4	0	.600	.075	383.5	1.031	.58683	16.46940	.90691	439.8	1.192	.67302	18.88835	.77390
5	0	.800	.100	379.9	1.021	.58133	16.31500	.91552	437.4	1.185	.66936	18.78541	.77953
6	0	1.000	.125	376.3	1.010	.57583	16.16060	.92416	435.0	1.178	.66569	18.69248	.78516
7	0	1.200	.150	372.7	1.000	.57033	16.00620	.93282	431.4	1.168	.66019	18.52808	.79361
8	0	1.400	.175	376.3	1.010	.57583	16.16060	.92416	436.2	1.182	.66752	18.73394	.78235
9	0	1.600	.200	377.5	1.014	.57766	16.21207	.92128	436.2	1.182	.66752	18.73394	.78235
10	0	1.800	.225	378.7	1.017	.57950	16.26353	.91840	436.2	1.182	.66752	18.73394	.78235
11	0	2.000	.250	379.9	1.021	.58133	16.31500	.91552	436.2	1.182	.66752	18.73394	.78235
12	0	2.200	.275	381.1	1.024	.58316	16.36647	.91265	437.4	1.185	.66936	18.78541	.77953
13	0	2.400	.300	381.1	1.024	.58316	16.36647	.91265	437.4	1.185	.66936	18.78541	.77953
14	0	2.600	.325	381.1	1.024	.58316	16.36647	.91265	436.2	1.182	.66752	18.73394	.78235
15	0	2.800	.350	379.9	1.021	.58133	16.31500	.91552	436.2	1.182	.66752	18.73394	.78235
16	0	3.000	.375	379.9	1.021	.58133	16.31500	.91552	432.6	1.172	.66202	18.57954	.79079
17	0	3.200	.400	379.9	1.021	.58133	16.31500	.91552	430.2	1.165	.65835	18.47661	.79642
18	0	3.400	.425	376.3	1.010	.57583	16.16060	.92416	426.6	1.154	.65285	18.32221	.80487
19	0	3.600	.450	373.9	1.003	.57216	16.05767	.92993	421.9	1.141	.64552	18.11634	.81614
20	0	3.800	.475	369.1	.990	.56483	15.85180	.94150	414.7	1.120	.63451	17.80754	.83305
21	0	4.000	.500	365.5	.979	.55932	15.69740	.95022	407.5	1.099	.62351	17.49874	.85000
22	0	4.200	.525	354.7	.949	.54282	15.23420	.97655	390.7	1.051	.59784	16.77820	.88976
23	0	4.400	.550	336.8	.897	.51531	14.46219	1.02116	365.5	.979	.55932	15.69740	.95022
24	180	.200	.025	505.6	1.380	.77365	21.71248	.61676	473.8	1.289	.72495	20.34569	.69374
25	180	.400	.050	509.2	1.391	.77918	21.86757	.60784	448.5	1.217	.68631	19.26128	.75348
26	180	.600	.075	509.2	1.391	.77918	21.86757	.60784	438.9	1.189	.67159	18.84817	.77610
27	180	.800	.100	509.2	1.391	.77918	21.86757	.60784	435.3	1.179	.66607	18.69325	.78457
28	180	1.000	.125	511.6	1.398	.78286	21.97096	.60186	435.3	1.179	.66607	18.69325	.78457
29	180	1.200	.150	512.8	1.401	.78470	22.02266	.59886	436.5	1.183	.66791	18.74489	.78175
30	180	1.400	.175	514.0	1.404	.78655	22.07436	.59586	437.7	1.186	.66975	18.79653	.77892
31	180	1.600	.200	512.8	1.401	.78470	22.02266	.59886	436.5	1.183	.66791	18.74489	.78175
32	180	1.800	.225	514.0	1.404	.78655	22.07436	.59586	437.7	1.186	.66975	18.79653	.77892
33	180	2.000	.250	512.8	1.401	.78470	22.02266	.59886	436.5	1.183	.66791	18.74489	.78175
34	180	2.200	.275	512.8	1.401	.78470	22.02266	.59886	437.7	1.186	.66975	18.79653	.77892
35	180	2.400	.300	509.2	1.391	.77918	21.86757	.60784	435.3	1.179	.66607	18.69325	.78457
36	180	2.600	.325	508.0	1.387	.77734	21.81588	.61082	434.1	1.176	.66423	18.64161	.78740
37	180	2.800	.350	506.8	1.384	.77549	21.76418	.61379	434.1	1.176	.66423	18.64161	.78740
38	180	3.000	.375	504.4	1.377	.77181	21.66079	.61973	432.9	1.172	.66239	18.58997	.79022
39	180	3.200	.400	500.8	1.367	.76628	21.50570	.62859	430.5	1.165	.65871	18.48670	.79587
40	180	3.400	.425	494.8	1.349	.75707	21.24722	.64327	425.7	1.152	.65135	18.28014	.80717
41	180	3.600	.450	488.7	1.332	.74786	20.98873	.65785	422.1	1.141	.64583	18.12523	.81565
42	180	3.800	.475	481.5	1.311	.73681	20.67855	.67522	416.0	1.124	.63663	17.86703	.82797
43	180	4.000	.500	469.5	1.277	.71839	20.16159	.70394	407.6	1.100	.62375	17.50556	.84963
44	180	4.200	.525	446.6	1.211	.66339	19.17936	.75797	392.0	1.055	.59983	16.83426	.88665
45	180	4.400	.550	412.9	1.115	.63182	17.73186	.83720	365.5	.979	.55935	15.69820	.95017
46	90	1.000	.125	340.4	.907	.52081	14.61659	1.01215	355.9	.952	.54465	15.28566	.97361
47	90	2.000	.250	346.4	.925	.52998	14.87393	.99724	346.4	.925	.52998	14.87393	.99724
48	90	3.000	.375	346.4	.925	.52998	14.87393	.99724	346.4	.925	.52998	14.87393	.99724
49	90	4.000	.500	340.4	.907	.52081	14.61659	1.01215	342.8	.914	.52448	14.71953	1.00618
50	270	1.000	.125	632.0	1.742	.96706	27.14060	.21925	650.5	1.795	.99543	27.93660	.08094
51	270	2.000	.250	633.2	1.745	.96891	27.19230	.21290	651.7	1.799	.99727	27.98824	.06254
52	270	3.000	.375	621.2	1.711	.95049	26.67534	.27032	638.5	1.761	.99703	27.42021	.18251
53	270	4.000	.500	581.4	1.597	.88970	24.96936	.41204	597.6	1.644	.91447	25.66449	.35969
54	0	4.877	.610	13.1	-.029	.02000	.56140	3.20758	13.1	-.029	.01997	.56055	3.20861
55	0	5.402	.675	7.5	-.045	.01147	.32178	3.59496	7.5	-.045	.01145	.32129	3.59604
56	0	5.927	.741	7.0	-.047	.01073	.30124	3.64207	7.0	-.047	.01072	.30078	3.64316
57	0	6.452	.807	6.9	-.047	.01049	.29439	3.65856	7.0	-.047	.01072	.30078	3.64316
58	0	6.977	.872	7.0	-.047	.01073	.30124	3.64207	7.0	-.047	.01072	.30078	3.64316
59	180	6.977	.872	7.0	-.047	.01073	.30124	3.64207	7.0	-.047	.01072	.30078	3.64316
60	180	6.452	.807	6.9	-.047	.01049	.29439	3.65856	7.0	-.047	.01072	.30078	3.64316
61	180	5.927	.741	6.9	-.047	.01049	.29439	3.65856	7.0	-.047	.01072	.30078	3.64316
62	180	5.402	.675	6.9	-.047	.01049	.29439	3.65856	7.0	-.047	.01072	.30078	3.64316
63	180	4.877	.610	6.9	-.047	.01049	.29439	3.65856	7.0	-.047	.01072	.30078	3.64316

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE IV.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_{\infty} = 2.96$ (a) $\alpha = 0^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 3254.8$ psf					$\phi = 22.5^\circ$, $p_t = 3254.1$ psf					$\phi = 45.0^\circ$, $p_t = 3255.8$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
2	0	.253	.032	1080.2	1.709	.97669	11.47959	1.18387	1080.2	1.709	.97690	11.49204	1.18303	1081.4	1.710	.97748	11.48881	.18070
3	0	.453	.057	1068.8	1.684	.96367	11.32652	2.23054	1065.8	1.684	.96389	11.32912	2.22982	1061.7	1.687	.96554	11.34855	.22438
4	0	.653	.082	1058.6	1.671	.95716	11.24999	2.25089	1056.6	1.672	.95739	11.25245	2.25021	1061.0	1.675	.95903	11.27204	.24519
5	0	.853	.107	1045.4	1.648	.94522	11.10969	2.28484	1045.4	1.649	.94546	11.11247	2.28240	1047.8	1.652	.94710	11.13178	.27973
6	0	1.053	.132	1034.6	1.630	.93545	10.99489	3.10222	1034.6	1.630	.93570	10.99778	3.0960	1035.8	1.631	.93625	11.00427	.30821
7	0	1.253	.157	1023.8	1.611	.92569	10.88010	3.33398	1022.7	1.609	.92486	10.87034	3.33593	1025.0	1.612	.92649	10.88951	.33208
8	0	1.453	.182	1014.2	1.594	.91700	10.77806	3.35401	1014.3	1.595	.91727	10.78114	3.35342	1016.6	1.598	.91889	10.80025	.34973
9	0	1.653	.207	1004.6	1.578	.90832	10.67601	3.37319	1007.1	1.582	.91076	10.70468	3.36788	1007.0	1.581	.91021	10.69824	.36908
10	0	1.853	.232	996.2	1.563	.90073	10.58673	3.38938	997.5	1.566	.92029	10.60273	3.36652	999.8	1.569	.90370	10.62173	.38309
11	0	2.053	.257	987.8	1.549	.89313	10.49744	4.0509	989.1	1.551	.89450	10.51352	4.0229	990.2	1.552	.89502	10.51972	.40121
12	0	2.253	.282	979.4	1.534	.88553	10.40816	4.2038	980.7	1.537	.88691	10.42432	4.1764	983.0	1.540	.88852	10.44321	.41442
13	0	2.453	.307	969.8	1.517	.87685	10.30612	4.3739	971.1	1.520	.87823	10.32337	4.3471	973.4	1.523	.87984	10.34120	.43159
14	0	2.653	.332	960.2	1.501	.86817	10.20408	4.5397	961.5	1.503	.86956	10.22042	4.5134	963.8	1.506	.87116	10.23920	.44831
15	0	2.853	.357	949.4	1.482	.85840	10.09828	4.7217	949.5	1.483	.85872	10.09298	4.7154	950.8	1.486	.86031	10.11168	.46650
16	0	3.053	.382	937.4	1.461	.84755	9.96173	4.9190	937.7	1.464	.84896	9.97829	4.8937	941.8	1.487	.86054	9.9992	.48550
17	0	3.253	.407	923.0	1.436	.83453	9.80867	5.1498	924.3	1.439	.83595	9.85536	5.1249	926.7	1.442	.83233	9.88391	.50972
18	0	3.453	.432	909.8	1.413	.82259	9.66836	5.35565	914.1	1.444	.82294	9.6744	5.3506	913.4	1.419	.82559	9.70365	.5350
19	0	3.653	.457	894.2	1.386	.80848	9.50255	5.5577	894.4	1.387	.80884	9.50677	5.5897	897.8	1.392	.81149	9.5798	.55452
20	0	3.853	.482	872.6	1.349	.78895	9.27795	5.7193	872.8	1.350	.78933	9.27739	5.9131	875.0	1.353	.79088	9.29561	.58877
21	0	4.053	.507	851.0	1.311	.76942	9.03336	6.2357	850.0	1.310	.76873	9.03526	6.2468	853.4	1.315	.77135	9.06609	.62047
22	0	4.253	.532	829.8	1.272	.72818	8.8057	8.057	823.1	1.233	.72861	8.6807	8.07	7.7	1.236	.73012	8.58154	.68668
23	0	4.453	.557	799.3	1.233	.68440	8.51714	7.8086	799.7	1.199	.68589	7.86288	7.8011	741.7	1.122	.67045	7.88023	.77784
24	180	.253	.032	1081.4	1.711	.97778	11.49204	1.17945	1080.2	1.709	.97690	11.49208	1.18301	1081.4	1.710	.97748	11.48890	.18067
25	180	.453	.057	1068.2	1.688	.95852	11.35178	2.2346	1057.0	1.686	.96494	11.34143	2.22539	1057.0	1.685	.96442	11.33537	.22809
26	180	.653	.082	1056.1	1.667	.95494	11.22394	2.25749	1054.9	1.665	.95466	11.21357	2.26008	1054.9	1.664	.95354	11.20743	.26160
27	180	.853	.107	1044.1	1.646	.94046	11.09611	2.28794	1042.9	1.644	.94318	11.08571	2.29030	1044.1	1.646	.94374	11.09229	.28881
28	180	1.053	.132	1032.1	1.625	.93319	10.94827	3.1586	1032.1	1.626	.93339	10.97063	3.1536	1032.0	1.625	.93285	10.96435	.31668
29	180	1.253	.157	1023.7	1.611	.92557	10.87879	3.3424	1023.7	1.611	.92577	10.88113	3.3377	1023.6	1.610	.92523	10.87479	.33504
30	180	1.453	.182	1012.6	1.590	.91470	10.75095	3.5918	1012.8	1.592	.91598	10.76605	3.5631	1014.0	1.593	.91653	10.77244	.35508
31	180	1.653	.207	1003.4	1.575	.90708	10.66147	3.7586	1004.4	1.578	.90837	10.67655	3.7309	1004.3	1.577	.90782	10.67009	.37428
32	180	1.853	.232	994.8	1.561	.89947	10.51798	3.9201	996.0	1.563	.90075	10.58704	3.8932	995.9	1.562	.90020	10.58053	.39049
33	180	2.053	.257	984.0	1.542	.88698	10.45693	4.1208	986.4	1.546	.88920	10.48475	4.0729	986.3	1.545	.89149	10.47818	.40842
34	180	2.253	.282	978.0	1.532	.88424	10.39301	4.29293	980.4	1.536	.88661	10.42082	4.1823	980.3	1.535	.88665	10.41421	.41935
35	180	2.453	.307	969.9	1.511	.87337	10.26518	4.44049	968.3	1.515	.87573	10.29296	4.3955	987.8	1.514	.87516	10.28627	.44665
36	180	2.653	.332	956.3	1.494	.86467	10.16291	4.60555	956.3	1.494	.86485	10.16510	4.62020	974.4	1.495	.86537	10.17113	.45924
37	180	2.853	.357	944.3	1.473	.85379	10.03507	4.8061	946.7	1.478	.85615	10.06511	4.8177	954.7	1.477	.86577	10.05569	.47177
38	180	3.053	.382	933.4	1.454	.84400	9.92002	4.98295	935.9	1.459	.84636	9.94044	5.00773	936.9	1.460	.84686	9.94363	.49314
39	180	3.253	.407	922.6	1.436	.83421	9.80457	5.1553	923.8	1.438	.83421	9.81987	5.1331	924.9	1.439	.84599	9.82569	.51244
40	180	3.453	.432	904.6	1.404	.81960	9.61120	5.24747	905.7	1.417	.81960	9.62807	5.2151	908.0	1.410	.82074	9.64458	.53883
41	180	3.653	.457	884.9	1.377	.80376	9.47403	5.3747	890.1	1.380	.80502	9.46185	5.35537	892.3	1.383	.80659	9.49026	.56275
42	180	3.853	.482	869.7	1.346	.78645	9.24250	5.5016	872.4	1.348	.78670	9.27006	5.59233	873.1	1.349	.78917	9.27556	.59157
43	180	4.053	.507	854.5	1.322	.76460	9.04629	5.62127	869.0	1.307	.76694	9.01433	5.62753	847.8	1.306	.76631	9.00688	.62855
44	180	4.253	.532	798.1	1.215	.71892	6.44992	7.03111	796.3	1.217	.72017	6.46652	7.0118	799.6	1.222	.72277	6.49513	.69713
45	180	4.453	.557	742.2	1.123	.67107	7.78874	7.77690	742.2	1.123	.67121	7.88914	7.77668	744.2	1.126	.67270	7.90661	.77440
46	90	1.053	.132	1035.8	1.632	.93645	11.00662	3.07711	1035.7	1.632	.93665	11.00899	3.0720	1035.6	1.631	.93733	11.01702	.30547
47	90	2.053	.257	991.4	1.555	.89638	10.53571	3.39841	990.3	1.553	.89558	10.52627	3.40007	991.4	1.554	.89611	10.53247	.39898
48	90	3.053	.382	939.8	1.465	.84972	9.98728	4.8779	939.9	1.466	.85004	9.99103	4.8714	938.6	1.463	.84837	9.97142	.49042
49	90	4.053	.507	849.8	1.309	.76833	9.03061	6.25311	848.8	1.308	.76764	9.02251	6.26642	848.6	1.307	.76701	9.01508	.52743
50	270	1.053	.132	1035.7	1.632	.93645	11.00662	3.07711	1035.7	1.632	.93665	11.00899	3.0720	1035.6	1.631	.93612	11.00273	.30854
51	270	2.053	.257	988.8	1.550	.89403	10.50807	4.0324	990.0	1.553	.89531	10.52311	4.0062	987.5	1.547	.89258	10.49097	.40521
52	270	3.053	.382	937.1	1.461	.84726	9.95837	4.9241	938.3	1.463	.84853	9.97330	4.90133	935.7	1.458	.84577	9.94084	.49509
53	270	4.053	.507	848.0	1.306	.76678	9.01239	6.2780	848.0	1.307	.76694	9.01433	6.2753	845.4	1.301	.76413	9.09130	.63203
54	0	4.931	.616	36.5	-1.100	.03299	.38779	2.87260	3h.5	-1.100	.02997	.35230	2.93604	33.1	-1.100	.03300	.38783	.287253
55	0	5.456	.682	32.6	-1.06	.02952	.34697	2.94614	32.7	-1.06	.02954	.34719	2.94572	32.8	-1.06	.0		

TABLE IV.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_{\infty} = 2.96$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 3256.1$ psf					$\phi = 90.0^\circ$, $p_t = 3257.2$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
2	0	.253	.032	1080.2	1.708	.97630	11.47499	.18543	1081.4	1.709	.97705	11.48384	.18241
3	0	.453	.057	1065.8	1.683	.96330	11.32216	.23175	1067.0	1.684	.96405	11.33107	.22928
4	0	.653	.082	1058.6	1.671	.95679	11.24574	.25198	1059.8	1.672	.95756	11.25468	.24969
5	0	.853	.107	1046.6	1.650	.94956	11.11838	.28284	1046.6	1.649	.94564	11.11463	.28371
6	0	1.053	.132	1035.8	1.631	.93621	11.00376	.30832	1037.0	1.633	.93697	11.01278	.30638
7	0	1.253	.157	1025.0	1.612	.92645	10.88914	.33216	1025.0	1.612	.92614	10.88546	.33290
8	0	1.453	.182	1016.7	1.598	.91887	10.79999	.34978	1016.7	1.597	.91856	10.79634	.35048
9	0	1.653	.207	1008.3	1.583	.91128	10.71084	.36673	1008.3	1.583	.91098	10.70722	.36740
10	0	1.853	.232	998.7	1.567	.90262	10.60895	.38540	999.9	1.568	.90339	10.61810	.38375
11	0	2.053	.257	990.3	1.552	.89503	10.51980	.40120	990.3	1.552	.89473	10.51625	.40182
12	0	2.253	.282	983.1	1.540	.88853	10.44339	.41439	983.1	1.539	.88823	10.43986	.41499
13	0	2.453	.307	973.5	1.523	.87986	10.34150	.43154	974.7	1.525	.88065	10.35074	.43001
14	0	2.653	.332	963.9	1.507	.87119	10.23961	.44824	965.1	1.508	.87198	10.24889	.44674
15	0	2.853	.357	953.1	1.488	.86144	10.12499	.46656	953.1	1.487	.86115	10.12157	.46710
16	0	3.053	.382	941.1	1.467	.85060	9.99763	.48640	941.1	1.467	.85032	9.99425	.48691
17	0	3.253	.407	927.9	1.444	.83869	9.85754	.50768	929.1	1.446	.83949	9.86694	.50627
18	0	3.453	.432	913.6	1.419	.82568	9.70471	.53034	913.6	1.419	.82540	9.70143	.53082
19	0	3.653	.457	894.0	1.392	.81160	9.53914	.55434	898.0	1.392	.81132	9.53592	.55480
20	0	3.853	.482	876.4	1.355	.79209	9.30990	.58678	876.4	1.354	.79182	9.30675	.58721
21	0	4.053	.507	852.4	1.313	.77042	9.05518	.62196	853.6	1.315	.77124	9.06485	.62064
22	0	4.253	.532	808.1	1.237	.73033	8.58395	.68536	809.2	1.238	.73116	8.59379	.68405
23	0	4.453	.557	742.1	1.122	.67073	7.88348	.77742	742.1	1.122	.67051	7.88082	.77777
24	180	.253	.032	1079.0	1.706	.97522	11.46225	.18969	1079.0	1.705	.97489	11.45838	.19096
25	180	.453	.057	1065.8	1.683	.96326	11.32169	.23188	1065.8	1.682	.96294	11.31802	.23288
26	180	.653	.082	1053.7	1.662	.95238	11.19390	.26492	1055.0	1.664	.95317	11.20318	.26265
27	180	.853	.107	1042.9	1.643	.94260	11.07890	.29183	1043.0	1.643	.94232	11.07558	.29257
28	180	1.053	.132	1032.1	1.625	.93282	10.96389	.31678	1033.3	1.626	.93363	10.97351	.31476
29	180	1.253	.157	1023.7	1.610	.92520	10.87444	.33511	1023.7	1.610	.92495	10.87143	.33572
30	180	1.453	.182	1014.0	1.593	.91651	10.77222	.35513	1014.1	1.593	.91626	10.76935	.35568
31	180	1.653	.207	1004.4	1.577	.90781	10.66999	.37430	1004.5	1.576	.90758	10.66727	.37480
32	180	1.853	.232	996.0	1.562	.90020	10.58054	.39048	996.1	1.562	.89998	10.57795	.39195
33	180	2.053	.257	986.4	1.545	.89150	10.47831	.40840	986.5	1.545	.89129	10.47587	.40882
34	180	2.253	.282	980.4	1.535	.88607	10.41442	.41932	980.5	1.535	.88587	10.41207	.41972
35	180	2.453	.307	968.3	1.514	.87519	10.28664	.44059	968.5	1.514	.87501	10.28447	.44094
36	180	2.653	.332	957.5	1.495	.86541	10.17163	.45916	957.6	1.495	.86524	10.16963	.45948
37	180	2.853	.357	947.9	1.479	.85671	10.06940	.47528	949.2	1.481	.85764	10.08031	.47357
38	180	3.053	.382	938.3	1.462	.84801	9.96718	.49107	938.4	1.462	.84787	9.96547	.49133
39	180	3.253	.407	926.4	1.441	.83714	9.83939	.51040	927.6	1.443	.83810	9.85063	.50871
40	180	3.453	.432	909.4	1.412	.82192	9.66049	.53680	909.6	1.412	.82181	9.65924	.53698
41	180	3.653	.457	893.8	1.385	.80779	9.49437	.56074	894.0	1.385	.80770	9.49336	.56088
42	180	3.853	.482	874.5	1.352	.79039	9.28992	.58956	874.7	1.352	.79033	9.28920	.58966
43	180	4.053	.507	849.2	1.308	.76756	9.02157	.62654	850.7	1.310	.76862	9.03400	.62485
44	180	4.253	.532	799.9	1.222	.72299	8.49766	.66680	801.4	1.225	.72411	8.51085	.69505
45	180	4.453	.557	745.8	1.129	.67404	7.92263	.77230	748.6	1.133	.67634	7.94941	.76880
46	90	1.053	.132	1035.8	1.631	.93621	11.00376	.30832	1035.8	1.630	.93589	11.00005	.30912
47	90	2.053	.257	989.1	1.550	.89395	10.50706	.40342	989.1	1.550	.89365	10.50352	.40404
48	90	3.053	.382	937.5	1.461	.84735	9.95942	.49225	936.3	1.458	.84598	9.94333	.49471
49	90	4.053	.507	846.4	1.303	.76500	8.99150	.63064	846.4	1.303	.76674	8.98846	.63105
50	270	1.053	.132	1035.7	1.631	.93608	11.00223	.30865	1035.7	1.630	.93580	10.99902	.30934
51	270	2.053	.257	987.6	1.548	.89259	10.49109	.46619	987.7	1.547	.89238	10.48863	.46662
52	270	3.053	.382	934.7	1.456	.84475	9.92884	.49691	934.8	1.456	.84461	9.92719	.49716
53	270	4.053	.507	842.0	1.295	.76104	8.94490	.63697	843.5	1.297	.76210	8.95744	.63526
54	0	4.931	.616	36.9	-.099	.03339	.39246	.286471	37.0	-.099	.03342	.39277	2.86620
55	0	5.456	.682	33.6	-.105	.03036	.35679	.292765	33.6	-.105	.03038	.35706	2.92714
56	0	5.981	.748	33.4	-.105	.03021	.35509	.293081	33.5	-.105	.03023	.35536	2.93030
57	0	6.506	.813	32.9	-.106	.02978	.34999	.294039	33.0	-.106	.02980	.35026	2.93988
58	0	7.031	.879	32.5	-.107	.02934	.34489	.295012	32.5	-.107	.02937	.34516	2.94961
59	180	7.031	.879	32.0	-.108	.02891	.33980	.296001	32.0	-.108	.02893	.34006	2.95949
60	180	6.506	.813	32.8	-.106	.02963	.34829	.294362	32.7	-.106	.02951	.34686	2.94635
61	180	5.981	.748	31.8	-.108	.02877	.33810	.296334	31.7	-.108	.02864	.33666	2.96617
62	180	5.456	.682	31.7	-.108	.02862	.33640	.296669	31.5	-.108	.02850	.33496	2.96954
63	180	4.931	.616	32.3	-.107	.02920	.34319	.295340	32.2	-.107	.02908	.34176	2.95618

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE IV.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 2.96$ - Continued(b) $\alpha = 20^\circ$

