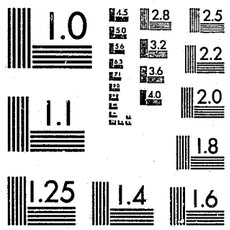

U.S. Department of Justice
National Institute of Justice

NIJ

Technology Assessment Program

Police Handgun Ammunition: Incapacitation Effects Volume II: Experimental Data

NIJ Report 101-83

a publication of the **National Institute of Justice**

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James K. Stewart
Director

Technology Assessment Program

Police Handgun Ammunition: Incapacitation Effects Volume II: Experimental Data

NIJ Report 101-83

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National Institute of Justice
James K. Stewart
Director

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Foreword

This report on Police Handgun Ammunition continues the tradition of the Technology Assessment Program, whose goal is to enable purchasers of criminal justice equipment to make informed purchasing decisions that consider both economy and effectiveness. Millions of dollars have been saved in purchases of communications equipment, special protective equipment, and other tools of the criminal justice system guided by performance standards established by the program.

Even more significant than the cost savings are the lives saved by the program. The lightweight armor now widely used by police was developed under the Technology Assessment Program. Since its introduction, the armor has saved the lives of more than 500 law enforcement officers.

The National Institute of Justice sponsored this study to provide the law enforcement community with criteria for deciding what ammunition is most suitable for their needs. Rarely is a law enforcement officer forced to fire his service revolver. However, in such situations, a person posing a life-endangering threat to an officer or to others must be effectively incapacitated. Under these extreme circumstances the police officer must have the most reliable ammunition available, yet the ammunition must not endanger the safety of bystanders. These are vital considerations law enforcement agencies must take into account in selecting handgun ammunition, and the data presented here proceed from these basic concerns.

We believe this report will help inform the administrative process of selecting the most cost-effective product. As police agencies continue to operate within budget constraints, the Technology Assessment Program will maintain its effort to be a source of practical and useful information that increases public safety while saving dollars.

James K. Stewart,
Director
National Institute of Justice

Police Handgun Ammunition: Incapacitation Effects
Volume II: Experimental Data

CONTENTS

1. INTRODUCTION

National Institute of Justice (NIJ) Report 100-83, "Police Handgun Ammunition: Incapacitation Effects, Volume I: Evaluation," tabulates the relative incapacitation index (RII), which is the measure of the stopping power, for most commercially available ammunition that a law enforcement agency might consider adopting for use in service weapons. The purpose of this report is to supplement NIJ Report 100-83 by presenting the experimental data for all rounds that were tested during the laboratory research and to describe the experimental procedures in sufficient detail that other researchers can determine the RII of bullets that were not evaluated during the course of this effort.

2. BACKGROUND

The NBS Law Enforcement Standards Laboratory (LESL), as part of the U.S. Department of Justice, National Institute of Justice (NIJ) Technology Assessment Program (see the brief description of the Technology Assessment Program inside front cover), contracted with the U.S. Army Ballistic Research Laboratory (BRL) late in 1973 to conduct a study of the terminal effects of police handgun ammunition. The objective of the project was to provide the law enforcement community with a criterion for the selection of handgun ammunition that considers the defensive capabilities and the safety factors concerning innocent bystanders. The initial findings of this study were published in summary form in October 1975.

Subsequently, manufacturers began to introduce new ammunition that was not available at the time of the original laboratory effort. Rather than publish incomplete data, NIJ elected to delay publication of the full report until additional ammunition was tested. The additional testing was accomplished by the Chemical Systems Laboratory, Aberdeen Proving Grounds, Edgewood Area in the summer of 1981 and the test results are included in this report.

The methodology used to evaluate ammunition and to determine the RII of commercial rounds is fully discussed in the main report, and will not be repeated here, except as necessary to permit duplication of the laboratory experiments. The initial effort by the technical staff at BRL focused upon an investigation of the susceptibility of the human body to incapacitation as a function of the trajectory of a given round as it passes through the body. This was accomplished through a computer simulation that plotted the path of a bullet through the body, with each volume element along the path penetrated by the round assigned a

probability of incapacitation ranging from 0 to 10. This simulation took into account the accuracy of both the marksman and the weapon, and resulted in the development of an average vulnerability index shown in figure 1, which is a function of the depth of penetration. The vulnerability index is presented in tabular form in the example in section 5 of this document.

The RII is calculated as the integral of the product of the vulnerability index and the volume of the maximum temporary cavity produced in a tissue simulant measured from the striking face to that depth at which the vulnerability index becomes zero. The volume and shape of a temporary cavity are dependent upon the configuration, composition, and striking velocity of the individual bullet. During this program, the primary focus was upon handgun ammunition in the caliber range from 0.355 (9 mm) through 0.45. Approximately 90 percent of the commercially available bullets that were possible candidates for law enforcement use were evaluated.

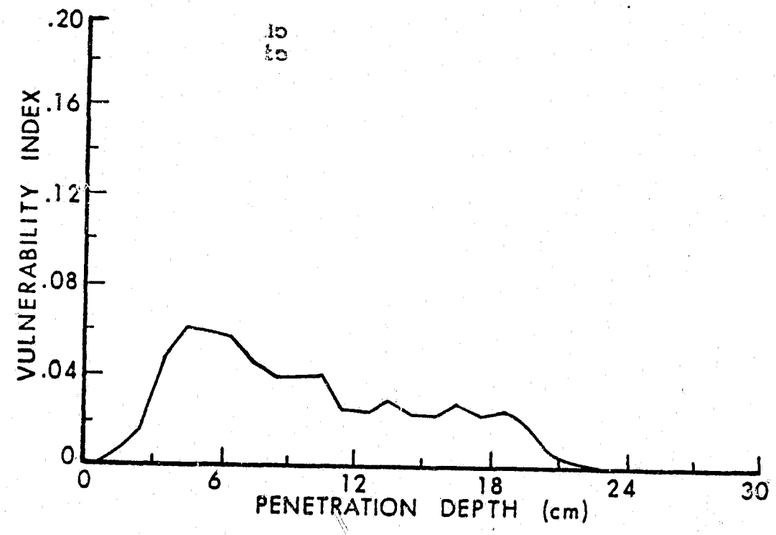


Figure 1. Vulnerability index for handguns at a range of 6 m for the average shooter hit distribution.

The RII data for each caliber of bullet were grouped by construction and configuration to develop average curves for RII as a function of velocity. Based upon these data, curve fitting techniques were used to develop a series of parameters that enable the RII of a round to be calculated for known velocity.

3. EXPERIMENTAL TECHNIQUES

The purpose of this study was to experimentally determine the effect of such bullet parameters as geometry, construction, mass, velocity, and manufacturer on the penetration through tissue simulant and the ultimate effect of these parameters on wound formation and resultant relative stopping power.

3.1 Ammunition

The ammunition used in this phase of the study consisted primarily of hand loaded ammunition in calibers .355 through .45. Bullet velocities were adjusted such that striking velocities varied nominally between 120 m/s and 700 m/s (394 f/s and 2297 f/s). Bullets used in this study were obtained from commercial manufacturers within the United States. Most weights and type bullets available from these manufacturers were evaluated. The manufacturers were chosen such that the vast majority of bullets used in commercial handgun cartridges could be evaluated. The actual bullet manufacturers considered were:

a. Hi-Precision
b. Hornady
c. MB Associates
d. Remington-Peter
e. Sierra
f. Smith & Wesson
g. Speer
h. SuperVel
i. Winchester-Western
j. Zero

Obviously, the above list does not include all manufacturers of ammunition for two reasons. First, many other manufacturers use the above bullets in their loaded cartridges and differences in stopping power would only depend on velocity; and second, this list comprises over 90 percent of the bullets available on the market. The rounds to be tested were selected by BRL, LESL, and NIJ during the earlier testing. The additional rounds tested in 1981 were based upon the recommendations of the NIJ Technology Assessment Program Advisory Council Weapons and Protective Equipment Committee.

For the tissue simulant firings, actual service weapons were not used. Since one of the more important parameters under investigation was the effect of bullet velocity on stopping power, it was necessary to examine velocity levels below and well above those experienced from standard cartridges fired from standard weapons. In both cases, chamber pressures can exceed those permissible in standard handguns. For safety reasons, then, Mann test barrels were used. At this point it should be noted that even though stopping power results were generated up to velocities approaching 700 m/s, the powder charges necessary to attain these velocities from standard handguns may be well above acceptable safety limits and should be approached with caution.

The justification for testing at nonstandard velocities was manyfold. As is well documented in previous studies by many investigators, different type bullets deform differently as a function of velocity. It was the purpose of this study to develop a general criterion, which requires that stopping power be known as a continuous function of velocity. To this end, it was important to know the degree of degradation experienced in stopping power if lower than standard velocities are used i.e., velocities below which deformation of the bullet occurs. Also, it was important to determine if the effects of possible excess deformation or fragmentation of the bullet at higher than standard velocities enhances or degrades stopping power Additionally, if only commercial loadings were used and stopping power reported for these particular cartridges future changes in loading specifications by a manufacturer to alter velocity would make the stopping power estimate meaningless. Further, bullet muzzle velocity depends on the particular type handgun being used and it was felt that law enforcement agencies should test fire their weapon/ammunition combination to determine actual muzzle velocities which in turn could be used to calculate the stopping power more precisely.

3.2 Tissue Simulant

The target material used was gelatin purchased from the Kind and Knox Gelatin Company specified as Ordnance Type 250A. The gelatin powder was mixed with water (20% gelatin by weight) to form 15x15x30-cm blocks for testing. A standard procedure for preparing the gelatin blocks for testing is given below.

a. Materials

(1) Pharmagel A. Gelatin, Kind and Knox Gelatin Company, Ordnance Type 250A. Home office: Johnstown, NY; production plant: Camden, NJ.