Orifice	θ, deg	s, in.	s/d	$\phi = 0.0^\circ, p_t = 3253.2 \text{ psf}$					$\phi = 22.5^\circ, p_t = 3254.2 \text{ psf}$					$\phi = 45.0^\circ, p_t = 3255.8 \text{ psf}$				
				p_l, psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l, psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l, psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	743.3	1.126	.67241	7.90326	.77483	681.0	1.017	.61583	7.23818	.86186	646.9	.958	.58475	6.87288	*91017
3	0	.453	.057	756.7	1.078	.66747	7.61007	.81313	701.3	1.052	.63426	7.45481	.83346	676.9	1.010	.61187	7.19166	*86798
4	0	.653	.082	727.1	1.144	.68217	8.01798	.75984	707.3	1.063	.63968	7.51453	.82525	700.9	1.051	.63357	7.44669	*83450
5	0	.853	.107	727.1	1.099	.65832	7.73754	.79648	715.7	1.077	.64727	7.60773	.81344	706.9	1.062	.63899	7.51044	*82616
6	0	1.053	.132	716.9	1.080	.64855	7.62282	.81147	706.1	1.061	.63860	7.50579	.82677	703.3	1.055	.63574	7.47219	*83117
7	0	1.253	.157	699.0	1.049	.63229	7.43161	.83648	697.8	1.046	.63101	7.41658	.83845	697.3	1.045	.63031	7.40843	*83952
8	0	1.453	.182	702.5	1.055	.63554	7.46498	.83147	697.8	1.046	.63101	7.41658	.83845	699.7	1.049	.63248	7.43394	*83957
9	0	1.653	.207	697.8	1.047	.63120	7.41886	.83815	694.2	1.040	.62776	7.37835	.84346	697.3	1.045	.63031	7.40843	*83952
10	0	1.853	.232	694.2	1.040	.62795	7.38062	.84316	691.8	1.036	.62559	7.35287	.84680	696.1	1.033	.63223	7.37068	*84119
11	0	2.053	.257	691.8	1.036	.62578	7.35513	.84650	689.4	1.032	.62342	7.32738	.85014	693.7	1.039	.62706	7.37018	*84453
12	0	2.253	.282	691.8	1.036	.62578	7.35513	.84650	687.0	1.028	.62125	7.30189	.85584	692.5	1.037	.62597	7.35743	*84620
13	0	2.453	.307	689.4	1.032	.62361	7.32963	.84985	684.6	1.023	.61908	7.26641	.86584	691.3	1.034	.62489	7.34468	*84787
14	0	2.653	.332	685.8	1.026	.62036	7.29139	.85487	681.0	1.017	.61583	7.2318	.86186	688.9	1.030	.62272	7.31918	*85122
15	0	2.853	.357	684.6	1.024	.61927	7.27864	.85654	678.6	1.013	.61366	7.21269	.86522	685.3	1.024	.61947	7.28092	*85624
16	0	3.053	.382	681.0	1.017	.61602	7.24040	.86157	676.2	1.009	.61076	7.19721	.87487	681.7	1.018	.61621	7.24267	*86127
17	0	3.253	.407	676.2	1.009	.61168	7.18941	.87164	669.2	1.001	.60716	7.13623	.87526	678.1	1.012	.61296	7.20442	*86531
18	0	3.453	.432	673.8	1.005	.60951	7.16392	.87164	665.9	.994	.60499	7.11075	.87865	673.3	1.003	.60862	7.15341	*87302
19	0	3.653	.457	672.6	1.003	.60843	7.1417	.87164	665.2	.990	.60173	7.07252	.88370	668.5	.995	.60428	7.10241	*87975
20	0	3.853	.482	665.4	.990	.60792	7.07469	.88341	659.6	.986	.59561	7.00880	.89213	660.1	.980	.59668	7.01315	*89155
21	0	4.053	.507	665.4	.990	.60192	7.07469	.88341	655.8	.973	.59306	6.97057	.89719	655.3	.972	.59234	6.96214	*89831
22	0	4.253	.532	662.8	.985	.58348	6.87799	.91215	641.4	.949	.58005	6.81765	.91753	634.9	.937	.57390	6.74537	*92719
23	0	4.453	.557	616.2	.905	.55745	6.55205	.95319	611.0	.897	.55294	6.49907	.96036	602.5	.881	.54461	6.40109	*97368
24	180	.257	.322	1032.9	1.428	.99469	10.98591	.31213	1014.0	1.594	.91704	10.77851	.35392	940.5	1.466	.85013	9.99201	*48726
25	180	.453	.507	1064.2	1.689	.96628	11.35723	.22191	1044.1	1.646	.94424	11.09815	.28748	969.4	1.516	.87625	10.29997	*43855
26	180	.653	.682	1046.2	1.720	.98262	11.54929	.15845	1059.8	1.674	.95838	11.26437	.24719	985.1	1.543	.89040	10.46539	*41062
27	180	.853	.857	1049.4	1.735	.99025	11.63892	.11841	1068.2	1.688	.96599	11.35387	.22287	993.5	1.558	.89802	10.55494	*39528
28	180	1.053	.132	1094.3	1.741	.99352	11.67734	.09645	1073.0	1.697	.97035	11.40501	.20782	999.5	1.568	.90346	10.61891	*38360
29	180	1.253	.157	1110.9	1.747	.99678	11.71575	.06786	1076.6	1.703	.97361	11.44337	.19584	1001.9	1.573	.90782	10.65150	*37496
30	180	1.453	.182	1101.9	1.747	.99678	11.71575	.06786	1076.6	1.703	.97361	11.44337	.19584	1004.3	1.577	.90782	10.67009	*37428
31	180	1.653	.207	1101.9	1.747	.99678	11.71575	.06786	1076.6	1.701	.97259	11.34059	.19991	1004.3	1.577	.90782	10.67009	*37428
32	180	1.853	.232	1101.9	1.747	.99678	11.71575	.06786	1073.0	1.697	.97035	11.40501	.19703	1011.7	1.570	.90555	10.63171	*38129
33	180	2.053	.257	1101.9	1.747	.99678	11.71575	.06786	1073.0	1.697	.97035	11.40501	.19703	1011.7	1.570	.90555	10.63171	*38129
34	180	2.253	.282	1095.9	1.737	.99134	11.65173	.11156	1070.6	1.692	.96382	11.20300	.21005	992.3	1.556	.89693	10.54215	*39728
35	180	2.453	.307	1093.5	1.733	.98916	11.62612	.12689	1065.9	1.684	.95947	11.17716	.24386	987.5	1.547	.89258	10.49997	*40621
36	180	2.653	.332	1088.6	1.724	.98480	11.57490	.14808	1061.0	1.676	.95947	11.17697	.25697	982.7	1.539	.88822	10.43980	*41501
37	180	2.853	.357	1082.6	1.714	.97935	11.51088	.10564	1056.4	1.667	.95512	11.22601	.27563	977.8	1.531	.88387	10.38862	*42367
38	180	3.053	.382	1076.6	1.703	.97391	11.46466	.10472	1049.9	1.655	.94989	11.14930	.27325	976.0	1.518	.87734	10.31186	*43644
39	180	3.253	.407	1068.2	1.689	.96640	11.37523	.02191	1041.7	1.642	.94204	11.07258	.31957	958.6	1.497	.86645	10.18392	*45720
40	180	3.453	.432	1057.3	1.670	.95640	11.24200	.02594	1030.9	1.624	.93227	10.95751	.31812	958.6	1.477	.85557	10.05598	*47737
41	180	3.653	.457	1024.6	1.611	.92597	10.89348	.33330	994.8	1.567	.90290	10.61229	.38480	929.7	1.447	.84033	9.87687	*50477
42	180	3.853	.482	1023.6	1.611	.90419	10.62740	.38207	973.1	1.523	.88006	10.34379	.43116	908.0	1.410	.82074	9.64658	*53883
43	180	4.053	.507	999.5	1.570	.85770	10.42433	.47011	925.0	1.440	.83654	9.83235	.51145	859.8	1.326	.77720	9.13482	*61104
44	180	4.253	.532	950.1	1.484	.85952	10.10243	.47011	925.0	1.440	.83654	9.83235	.51145	859.8	1.326	.77720	9.13482	*61104
45	180	4.453	.557	877.9	1.359	.79416	9.34319	.58338	855.3	1.319	.77345	9.09077	.61709	793.6	1.212	.71733	8.43116	*70559
46	90	1.053	.132	793.7	1.213	.71796	8.43864	.70460	725.3	1.094	.65594	7.07968	.80012	704.5	1.057	.63682	7.48494	*82950
47	90	2.053	.257	802.1	1.227	.72556	8.52787	.69280	728.9	1.100	.65920	7.74791	.79513	696.1	1.043	.62923	7.39568	*84171
48	90	3.053	.382	787.7	1.202	.71254	8.34790	.71301	714.5	1.075	.64619	7.54994	.81510	682.9	1.020	.61730	7.25542	*85660
49	90	4.053	.507	730.1	1.103	.66048	7.76304	.79315	671.4	1.001	.60716	7.13623	.87525	649.3	.962	.58692	6.89839	*90578
50	270	1.053	.132	791.2	1.209	.71572	8.41229	.70808	896.2	1.390	.81043	9.52549	.55629	998.3	1.566	.90346	10.61891	*38360
51	270	2.053	.257	799.6	1.223	.72335	8.50192	.69624	902.2	1.400	.81587	9.58942	.54711	999.5	1.566	.88149	10.36304	*42796
52	270	3.053	.382	782.8	1.194	.70810	8.32266	.71989	879.3	1.361	.79521	9.36464	.54711	975.4	1.527	.88159	10.36204	*42796
53	270	4.053	.507	727.4	1.098	.65799	7.73367	.79698	812.0	1.244	.73429	8.63488	.57117	907.0	1.599	.81529	9.59261	*54809
54	0	4.931	.616	28.0	-1.115	.02532	.29763	.304836	26.7	-1.117	.02115	.23889	.308007	25.7	-1.118	.02327	.23756	*310502
55	0	5.456	.682	23.2	-1.123	.02101	.24690	.317433	22.1	-1.125	.01996	.23460	.320909	21.3	-1.126	.01923	.22598	*323459
56	0	5.981	.744	22.1	-1.125	.02000	.23568	.32673	21.1	-1.126	.01909	.22440	.323941	20.6	-1.127	.01865	.21919	*325547
5																		

TABLE IV.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_{\infty} = 2.96$ - Concluded(b) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 3256.1$ psf					$\phi = 90.0^\circ$, $p_t = 3256.0$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
				.253	.032	612.6	.898	.55371	6.50801	.95915	.664.2	.988	.60037
2	0	.253	.057	667.8	.994	.60355	7.09386	.80088	727.8	1.098	.65781	7.73161	.79725
3	0	.453	.082	718.1	1.081	.64906	7.62877	.81069	777.0	1.183	.70224	8.25384	.72894
4	0	.653	.107	722.9	1.089	.65339	7.67971	.80403	788.9	1.204	.71308	8.3121	.71218
5	0	.853	.132	722.9	1.089	.65339	7.67971	.80403	790.1	1.206	.71416	8.39395	.71050
6	0	1.053	.157	720.5	1.085	.65123	7.65424	.80736	790.1	1.206	.71416	8.39395	.71050
7	0	1.253	.182	727.7	1.097	.65773	7.73065	.79738	799.7	1.222	.72283	8.49585	.69704
8	0	1.453	.207	727.7	1.097	.65773	7.73065	.79738	799.7	1.222	.72283	8.49585	.69704
9	0	1.653	.232	727.7	1.097	.65773	7.73065	.79738	800.9	1.224	.72392	8.50859	.69535
10	0	1.853	.257	726.5	1.095	.65665	7.71792	.79904	800.9	1.224	.72392	8.50859	.69535
11	0	2.053	.282	726.5	1.095	.65665	7.71792	.79904	800.9	1.224	.72392	8.50859	.69535
12	0	2.253	.307	725.3	1.093	.65556	7.70518	.80071	799.7	1.222	.72283	8.49585	.69704
13	0	2.453	.332	721.7	1.087	.65231	7.66697	.80570	797.3	1.218	.72066	8.47038	.70041
14	0	2.653	.357	719.3	1.083	.65014	7.64150	.80903	792.5	1.210	.71633	8.41943	.70714
15	0	2.853	.382	715.7	1.077	.64689	7.60329	.81402	787.7	1.201	.71200	8.36848	.71386
16	0	3.053	.407	709.7	1.066	.64148	7.53961	.82234	779.3	1.187	.70441	8.27931	.72559
17	0	3.253	.432	704.9	1.058	.63714	7.48867	.82901	772.2	1.174	.69791	8.20289	.73562
18	0	3.453	.457	695.4	1.041	.62847	7.38678	.84235	762.6	1.158	.68924	8.10099	.74898
19	0	3.653	.482	685.8	1.025	.61980	7.28490	.85572	788.2	1.133	.67623	7.94814	.76897
20	0	3.853	.507	676.2	1.008	.61114	7.18301	.86912	732.6	1.106	.66214	7.78256	.79060
21	0	4.053	.532	649.8	.962	.58730	6.90282	.90619	700.2	1.050	.63288	7.43865	.83556
22	0	4.253	.557	611.4	.896	.55262	6.49528	.96087	649.9	.963	.58737	6.90367	.90607
23	0	4.453	.582	827.6	1.270	.74799	8.79156	.65765	707.4	1.062	.63935	7.51464	.82561
24	180	.253	.032	860.1	1.327	.77735	9.13658	.61080	747.1	1.131	.67523	7.93638	.77051
25	180	.453	.057	879.3	1.360	.79474	9.34103	.58242	773.5	1.177	.69915	8.21754	.73370
26	180	.653	.082	886.5	1.372	.80126	9.41770	.57162	782.0	1.191	.70677	8.30700	.72195
27	180	.853	.107	896.2	1.389	.80996	9.51993	.55709	791.6	1.208	.71546	8.40924	.70848
28	180	1.053	.132	899.8	1.395	.81322	9.55827	.55159	796.4	1.216	.71981	8.46036	.70173
29	180	1.253	.157	899.8	1.395	.80235	9.58382	.54791	800.0	1.223	.72308	8.49870	.69666
30	180	1.453	.182	902.2	1.400	.81540	9.58382	.54791	801.2	1.225	.72416	8.51148	.69497
31	180	1.653	.207	902.2	1.400	.81540	9.58382	.54791	801.2	1.225	.72416	8.51148	.69497
32	180	1.853	.232	902.2	1.400	.81540	9.58382	.54791	801.2	1.225	.72416	8.51148	.69497
33	180	2.053	.257	898.6	1.393	.81214	9.54549	.55343	800.0	1.223	.72308	8.49870	.69666
34	180	2.253	.282	897.4	1.391	.81105	9.53271	.55526	800.0	1.223	.72308	8.49870	.69666
35	180	2.453	.307	891.3	1.381	.80561	9.46882	.56438	794.0	1.212	.71764	8.43480	.70511
36	180	2.653	.332	887.7	1.375	.80235	9.43048	.56982	790.4	1.206	.71438	8.39646	.71017
37	180	2.853	.357	885.3	1.370	.80018	9.40492	.57343	789.2	1.204	.71329	8.38368	.71185
38	180	3.053	.382	880.5	1.362	.79583	9.35381	.58062	784.4	1.196	.70894	8.33256	.71859
39	180	3.253	.407	873.3	1.350	.78931	9.27714	.59135	778.3	1.185	.70350	8.26866	.72699
40	180	3.453	.432	862.5	1.331	.77952	9.16213	.60728	769.9	1.171	.69589	8.17920	.73873
41	180	3.653	.457	850.4	1.310	.76865	9.03435	.62480	761.5	1.156	.68828	8.08974	.75045
42	180	3.853	.482	836.0	1.285	.75560	8.88101	.64561	749.5	1.135	.67741	7.96194	.76717
43	180	4.053	.507	814.4	1.247	.73603	8.65100	.67644	731.4	1.104	.66110	7.77024	.79221
44	180	4.253	.532	772.3	1.175	.69798	8.20375	.73551	696.5	1.043	.62956	7.39962	.84067
45	180	4.453	.557	716.9	1.079	.64797	7.61594	.81236	649.6	.962	.58716	6.90120	.90640
46	90	1.053	.132	706.1	1.060	.63822	7.50141	.82734	714.6	1.075	.64589	7.59149	.81556
47	90	2.053	.257	690.6	1.033	.62414	7.33584	.84903	691.8	1.035	.62530	7.34948	.84724
48	90	3.053	.382	678.6	1.012	.61330	7.20848	.86577	679.8	1.015	.61446	7.22211	.86398
49	90	4.053	.507	654.6	.971	.59163	6.95377	.89942	658.3	.977	.59495	6.99284	.89424
50	270	1.053	.132	1074.2	1.698	.97087	11.41114	.20595	1100.8	1.744	.99491	11.69371	.08543
51	270	2.053	.257	1074.2	1.698	.97087	11.41114	.20595	1100.8	1.744	.99491	11.69371	.08543
52	270	3.053	.382	1048.9	1.654	.94804	11.14279	.27716	1077.9	1.704	.97425	11.45089	.19341
53	270	4.053	.507	973.1	1.523	.87954	10.33775	.43216	1002.1	1.573	.90575	10.644575	.37874
54	0	4.931	.616	25.4	.119	.02296	.26984	3.11425	25.1	.120	.02270	.26675	3.12202
55	0	5.456	.682	21.1	.127	.01906	.22402	3.24056	21.0	.127	.01894	.22257	3.24498
56	0	5.981	.748	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
57	0	6.506	.813	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
58	0	7.031	.879	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
59	180	7.031	.879	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
60	180	6.506	.813	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
61	180	5.981	.748	20.8	.127	.01877	.22062	3.25100	20.6	.127	.01865	.21917	3.25551
62	180	5.456	.682	20.9	.127	.01892	.22232	3.24576	20.6	.127	.01865	.21917	3.25551
63	180	4.931	.616	21.1	.127	.01906	.22402	3.24056	20.8	.127	.01879	.22087	3.25022

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE V.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 3.95$ (a) $\alpha = 0^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 5808.2$ psf					$\phi = 22.5^\circ$, $p_t = 5808.2$ psf					$\phi = 45.0^\circ$, $p_t = 5808.2$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	$p_l/p_{\infty-}$	M_l
2	0	.253	.032	809.0	1.720	.96196	19.78102	.23604	808.9	1.719	.96187	19.77919	.23633	809.3	1.720	.96231	19.78386	*23491
3	0	.453	.057	798.2	1.695	.94911	19.51688	.27418	796.9	1.693	.94760	19.48573	.27337	797.3	1.693	.94806	19.49520	*27710
4	0	.653	.082	792.2	1.682	.94198	19.37014	.29348	790.9	1.680	.94046	19.34000	.29743	791.3	1.680	.94093	19.34862	*29622
5	0	.853	.107	782.6	1.660	.93056	19.13535	.32030	781.3	1.658	.92904	19.14223	.32597	781.4	1.656	.92810	19.08477	*32824
6	0	1.053	.132	774.2	1.642	.92057	18.92939	.34590	772.9	1.639	.91925	18.89981	.34936	773.4	1.640	.91954	18.90888	*34824
7	0	1.253	.157	767.0	1.626	.91200	18.75382	.36515	765.7	1.623	.91090	18.72723	.36847	766.2	1.624	.91099	18.73298	*34738
8	0	1.453	.182	761.0	1.602	.90487	18.54007	.38662	759.7	1.609	.90236	18.57600	.38383	760.2	1.610	.90386	18.58640	*34826
9	0	1.653	.207	755.0	1.599	.89773	18.44033	.39563	754.9	1.599	.89765	18.45862	.39580	755.4	1.599	.89816	18.44913	*34947
10	0	1.853	.232	750.2	1.588	.89202	18.34293	.41734	749.9	1.585	.89051	18.31189	.41040	749.2	1.583	.88961	18.29324	*41223
11	0	2.053	.257	745.4	1.577	.88631	18.22554	.41882	744.1	1.574	.88480	18.19450	.42182	743.4	1.573	.88390	18.17597	*42361
12	0	2.253	.282	740.6	1.566	.88060	18.18184	.43009	738.1	1.561	.87767	18.04777	.41581	737.4	1.559	.87677	18.02939	*43754
13	0	2.453	.307	734.6	1.553	.87347	17.96140	.44390	732.1	1.547	.87053	17.90105	.44950	731.4	1.546	.86965	17.88281	*45118
14	0	2.653	.332	728.6	1.540	.86633	17.81466	.45743	727.3	1.537	.86482	17.78366	.46025	725.4	1.532	.86252	17.73623	*46456
15	0	2.853	.357	722.6	1.526	.85920	17.66791	.47071	720.1	1.521	.85626	17.60759	.47610	719.4	1.519	.85539	17.58965	*47770
16	0	3.053	.382	715.4	1.510	.85063	17.49182	.48635	712.9	1.504	.84770	17.43151	.49163	712.2	1.503	.84684	17.41375	*49318
17	0	3.253	.407	705.8	1.489	.83921	17.25703	.50674	704.5	1.486	.83771	17.22609	.50940	703.8	1.484	.83686	17.20854	*51090
18	0	3.453	.432	696.2	1.467	.82780	17.02224	.52669	694.9	1.464	.82629	16.99132	.52929	694.2	1.463	.82545	16.97401	*53076
19	0	3.653	.457	685.4	1.443	.81495	16.75811	.54867	684.1	1.440	.81345	16.72721	.55121	683.4	1.438	.81262	16.71017	*55261
20	0	3.853	.482	671.0	1.411	.79782	16.45952	.57733	669.7	1.408	.79632	16.37505	.57981	667.8	1.404	.79409	16.32906	*58349
21	0	4.053	.507	653.0	1.370	.77642	15.96569	.61230	651.7	1.367	.77492	15.93486	.61472	651.1	1.366	.77413	15.91863	*61599
22	0	4.253	.532	621.8	1.300	.73931	15.20262	.67131	619.3	1.295	.73639	15.14252	.67589	618.7	1.293	.73464	15.12710	*67766
23	0	4.453	.557	599.0	1.182	.67651	13.91128	.76854	587.7	1.179	.67502	13.88065	.77333	587.1	1.178	.67433	13.86651	*71789
24	180	.253	.032	811.7	1.726	.96188	19.84725	.22559	798.5	1.696	.94943	19.52334	.21246	814.1	1.712	.95229	19.58223	*24519
25	180	.453	.057	790.1	1.677	.93970	19.31700	.27150	790.9	1.676	.94036	19.33700	.20769	790.1	1.677	.93940	19.31721	*30018
26	180	.653	.082	779.2	1.657	.92518	19.15218	.33020	770.8	1.657	.92890	19.10118	.32632	782.8	1.661	.93081	19.14052	*32169
27	180	.853	.107	770.8	1.634	.91649	18.84606	.35517	772.8	1.638	.91886	18.84484	.34980	772.0	1.637	.91792	18.87550	*35193
28	180	1.053	.132	770.8	1.623	.91076	17.98767	.36788	766.8	1.625	.91169	17.84746	.36583	767.2	1.626	.91219	18.75771	*36473
29	180	1.253	.157	766.0	1.594	.89931	18.42969	.39235	759.5	1.609	.90309	18.57059	.38439	758.7	1.607	.90217	18.55159	*38634
30	180	1.453	.182	750.3	1.502	.88924	18.19822	.40709	753.5	1.595	.89593	18.42321	.39936	752.7	1.594	.89501	18.40435	*40124
31	180	1.653	.207	750.3	1.588	.88214	18.34546	.42146	746.3	1.579	.88733	18.24634	.41681	746.7	1.580	.88785	18.25712	*41576
32	180	1.853	.232	744.3	1.575	.88498	18.19822	.43287	741.4	1.568	.88155	18.12844	.42816	740.7	1.567	.88069	18.10988	*42993
33	180	2.053	.257	737.1	1.558	.87639	18.02154	.44925	735.4	1.555	.87442	17.98105	.44207	734.7	1.553	.87353	17.96265	*44378
34	180	2.253	.282	732.2	1.548	.87066	17.90375	.44925	730.5	1.547	.87065	17.87700	.44610	726.2	1.534	.86350	17.75652	*46272
35	180	2.453	.307	725.0	1.532	.86207	17.72707	.45538	727.0	1.536	.86439	17.77471	.46107	726.2	1.534	.86491	17.57984	*47875
36	180	2.653	.332	717.8	1.515	.85348	17.55039	.48118	719.7	1.520	.85579	17.59785	.47697	719.0	1.518	.85491	17.57984	*47875
37	180	2.853	.357	711.8	1.502	.84632	17.40315	.49411	712.5	1.504	.84719	17.42098	.49255	711.8	1.502	.84632	17.40315	*49411
38	180	3.053	.382	703.3	1.483	.83630	17.19703	.51186	705.3	1.487	.83859	17.24412	.50785	704.5	1.486	.83773	17.22647	*50936
39	180	3.253	.407	696.1	1.467	.82770	17.02034	.52485	695.6	1.466	.82712	17.00830	.52786	696.1	1.467	.82770	17.02034	*52685
40	180	3.453	.432	684.1	1.440	.81338	16.72587	.55132	684.8	1.441	.81422	16.74301	.54991	684.1	1.440	.81338	16.72587	*55132
41	180	3.653	.457	673.2	1.416	.80050	16.46085	.57290	673.9	1.417	.80132	16.47772	.57154	674.4	1.418	.80193	16.49303	*57052
42	180	3.853	.482	658.8	1.383	.78331	16.17479	.60113	659.5	1.385	.78441	16.23411	.59946	658.8	1.383	.78331	16.49303	*57052
43	180	4.053	.507	640.7	1.343	.76183	15.66578	.63570	641.4	1.344	.76261	15.48183	.63466	640.9	1.344	.76326	15.69523	*53342
44	180	4.253	.532	625.8	1.265	.72030	14.81182	.67203	626.4	1.266	.72030	14.89700	.69982	626.0	1.265	.72030	15.81182	*70079
45	180	4.453	.557	563.6	1.170	.67614	13.71018	.77862	565.5	1.174	.67230	13.84777	.77501	566.8	1.173	.67161	13.81062	*77606
46	90	1.053	.120	777.8	1.550	.92485	17.71795	.33598	776.5	1.547	.92334	18.96865	.33949	777.0	1.548	.92382	18.99682	*33836
47	90	2.053	.257	771.4	1.577	.88631	18.22554	.41882	748.3	1.577	.88623	18.23385	.41899	748.2	1.583	.88961	18.29324	*41223
48	90	3.053	.382	710.4	1.499	.84492	17.37443	.40660	712.9	1.504	.84770	17.43151	.49163	715.8	1.511	.85111	17.50170	*48584
49	90	4.053	.507	664.8	1.354	.76785	15.74960	.62608	664.1	1.359	.77064	15.84683	.62161	652.3	1.369	.77555	15.94795	*61370
50	90	4.253	.532	622.0	1.327	.78212	18.13933	.44712	742.6	1.357	.78302	18.15791	.42534	738.3	1.357	.78778	18.05099	*43350
51	270	2.053	.257	741.9	1.569	.88212	18.13933	.44712	742.6	1.357	.78302	18.15791	.42534	740.2	1.348	.83486	17.16758	*51439
52	270	3.053	.382	707.0	1.491	.84059	17.28537	.50431	705.3	1.487	.83859	17.24412	.50785	702.1	1.480	.83486	17.16758	*51439
53	270	4.053	.507	641.9	1.346	.76326	15.69523	.63342	641.4	1.344	.76261	15.68183	.63446	639.5	1.340	.76040	15.63634	*63798
54	0	4.931	.616	18.6	-.050	.02217	.45594	3.13775	18.4	-.050	.02234	.45933	3.13274	18.6	-.050	.02217	.45594	3.13775
55	0	5.456	.682	13.7	-.061	.01630	.33514	3.34817	13.9	-.061	.01647	.33866	3.34094	13.7	-.061	.01630	.33514	3.34817
56	0	5.981	.744	13.2	-.062	.01573	.32345	3.37276	13.5	-.061	.01609</td							

TABLE V.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 3.95$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 5808.2$ psf					$\phi = 90.0^\circ$, $p_t = 5808.2$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	810.2	1.722	.96338	19.81037	.23146	810.2	1.722	.96338	19.81037	.23146
3	0	.453	.057	797.0	1.693	.94768	19.48753	.27813	798.2	1.695	.94911	19.51688	.27418
4	0	.653	.082	792.2	1.682	.94198	19.37014	.29348	792.2	1.682	.94198	19.37014	.29348
5	0	.853	.107	781.4	1.658	.92913	19.10600	.32576	781.4	1.658	.92913	19.10600	.32576
6	0	1.053	.132	773.0	1.639	.91914	18.90056	.34916	774.2	1.642	.92057	18.92991	.34590
7	0	1.253	.157	765.8	1.623	.91058	18.72447	.36828	765.8	1.623	.91058	18.72447	.34828
8	0	1.453	.182	759.8	1.609	.90344	18.57772	.38365	759.8	1.609	.90344	18.57772	.34365
9	0	1.653	.207	755.0	1.599	.89773	18.46033	.39563	753.8	1.596	.89630	18.43098	.39858
10	0	1.853	.232	749.0	1.585	.89060	18.31359	.41023	747.8	1.583	.88917	18.28424	.41311
11	0	2.053	.257	743.0	1.572	.88346	18.16684	.42448	741.8	1.569	.88203	18.13749	.42729
12	0	2.253	.282	738.2	1.561	.87775	18.04945	.43565	737.0	1.558	.87632	18.02010	.43841
13	0	2.453	.307	731.0	1.545	.86919	17.87336	.45205	729.8	1.542	.86776	17.84401	.45474
14	0	2.653	.332	725.0	1.531	.86205	17.72661	.46543	723.8	1.529	.86062	17.69726	.46807
15	0	2.853	.357	719.0	1.518	.85491	17.57987	.47857	717.8	1.515	.85349	17.55052	.48117
16	0	3.053	.382	711.6	1.499	.84492	17.37443	.49660	709.4	1.497	.84350	17.34508	.49915
17	0	3.253	.407	701.0	1.478	.83351	17.13964	.51677	701.0	1.478	.83351	17.13964	.51677
18	0	3.453	.432	692.6	1.459	.82351	16.93420	.53407	691.4	1.456	.82209	16.94485	.53652
19	0	3.653	.457	680.6	1.432	.80924	16.64071	.55830	679.4	1.429	.80782	16.61136	.56069
20	0	3.853	.482	666.2	1.400	.79212	16.28853	.58674	663.8	1.394	.78926	16.22983	.59142
21	0	4.053	.507	649.4	1.362	.77213	15.87764	.61920	647.0	1.357	.76928	15.81895	.62379
22	0	4.253	.532	615.8	1.287	.73217	15.05588	.68248	614.6	1.284	.73074	15.02653	.68471
23	0	4.453	.557	565.4	1.174	.67223	13.82324	.77512	564.2	1.171	.67080	13.79389	.77731
24	180	.253	.032	810.8	1.724	.96410	19.82513	.22913	811.4	1.725	.96482	19.83995	.22676
25	180	.453	.057	798.8	1.697	.94980	19.53098	.27226	799.4	1.698	.95049	19.54515	.27032
26	180	.653	.082	790.4	1.678	.93978	19.35209	.29919	790.9	1.679	.94045	19.33879	.29746
27	180	.853	.107	780.8	1.656	.92834	19.08977	.32766	783.7	1.663	.93185	19.16191	.31915
28	180	1.053	.132	772.3	1.637	.91833	18.88387	.35101	774.1	1.641	.92038	18.92607	.34633
29	180	1.253	.157	766.3	1.624	.91118	18.73680	.36697	768.0	1.628	.91321	18.77867	.36248
30	180	1.453	.182	759.1	1.608	.90259	18.56032	.38545	760.8	1.612	.90461	18.60179	.38116
31	180	1.653	.207	753.1	1.594	.89544	18.41325	.40036	754.8	1.598	.89744	18.45439	.39623
32	180	1.853	.232	747.1	1.581	.88829	18.26618	.41688	748.7	1.585	.89027	18.30699	.41088
33	180	2.053	.257	741.1	1.567	.88114	18.11911	.42905	741.5	1.568	.88167	18.13012	.42800
34	180	2.253	.282	735.0	1.554	.87399	17.97204	.44291	736.7	1.558	.87594	18.01220	.43915
35	180	2.453	.307	729.0	1.541	.86683	17.82496	.45649	729.4	1.541	.86734	17.83532	.45554
36	180	2.653	.332	719.4	1.519	.85539	17.58965	.47770	723.4	1.528	.86017	17.648792	.46891
37	180	2.853	.357	713.4	1.505	.84824	17.44258	.49066	717.4	1.514	.85300	17.54052	.48205
38	180	3.053	.382	706.2	1.489	.83966	17.26610	.50597	707.7	1.493	.84153	17.30468	.51264
39	180	3.253	.407	697.7	1.470	.82964	17.06020	.52350	699.3	1.474	.83150	17.09832	.52027
40	180	3.453	.432	685.7	1.444	.81534	16.76606	.54801	688.5	1.450	.81859	16.83300	.54248
41	180	3.653	.457	676.1	1.422	.80389	16.53074	.56725	676.4	1.423	.80426	16.53820	.56664
42	180	3.853	.482	662.9	1.392	.78816	16.20719	.59322	663.1	1.393	.78849	16.21392	.59268
43	180	4.053	.507	646.0	1.355	.76813	15.79539	.62563	645.0	1.353	.76698	15.77173	.62747
44	180	4.253	.532	608.7	1.271	.72379	14.88355	.69555	610.1	1.274	.72541	14.91681	.69303
45	180	4.453	.557	566.6	1.177	.67373	13.85406	.77282	567.9	1.180	.67523	13.88502	.77051
46	90	1.053	.132	776.6	1.647	.92342	18.98861	.33929	775.4	1.644	.92199	18.95926	.34261
47	90	2.053	.257	747.8	1.583	.88917	18.28424	.41311	745.4	1.577	.88631	18.22554	.41882
48	90	3.053	.382	716.6	1.513	.85206	17.52117	.48376	714.2	1.507	.84921	17.46247	.48892
49	90	4.053	.507	653.0	1.370	.77642	15.96569	.61230	651.8	1.368	.77499	15.93634	.61461
50	270	1.053	.132	772.3	1.637	.91833	18.88387	.35101	775.3	1.644	.92181	18.95555	.34302
51	270	2.053	.257	738.6	1.562	.87828	18.06028	.43463	741.5	1.568	.88167	18.13012	.42800
52	270	3.053	.382	702.6	1.481	.83536	17.17785	.51532	705.3	1.487	.83866	17.24572	.50771
53	270	4.053	.507	638.8	1.339	.75955	15.61890	.63933	640.2	1.342	.76125	15.65381	.63663
54	0	4.931	.616	18.7	.050	.02220	.45645	3.13700	18.8	.049	.02236	.45984	3.13199
55	0	5.456	.682	13.9	.060	.01651	.33941	3.33942	14.0	.060	.01668	.34293	3.33228
56	0	5.981	.748	13.6	.061	.01613	.33161	3.35550	13.7	.061	.01630	.33514	3.34817
57	0	6.506	.813	13.4	.062	.01594	.32771	3.36370	13.4	.062	.01592	.32734	3.36446
58	0	7.031	.879	13.1	.062	.01556	.31990	3.38041	13.1	.062	.01554	.31955	3.38118
59	180	7.031	.879	13.1	.062	.01556	.31990	3.38041	13.1	.062	.01554	.31955	3.38118
60	180	6.506	.813	13.2	.062	.01575	.32380	3.37200	13.4	.062	.01592	.32734	3.36446
61	180	5.981	.748	12.8	.063	.01518	.31210	3.39757	12.8	.063	.01516	.31176	3.39834
62	180	5.456	.682	12.6	.063	.01499	.30802	3.40632	12.6	.063	.01497	.30786	3.40709
63	180	4.931	.616	12.8	.063	.01518	.31210	3.39757	12.9	.063	.01535	.31565	3.38970

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE V. - TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 3.95$ - Continued(b) $\alpha = 20^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 5808.2$ psf					$\phi = 22.5^\circ$, $p_t = 5808.2$ psf					$\phi = 45.0^\circ$, $p_t = 5808.2$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.037	513.7	1.059	.61086	12.56124	.86955	464.5	.948	.55229	11.35689	.96140	435.7	.884	.51804	10.65259	1.01669
3	0	.453	.057	498.1	1.024	.59230	12.17971	.83871	483.7	.991	.57512	11.82643	.92527	463.3	.946	.55086	11.32755	.94368
4	0	.653	.082	530.5	1.096	.63084	12.97212	.83871	489.7	1.005	.58226	11.97316	.91407	484.9	.994	.57655	11.85577	.92302
5	0	.853	.107	504.9	1.048	.60515	12.44385	.87840	498.1	1.024	.59225	12.17858	.89846	490.9	1.007	.58369	12.00250	.91184
6	0	1.053	.132	500.5	1.029	.59516	12.23841	.89393	493.3	1.013	.58654	12.04120	.90737	490.9	1.007	.58369	12.00250	.91184
7	0	1.253	.157	486.1	.997	.57803	11.88622	.92070	487.3	.999	.57940	11.91447	.91856	488.1	.997	.57798	11.88512	.92078
8	0	1.453	.182	492.1	1.010	.58517	12.03297	.90952	487.3	.999	.57940	11.91447	.91856	489.7	1.005	.58226	11.97316	.91407
9	0	1.653	.207	488.5	1.002	.58088	11.94492	.91622	486.1	.997	.57798	11.88512	.92078	489.7	1.005	.58226	11.97316	.91407
10	0	1.853	.239	487.3	.999	.57946	11.91557	.91846	484.9	.994	.57655	11.85577	.92302	488.5	1.005	.58083	11.94381	.91631
11	0	2.053	.257	487.3	.999	.57946	11.91557	.91846	484.9	.994	.57655	11.85577	.92302	489.7	1.005	.58083	11.94381	.91631
12	0	2.253	.282	487.3	.999	.57946	11.91557	.91846	483.7	.991	.57512	11.82643	.92527	489.7	1.005	.58226	11.97316	.91407
13	0	2.453	.307	487.3	.999	.57946	11.91557	.91846	483.7	.991	.57512	11.82643	.92527	489.7	1.005	.58226	11.97316	.91407
14	0	2.653	.332	486.1	.997	.57803	11.88622	.92070	482.5	.986	.57300	11.75774	.92976	488.5	1.002	.58083	11.94381	.91631
15	0	2.853	.357	486.1	.997	.57803	11.88622	.92070	481.3	.983	.57084	11.73839	.93201	487.3	.999	.57940	11.91447	.91856
16	0	3.053	.382	484.9	.994	.57660	11.85687	.92294	480.1	.981	.56941	11.70904	.93426	484.9	.994	.57655	11.85577	.92302
17	0	3.253	.407	481.3	.986	.57232	11.74883	.92967	478.0	.981	.56941	11.70904	.93426	483.7	.991	.57512	11.82643	.92527
18	0	3.453	.432	482.5	.989	.57375	11.7918	.9343	478.9	.981	.56799	11.67970	.93651	481.3	.986	.57227	11.76774	.92976
19	0	3.653	.457	482.5	.989	.57375	11.7718	.92743	477.7	.978	.56513	11.62101	.94102	476.5	.975	.56656	11.65035	.93878
20	0	3.853	.482	481.3	.986	.57232	11.76883	.92967	475.3	.972	.56371	11.59166	.94327	474.1	.970	.56371	11.59166	.94327
21	0	4.053	.507	482.5	.989	.57375	11.7918	.92743	474.1	.970	.56200	11.54304	.94554	466.3	.966	.55088	11.32755	.96368
22	0	4.253	.532	471.7	.965	.56090	11.54304	.94771	466.9	.954	.55514	11.45558	.96866	463.3	.946	.52803	10.85801	1.00001
23	0	4.453	.557	466.1	.930	.56225	11.15250	.97730	467.7	.911	.53231	10.94605	.99348	444.1	.903	.52803	10.85801	.96819
24	180	.453	.037	80.9	1.701	.95229	19.58223	.2519	784.8	1.665	.93320	19.19861	.31584	723.7	1.529	.86056	17.69598	.46819
25	180	.453	.057	82.6	1.758	.98236	20.20602	.15965	807.4	1.717	.96043	19.74968	.24085	744.2	1.575	.88490	18.19654	.42163
26	180	.453	.082	83.9	1.788	.99811	20.52453	.05194	818.6	1.741	.97333	20.01497	.19688	755.1	1.599	.89779	18.46153	.39551
27	180	.453	.107	84.5	1.801	.00527	20.67177	.00000	824.6	1.755	.98050	20.16236	.16796	759.9	1.610	.90352	18.57931	.38349
28	180	.453	.132	84.9	1.809	.00957	20.76011	.00000	827.0	1.760	.98337	20.22131	.15497	764.7	1.620	.90924	18.69709	.37119
29	180	.453	.157	85.0	1.812	.01100	20.74955	.00000	828.2	1.763	.98480	20.25079	.14808	767.1	1.626	.91211	18.75598	.36492
30	180	.453	.182	85.0	1.812	.01100	20.74955	.00000	827.0	1.760	.98337	20.22131	.15497	767.1	1.626	.91211	18.75598	.36492
31	180	.453	.207	85.0	1.812	.01100	20.74955	.00000	824.2	1.763	.98480	20.25079	.14808	767.1	1.626	.91211	18.75598	.36492
32	180	.453	.232	84.9	1.809	.00957	20.76011	.00000	827.0	1.760	.98337	20.22131	.15497	767.1	1.626	.91211	18.75598	.36492
33	180	.453	.257	84.9	1.809	.01057	20.76011	.00000	825.8	1.757	.98193	20.19183	.14759	755.9	1.623	.91068	18.72653	.36906
34	180	.453	.282	84.5	1.801	.00527	20.67177	.00000	824.6	1.755	.98050	20.46250	.16796	761.0	1.623	.91068	18.72653	.36906
35	180	.453	.307	84.0	1.796	.01241	20.61287	.00000	819.8	1.744	.97407	20.04445	.01142	758.7	1.607	.90209	18.56987	.38652
36	180	.453	.332	83.9	1.788	.01241	20.61287	.00000	816.2	1.736	.97047	19.95602	.20739	755.1	1.601	.89922	18.40998	.39253
37	180	.453	.357	83.7	1.788	.01241	20.61287	.00000	816.2	1.736	.97047	19.95602	.20739	755.1	1.599	.89779	18.44153	.39551
38	180	.453	.382	829.8	1.766	.98666	20.28866	.08250	807.7	1.717	.96043	19.74698	.24085	747.8	1.583	.88920	18.24487	.41305
39	180	.453	.407	825.0	1.755	.98093	20.17117	.08168	801.7	1.703	.95327	19.61608	.08200	723.8	1.569	.88204	18.13765	.42728
40	180	.453	.432	814.1	1.731	.95659	19.47057	.25261	783.6	1.663	.94376	19.16013	.21936	725.0	1.531	.87345	17.96098	.44394
41	180	.3653	.457	804.5	1.709	.95659	19.47057	.25261	783.6	1.663	.93176	19.16013	.21936	725.0	1.531	.86199	17.72543	.44553
42	180	.3853	.482	790.1	1.677	.93940	19.17212	.30018	770.4	1.633	.91599	18.85189	.34628	711.7	1.502	.84624	17.40154	.44425
43	180	.4053	.507	772.0	1.637	.91792	18.87550	.31593	749.9	1.587	.89163	18.33478	.48115	693.6	1.461	.82476	16.95988	.53192
44	180	.4253	.532	757.5	1.550	.91792	18.87550	.31593	749.9	1.587	.89163	18.33478	.48115	693.6	1.461	.82476	16.95988	.53192
45	180	.4453	.557	757.5	1.522	.91792	18.87550	.31593	749.9	1.587	.89163	18.33478	.48115	693.6	1.461	.82476	16.95988	.53192
46	90	1.053	1.132	594.2	1.239	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
47	90	1.053	1.132	579.3	1.205	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
48	90	1.053	1.132	579.3	1.224	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
49	90	1.053	1.132	579.3	1.224	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
50	270	2.053	.257	879.1	1.03	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
51	270	2.053	.257	879.1	1.03	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
52	270	3.053	.382	817.7	1.211	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
53	270	3.053	.382	817.7	1.211	.01268	.26681	.1344170	495.7	1.018	.58939	12.11989	.92971	472.9	.967	.56228	11.56231	.94553
54	0	4.931	.616	17.0	.053	.02026	.41651	.319908	16.4	.055	.01954	.40183	.42353	16.2	.055	.01931	.39705	.323169
55	0	5.456	.682	11.6	.066	.01382	.28416	.344305	11.2	.067	.01328	.27309	.344306	11.1	.067	.01325	.27249	.344925
56	0	5.981	.748	11.0	.067	.01306	.26859	.350264	10.5	.068	.01252	.25748	.350265	10.7	.068	.01268	.26081	.352339
57	0	6.506	.813	10.7	.068	.01268	.26681	.352339	10.2	.069	.							

TABLE V.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 3.95$ - Concluded(b) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 5808.2 \text{ psf}$					$\phi = 90.0^\circ, p_t = 5808.2 \text{ psf}$				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	411.7	.830	.48954	10.06660	1.06395	471.2	.963	.56023	11.52015	.94878
3	0	.453	.057	452.1	.943	.54949	11.29925	1.06588	523.9	1.081	.62295	12.80994	.85086
4	0	.653	.082	502.9	1.034	.59801	12.29710	.88948	564.7	1.173	.67142	13.80660	.77636
5	0	.853	.107	510.1	1.050	.60658	12.47320	.87619	574.3	1.194	.68282	14.04110	.75884
6	0	1.053	.132	511.3	1.053	.60800	12.50254	.87398	576.7	1.199	.68567	14.09973	.75446
7	0	1.253	.157	510.1	1.050	.60658	12.47320	.87619	577.9	1.202	.68710	14.12904	.75227
8	0	1.453	.182	517.3	1.067	.61514	12.64929	.86293	586.3	1.221	.69708	14.33424	.73690
9	0	1.653	.207	518.5	1.069	.61657	12.67864	.86072	587.5	1.224	.69850	14.36355	.73470
10	0	1.853	.232	519.7	1.072	.61799	12.70799	.85852	588.7	1.226	.69993	14.39286	.73250
11	0	2.053	.257	520.9	1.075	.61942	12.73733	.85631	588.7	1.226	.69993	14.39286	.73250
12	0	2.253	.282	522.1	1.077	.62085	12.76668	.85411	589.9	1.229	.70135	14.42218	.73031
13	0	2.453	.307	522.1	1.077	.62085	12.76668	.85411	591.1	1.232	.70278	14.45149	.72810
14	0	2.653	.332	522.1	1.077	.62085	12.76668	.85411	589.9	1.229	.70135	14.42218	.73031
15	0	2.853	.357	520.9	1.075	.61942	12.73733	.85631	587.5	1.224	.69850	14.36355	.73470
16	0	3.053	.382	519.7	1.072	.61799	12.70799	.85852	586.3	1.221	.69708	14.33424	.73690
17	0	3.253	.407	516.1	1.064	.61371	12.61994	.86514	580.3	1.207	.68995	14.18767	.74788
18	0	3.453	.432	513.7	1.059	.61086	12.56124	.86955	576.7	1.199	.68567	14.09973	.75446
19	0	3.653	.457	508.9	1.048	.60515	12.44385	.87840	569.5	1.183	.67712	13.92385	.76761
20	0	3.853	.482	502.9	1.034	.59801	12.29710	.88948	562.3	1.167	.66857	13.74797	.78074
21	0	4.053	.507	496.9	1.021	.59088	12.15036	.90060	550.3	1.140	.65431	13.45484	.80262
22	0	4.253	.532	480.1	.983	.57089	11.73948	.93192	526.3	1.087	.62580	12.86857	.84647
23	0	4.453	.557	454.9	.927	.54092	11.21316	.97959	490.3	1.006	.58300	11.98917	.91285
24	180	.253	.032	629.6	1.318	.74859	15.39341	.65671	517.8	1.068	.61571	12.66102	.86205
25	180	.453	.057	650.1	1.364	.77301	15.89569	.61779	544.3	1.127	.64721	13.30879	.81353
26	180	.653	.082	665.8	1.399	.79169	16.27978	.58743	563.6	1.170	.67012	13.77990	.77836
27	180	.853	.107	670.7	1.410	.79744	16.39797	.57797	572.0	1.189	.68014	13.98601	.76296
28	180	1.053	.132	676.7	1.423	.80462	16.54570	.56603	580.4	1.208	.69017	14.19212	.74755
29	180	1.253	.157	680.3	1.431	.80893	16.63433	.55882	585.3	1.219	.69589	14.30990	.73873
30	180	1.453	.182	682.7	1.437	.81181	16.69343	.55398	587.7	1.224	.69876	14.36879	.73431
31	180	1.653	.207	682.7	1.437	.81181	16.69343	.55398	587.7	1.224	.69876	14.36879	.73431
32	180	1.853	.232	684.0	1.440	.81324	16.72297	.55156	591.3	1.232	.70305	14.45712	.72768
33	180	2.053	.257	682.7	1.437	.81181	16.69343	.55398	591.3	1.232	.70305	14.45712	.72768
34	180	2.253	.282	682.7	1.437	.81181	16.69343	.55398	591.3	1.232	.70305	14.45712	.72768
35	180	2.453	.307	677.9	1.426	.80606	16.57524	.56363	586.5	1.221	.69733	14.33934	.73652
36	180	2.653	.332	675.5	1.421	.80319	16.51615	.56843	586.5	1.221	.69733	14.33934	.73652
37	180	2.853	.357	675.5	1.421	.80319	16.51615	.56843	586.5	1.221	.69733	14.33934	.73652
38	180	3.053	.382	670.7	1.410	.79744	16.39797	.57797	584.1	1.216	.69446	14.28045	.74093
39	180	3.253	.407	665.8	1.399	.79169	16.27978	.58743	584.1	1.216	.69446	14.28045	.74093
40	180	3.453	.432	658.6	1.383	.78307	16.10251	.60152	574.4	1.194	.68301	14.04490	.75856
41	180	3.653	.457	648.9	1.361	.77158	15.86614	.62010	568.4	1.181	.67585	13.89768	.76956
42	180	3.853	.482	638.0	1.337	.75864	15.60023	.64078	561.2	1.165	.66726	13.72101	.78275
43	180	4.053	.507	622.3	1.302	.73996	15.21613	.67028	549.1	1.138	.65294	13.42657	.80473
44	180	4.253	.532	590.9	1.231	.70261	14.44794	.72837	525.0	1.084	.62430	12.83769	.84878
45	180	4.453	.557	547.4	1.134	.65088	13.38429	.80789	492.5	1.011	.58564	12.04269	.90878
46	90	1.053	.132	493.3	1.013	.58659	12.06231	.90729	499.9	1.028	.59444	12.22367	.89504
47	90	2.053	.257	484.9	.994	.57660	11.85687	.92294	487.9	1.001	.58019	11.93054	.91732
48	90	3.053	.382	481.3	.986	.57232	11.76883	.92967	486.4	.993	.57591	11.84260	.92403
49	90	4.053	.507	471.7	.965	.56090	11.53404	.94771	478.4	.979	.56878	11.69603	.93525
50	270	1.053	.132	824.1	1.753	.97991	20.15029	.17050	849.0	1.809	1.00948	20.75818	0.00000
51	270	2.053	.257	825.3	1.756	.98135	20.17984	.16421	849.0	1.809	1.00948	20.75818	0.00000
52	270	3.053	.382	807.2	1.716	.95980	19.73665	.24282	829.7	1.766	.98657	20.28708	.13913
53	270	4.053	.507	750.4	1.588	.89227	18.34800	.40684	773.1	1.639	.91927	18.90320	.34887
54	0	4.931	.616	15.9	-.056	.01893	.38927	.324522	15.9	-.056	.01895	.38970	3.24446
55	0	5.456	.682	10.8	-.067	.01287	.26470	.351293	10.8	-.067	.01289	.26499	3.51215
56	0	5.981	.748	10.3	-.068	.01230	.25302	.354481	10.4	-.068	.01232	.25330	3.54403
57	0	6.506	.813	10.3	-.068	.01230	.25302	.354481	10.2	-.069	.01213	.24941	3.55501
58	0	7.031	.879	10.2	-.069	.01212	.24913	.355579	10.2	-.069	.01213	.24941	3.55501
59	180	7.031	.879	10.2	-.069	.01212	.24913	.355579	10.2	-.069	.01213	.24941	3.55501
60	180	6.506	.813	10.2	-.069	.01212	.24913	.355579	10.2	-.069	.01213	.24941	3.55501
61	180	5.981	.748	10.2	-.069	.01212	.24913	.355579	10.2	-.069	.01213	.24941	3.55501
62	180	5.456	.682	10.3	-.068	.01230	.25302	.354481	10.2	-.069	.01213	.24941	3.55501
63	180	4.931	.616	10.3	-.068	.01230	.25302	.354481	10.2	-.069	.01213	.24941	3.55501