(2) Thymol. Available from Fisher Scientific Company and many local chemical and pharmaceutical companies.

(3) Pyrex or stainless steel container; 20-L to 30-L capacity for mixing gelatin.

(4) Heavy-duty stirrers, electric.

(5) Stainless steel containers for use as molds, 15-cm wide, 15-cm high, 30-cm long. Other size containers may be used depending upon the gelatin target size desired.

b. Method

Place 12,000 g of hot water (at least 65°C) in the 20-L to 30-L container. Place two electric stirrers in the hot water. It has been found that it is preferable to place one stirrer near the top of the container and the other stirrer near the bottom. Add 3 g of thymol[1] and dissolve in the hot water. Add 3000 g of Pharmagel A to the hot water. It is often helpful to supplement the stirring by manually breaking up any lumps of undissolved gelatin with a stainless steel rod or paddle.

After the gelatin has completely dissolved, which usually requires from 5 to 15 min, turn off the stirrers. Allow bubbles and foam to rise to the surface of the gelatin. This usually requires from 15 to 20 min.

The 20-percent gelatin solution is then transferred to the 15x15x30-cm containers. If the original mixing container does not have a spigot at the bottom, it is necessary to remove the foam from the top of the gelatin before transferring the solution. Allow the gelatin to remain at room temperature for at least 1 h after transferring. Any additional foam which rises to the surface should be removed.

Place the gelatin in a refrigerator, or other cold storage at 0°C to 5°C overnight. The gelatin may be removed from the stainless steel container by placing the stainless steel container in a container of hot water. After about 15 s, loosen the gelatin from the sides of the container with a spatula. After 1-2 min, remove the container from the hot water and invert it to permit the gelatin block to slide out. Allow the gelatin to remain at room temperature for about 1 h. The gelatin is then placed in heavy-duty

[1] Cinnamon oil may be substituted: 5/8 mL/12,000 g of hot water.

plastic bags to prevent evaporation, which will drastically change the consistency of the gelatin. The 20-percent gelatin is usually stored at 10°C (50°F) since the consistency of the gelatin is a function of the temperature.

3.3 Cavity Measurements

High-speed motion pictures were taken for each test shot to determine how the temporary cavities in gelatin varied in size and shape for different bullet types and velocities. The relation of the high-speed camera to the gelatin target can be seen in the schematic drawing of figure 2. Photographic floodlights were placed behind the gelatin target to provide backlighting for the motion pictures.

A 60-m roll of film was used for each shot, with maximum attained film speed of approximately 10,000 frames/s. The formation and subsequent growth of the cavity is clearly shown in these movies. A typical sequence from a high-speed movie is shown in figure 3 for a .45 caliber full jacketed bullet. Figure 4, shows a typical movie sequence for a 9 mm hollow point bullet.

The measure chosen as the indicator of the actual damage produced in tissue was the maximum temporary cavity (MTC) formed in the gelatin. The film for each test shot was viewed on a motion analyzer and the contour of the cavity traced frame by frame. A digitizer was then used to record the scaled coordinates of the envelope of these cavities from these tracings at increments along the z-axis of approximately 5 mm.

4. RESULTS

Data recorded by the 16-mm high-speed camera was analyzed using a Telecomputing Telereadex Model 29E Film Analyzer. For each round fired the size and shape of the maximum temporary cavity formed in the gelatin simulant was measured versus the depth of penetration of the bullet. These measurements were taken at approximately 5-mm increments along the bullet trajectory through the simulant. These data were stored on computer cards for later tabulation and subsequent plotting of the resultant cavity contours.

The maximum temporary cavity produced in the tissue simulant was plotted as a function of depth of penetration for each test round, and are presented in appendix A. In order to assist the reader in comparing the differences between bullets

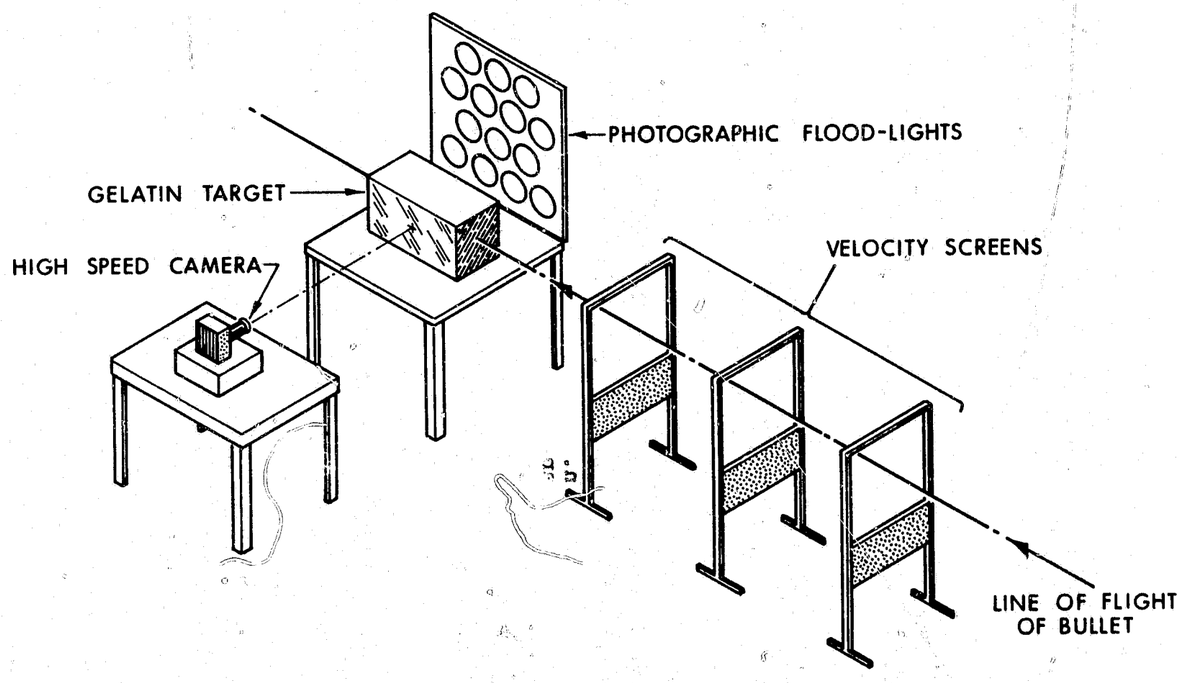


Figure 2. A schematic representation of the experimental test setup.

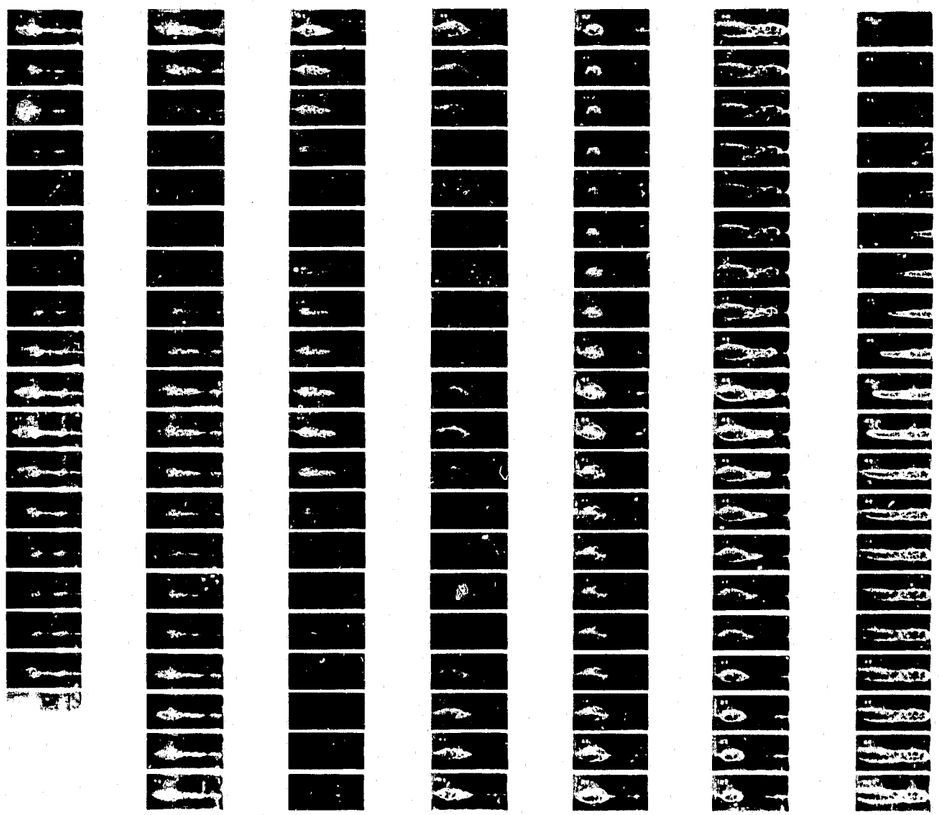


Figure 3. Representative series of high-speed movie frames for a .45 caliber full jacketed bullet.