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 4.63$ (a) $\alpha = 0^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7924.4$ psf					$\phi = 22.5^\circ$, $p_t = 7924.4$ psf					$\phi = 45.0^\circ$, $p_t = 7924.4$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
2	0	.253	.032	637.3	1.755	.97392	27.33311	.19465	636.7	1.753	.97311	27.31033	.19771	637.4	1.755	.97419	27.34071	.19362
3	0	.453	.057	626.5	1.724	.95742	26.86983	.25011	625.9	1.722	.95662	26.84744	.25251	626.6	1.724	.95768	26.87731	.24930
4	0	.653	.082	621.7	1.710	.95008	26.63694	.27147	621.1	1.709	.94929	26.64171	.27368	621.8	1.711	.95034	26.67135	.27072
5	0	.853	.107	613.3	1.686	.93724	26.30361	.30570	612.7	1.685	.93646	26.28169	.30768	613.4	1.687	.93750	26.31093	.30504
6	0	1.053	.132	606.1	1.666	.92624	25.99476	.33267	604.4	1.661	.92363	25.92167	.33480	606.2	1.666	.92649	26.00199	.33206
7	0	1.253	.157	591.9	1.645	.91523	25.68591	.36799	598.4	1.644	.91447	25.66451	.35969	599.0	1.646	.91549	25.69306	.35742
8	0	1.453	.182	595.3	1.635	.90973	25.53149	.37013	593.6	1.630	.90714	25.45878	.37575	595.4	1.635	.90994	25.53859	.36958
9	0	1.653	.207	591.7	1.625	.90423	25.37707	.38198	590.0	1.620	.90164	25.30449	.38746	590.6	1.622	.90264	25.33263	.38534
10	0	1.853	.232	586.9	1.611	.89689	25.17117	.39737	585.2	1.606	.89431	25.09876	.40268	585.8	1.608	.89531	25.12668	.40064
11	0	2.053	.257	582.1	1.597	.88955	24.96527	.41233	581.6	1.596	.88881	24.94446	.41383	581.0	1.594	.88846	24.97172	.42552
12	0	2.253	.282	578.5	1.587	.88405	24.1084	.42331	576.8	1.582	.88148	24.73874	.42837	577.4	1.584	.88246	24.86595	.42424
13	0	2.453	.307	573.7	1.573	.87671	24.66494	.43765	573.2	1.572	.87598	24.58444	.43906	571.4	1.567	.87329	24.50881	.44424
14	0	2.653	.332	568.9	1.559	.86938	24.39905	.45169	568.4	1.558	.86885	24.37871	.45306	568.6	1.553	.86595	24.3285	.45814
15	0	2.853	.357	564.1	1.546	.86294	24.19135	.46544	563.6	1.544	.86132	24.17929	.46677	563.8	1.549	.85861	24.09889	.47178
16	0	3.053	.382	558.1	1.528	.85287	23.93577	.48229	557.6	1.527	.85256	23.91582	.48358	557.8	1.522	.84944	23.83945	.48850
17	0	3.253	.407	552.1	1.511	.84370	23.74800	.49879	550.6	1.507	.84116	23.66723	.50329	550.6	1.501	.83843	23.53051	.50813
18	0	3.453	.432	544.9	1.491	.83277	23.52955	.51918	543.2	1.486	.83017	23.29864	.52258	541.4	1.481	.82742	23.22158	.52734
19	0	3.653	.457	535.5	1.463	.81802	22.97575	.53436	534.8	1.462	.81734	22.91862	.54462	531.8	1.453	.81275	22.80967	.55240
20	0	3.853	.482	524.4	1.432	.80152	22.49448	.57121	522.8	1.428	.79901	22.42430	.57536	521.0	1.423	.79623	22.34627	.57995
21	0	4.053	.507	511.2	1.395	.79134	21.92826	.60433	510.8	1.393	.78069	21.91998	.60539	507.8	1.385	.77605	21.77989	.61289
22	0	4.253	.532	487.2	1.326	.74666	20.89876	.62690	485.6	1.321	.74220	20.82991	.66676	485.0	1.320	.74120	20.80159	.66834
23	0	4.453	.557	467.6	1.213	.68413	19.20009	.75683	467.3	1.212	.68356	19.18409	.75771	465.4	1.206	.68065	19.10245	.76218
24	180	.253	.032	644.2	1.775	.98455	27.51231	.14933	644.4	1.775	.98482	27.63890	.14799	642.0	1.768	.98114	27.53557	.16151
25	180	.453	.057	633.4	1.744	.96798	27.16639	.21611	633.5	1.744	.96825	27.17394	.21518	632.3	1.741	.96641	27.12228	.22146
26	180	.653	.082	626.1	1.723	.95694	26.88651	.25154	626.3	1.724	.95721	26.86397	.25074	623.9	1.717	.95353	26.76055	.24162
27	180	.853	.107	620.1	1.706	.94774	26.59827	.27797	620.3	1.706	.94800	26.60567	.27725	615.5	1.693	.94064	26.39902	.29697
28	180	1.053	.132	611.7	1.682	.93486	26.23674	.31171	609.5	1.675	.93144	26.14071	.32016	604.3	1.672	.92960	26.08905	.32464
29	180	1.253	.157	608.1	1.671	.92934	26.01810	.32526	606.8	1.665	.92591	25.98573	.33344	603.4	1.658	.92223	25.88241	.34205
30	180	1.453	.182	602.1	1.654	.92014	25.82556	.34689	598.6	1.644	.91487	25.67576	.35880	597.4	1.641	.91303	25.62410	.36289
31	180	1.653	.207	597.2	1.640	.91278	25.61698	.36345	596.2	1.638	.91119	25.57244	.36694	592.6	1.627	.90567	25.41745	.37891
32	180	1.853	.232	593.6	1.630	.90725	25.46203	.37550	591.4	1.624	.90383	25.36357	.38284	589.0	1.617	.90014	25.25601	.39560
33	180	2.053	.257	587.6	1.613	.89805	25.20380	.39499	586.6	1.610	.89664	25.15914	.39848	584.2	1.604	.89384	25.05582	.40580
34	180	2.253	.282	584.0	1.603	.89253	25.04886	.40631	584.2	1.603	.89278	25.05582	.40500	579.3	1.589	.88542	24.94918	.42061
35	180	2.453	.307	579.2	1.589	.88517	24.82227	.42109	578.1	1.586	.88358	24.79751	.42525	577.3	1.572	.88621	24.9087	.43962
36	180	2.653	.332	573.2	1.572	.87597	24.58403	.43909	572.1	1.569	.87457	24.53921	.44216	567.3	1.555	.86701	24.33256	.45616
37	180	2.853	.357	564.3	1.558	.86861	24.37744	.45436	563.6	1.555	.86701	24.35566	.45616	562.5	1.541	.85965	24.12591	.46988
38	180	3.053	.382	562.3	1.541	.85921	24.11911	.47812	561.3	1.538	.85781	24.07425	.47327	556.5	1.524	.85044	23.86761	.48669
39	180	3.253	.407	556.3	1.523	.83201	23.89494	.50108	554.2	1.503	.83940	23.85764	.50642	542.0	1.483	.84124	23.69303	.50316
40	180	3.453	.432	539.4	1.479	.82444	23.53791	.53248	537.2	1.469	.82099	23.41021	.53439	533.6	1.459	.81547	22.88604	.54780
41	180	3.653	.457	530.9	1.478	.80972	23.27474	.55750	526.4	1.438	.80442	22.57607	.55637	522.7	1.428	.79890	22.42109	.57555
42	180	3.853	.482	529.9	1.448	.79745	22.95322	.59708	513.1	1.400	.78417	22.00779	.59972	508.3	1.386	.77681	21.80115	.61166
43	180	4.053	.507	514.2	1.403	.78580	22.05322	.60631	504.2	1.603	.89278	25.05582	.40580	585.4	1.607	.89462	25.1746	.46204
44	180	4.253	.532	488.9	1.331	.74715	20.96873	.65897	487.8	1.328	.74552	20.92290	.66154	483.0	1.314	.73815	20.71626	.67312
45	180	4.453	.557	452.8	1.227	.69194	19.1932	.74481	452.9	1.228	.69213	19.42472	.74452	448.1	1.214	.68477	19.21807	.75585
46	90	1.053	.132	609.7	1.676	.93174	26.14919	.31942	606.8	1.668	.92730	26.02453	.33015	606.2	1.666	.92649	26.00199	.33206
47	90	2.053	.257	582.1	1.597	.88955	24.95627	.41233	580.4	1.592	.88699	24.89303	.41749	579.8	1.591	.88613	24.86923	.41919
48	90	3.053	.382	556.9	1.525	.85104	23.88430	.48561	554.0	1.517	.84666	23.71653	.49349	554.6	1.519	.84766	23.78796	.49180
49	90	4.053	.507	506.4	1.381	.77400	21.7236	.61619	504.8	1.376	.77153	21.65282	.62018	505.4	1.378	.77238	21.67691	.61880
50	270	1.053	.132	609.3	1.675	.93118	26.13345	.32079	610.7	1.679	.93328	26.19237	.31564	610.7	1.679	.93328	26.19237	.31564
51	270	2.053	.257	584.0	1.603	.89253	25.04886	.40631	584.2	1.603	.89278	25.05582	.40580	585.4	1.607	.89462	25.1746	.46204
52	270	3.053	.382	557.5	1.527	.85205	23.91262	.48378	557.7	1.527	.85228	23.91927	.48435	560.1	1.534	.85596	24.15597	.47664
53	270	4.053	.507	509.3	1.389	.77844	21.84673	.60904	509.5	1.390	.77865	21.85281	.60869	509.5	1.390	.77865	21.85213	.60869
54	0	4.931	.616	14.5	-.025	.02214	.62140	3.13869	14.5	-.025	.02214	.62140	3.13869	14.2	-.026	.02214	.62140	3.13869
55	0	5.456	.682	9.2	-.040	.01411	.39606	3.44834	8.9	-.041	.01363	.38240	3.47293	8.8	-.042	.01363	.38240	3.47293
56	0	5.981	.748	8.8	-.042	.01338	.37557	3.48559	8.4	-.042	.01314	.34855						

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_{\infty} = 4.63$ - Continued(a) $\alpha = 0^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 7915.0$ psf					$\phi = 90.0^\circ, p_t = 7915.0$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_{∞}	M_l
2	0	.253	.032	637.4	1.758	.97536	27.37349	.18911	638.6	1.761	.97720	27.42504	.18182
3	0	.453	.057	627.8	1.730	.96067	26.96108	.24011	629.0	1.734	.96250	27.01263	.23429
4	0	.653	.082	623.0	1.716	.95332	26.75488	.26222	624.2	1.720	.95516	26.80643	.25685
5	0	.853	.107	614.6	1.692	.94046	26.39402	.29743	615.8	1.696	.94230	26.44557	.29262
6	0	1.053	.132	607.4	1.672	.92944	26.08472	.32501	608.6	1.675	.93128	26.13627	.32055
7	0	1.253	.157	600.2	1.651	.91842	25.77541	.35080	601.4	1.654	.92026	25.82696	.34661
8	0	1.453	.182	595.4	1.637	.91107	25.56921	.36719	597.8	1.644	.91475	25.67231	.35907
9	0	1.653	.207	590.6	1.624	.90373	25.36301	.38305	593.0	1.630	.90740	25.46611	.37518
10	0	1.853	.232	585.8	1.610	.89638	25.15680	.39443	588.2	1.617	.90005	25.25991	.39079
11	0	2.053	.257	581.0	1.596	.88903	24.95060	.41339	583.4	1.603	.89270	25.05370	.40595
12	0	2.253	.282	577.4	1.586	.88352	24.79595	.42436	578.6	1.589	.88536	24.84750	.42072
13	0	2.453	.307	572.6	1.572	.87617	24.54974	.43870	573.8	1.575	.87801	24.64130	.43514
14	0	2.653	.332	567.8	1.558	.86883	24.38354	.45273	569.0	1.562	.87066	24.43509	.44925
15	0	2.853	.357	561.8	1.541	.85964	24.12579	.46989	564.2	1.548	.86332	24.22889	.46307
16	0	3.053	.382	555.8	1.524	.85046	23.86803	.48666	558.2	1.531	.85413	23.97113	.47999
17	0	3.253	.407	549.8	1.507	.84127	23.61028	.50310	551.0	1.510	.84311	23.66183	.49984
18	0	3.453	.432	541.4	1.483	.82842	23.24942	.52562	543.8	1.490	.83209	23.35252	.51924
19	0	3.653	.457	531.8	1.455	.81372	22.83702	.55075	535.4	1.466	.81923	22.99167	.56140
20	0	3.853	.482	521.0	1.424	.79719	22.37306	.57838	523.4	1.431	.80086	22.47616	.57229
21	0	4.053	.507	507.8	1.387	.77698	21.80600	.61139	510.2	1.393	.78066	21.90910	.60544
22	0	4.253	.532	483.8	1.318	.74025	20.77498	.66983	485.0	1.321	.74208	20.82653	.66695
23	0	4.453	.557	445.4	1.208	.68147	19.12536	.76093	446.6	1.211	.68331	19.17691	.75810
24	180	.253	.032	639.6	1.764	.97863	27.46514	.17595	639.3	1.763	.97829	27.45558	.17736
25	180	.453	.057	628.7	1.733	.96204	26.99963	.23577	627.3	1.729	.95990	26.93950	.24251
26	180	.653	.082	620.3	1.709	.94914	26.63757	.27409	622.5	1.715	.95254	26.73307	.26446
27	180	.853	.107	611.9	1.684	.93624	26.27550	.30824	611.7	1.684	.93599	26.26859	.30886
28	180	1.053	.132	604.6	1.664	.92518	25.96516	.33517	604.5	1.663	.92496	25.95894	.33569
29	180	1.253	.157	599.8	1.650	.91781	25.75827	.35219	599.7	1.650	.91760	25.75251	.35265
30	180	1.453	.182	596.2	1.640	.91228	25.61310	.36454	593.7	1.632	.90841	25.49447	.37300
31	180	1.653	.207	590.2	1.622	.90307	25.34448	.38445	588.9	1.619	.90105	25.28803	.38869
32	180	1.853	.232	585.4	1.609	.89569	25.13759	.39984	585.3	1.608	.89554	25.13321	.40016
33	180	2.053	.257	579.3	1.591	.88648	24.87897	.41849	580.5	1.594	.88818	24.92678	.41509
34	180	2.253	.282	576.9	1.584	.88279	24.77552	.42580	575.7	1.581	.88083	24.72334	.42966
35	180	2.453	.307	572.1	1.571	.87542	24.58683	.44015	570.8	1.567	.87347	24.51391	.44389
36	180	2.653	.332	564.9	1.550	.86436	24.25829	.46112	564.8	1.550	.86428	24.25587	.46128
37	180	2.853	.357	560.1	1.536	.85699	24.05140	.47476	561.2	1.539	.85876	24.10105	.47151
38	180	3.053	.382	554.1	1.519	.84778	23.79278	.49149	555.2	1.522	.84957	23.84300	.48827
39	180	3.253	.407	548.0	1.502	.83856	23.53416	.50790	549.2	1.505	.84037	23.58496	.50470
40	180	3.453	.432	539.6	1.478	.82566	23.17210	.53038	539.6	1.478	.82566	23.17210	.53038
41	180	3.653	.457	531.2	1.453	.81276	22.81003	.55238	531.2	1.453	.81279	22.81084	.55233
42	180	3.853	.482	520.3	1.422	.79617	22.34452	.58006	520.4	1.423	.79624	22.34637	.57995
43	180	4.053	.507	507.1	1.384	.77590	21.77556	.61314	507.2	1.385	.77601	21.77867	.61296
44	180	4.253	.532	481.8	1.312	.73720	20.68937	.67462	480.7	1.309	.73555	20.64329	.67719
45	180	4.453	.557	445.7	1.209	.68191	19.13767	.76025	447.1	1.213	.68407	19.19826	.75693
46	90	1.053	.132	605.0	1.665	.92577	25.98162	.33378	605.0	1.665	.92577	25.98162	.33378
47	90	2.053	.257	579.8	1.593	.88719	24.89095	.41707	581.0	1.596	.88903	24.95060	.41339
48	90	3.053	.382	555.8	1.524	.85046	23.86803	.48666	555.8	1.524	.85046	23.86803	.48666
49	90	4.053	.507	506.6	1.383	.77515	21.75445	.61435	507.8	1.387	.77698	21.80600	.61139
50	270	1.053	.132	610.7	1.681	.93440	26.22378	.31286	611.7	1.684	.93599	26.26859	.30886
51	270	2.053	.257	586.6	1.612	.89754	25.18931	.39603	588.9	1.619	.90105	25.28803	.38869
52	270	3.053	.382	561.3	1.540	.85883	24.13124	.47138	562.4	1.543	.86060	24.15265	.46812
53	270	4.053	.507	513.1	1.402	.78511	22.03418	.59819	514.4	1.405	.78704	22.08832	.59504
54	0	4.931	.616	14.2	.026	.02170	.60915	3.15217	14.2	-.026	.02170	.60915	3.15217
55	0	5.456	.682	8.8	.042	.01341	.37644	3.48397	8.6	-.042	.01317	.36960	3.49687
56	0	5.981	.748	8.3	.043	.01268	.35591	3.52348	8.1	-.043	.01244	.34906	3.53720
57	0	6.506	.813	8.1	.043	.01244	.34906	3.53720	8.0	-.044	.01219	.34222	3.55122
58	0	7.031	.879	7.8	.044	.01195	.33537	3.56554	7.8	-.044	.01195	.33537	3.56554
59	180	7.031	.879	7.7	.045	.01171	.32853	3.58019	7.8	-.044	.01195	.33537	3.56554
60	180	6.506	.813	7.7	.045	.01171	.32853	3.58019	8.0	-.044	.01219	.34222	3.55122
61	180	5.981	.748	7.7	.045	.01171	.32853	3.58019	7.8	-.044	.01195	.33537	3.56554
62	180	5.456	.682	7.7	.045	.01171	.32853	3.58019	7.8	-.044	.01195	.33537	3.56554
63	180	4.931	.616	7.7	.045	.01171	.32853	3.58019	7.8	-.044	.01195	.33537	3.56554

*The following conversion factors can be used to convert these data to the International System of Units:

$$1 \text{ inch} = 25.4 \text{ mm}; 1 \text{ psf} = 47.88 \text{ N/m}^2.$$

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 4.63$ - Continued(b) $\alpha = 10^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7924.4$ psf					$\phi = 22.5^\circ$, $p_t = 7924.4$ psf					$\phi = 45.0^\circ$, $p_t = 7924.4$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	512.6	1.399	78339	21.95845	.61100	512.1	1.397	.78298	21.94345	.60229	507.8	1.385	.77605	21.77989	.61289
3	0	.453	.057	506.6	1.381	77422	21.7840	.61585	504.9	1.376	.77160	21.65483	.62007	505.4	1.378	.77238	21.67691	.61880
4	0	.653	.082	513.8	1.402	78523	20.3733	.59801	510.9	1.394	.78076	21.9210	.61527	515.0	1.405	.78706	22.08882	.59502
5	0	.853	.107	510.2	1.392	77972	21.8826	.61695	507.3	1.383	.77526	21.75770	.61416	511.4	1.395	.78156	21.93435	.60398
6	0	1.053	.132	503.0	1.371	76871	21.57393	.62470	502.5	1.370	.76793	21.55196	.62595	506.6	1.381	.77422	21.72840	.61585
7	0	1.253	.157	498.8	1.350	75771	21.26499	.62226	496.5	1.352	.75877	21.20477	.61058	501.8	1.368	.76688	21.52244	.62764
8	0	1.453	.182	495.8	1.350	75771	21.26499	.62226	495.3	1.349	.75694	21.23434	.61349	501.8	1.368	.76688	21.52244	.62764
9	0	1.653	.207	491.4	1.344	75404	21.16202	.61809	494.1	1.346	.75510	21.19190	.61640	499.4	1.361	.76321	21.41946	.63070
10	0	1.853	.232	491.0	1.337	75037	21.05904	.61589	491.7	1.339	.75144	21.08903	.61220	494.2	1.357	.76138	21.36387	.63443
11	0	2.053	.257	491.0	1.337	75037	21.05904	.61589	490.5	1.335	.74960	21.03759	.61510	497.0	1.354	.75954	21.36648	.63935
12	0	2.253	.282	489.8	1.333	74853	21.07755	.61679	489.3	1.332	.74777	20.98615	.61799	495.8	1.355	.75771	21.26499	.64226
13	0	2.453	.307	488.6	1.330	74670	20.95606	.61598	488.1	1.328	.74594	20.93472	.61688	494.1	1.344	.75404	21.16202	.64809
14	0	2.653	.332	486.2	1.323	74303	20.85308	.61546	486.9	1.325	.74411	20.83328	.61777	491.0	1.337	.75037	21.05904	.65389
15	0	2.853	.357	486.2	1.323	74303	20.85308	.61546	484.5	1.318	.74044	20.7841	.61553	488.6	1.330	.74670	20.95606	.65968
16	0	3.053	.382	483.8	1.316	73936	20.75010	.61381	483.3	1.315	.73861	20.72897	.61241	484.3	1.323	.74303	20.85308	.66546
17	0	3.253	.407	482.6	1.313	73753	20.69861	.61710	479.7	1.304	.73311	20.57466	.61101	483.8	1.316	.73936	20.75010	.67122
18	0	3.453	.432	477.8	1.299	73019	20.49266	.61558	477.3	1.298	.72944	20.47179	.61674	480.2	1.306	.73386	20.59564	.67985
19	0	3.653	.457	477.8	1.299	73019	20.49266	.61558	473.1	1.297	.72395	20.41748	.61531	475.4	1.292	.72652	20.39968	.69130
20	0	3.853	.482	471.8	1.282	72101	20.23521	.61207	467.6	1.274	.71661	20.11173	.60670	468.2	1.272	.71551	20.08075	.70441
21	0	4.053	.507	468.2	1.272	71551	20.08037	.60941	464.1	1.260	.70928	19.95958	.71805	462.2	1.254	.70634	19.82330	.72261
22	0	4.253	.532	455.0	1.234	69533	19.51437	.73960	455.9	1.222	.68912	19.34018	.74915	464.6	1.210	.68249	19.15394	.75936
23	0	4.453	.557	429.8	1.162	65680	18.43309	.70980	424.5	1.147	.68880	18.20857	.81109	416.6	1.124	.63662	17.86671	.82981
24	180	.253	.032	662.5	1.427	1.01243	20.41382	.00000	652.9	1.400	.99780	28.0312	.05613	625.1	1.720	.95537	26.81231	.25623
25	180	.453	.057	662.5	1.427	1.01243	20.41382	.00000	652.9	1.400	.99596	27.95145	.07610	622.7	1.713	.95169	26.70899	.264692
26	180	.653	.082	653.0	1.381	1.00507	20.20717	.00000	645.7	1.379	.98675	27.69312	.13816	620.3	1.706	.94800	26.60567	.27725
27	180	.853	.107	657.6	1.317	1.00507	20.20717	.00000	645.7	1.379	.98675	27.69312	.13816	620.3	1.706	.94800	26.60567	.27725
28	180	1.053	.132	652.8	1.299	99771	20.00503	.05730	642.0	1.269	.98123	27.53812	.16475	615.5	1.693	.94064	26.39902	.29697
29	180	1.253	.157	650.4	1.292	99402	27.89720	.09258	639.6	1.262	.97755	27.43479	.18041	613.1	1.686	.93696	26.29570	.30216
30	180	1.453	.182	645.6	1.279	98665	27.69056	.13864	633.6	1.244	.96833	27.17646	.21487	609.5	1.675	.93144	26.14711	.32016
31	180	1.653	.207	644.4	1.275	98482	27.63890	.14799	632.4	1.241	.96650	27.12479	.22116	605.8	1.666	.92551	25.84573	.33444
32	180	1.853	.232	639.6	1.261	97746	27.43225	.18078	630.0	1.234	.96282	27.02146	.23328	603.4	1.658	.92223	25.82411	.34205
33	180	2.053	.257	638.4	1.258	97562	27.38059	.18113	625.2	1.220	.95546	26.81480	.25597	594.6	1.644	.91119	25.57244	.36694
34	180	2.253	.282	632.3	1.241	96641	27.12228	.22146	621.6	1.210	.94993	26.65980	.27188	596.2	1.638	.90383	25.36579	.38284
35	180	2.453	.307	626.3	1.224	95721	26.86397	.25074	615.5	1.693	.94073	26.40147	.29674	591.4	1.624	.89646	25.15914	.39828
36	180	2.653	.332	622.7	1.213	95169	26.70899	.26692	610.7	1.679	.93336	26.19400	.31242	586.6	1.610	.89810	24.95250	.41325
37	180	2.853	.357	616.7	1.196	94248	26.45068	.29214	605.9	1.665	.92860	26.04811	.33232	581.8	1.596	.88910	24.69419	.43148
38	180	3.053	.382	610.7	1.179	93328	26.19237	.31564	599.9	1.648	.91980	25.47147	.35448	575.7	1.579	.87989	24.49419	.43148
39	180	3.253	.407	603.4	1.158	92223	25.88241	.34205	593.9	1.611	.90759	25.17474	.37477	569.7	1.562	.87069	24.43588	.44920
40	180	3.453	.432	596.2	1.138	92223	25.57244	.36364	594.5	1.607	.89490	25.10981	.40187	562.5	1.541	.85965	24.12591	.46988
41	180	3.653	.457	585.4	1.107	89462	25.10748	.40242	584.6	1.576	.87814	24.64481	.43490	554.1	1.517	.84676	23.76428	.49332
42	180	3.853	.482	574.5	1.076	87085	24.64233	.40566	564.8	1.541	.85973	24.12915	.44973	547.0	1.483	.82835	23.24767	.52573
43	180	4.053	.507	556.5	1.524	858.4	24.18671	.48659	548.1	1.500	.83763	23.50816	.50953	527.6	1.441	.80626	22.62773	.56329
44	180	4.253	.532	528.8	1.445	818.0	22.79739	.50201	518.0	1.414	.79161	22.16505	.58757	499.9	1.362	.76393	21.43952	.63236
45	180	4.453	.557	485.4	1.321	74184	20.19588	.66734	477.0	1.297	.72902	20.45984	.68740	461.3	1.252	.70502	19.78635	.72464
46	90	1.053	1.132	546.6	1.424	63843	23.53051	.50813	520.5	1.421	.75942	22.32350	.58129	506.6	1.381	.77422	21.72840	.61585
47	90	2.053	1.257	537.1	1.419	62192	23.06711	.53680	510.9	1.394	.78076	21.91201	.60527	495.8	1.350	.75771	21.26499	.62226
48	90	3.053	1.382	519.4	1.419	79440	22.29478	.58299	495.5	1.352	.75877	21.24977	.60405	485.0	1.320	.74120	20.80159	.66634
49	90	4.053	1.510	480.2	1.306	73386	20.59564	.67985	464.1	1.260	.70928	19.95958	.71805	458.6	1.244	.70983	19.66883	.73111
50	270	1.053	1.132	551.6	1.510	84308	23.66096	.49989	566.6	1.610	.89655	25.16148	.39808	620.3	1.706	.94800	26.65534	.21265
51	270	2.053	1.257	521.5	1.424	79706	22.36942	.57859	550.5	1.507	.80132	23.61149	.50302	579.3	1.589	.92223	25.84916	.34205
52	270	3.053	1.382	512.5	1.424	79706	22.36942	.57859	550.5	1.507	.80132	23.61149	.50302	579.3	1.589	.92223	25.84916	.34205
53	270	4.053	1.507	481.8	1.310	73631	20.66460	.67600	504.7	1.376	.77136	21.64817	.62045	530.0	1.448	.80996	22.73105	.56712
54	0	4.931	.616	1.43	1.026	.02190	.61458	3.14616	13.9	1.027	.02119	.59475	3.16838	13.7	1.028	.02093	.58726	3.17697
55	0	5.456	.682	8.8	1.042	.01338	.37557	3.48559	8.3	1.043	.01267	.35548	3.52432	8.1	1.044	.01217	.34143	3.55285
56	0	5.981	.748	8.0	1.044	.01217	.34143	3.55285	7.									