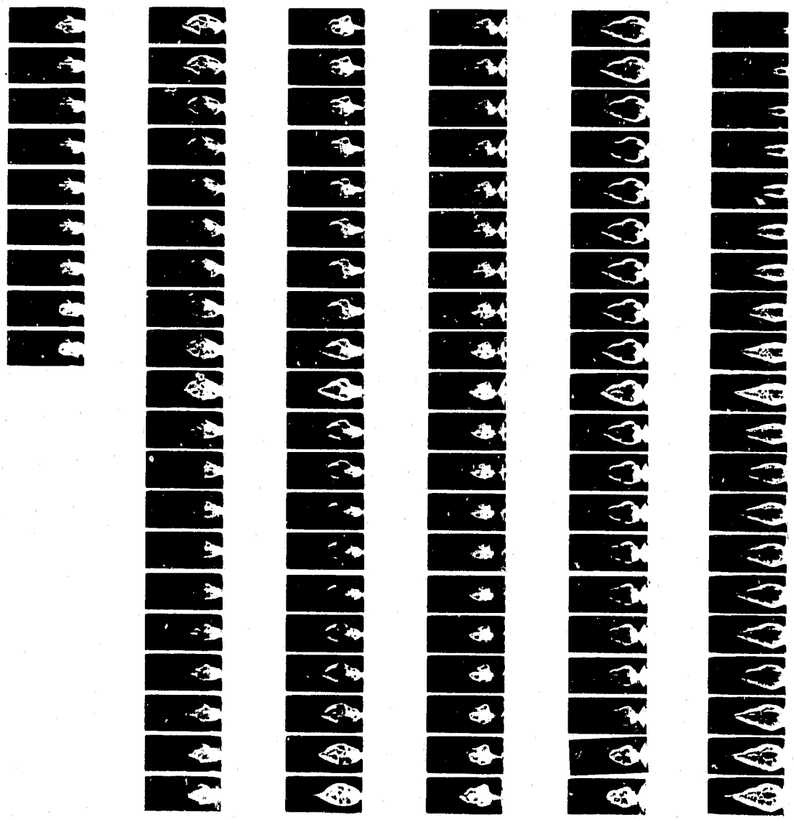


Figure 4. Representative series of high-speed movie frames for a 9 mm hollow point bullet.

of identical configuration as a result of velocity or manufacturer, appendix A is separated into sections, which are arranged in order of increasing caliber and bullet mass in grains. For each caliber and mass bullet, the sections are presented in the following order by type of construction:

a. Full Jacket (FJ)
b. Power Point (PP)
c. Jacketed Hollow Point (JHP)
d. Jacketed Soft Point (JSP)
e. Lead Hollow Point (LHP)
f. Lead Round Nose (LRN)
g. Metal Piercing (MP)
h. Semi-Wadcutter (SWC)
i. Wadcutter (WC)

Each section of appendix A groups the plots of the maximum temporary cavity by manufacturer in alphabetical order. Further, the plots of the maximum temporary cavity are presented in the order of increasing velocity for each manufacturer. The plots are identified by the test round number and the velocity of the bullet. The relative incapacitation index calculated for the cavity is noted in the brackets following the test round identification number.

The individual plots of the maximum temporary cavity are provided primarily for illustration of velocity and configuration effects. The actual measurements of the radius of the individual cavities as a function of depth of penetration are presented in appendix B, which is arranged in increasing numerical order by test round identification number. For simplicity, the radius data is presented for 1-cm increments of penetration to a maximum depth of 22 cm, which is the depth beyond which the vulnerability index becomes zero (0). It should be noted that many test rounds were used for other experimental purposes during the research program, so the round identification numbers are not a complete set of numbers. Only data for those rounds for which a plot of the maximum temporary cavity appears in appendix A are tabulated in appendix B.

Appendix A also presents a plot of the average relative incapacitation index as a function of velocity for each bullet caliber, mass, and configuration. These plots, presented at the beginning of each section of appendix A, are the average of all rounds that are contained in that section except for those rounds preceeded by an "*". Each of the rounds marked by an "*" represents a unique point (flyer) or a data point which for some other reason was not included in the analysis but is presented here in the interest of completeness. The average

plots of RII vs. velocity can be used to predict the performance of bullets of similar construction up to the maximum velocity of the experimental data. The curve fitting technique used to obtain the average plots does not allow extrapolation of the curve past the last data point. One final note about the average plots, for some bullet constructions and caliber only one round was shot, however, an average RII curve is still presented. As part of this and other programs, BRL has developed a theoretical model for predicting the size of the MTC for nondeforming projectiles. In those cases where it was decided that firing additional rounds would not produce results appreciably different than what the model would predict, the theoretical model was used to supply a sufficient number of additional data points to permit the average RII curve to be drawn. A discussion of the model for the MTC produced by nondeforming projectiles in tissue simulant can be found in the final report for this project, NIJ Report 100-83.

The index listing in appendix C of this report enables the reader to quickly locate the plot of the maximum temporary cavity for any specific manufacturer's bullet type and mass.

5. METHOD FOR CALCULATING A RELATIVE INCAPACITATION INDEX

Those wishing to experimentally evaluate the performance of bullets not included in this study, or at velocities different from those used in the study need only determine the radius (r) of the maximum temporary cavity formed in the tissue simulant as a function of depth of penetration. For convenience in computation, the RII for 1-cm volume elements is summed from the striking surface to a depth of 22 cm, beyond which the vulnerability index (V. Ind.) is zero, or to the maximum depth of penetration if it is less than 22 cm.

$$RII = \sum_{x=1}^{x_{max}} \pi r^2 (\text{Vulnerability Index})$$

As an example, consider the maximum temporary cavity radius data for round number 519 in appendix B, a Speer, 45 caliber, JHP bullet at a velocity of 374 m/s (1227 f/s). In the calculation that follows, the first column presents the depth of penetration; the second, the average vulnerability for that depth; the third, the radius in centimeters for the maximum temporary cavity at that depth; the fourth, the product of r^2(V. Ind.). The values for r^2(V. Ind.) for 1 cm increment of penetration are totaled and multiplied by π to obtain the RII, which in this case is 53.1.

Sample Calculations

Penetration Depth (cm)	Vulnerability Index (V. Ind.)	Cavity Radius r(cm)	r^2(V. Ind.)
1	0.0061	4.3	0.113
2	0.0169	5.1	0.440
3	0.0477	5.8	1.604
4	0.0608	6.0	2.189
5	0.0588	6.3	2.333
6	0.0564	6.4	2.309
7	0.0458	6.2	1.761
8	0.0388	6.1	1.444
9	0.0401	5.6	1.257
10	0.0405	5.4	1.181
11	0.0248	5.0	0.621
12	0.0238	4.4	0.460
13	0.0292	4.0	0.467
14	0.0231	3.1	0.222
15	0.0227	2.4	0.131
16	0.0273	2.3	0.144
17	0.0230	2.2	0.111
18	0.0247	1.8	0.080
19	0.0196	1.3	0.033
20	0.0074	1.1	0.009
21	0.0014	0.8	0.001
22	0.0003	0.6	0.000

$$\text{Total} = \sum_{x=1}^{x_{max}} r^2(\text{V. Ind.}) = 16.910$$

$$\text{RII} = \pi(\text{Total}) = 53.1$$

where $\pi = 3.14$.

APPENDIX

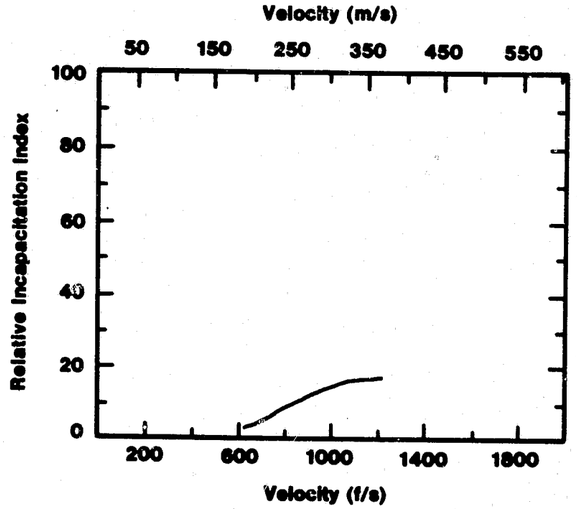
A

PLOTS OF AVERAGE RII VS VELOCITY

AND

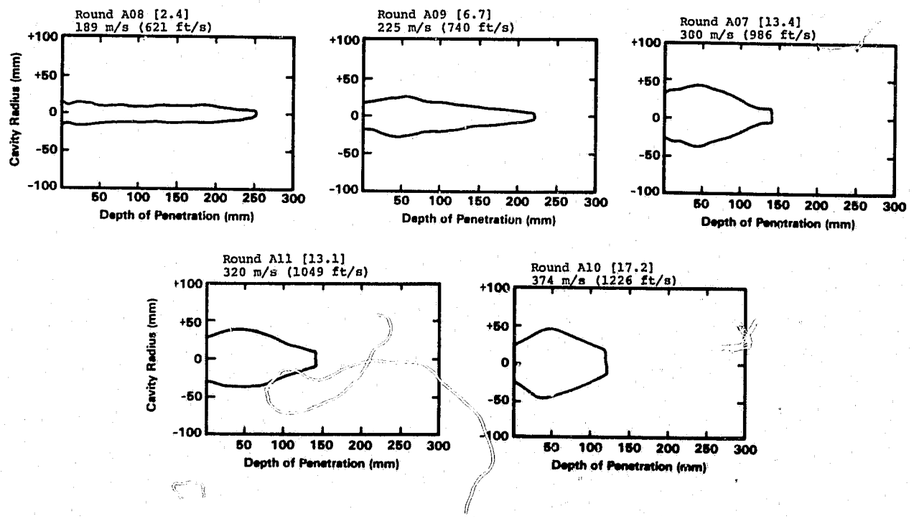
PLOTS OF TISSUE SIMULANT MAXIMAL TEMPORARY CAVITIES