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 4.63$ - Continued(b) $\alpha = 10^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ, p_t = 7915.0$ psf					$\phi = 90.0^\circ, p_t = 7915.0$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	511.4	1.397	.78249	21.96065	.60246	531.8	1.455	.81372	22.83702	.55075
3	0	.453	.057	516.2	1.411	.78984	22.16686	.59047	541.4	1.483	.82842	23.24942	.52562
4	0	.653	.082	527.0	1.441	.80637	22.63081	.56311	552.2	1.514	.84495	23.71338	.49656
5	0	.853	.107	524.6	1.435	.80270	22.52771	.56924	551.0	1.510	.84311	23.66183	.49984
6	0	1.053	.132	519.8	1.421	.79535	22.32151	.58141	547.4	1.500	.83760	23.50718	.50959
7	0	1.253	.157	517.4	1.414	.79168	22.21841	.58745	545.0	1.493	.83393	23.40408	.51604
8	0	1.453	.182	517.4	1.414	.79168	22.21841	.58745	543.8	1.490	.83209	23.35252	.51924
9	0	1.653	.207	515.0	1.407	.78800	22.11531	.59347	543.8	1.490	.83209	23.35252	.51924
10	0	1.853	.232	513.8	1.404	.78617	22.06375	.59647	541.4	1.483	.82842	23.24942	.52562
11	0	2.053	.257	511.4	1.397	.78249	21.96065	.60246	537.8	1.472	.82290	23.09477	.53512
12	0	2.253	.282	510.2	1.393	.78066	21.90910	.60544	536.6	1.469	.82107	23.04322	.53826
13	0	2.453	.307	507.8	1.387	.77698	21.80600	.61139	533.0	1.459	.81556	22.88857	.54764
14	0	2.653	.332	505.4	1.380	.77331	21.70290	.61731	529.4	1.448	.81005	22.73391	.55695
15	0	2.853	.357	501.8	1.369	.76780	21.54825	.62616	525.8	1.438	.80454	22.57926	.56618
16	0	3.053	.382	499.4	1.362	.76413	21.44514	.63204	522.2	1.428	.79903	22.42461	.57534
17	0	3.253	.407	494.6	1.349	.75678	21.23894	.64374	516.2	1.411	.78984	22.16686	.59047
18	0	3.453	.432	489.8	1.335	.74943	21.03274	.65537	511.4	1.397	.78249	21.96065	.60246
19	0	3.653	.457	484.8	1.318	.74025	20.77498	.66983	503.0	1.373	.76964	21.59980	.62322
20	0	3.853	.482	476.6	1.297	.72923	20.46568	.68708	493.4	1.345	.75494	21.18739	.64665
21	0	4.053	.507	467.0	1.270	.71453	20.05327	.70993	483.8	1.318	.74025	20.77498	.66983
22	0	4.253	.532	449.0	1.218	.68698	19.28001	.75245	461.0	1.253	.70535	19.79552	.72414
23	0	4.453	.557	416.6	1.125	.63738	17.88814	.82863	425.0	1.149	.65024	18.24899	.80887
24	180	.253	.032	585.4	1.609	.89569	25.13759	.39984	545.6	1.495	.83488	23.43071	.51437
25	180	.453	.057	585.4	1.609	.89569	25.13759	.39984	548.0	1.502	.83856	23.53416	.50790
26	180	.653	.082	585.4	1.609	.89569	25.13759	.39984	548.0	1.502	.83856	23.53416	.50790
27	180	.853	.107	584.2	1.605	.89385	25.08586	.40362	548.0	1.502	.83856	23.53416	.50790
28	180	1.053	.132	581.8	1.598	.89016	24.98242	.41110	548.0	1.502	.83856	23.53416	.50790
29	180	1.253	.157	579.3	1.591	.88648	24.87897	.41849	545.6	1.495	.83488	23.43071	.51437
30	180	1.453	.182	574.5	1.578	.87911	24.67208	.43301	543.2	1.488	.83119	23.32727	.52081
31	180	1.653	.207	573.3	1.574	.87726	24.62035	.43659	542.0	1.484	.82935	23.27554	.52401
32	180	1.853	.232	572.1	1.571	.87542	24.56863	.44015	538.4	1.474	.82382	23.12037	.53355
33	180	2.053	.257	567.3	1.557	.86805	24.36174	.45420	536.0	1.467	.82013	23.01693	.53986
34	180	2.253	.282	564.9	1.550	.86436	24.25829	.46112	533.6	1.460	.81645	22.91348	.54614
35	180	2.453	.307	561.3	1.540	.85883	24.10312	.47138	530.0	1.450	.81092	22.75831	.55548
36	180	2.653	.332	555.3	1.522	.84962	23.84450	.48818	526.4	1.440	.80539	22.60314	.54476
37	180	2.853	.357	552.8	1.515	.84593	23.74105	.49480	523.9	1.433	.80170	22.49969	.57090
38	180	3.053	.382	548.0	1.502	.83856	23.53416	.50790	517.9	1.416	.79249	22.24108	.56163
39	180	3.253	.407	542.0	1.484	.82935	23.27554	.52401	513.1	1.402	.78511	22.03418	.59819
40	180	3.453	.432	536.0	1.467	.82013	23.01693	.53986	507.1	1.384	.77590	21.77556	.61314
41	180	3.653	.457	526.4	1.440	.80539	22.60314	.56476	499.9	1.364	.76484	21.46522	.63090
42	180	3.853	.482	515.5	1.409	.78880	22.13763	.59217	490.2	1.336	.75010	21.05144	.65432
43	180	4.053	.507	502.3	1.371	.76851	21.56867	.62500	478.2	1.302	.73167	20.53420	.68327
44	180	4.253	.532	477.0	1.298	.72982	20.48248	.68614	456.5	1.240	.69849	19.60318	.73472
45	180	4.453	.557	439.6	1.191	.67269	18.87905	.77441	422.8	1.143	.66489	18.15492	.81402
46	90	1.053	.132	500.6	1.366	.76596	21.49670	.62910	499.4	1.362	.76413	21.44514	.63204
47	90	2.053	.257	489.8	1.335	.74943	21.03274	.65537	487.4	1.328	.74576	20.92964	.66117
48	90	3.053	.382	481.4	1.311	.73657	20.67188	.67559	480.2	1.308	.73474	20.62033	.67847
49	90	4.053	.507	459.8	1.249	.70351	19.74397	.72698	462.2	1.256	.70718	19.84707	.72130
50	270	1.053	.132	640.8	1.767	.98047	27.51687	.16809	649.2	1.791	.99337	27.87893	.09751
51	270	2.053	.257	625.1	1.722	.95651	26.84446	.25283	632.3	1.743	.96757	27.15480	.21753
52	270	3.053	.382	599.8	1.650	.91781	25.75827	.35219	605.8	1.667	.92702	26.01689	.33080
53	270	4.053	.507	548.0	1.502	.83856	23.53416	.50790	552.8	1.515	.84593	23.74105	.49480
54	0	4.931	.616	13.4	.028	.02046	.57429	3.19214	13.2	.029	.02024	.56808	3.19953
55	0	5.456	.682	7.8	.044	.01194	.35000	3.56633	7.7	.045	.01171	.32853	3.58019
56	0	5.981	.748	7.3	.046	.01121	.31449	3.61129	7.2	.046	.01097	.30800	3.62620
57	0	6.506	.813	7.2	.046	.01096	.30766	3.62699	7.0	.047	.01073	.30115	3.64229
58	0	7.031	.879	7.2	.046	.01096	.30766	3.62699	7.2	.046	.01097	.30800	3.62620
59	180	7.031	.879	7.2	.046	.01096	.30766	3.62699	7.2	.046	.01097	.30800	3.62620
60	180	6.506	.813	7.2	.046	.01096	.30766	3.62699	7.2	.046	.01097	.30800	3.62620
61	180	5.981	.748	7.2	.046	.01096	.30766	3.62699	7.0	.047	.01073	.30115	3.64229
62	180	5.456	.682	7.2	.046	.01096	.30766	3.62699	7.0	.047	.01073	.30115	3.64229
63	180	4.931	.616	7.2	.046	.01096	.30766	3.62699	7.2	.046	.01097	.30800	3.62620

*The following conversion factors can be used to convert these data to the International System of Units:

1 inch = 25.4 mm; 1 psf = 47.88 N/m².

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 4.63$ - Continued(c) $\alpha = 20^\circ$

Orifice	θ , deg	s, in.	s/d	$\phi = 0.0^\circ$, $p_t = 7924.4$ psf						$\phi = 22.5^\circ$, $p_t = 7924.4$ psf						$\phi = 45.0^\circ$, $p_t = 7924.4$ psf					
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l			
2	0	.253	.032	358.9	.959	.54856	15.39524	.96736	327.4	.869	.50035	14.04220	1.04588	303.4	.801	.46365	13.01227	1.10813			
3	0	.453	.057	357.7	.956	.54672	14.34375	.97029	345.4	.921	.52784	14.81375	1.00072	328.6	.872	.50213	14.02934	1.04291			
4	0	.653	.082	381.7	1.025	.58342	16.34353	.91626	351.4	.938	.53700	15.07094	1.08590	345.3	.920	.52779	14.81238	1.00080			
5	0	.853	.107	364.9	.976	.55773	15.65568	.95274	357.4	.955	.54617	15.39812	.97118	350.1	.934	.53512	15.01811	.98893			
6	0	1.053	.132	340.1	.963	.55039	15.44673	.96443	356.0	.948	.54250	15.22525	.97706	350.1	.934	.53512	15.01811	.98893			
7	0	1.253	.157	349.3	.937	.53388	15.99333	.90094	351.4	.938	.53700	15.07094	.98590	348.9	.931	.53329	14.96668	.99189			
8	0	1.453	.182	354.1	.946	.54122	15.18928	.97912	351.4	.938	.53700	15.07094	.98590	351.3	.938	.53695	15.06954	.98598			
9	0	1.653	.207	354.1	.946	.54122	15.18928	.97912	349.0	.931	.53334	14.98086	.99181	351.3	.938	.53695	15.06954	.98598			
10	0	1.853	.232	350.5	.935	.53572	15.03481	.98797	349.0	.931	.53334	14.98086	.99181	351.3	.938	.53695	15.06954	.98598			
11	0	2.053	.257	350.5	.935	.53572	15.03481	.98797	349.0	.931	.53334	14.98086	.99181	351.3	.938	.53695	15.06954	.98598			
12	0	2.253	.282	350.5	.935	.53572	15.03481	.98797	349.0	.931	.53334	14.98086	.99181	351.3	.938	.53695	15.06954	.98598			
13	0	2.453	.307	350.5	.935	.53572	15.03481	.98797	349.0	.931	.53334	14.98086	.99181	352.5	.941	.53879	15.12097	.98303			
14	0	2.653	.332	350.5	.935	.53572	15.03481	.98797	347.8	.927	.53150	14.91663	.99478	352.5	.941	.53879	15.12097	.98303			
15	0	2.853	.357	350.5	.935	.53572	15.03481	.98797	347.8	.927	.53150	14.91663	.99478	351.3	.938	.53695	15.06954	.98598			
16	0	3.053	.382	349.3	.932	.53388	14.98333	.99094	347.8	.927	.53150	14.91663	.99478	351.3	.938	.53695	15.06954	.98598			
17	0	3.253	.407	349.3	.932	.53388	14.98333	.99094	347.8	.927	.53150	14.91663	.99478	350.1	.934	.53512	15.01811	.98893			
18	0	3.453	.432	349.1	.928	.53205	14.93184	.99390	346.6	.924	.52967	14.86519	.99775	350.1	.934	.53512	15.01811	.98893			
19	0	3.653	.457	348.1	.928	.53205	14.93184	.99390	346.6	.924	.52967	14.86519	.99775	349.9	.931	.53329	14.96668	.99189			
20	0	3.853	.482	346.9	.925	.53021	14.88035	.99687	345.4	.921	.52784	14.81375	1.00072	346.5	.920	.52779	14.81238	1.00080			
21	0	4.053	.507	348.1	.928	.53205	14.93184	.99390	344.2	.917	.52601	14.76232	1.0030	345.3	.920	.51863	14.55522	1.01573			
22	0	4.253	.532	344.5	.918	.52654	14.77737	1.00282	339.4	.903	.5197	14.55677	1.01656	339.3	.903	.49664	13.93804	1.05206			
23	0	4.453	.557	333.7	.887	.51003	14.31397	1.00284	327.1	.869	.50305	14.05220	1.04588	325.0	.862	.48034	23.58296	.50476			
24	180	.253	.032	614.3	1.856	.58680	26.3416	.301.0	590.0	1.648	.91680	25.73981	.54548	549.8	1.505	.86245	24.20459	.44648			
25	180	.453	.057	633.7	1.744	.9825	27.7394	.515.8	616.7	1.696	.94257	26.45313	.291.9	564.3	1.546	.87535	24.56662	.44029			
26	180	.653	.082	644.4	1.775	.98482	26.63890	.1479.9	626.4	1.724	.95730	26.66646	.25047	572.8	1.570	.88272	24.77350	.42594			
27	180	.853	.107	650.4	1.792	.99402	27.80720	.09258	632.4	1.741	.96650	27.12479	.22116	577.6	1.584	.89378	25.0382	.41496			
28	180	1.053	.132	651.6	1.796	.99586	27.94887	.07497	632.4	1.741	.96650	27.12479	.22116	581.2	1.595	.88225	24.92866	.41496			
29	180	1.253	.157	654.0	1.803	.99555	28.05219	.02547	636.0	1.751	.97202	27.27979	.20174	584.8	1.605	.89378	25.0382	.41377			
30	180	1.453	.182	656.0	1.803	.99595	28.06219	.02547	636.0	1.751	.97202	27.27979	.20174	584.8	1.605	.89378	25.0382	.41377			
31	180	1.653	.207	656.4	1.810	1.00323	28.15551	.00000	637.2	1.755	.97387	27.33146	.19487	584.8	1.605	.89378	25.0382	.41377			
32	180	1.853	.232	656.4	1.810	1.00323	28.15551	.00000	637.2	1.755	.97387	27.33146	.19487	584.8	1.605	.89378	25.0382	.41377			
33	180	2.053	.257	656.4	1.810	1.00323	28.15551	.00000	638.4	1.748	.97018	27.22813	.20840	584.8	1.605	.89378	25.0382	.41377			
34	180	2.253	.282	651.6	1.796	.99586	27.94887	.07697	638.4	1.748	.97018	27.22813	.20840	584.8	1.605	.89378	25.0382	.41377			
35	180	2.453	.307	651.6	1.796	.99586	27.94887	.07697	633.6	1.744	.96834	27.17646	.21487	584.2	1.598	.89009	24.90308	.41125			
36	180	2.653	.332	646.4	1.782	.98850	27.74222	.12864	630.0	1.734	.96828	27.02146	.23328	584.8	1.588	.88456	24.82522	.42230			
37	180	2.853	.357	646.4	1.782	.98850	27.74222	.12864	627.6	1.727	.95914	26.91813	.24488	575.2	1.577	.87904	24.67008	.43315			
38	180	3.053	.382	640.4	1.765	.97930	27.44391	.17313	624.0	1.717	.95361	26.76313	.26137	572.8	1.570	.87535	24.56662	.42939			
39	180	3.253	.407	638.4	1.758	.97652	27.30509	.18183	622.8	1.713	.95177	26.7146	.26667	567.9	1.557	.88161	24.55975	.45433			
40	180	3.453	.432	632.3	1.741	.96641	27.12228	.22146	614.3	1.689	.93889	26.34980	.30105	563.1	1.543	.88085	23.94286	.44810			
41	180	3.653	.457	623.9	1.717	.95353	26.76065	.26162	605.9	1.665	.92600	25.98844	.33333	555.5	1.522	.88085	23.94286	.44810			
42	180	3.853	.482	614.3	1.689	.93880	26.34736	.30172	596.3	1.638	.9127	25.51481	.336676	546.2	1.495	.83481	23.42880	.51449			
43	180	4.053	.507	598.6	1.644	.91487	25.67576	.35880	581.6	1.594	.89818	24.95481	.44308	532.2	1.460	.81638	22.91161	.51625			
44	180	4.253	.532	532.1	1.569	.8737	24.53921	.8737	554.1	1.517	.84664	23.7649	.49318	507.6	1.384	.77584	21.77379	.61324			
45	180	4.453	.557	525.1	1.494	.80258	22.54241	.56493	509.5	1.390	.77872	21.65483	.60857	545.4	1.264	.71134	19.96362	.71488			
46	0	1.053	.125	484.6	1.150	.65497	1.83161	.80182	370.6	.993	.56633	15.03923	.93913	350.1	.934	.53512	15.01811	.98893			
47	0	2.053	.257	437.0	1.182	.66781	1.84703	.78190	380.2	1.020	.58099	16.20542	.91600	352.5	.941	.53879	15.12097	.98303			
48	0	3.053	.382	432.2	1.169	.66047	1.85367	.79317	379.0	1.017	.57916	16.25398	.91893	351.3	.938	.53695	15.06954	.98598			
49	0	4.053	.507	408.3	1.100	.62378	1.75629	.84959	363.4	.972	.55533	15.58530	.95565	342.9	.914	.52412	14.70952	1.00676			
50	270	1.053	.132	430.0	1.162	.65716	18.44315	.79025	508.3	1.386	.77688	21.40317	.61155	574.8	1.588	.88456	24.82522	.42230			
51	270	2.053	.257	437.2	1.183	.66820	18.75312	.78130	511.9	1.397	.78241	21.95817	.60260	581.2	1.595	.88225	24.92866	.41496			
52	270	3.053	.382	433.6	1.173	.66268	18.49814	.78978	504.7	1.376	.77136	21.64817	.62045	572.8	1.570	.87535	24.56662	.44029			
53	270	4.053	.507	408.3	1.100	.62403	17.51324	.84921	469.8	1.276	.71797	20.14985	.70459	533.0	1.457	.81454	22.85989	.59437			
54	0	4.931	.616	13.7	.027	.02095	.58791	3.17622	13.5	.028	.02070	.58107	.318416	13.2	.029	.02022	.56740	3.20035			
55	0	5.456	.682	7.8	.044	.01194	.33497	3.56639	7.8	.044	.01194	.33497	3.56639	7.7	.045	.01169	.32814	3.58104			
56	0	5.981	.748	7.2	.046	.01094	.30763	3.62706	7.2	.046	.01094	.30763	3.62706	7.0	.047	.01072	.30079	3.64315			
57	0	6.506	.813	7.0	.																

TABLE VI.- TABULAR LISTING OF DATA* FOR SHARP CONE; $M_\infty = 4.63$ - Concluded(c) $\alpha = 20^\circ$ - Concluded

Orifice	θ , deg	s, in.	s/d	$\phi = 67.5^\circ$, $p_t = 7924.4$ psf					$\phi = 90.0^\circ$, $p_t = 7915.0$ psf				
				p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l	p_l , psf	C_p	$p_l/p_{t,2}$	p_l/p_∞	M_l
2	0	.253	.032	291.4	.766	.44532	12.49795	1.14023	344.5	.919	.52717	14.79509	1.00180
3	0	.453	.057	327.4	.869	.50030	14.04090	1.04595	384.1	1.033	.58779	16.49626	.91542
4	0	.653	.082	360.9	.965	.55161	15.48100	.96248	415.4	1.122	.63555	17.83659	.83146
5	0	.853	.107	366.9	.982	.56078	15.73816	.94791	422.6	1.143	.64657	18.14589	.81452
6	0	1.053	.132	368.1	.986	.56261	15.78959	.94501	423.8	1.146	.64841	18.19744	.81170
7	0	1.253	.157	369.3	.989	.56444	15.84102	.94211	425.0	1.149	.65024	18.24899	.80887
8	0	1.453	.182	374.1	1.003	.57177	16.04675	.93054	431.0	1.167	.65943	18.50675	.79477
9	0	1.653	.207	375.3	1.006	.57360	16.09818	.92765	432.2	1.170	.66126	18.55830	.79195
10	0	1.853	.232	376.5	1.010	.57544	16.14961	.92477	433.4	1.174	.66310	18.60985	.78913
11	0	2.053	.257	377.7	1.013	.57727	16.20104	.92189	433.4	1.174	.66310	18.60985	.78913
12	0	2.253	.282	378.9	1.016	.57910	16.25247	.91902	434.6	1.177	.66494	18.66140	.78631
13	0	2.453	.307	380.1	1.020	.58094	16.30391	.91614	435.8	1.180	.66677	18.71295	.78350
14	0	2.653	.332	380.1	1.020	.58094	16.30391	.91614	434.6	1.177	.66494	18.66140	.78631
15	0	2.853	.357	378.9	1.016	.57910	16.25247	.91902	433.4	1.174	.66310	18.60985	.78913
16	0	3.053	.382	378.9	1.016	.57910	16.25247	.91902	432.2	1.170	.66126	18.55830	.79195
17	0	3.253	.407	376.5	1.010	.57544	16.14961	.92477	428.6	1.160	.65575	18.40365	.80041
18	0	3.453	.432	375.3	1.006	.57360	16.09818	.92765	426.2	1.153	.65208	18.30054	.80605
19	0	3.653	.457	372.9	.999	.56994	15.99532	.93343	421.4	1.139	.64473	18.09434	.81734
20	0	3.853	.482	368.1	.986	.56261	15.78959	.94501	415.4	1.122	.63555	17.83659	.83146
21	0	4.053	.507	364.5	.975	.55711	15.63529	.95373	407.0	1.098	.62269	17.47573	.85127
22	0	4.253	.532	353.7	.944	.54062	15.17241	.98008	390.1	1.050	.59697	16.75402	.89110
23	0	4.453	.557	335.8	.893	.51313	14.40093	1.02474	364.9	.978	.55840	15.67145	.95168
24	180	.253	.032	471.5	1.281	.72055	20.22221	.70059	383.0	1.029	.58607	16.44805	.90101
25	180	.453	.057	484.7	1.319	.74082	20.79112	.66893	398.7	1.074	.61003	17.12046	.87083
26	180	.653	.082	494.4	1.346	.75556	21.20488	.64567	414.3	1.119	.63399	17.79286	.83386
27	180	.853	.107	500.4	1.364	.76478	21.46347	.63100	419.2	1.133	.64136	17.99975	.82252
28	180	1.053	.132	505.2	1.377	.77215	21.67035	.61918	427.6	1.157	.65426	18.36182	.80270
29	180	1.253	.157	507.6	1.384	.77584	21.77379	.61324	430.0	1.164	.65795	18.46526	.79704
30	180	1.453	.182	510.1	1.391	.77952	21.87723	.60728	433.6	1.174	.66348	18.62044	.78856
31	180	1.653	.207	508.9	1.388	.77768	21.82551	.61026	433.6	1.174	.66348	18.62044	.78856
32	180	1.853	.232	511.3	1.395	.78136	21.92895	.60429	434.8	1.178	.66532	18.67216	.78573
33	180	2.053	.257	508.9	1.388	.77768	21.82551	.61026	434.8	1.178	.66532	18.67216	.78573
34	180	2.253	.282	508.9	1.388	.77768	21.82551	.61026	434.8	1.178	.66532	18.67216	.78573
35	180	2.453	.307	508.9	1.388	.77768	21.82551	.61026	434.8	1.178	.66532	18.67216	.78573
36	180	2.653	.332	505.2	1.377	.77215	21.67035	.61918	433.6	1.174	.66348	18.62044	.78856
37	180	2.853	.357	504.0	1.374	.77031	21.61863	.62214	432.4	1.171	.66163	18.56871	.79138
38	180	3.053	.382	501.6	1.367	.76662	21.51519	.62805	431.2	1.167	.65979	18.51699	.79421
39	180	3.253	.407	499.2	1.360	.76294	21.41175	.63394	430.0	1.164	.65795	18.46526	.79704
40	180	3.453	.432	493.2	1.343	.75372	21.15316	.64859	425.2	1.150	.65058	18.25837	.80836
41	180	3.653	.457	487.1	1.326	.74451	20.89456	.66314	421.6	1.140	.64505	18.10320	.81685
42	180	3.853	.482	478.7	1.302	.73161	20.53253	.66336	415.5	1.123	.63583	17.84458	.83102
43	180	4.053	.507	467.9	1.271	.71502	20.06705	.70917	407.1	1.098	.62293	17.48252	.85090
44	180	4.253	.532	444.9	1.205	.68001	19.08439	.76317	391.5	1.054	.59897	16.81012	.88799
45	180	4.453	.557	410.0	1.105	.62657	17.58453	.84529	363.7	.974	.55658	15.62048	.95457
46	90	1.053	.132	352.5	.941	.53879	15.12097	.98303	357.4	.957	.54738	15.36215	.96924
47	90	2.053	.257	347.7	.927	.53145	14.91525	.99486	349.3	.933	.53452	15.00129	.98990
48	90	3.053	.382	345.3	.920	.52779	14.81238	1.00080	348.1	.930	.53268	14.94974	.99287
49	90	4.053	.507	340.5	.907	.52046	14.60665	1.01273	344.5	.919	.52717	14.79509	1.00180
50	270	1.053	.132	629.4	1.732	.96196	26.99743	.23602	650.4	1.795	.99522	27.93065	.08280
51	270	2.053	.257	631.8	1.739	.95655	27.10087	.22402	651.6	1.798	.99706	27.98238	.06489
52	270	3.053	.382	619.8	1.705	.94722	26.58367	.27940	638.4	1.760	.97679	27.41342	.18349
53	270	4.053	.507	578.8	1.588	.88456	24.82522	.42230	598.6	1.646	.91597	25.70655	.35634
54	0	4.931	.616	13.1	-.029	.01997	.56056	.320860	13.2	-.029	.02020	.56683	3.20103
55	0	5.456	.682	7.5	-.045	.01145	.32130	.359602	7.8	-.044	.01192	.33463	3.56711
56	0	5.981	.748	7.0	-.047	.01072	.30079	.364315	7.3	-.046	.01119	.31415	3.61208
57	0	6.506	.813	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778
58	0	7.031	.879	7.0	-.047	.01072	.30079	.364315	7.3	-.046	.01119	.31415	3.61208
59	180	7.031	.879	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778
60	180	6.506	.813	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778
61	180	5.981	.748	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778
62	180	5.456	.682	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778
63	180	4.931	.616	6.9	-.047	.01047	.29395	.365964	7.2	-.046	.01095	.30732	3.62778

*The following conversion factors can be used to convert these data to the International System of Units:

$$1 \text{ inch} = 25.4 \text{ mm}; 1 \text{ psf} = 47.88 \text{ N/m}^2.$$

Orifice number	θ, deg	s/d for -		Orifice number	θ, deg	s/d for -	
		Blunt cone	Sharp cone			Blunt cone	Sharp cone
1	0	0.000		33	180	0.250	0.257
2		.025	0.032	34		.275	.282
3		.050	.057	35		.300	.307
4		.075	.082	36		.325	.332
5		.100	.107	37		.350	.357
6		.125	.132	38		.375	.382
7		.150	.157	39		.400	.407
8		.175	.182	40		.425	.432
9		.200	.207	41		.450	.457
10		.225	.232	42		.475	.482
11		.250	.257	43		.500	.507
12		.275	.282	44		.525	.532
13		.300	.307	45		.550	.557
14		.325	.332	46	90	.125	.132
15		.350	.357	47		.250	.257
16		.375	.382	48		.375	.382
17		.400	.407	49		.500	.507
18		.425	.432	50	270	.125	.132
19		.450	.457	51		.250	.257
20		.475	.482	52		.375	.382
21		.500	.507	53		.500	.507
22		.525	.532	54 ^a	0	.610	.616
23		.550	.557	55 ^a		.675	.682
24	180	.025	.032	56 ^a		.741	.748
25		.050	.057	57 ^a		.807	.813
26		.075	.082	58 ^a		.872	.879
27		.100	.107	59 ^a	180	.872	.879
28		.125	.132	60 ^a		.807	.813
29		.150	.157	61 ^a		.741	.748
30		.175	.182	62 ^a		.675	.682
31		.200	.207	63 ^a		.610	.616
32		.225	.232				

^aOrifices located on model base

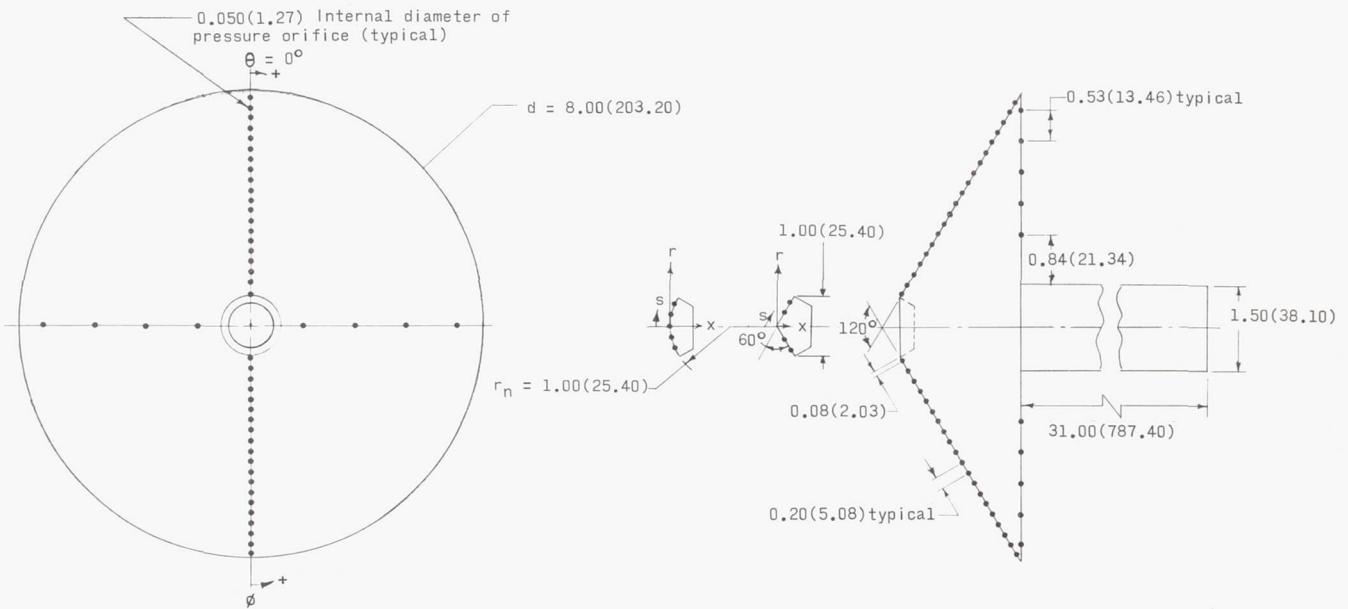


Figure 1.- Model dimensions and pressure orifice locations. Dimensions are in inches (millimeters).

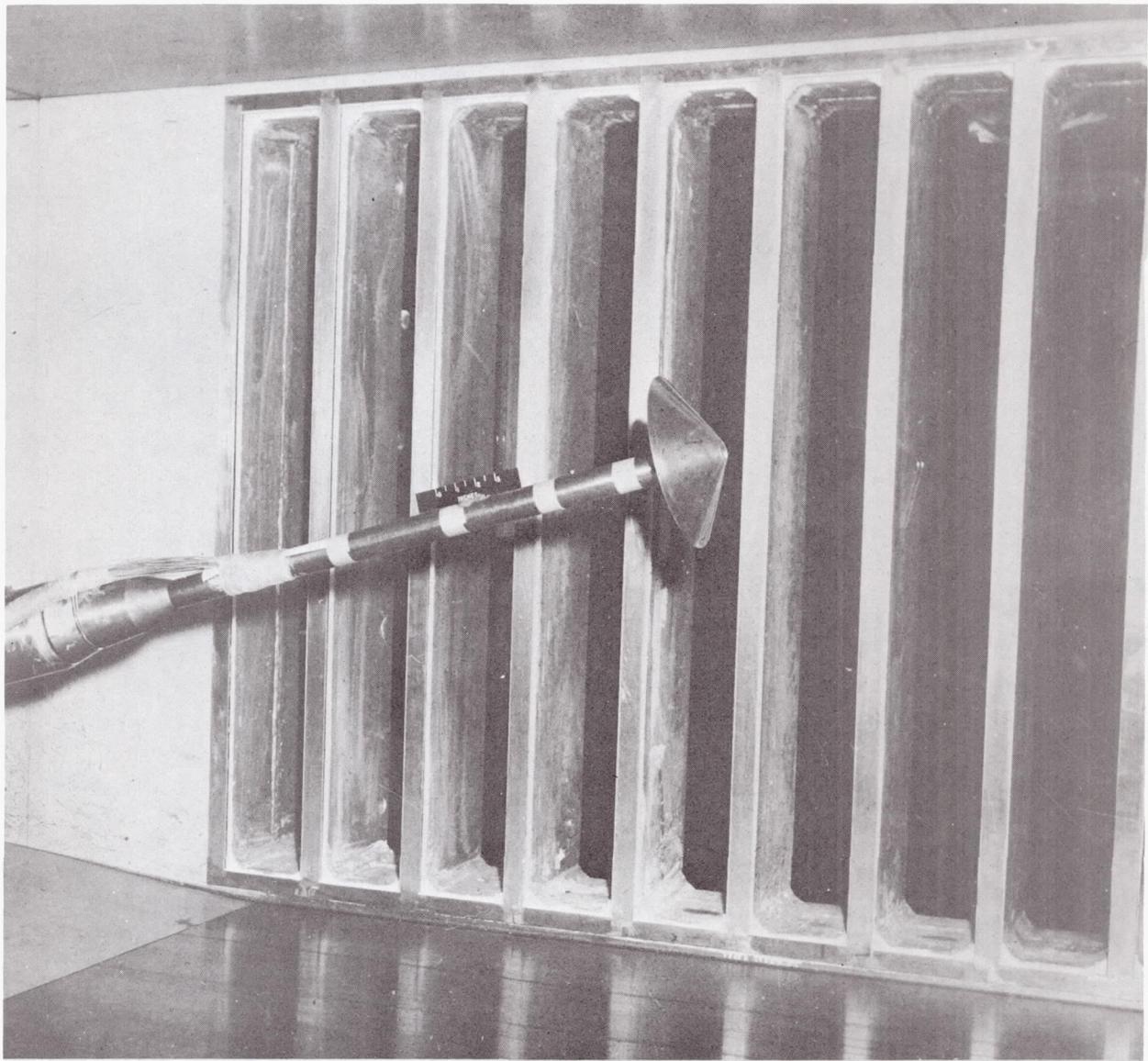


Figure 2.- Typical model installation in test section.

L-68-10,065

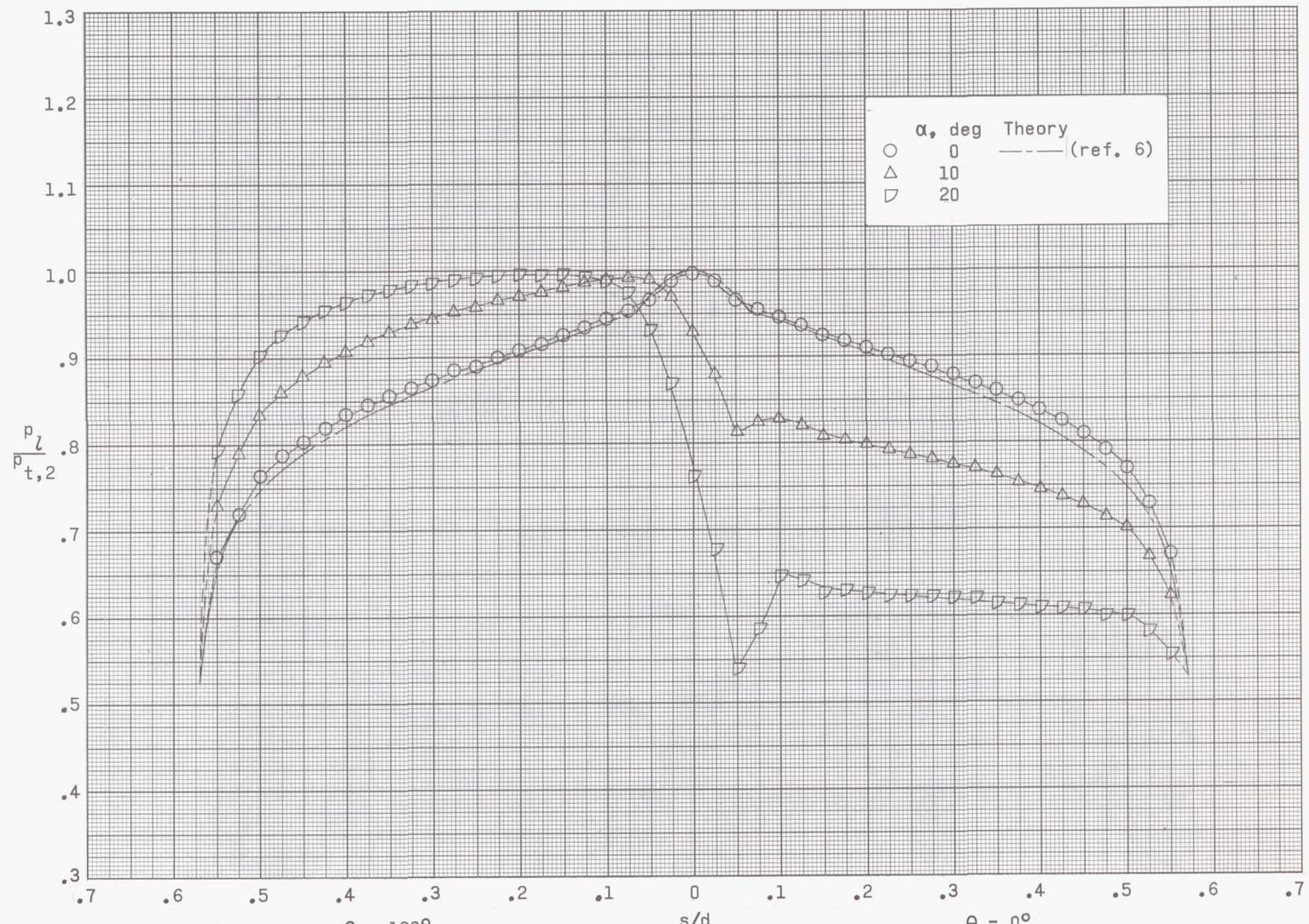
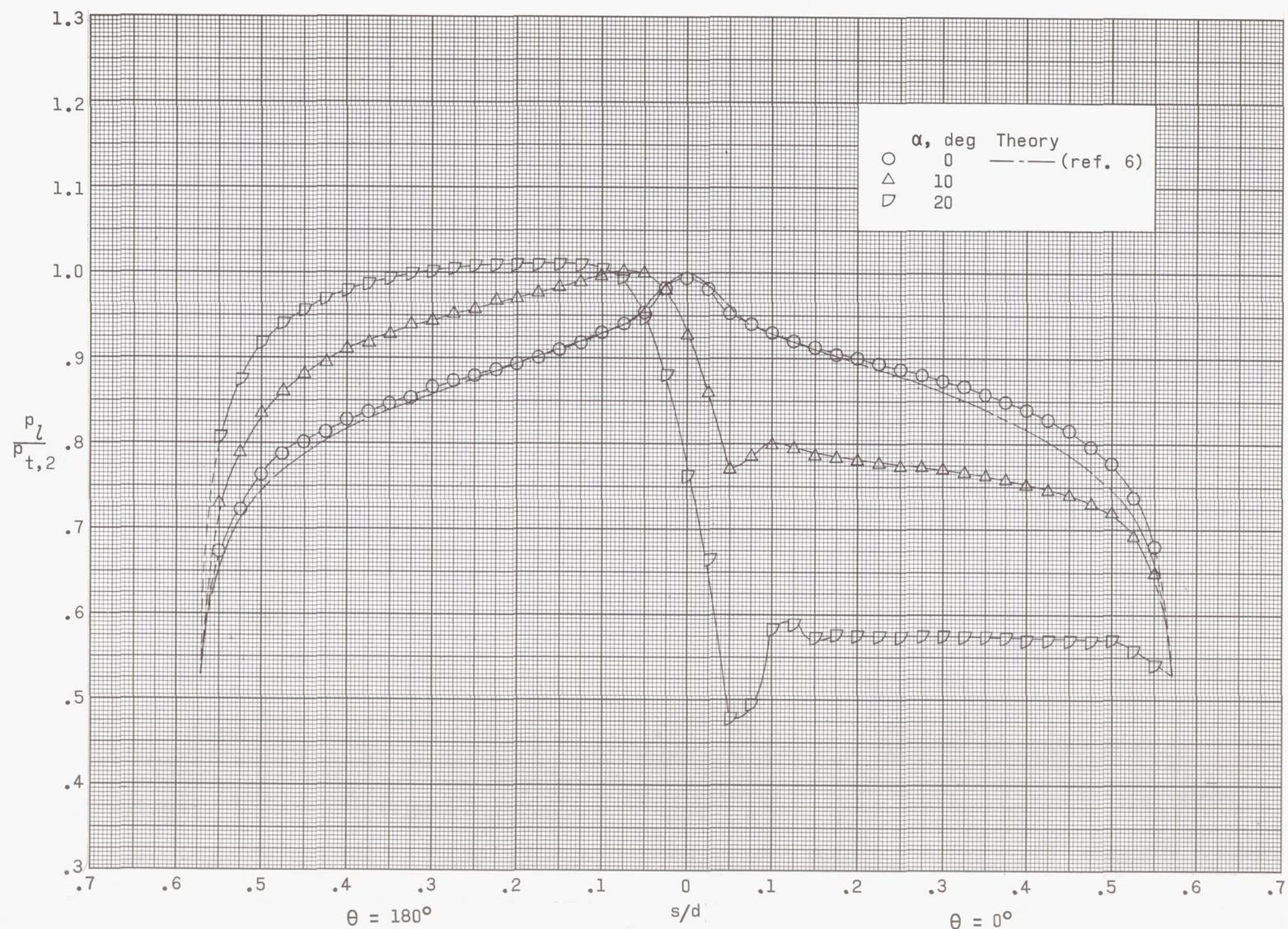
(a) $M_\infty = 2.96$.

Figure 3.- Effect of angle of attack on pressure distributions for the blunt cone. $\phi = 0^\circ$.



(b) $M_\infty = 3.95$.

Figure 3.- Continued.

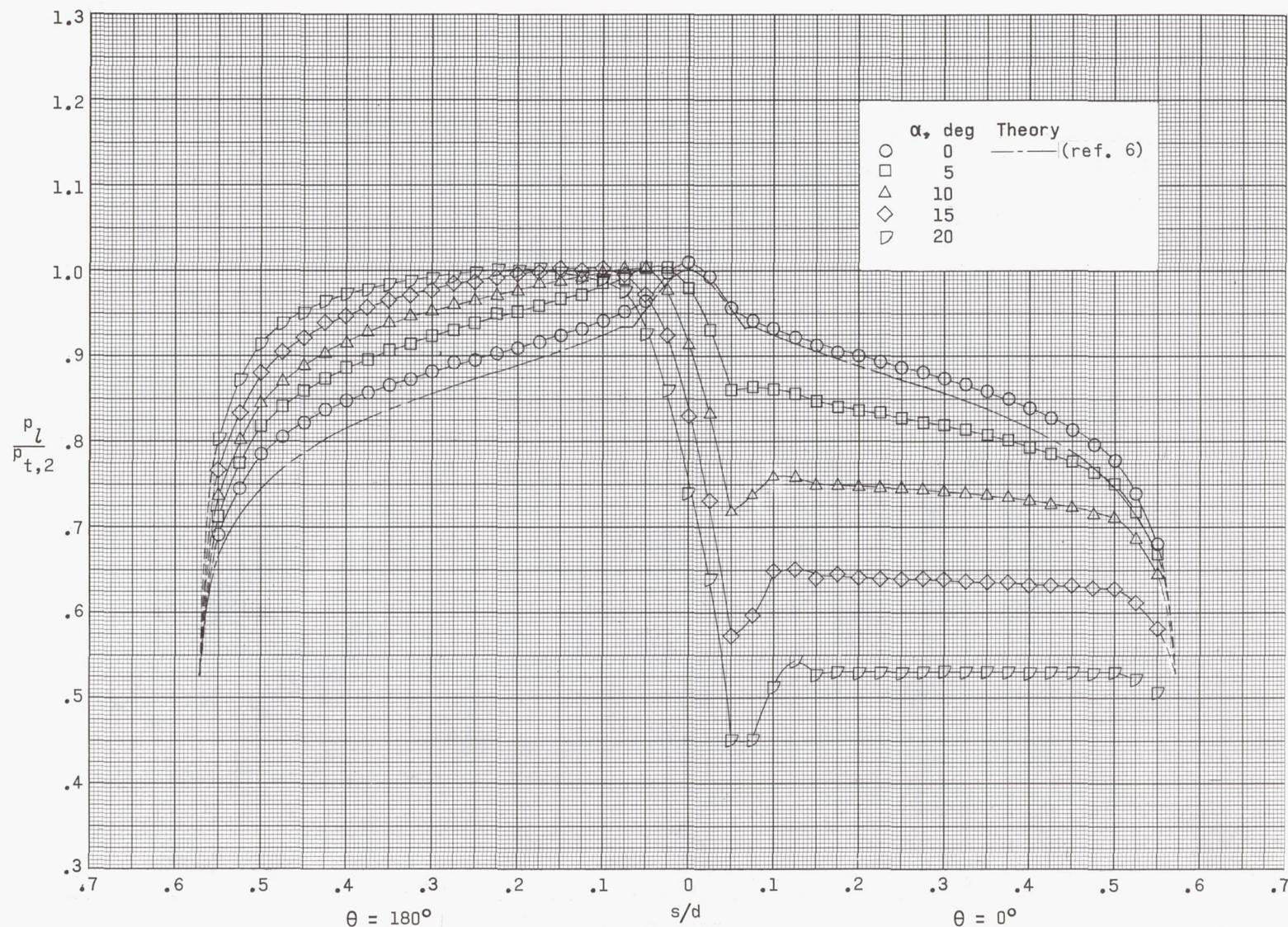
(c) $M_\infty = 4.63$.

Figure 3.- Concluded.

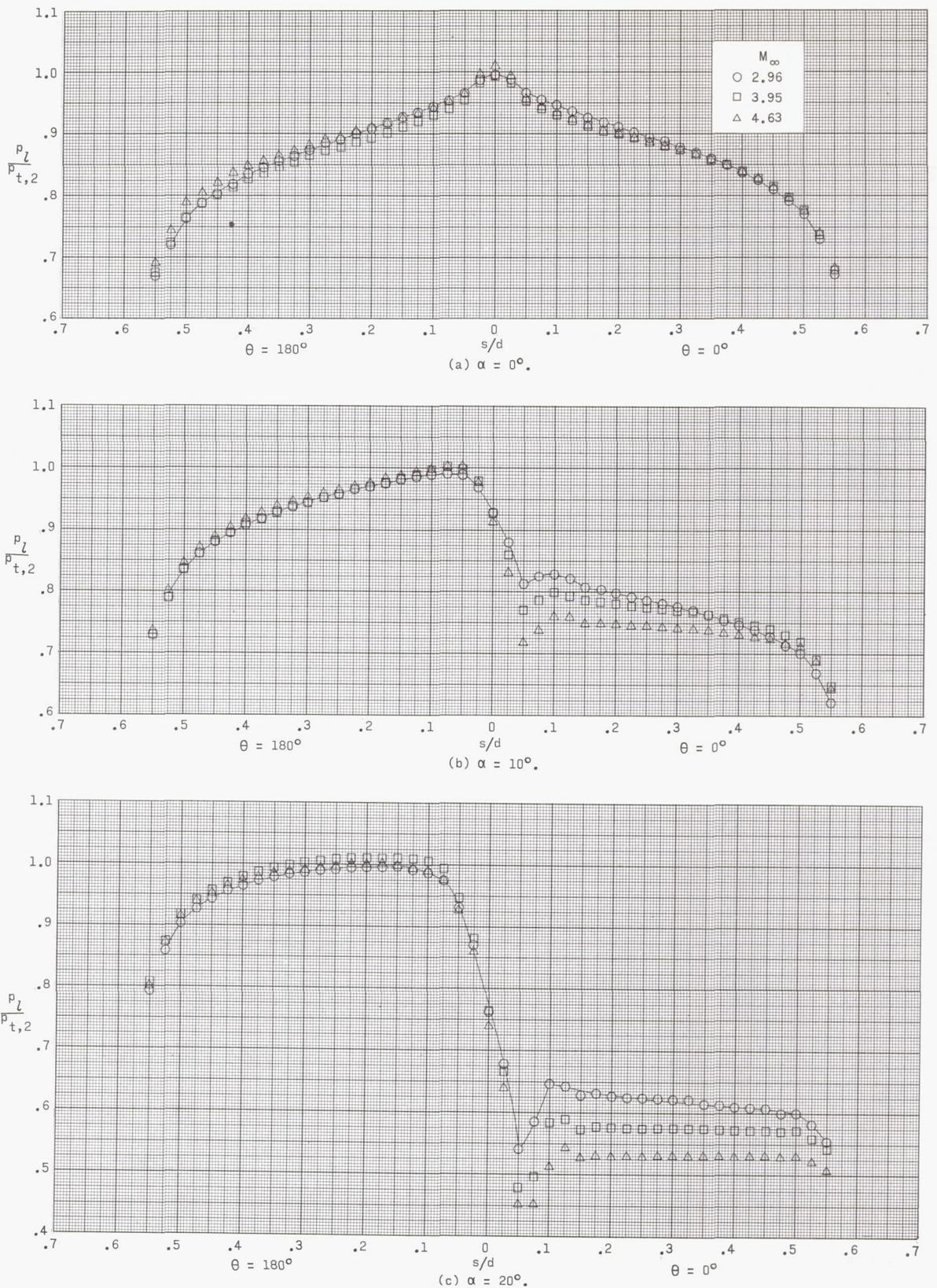


Figure 4.- Effect of Mach number on pressure distributions for the blunt cone. $\Phi = 0^\circ$.

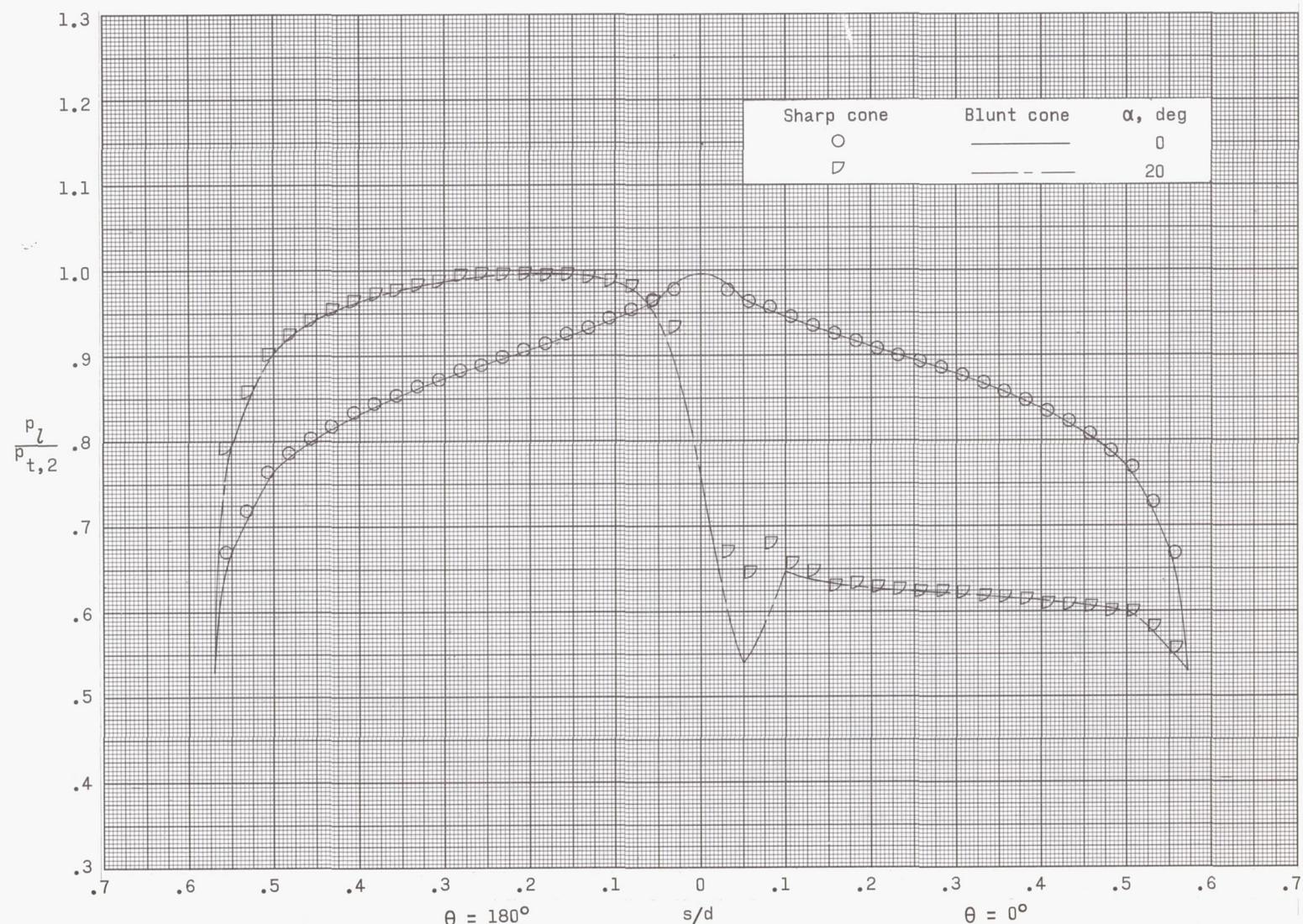
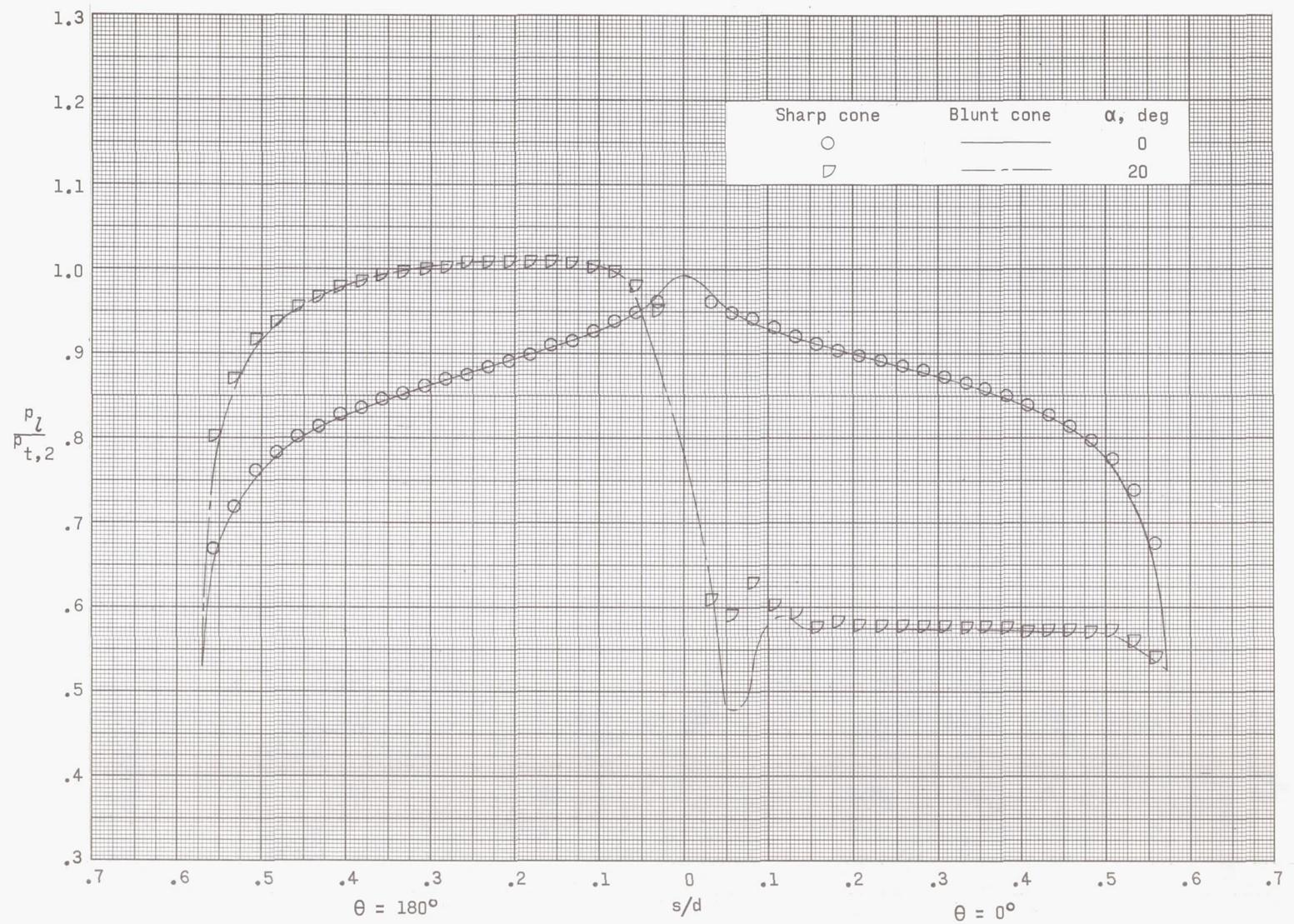
(a) $M_\infty = 2.96$.