APPENDIX A1
85 Grain, Jacketed Hollow Point (Silvertip), 9 mm

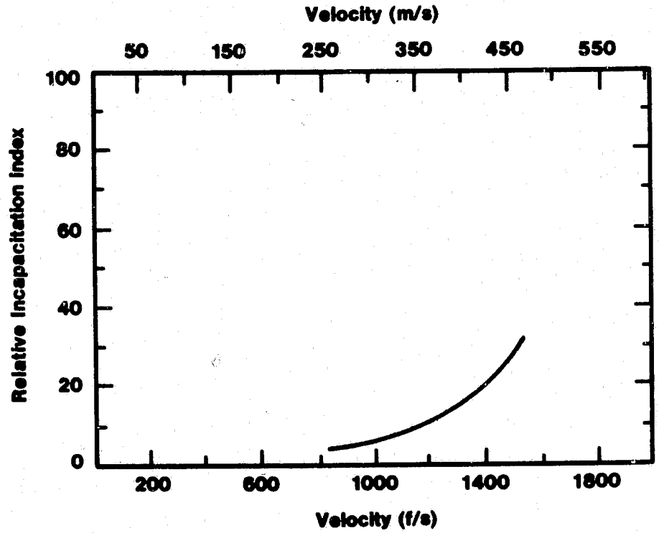


Relative Incapacitation Index as a function of velocity for 85 gr. JHP (Silvertip), 9 mm bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
85 grain, jacketed hollow point, 9mm

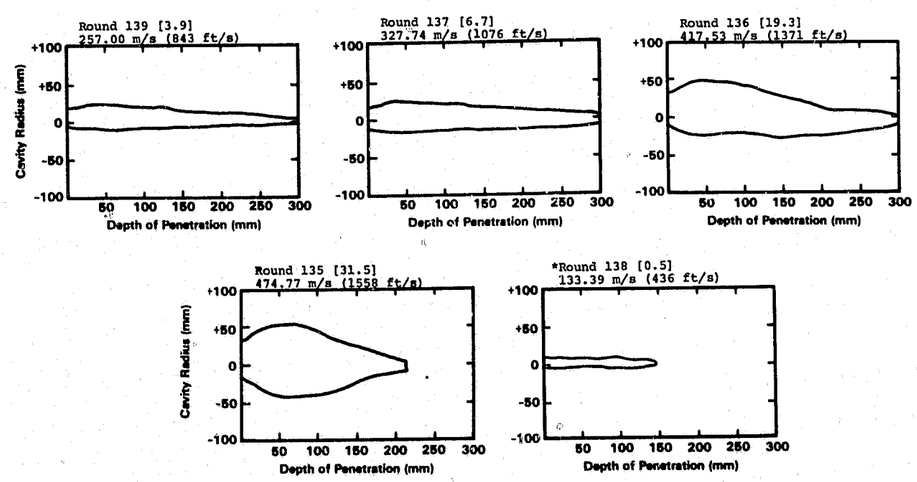


APPENDIX A2
90 Grain, Jacketed Soft Point, 9 mm

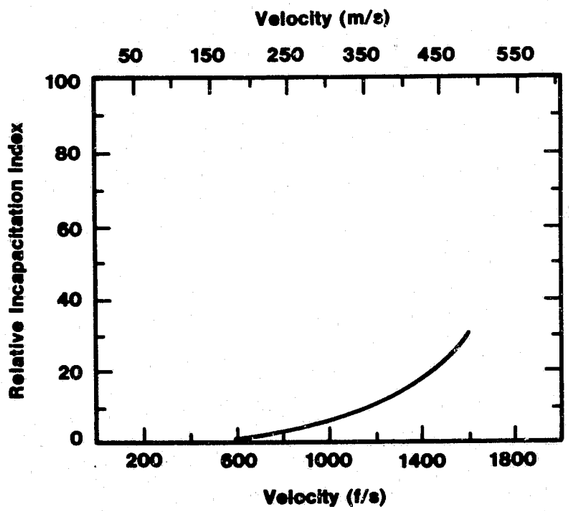


Relative Incapacitation Index as a function of velocity for 90 gr., JSP, 9 mm bullet manufactured by Smith & Wesson.

SMITH & WESSON
90 grain, jacketed soft point, 9mm

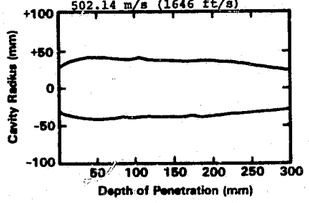


APPENDIX A3
100 Grain, Full Jacket, 9 mm

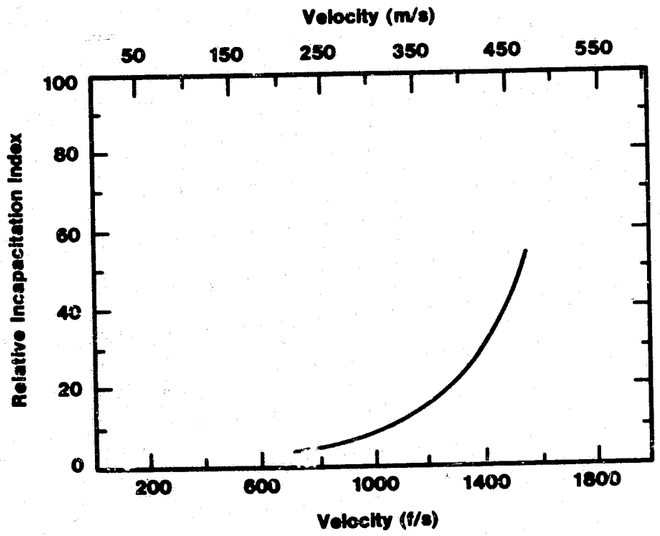


Relative Incapacitation Index as a function of velocity for 100 gr., FJ, 9 mm bullet manufactured by Smith & Wesson.