Figure 5.- Comparison of pressure distributions for the blunt cone with those for the sharp cone. $\phi = 0^\circ$.



(b) $M_\infty = 3.95$.

Figure 5.- Continued.

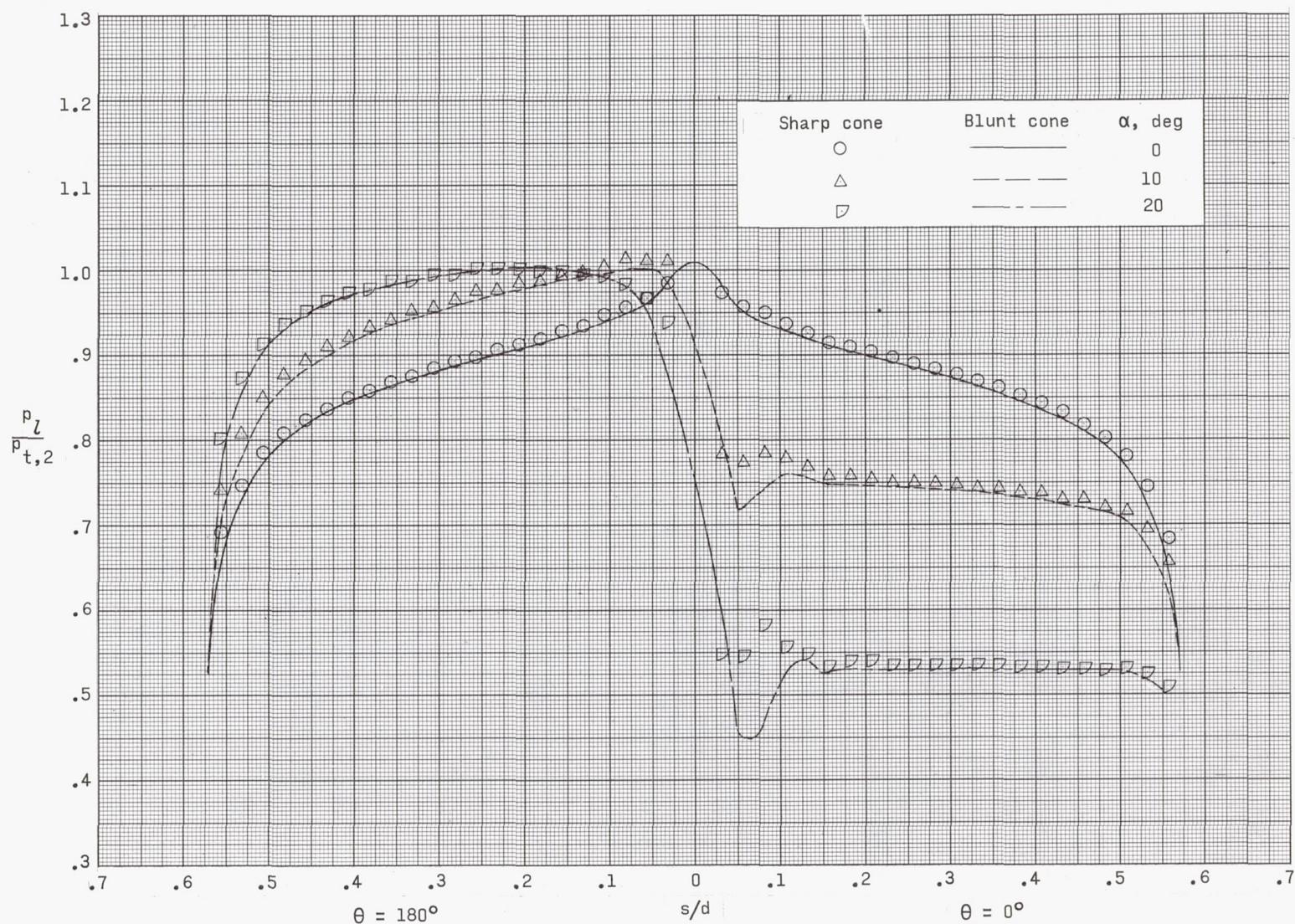
(c) $M_\infty = 4.63$.

Figure 5.- Concluded.

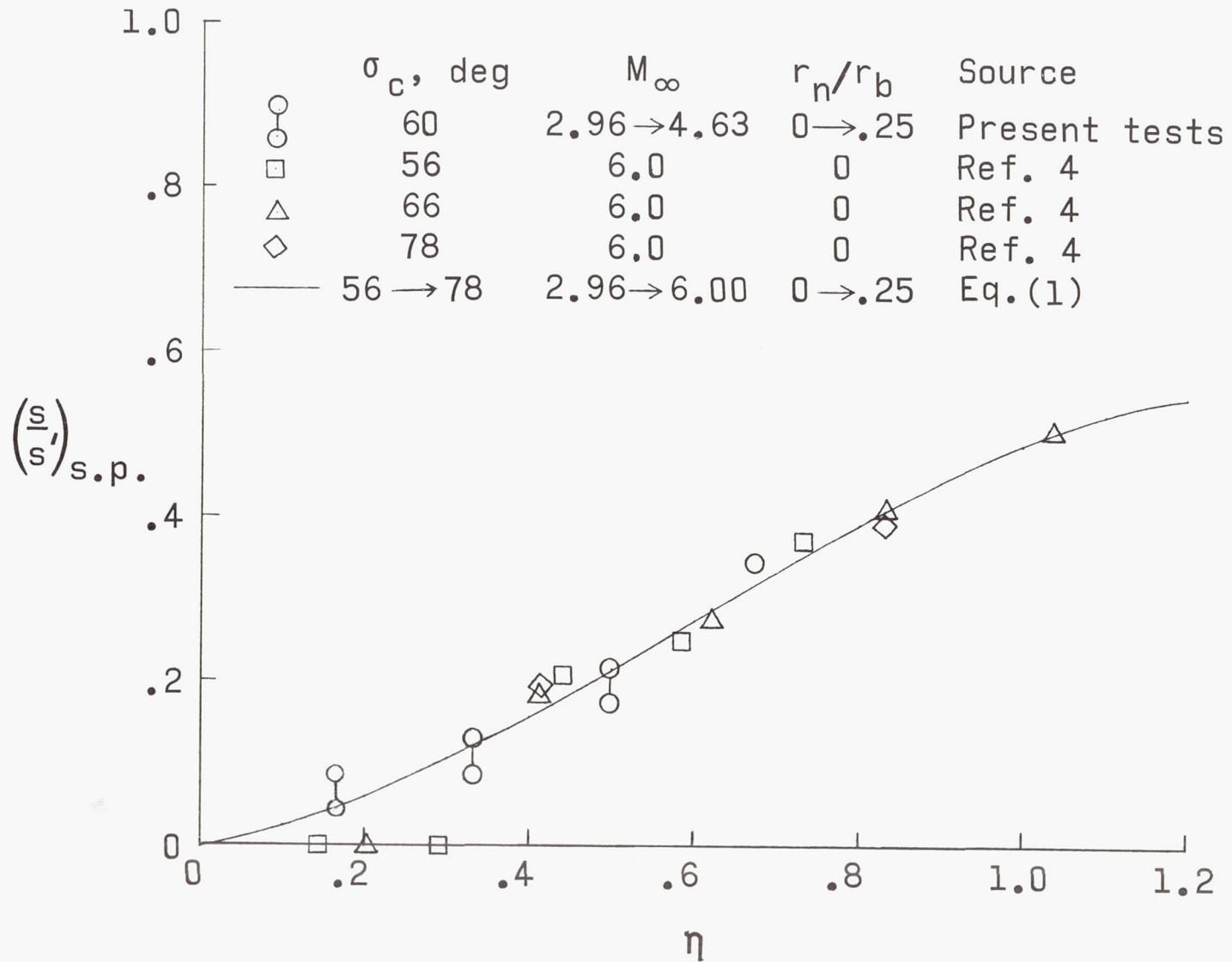


Figure 6.- Correlation of stagnation-point locations at angles of attack.

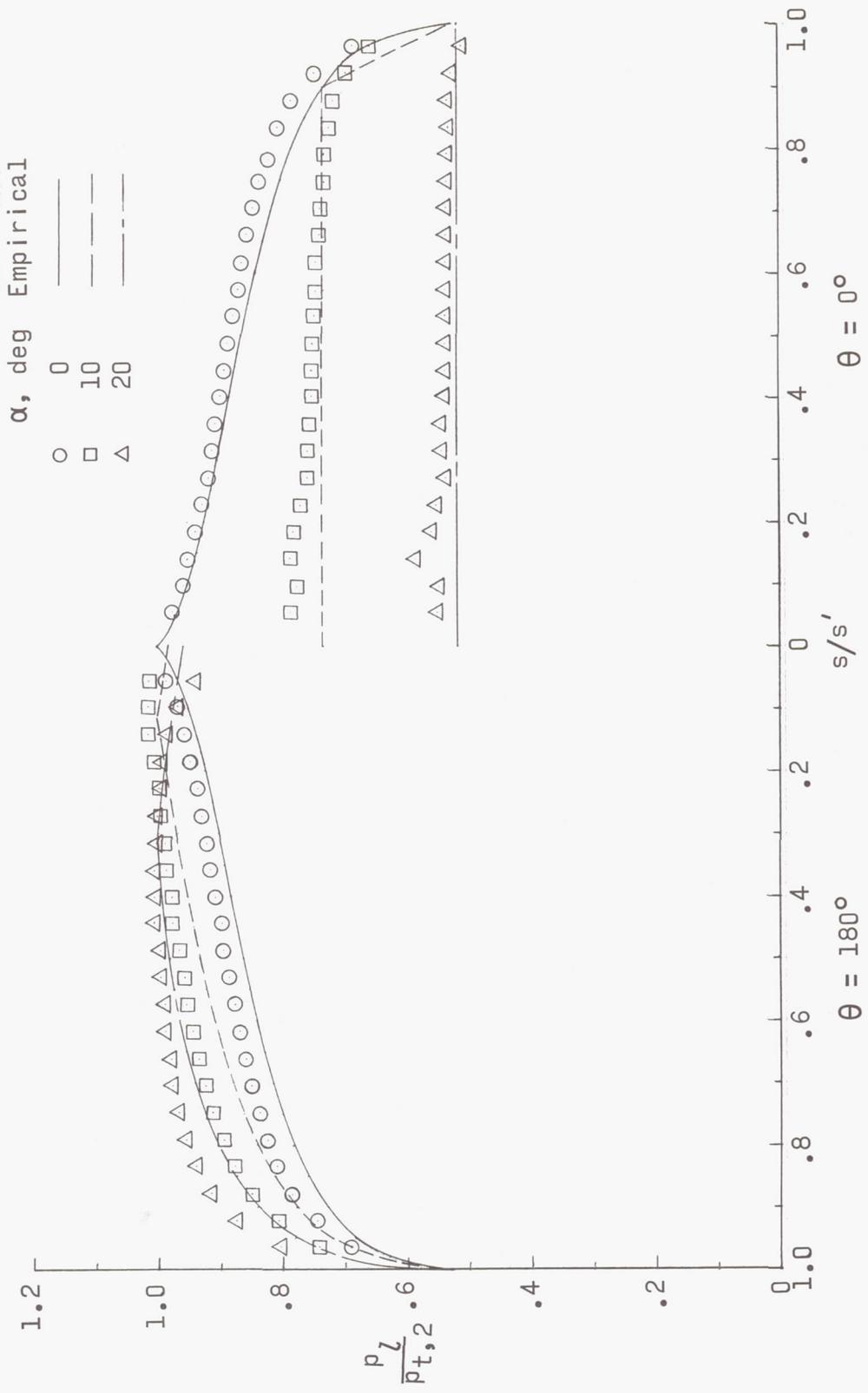
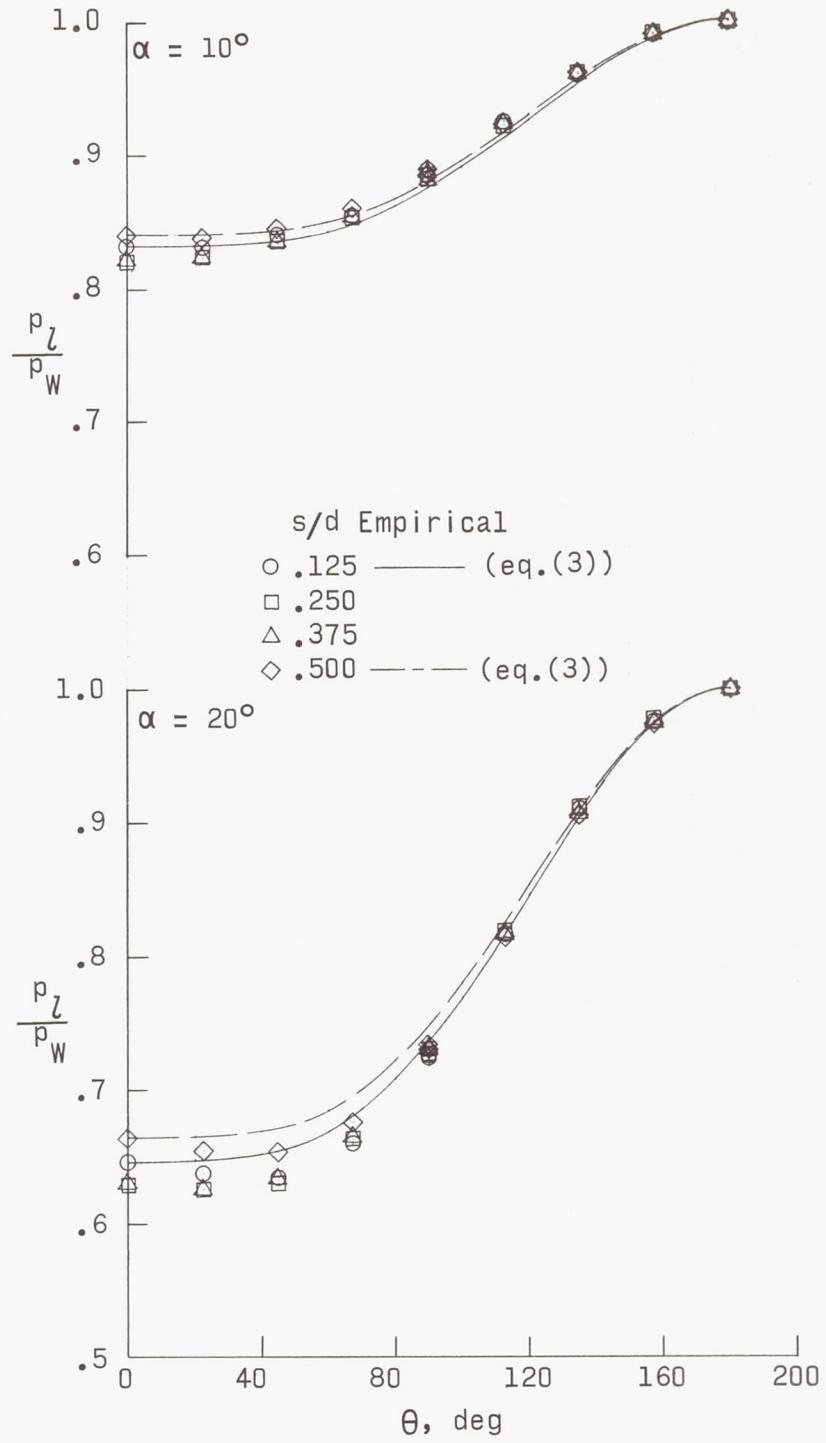
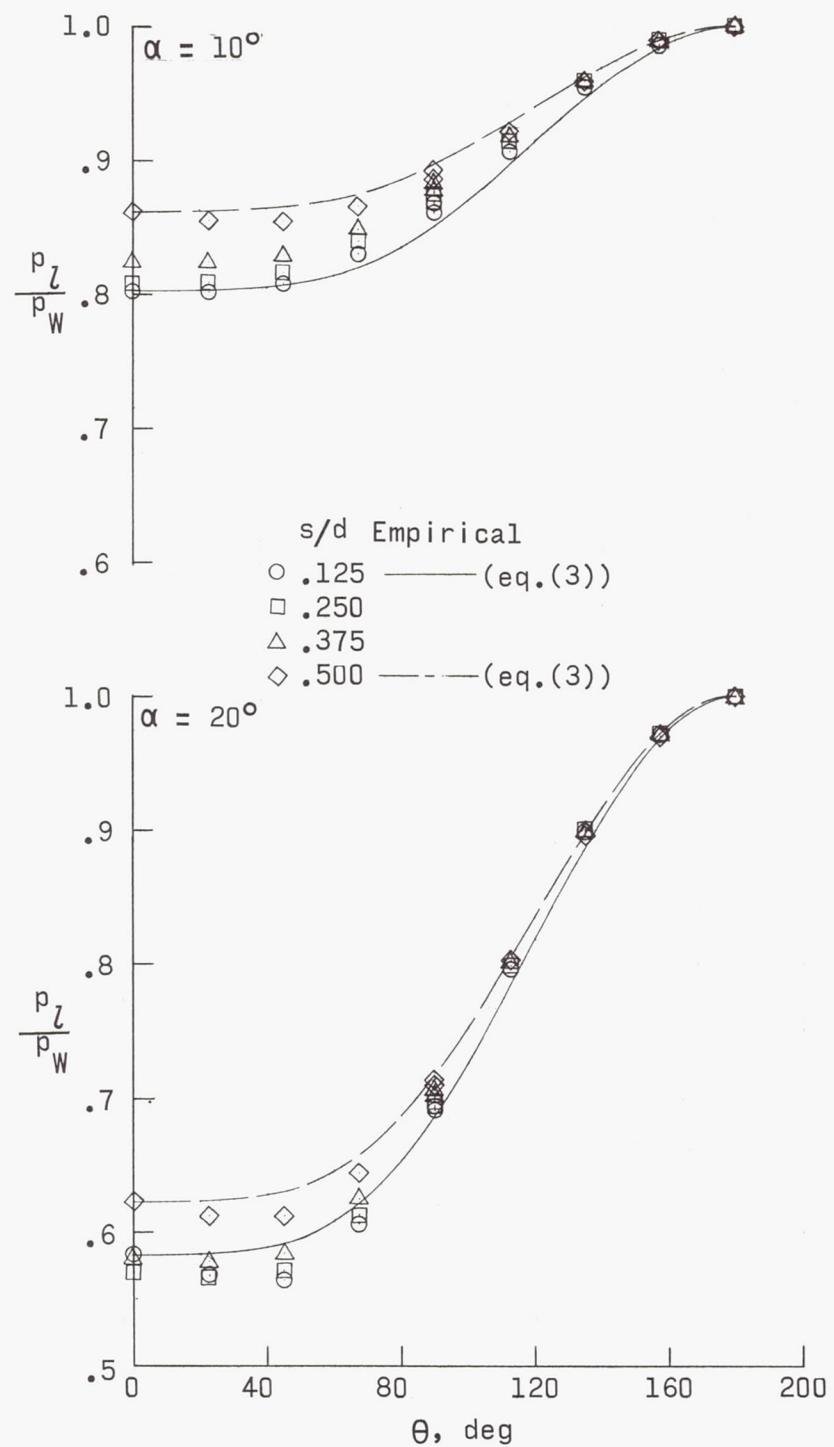


Figure 7.- Comparison of measured and empirical pressure distributions for the sharp cone. $M_\infty \approx 4.63$.



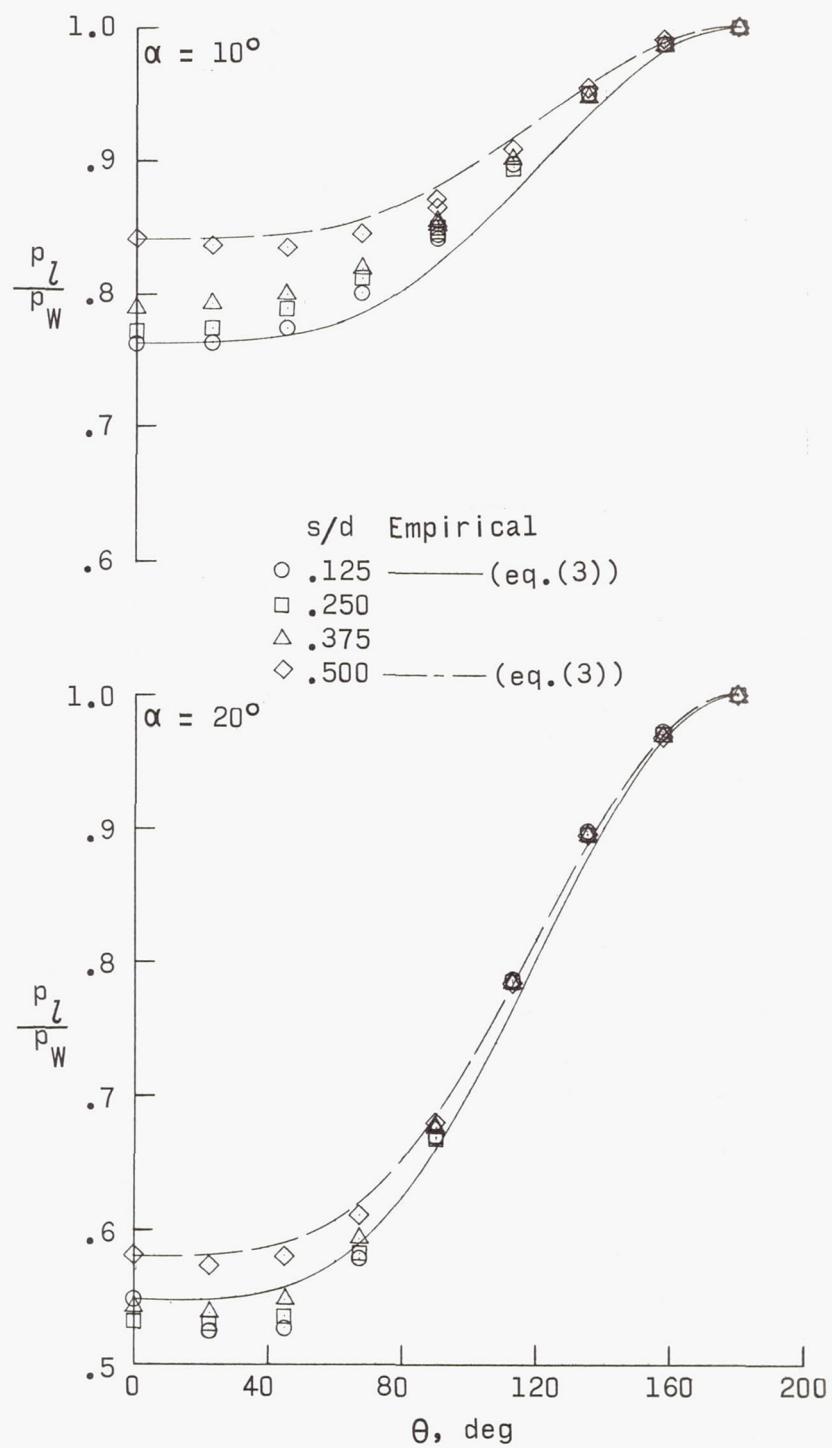
(a) $M_\infty = 2.96$.

Figure 8.- Circumferential pressure distributions at angles of attack for the blunt cone.



(b) $M_\infty = 3.95$.

Figure 8.- Continued.



(c) $M_\infty = 4.63$.

Figure 8.- Concluded.

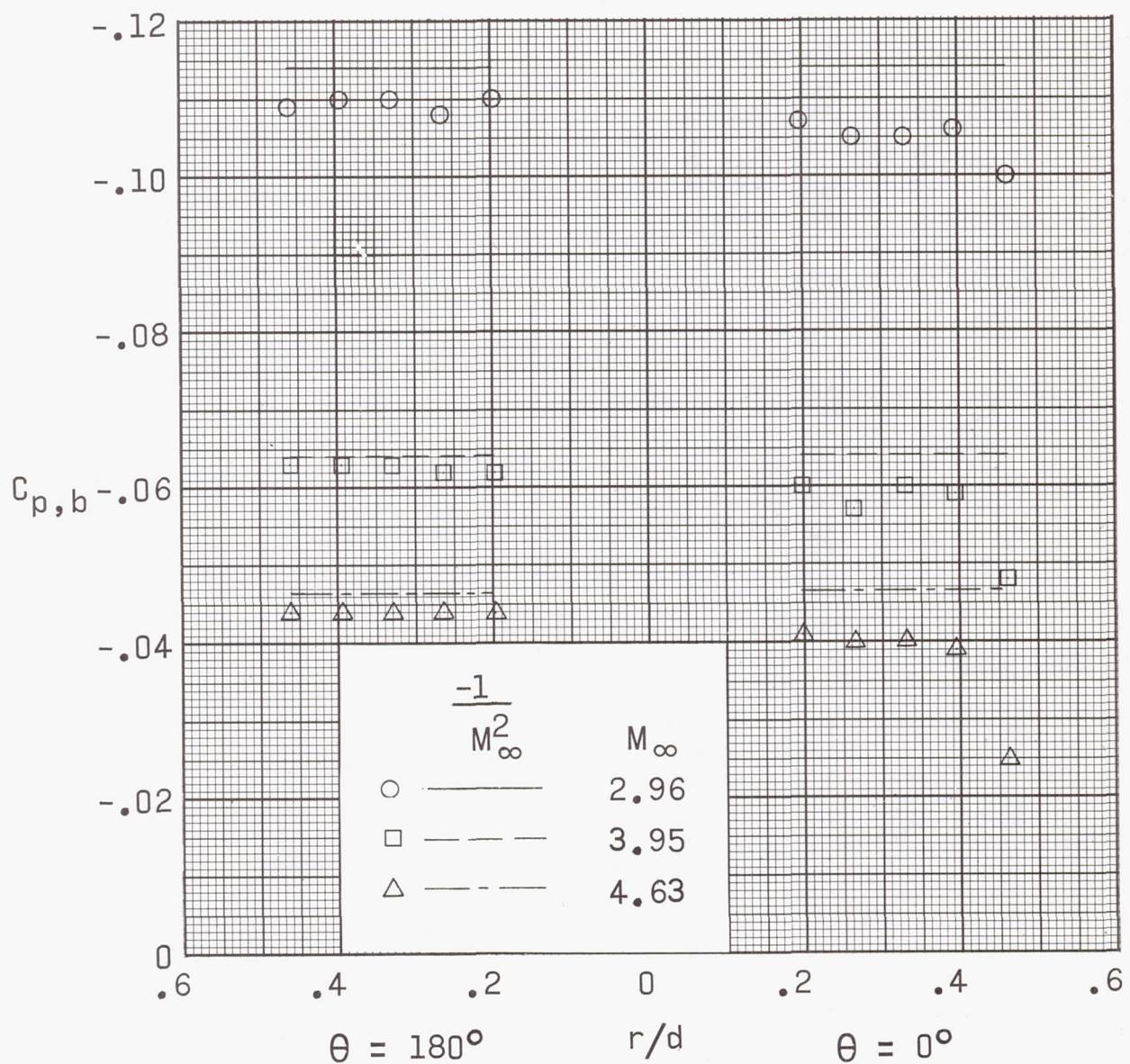


Figure 9.- Effect of Mach number on base pressure coefficients for the blunt cone. $\alpha = 0^\circ$; $\phi = 0^\circ$.

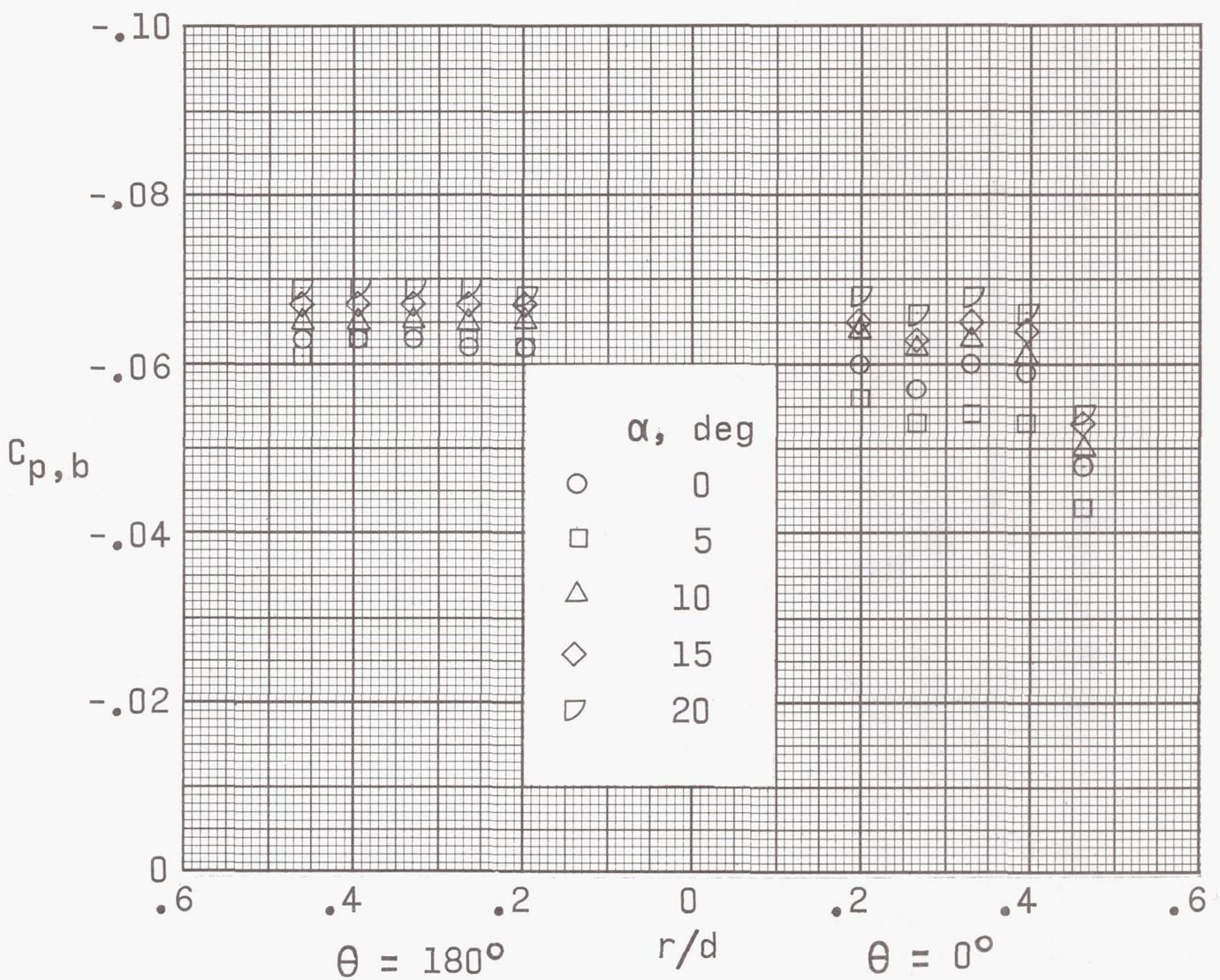


Figure 10.- Effect of angle of attack on base pressure coefficients for the blunt cone. $M_\infty = 3.95$; $\phi = 0^\circ$.

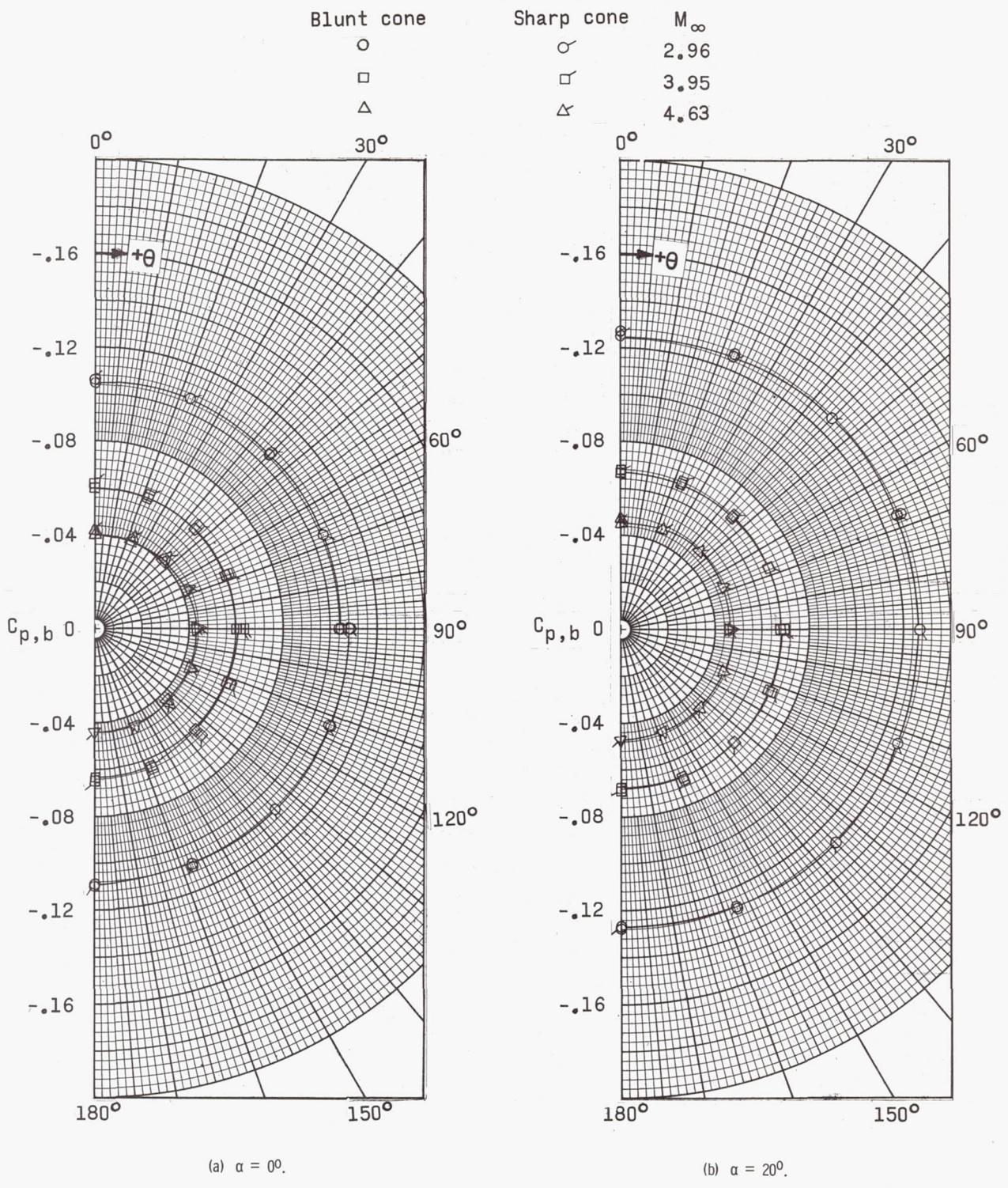
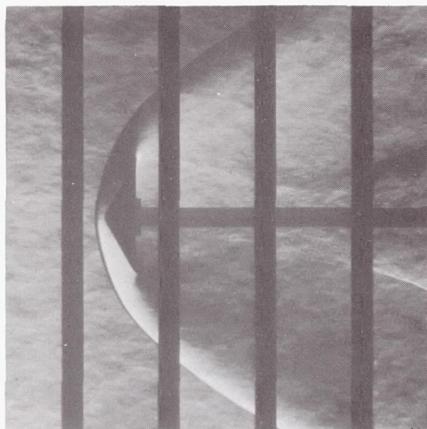
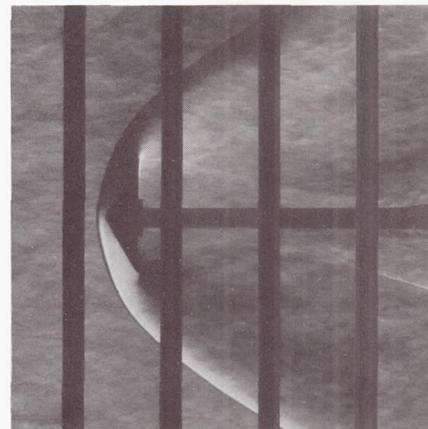


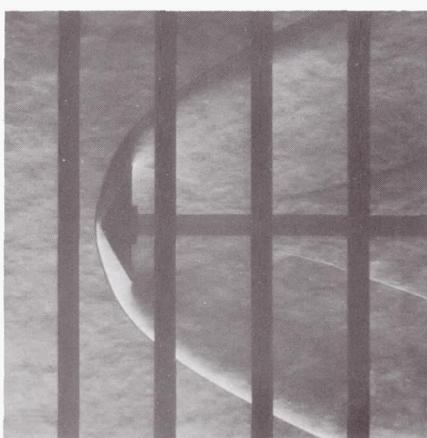
Figure 11.- Effect of nose bluntness and Mach number on circumferential distributions of base pressure coefficients. $r/d = 0.33$.



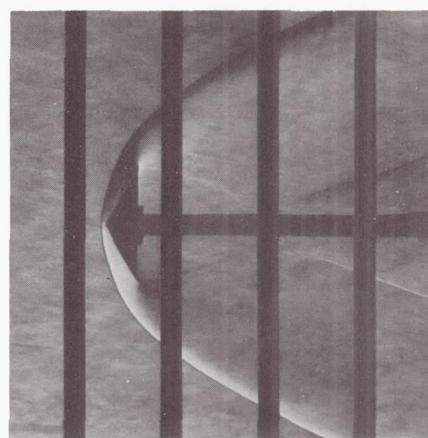
$M_\infty = 2.96$



$M_\infty = 2.96$



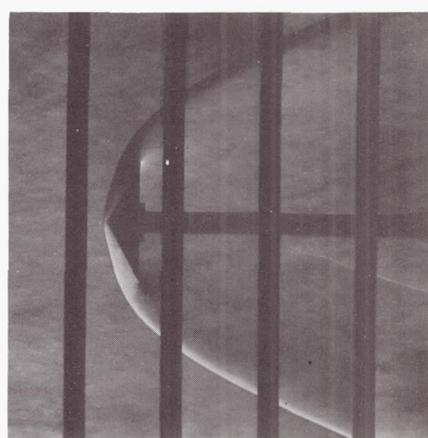
$M_\infty = 3.95$



$M_\infty = 3.95$



$M_\infty = 4.63$



$M_\infty = 4.63$

(a) Blunt cone.

(b) Sharp cone. L-68-10,066

Figure 12.- Effect of Mach number on shock shape. $\alpha = 0^0$.

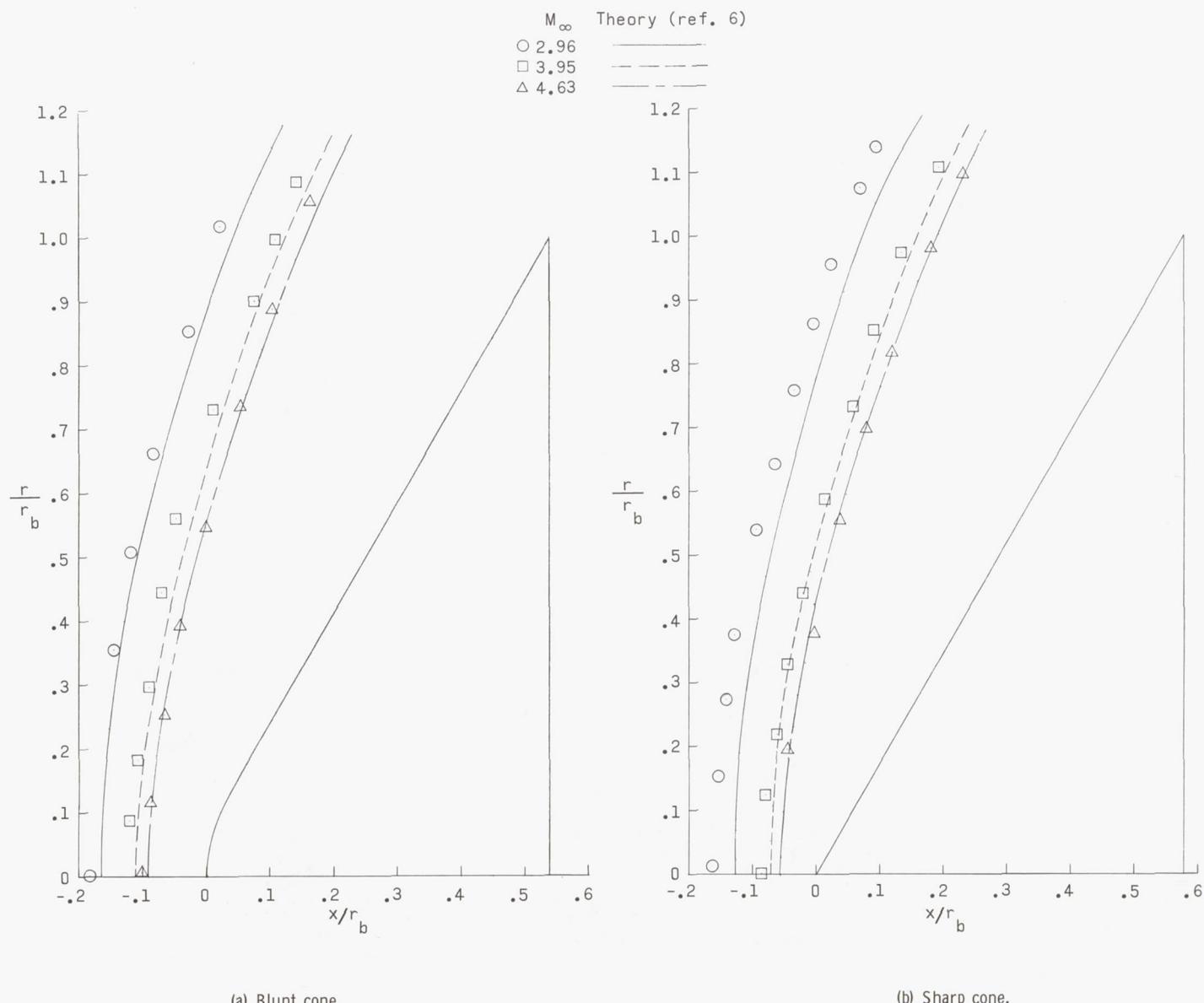
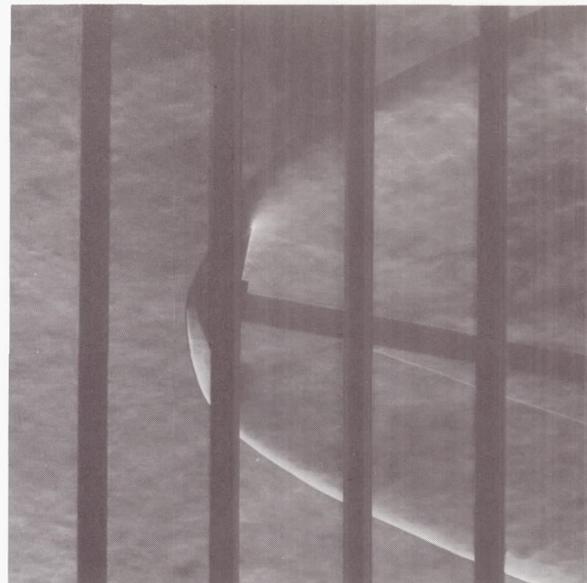


Figure 13.- Comparison of experimental and theoretically determined shock shapes. $\alpha = 0^\circ$.



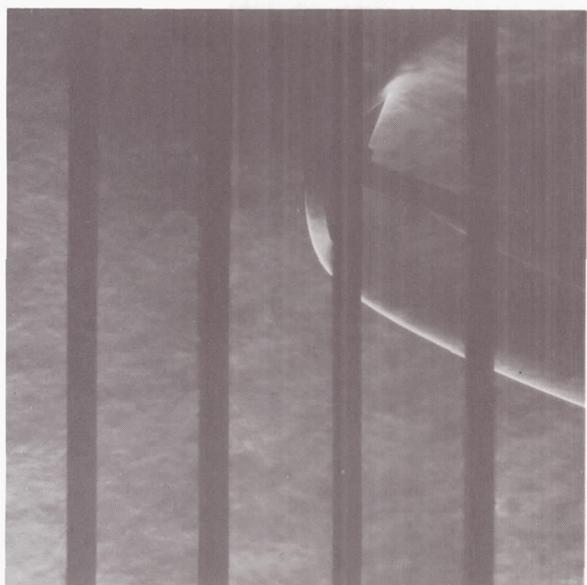
$$\alpha = 5^\circ$$



$$\alpha = 10^\circ$$



$$\alpha = 15^\circ$$

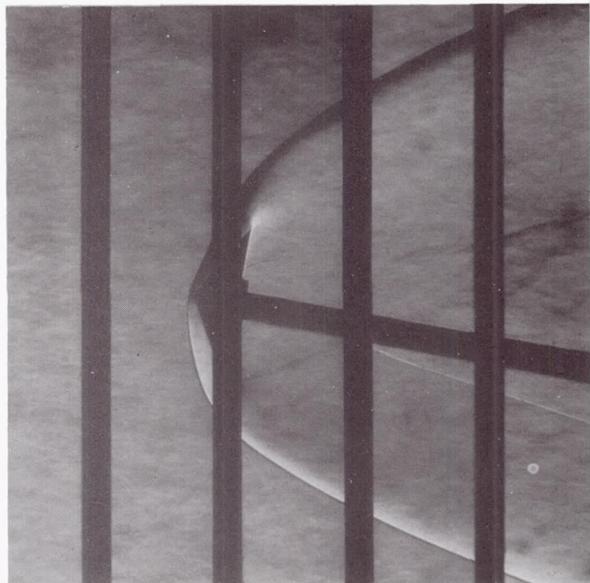


$$\alpha = 20^\circ$$

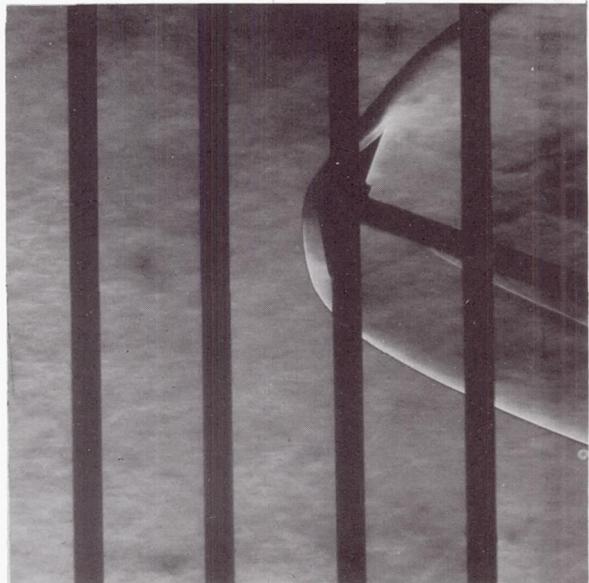
(a) Blunt cone.

L-68-10,067

Figure 14.- Effect of angle of attack on shock shape. $M_\infty = 4.63$.



$$\alpha = 10^\circ$$



$$\alpha = 20^\circ$$

(b) Sharp cone.

L-68-10,068

Figure 14.- Concluded.

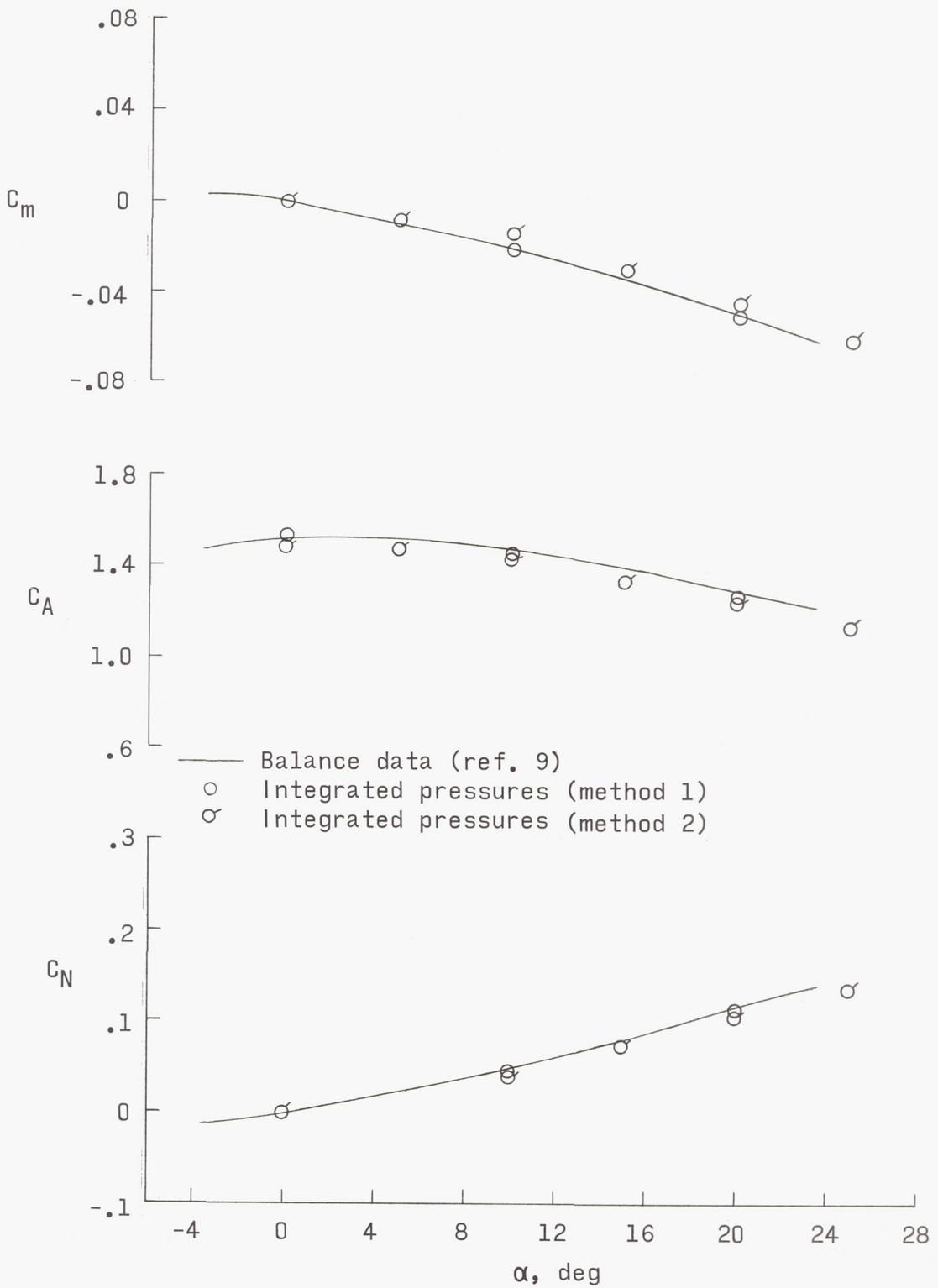


Figure 15.- Comparison of analytical and experimental force coefficients for the sharp cone. $M_\infty = 4.63$; $\sigma_C = 60^\circ$.

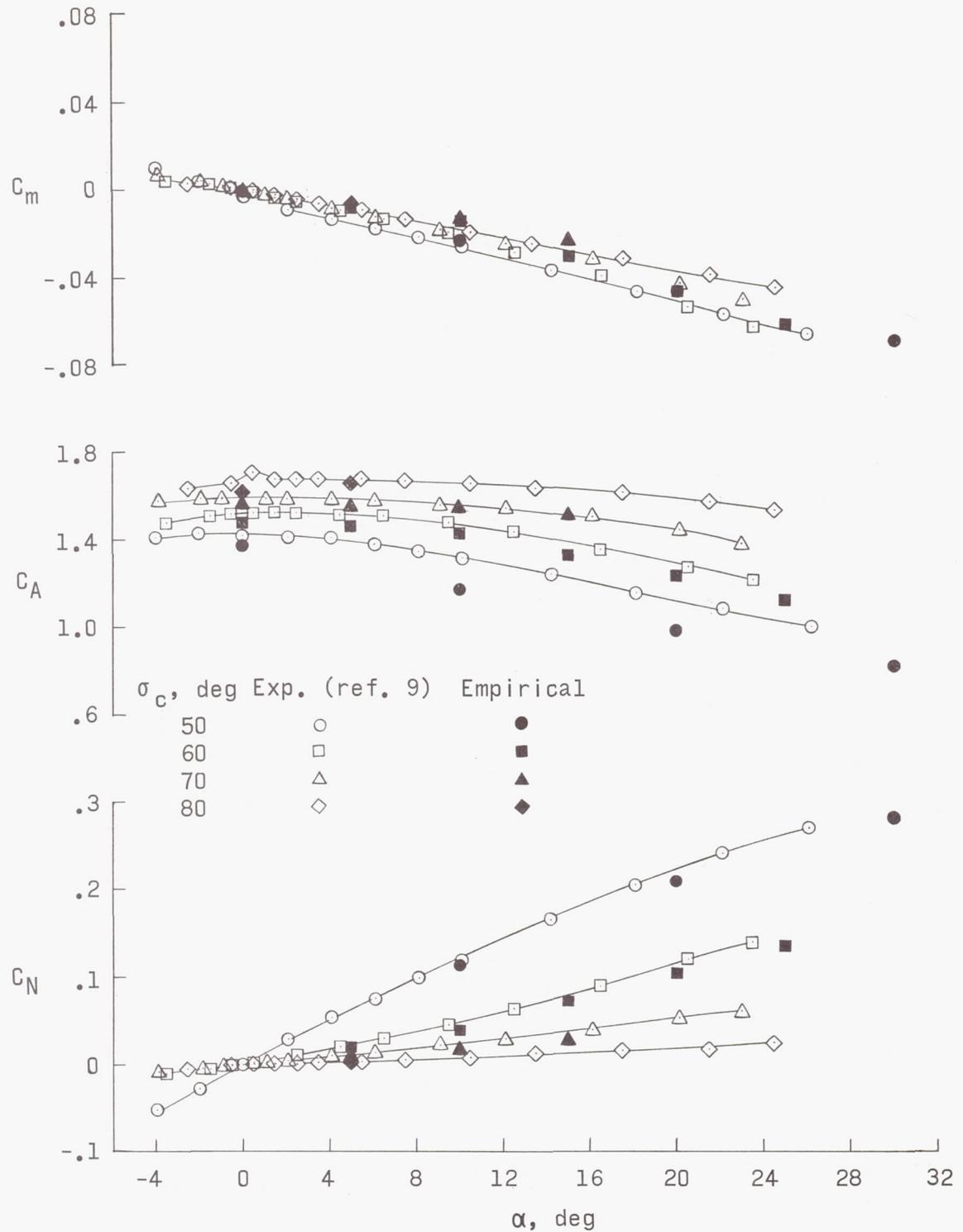


Figure 16.- Comparison of force coefficients evaluated from all-empirical pressure distributions with balance measurements for sharp cones. $M_\infty = 4.63$.