SMITH & WESSON
100 grain, full jacket, 9 mm

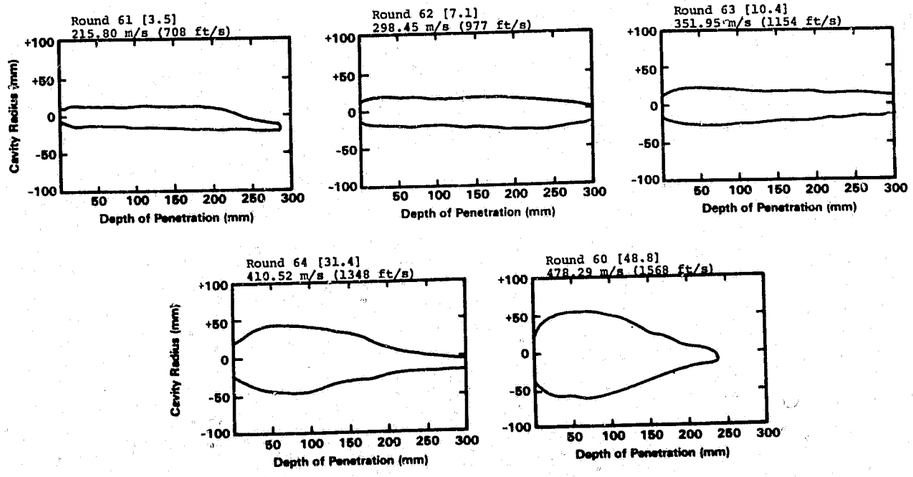


APPENDIX A4
100 Grain, Power Point, 9 mm

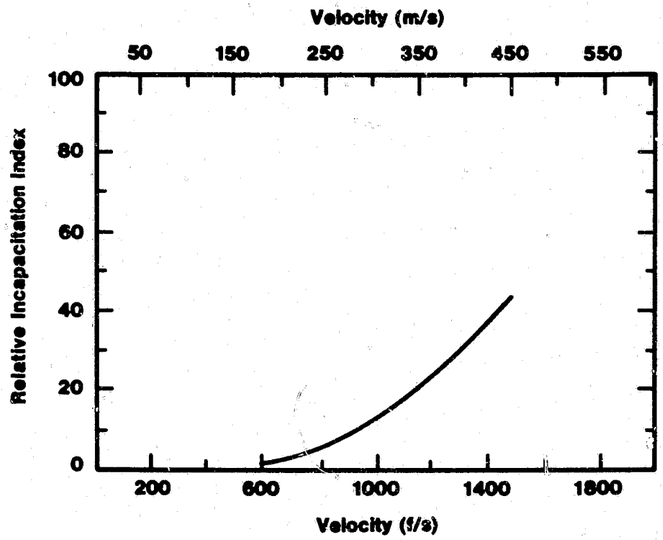


Relative Incapacitation Index as a function of velocity for 100 gr., PP, 9 mm bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
100 grain, power point, 9 mm

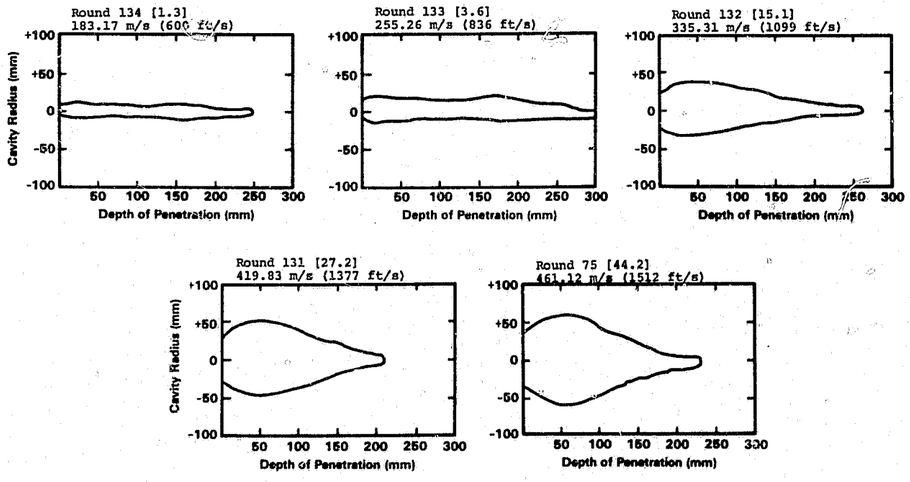


APPENDIX A5
100 Grain, Jacketed Hollow Point, 9 mm

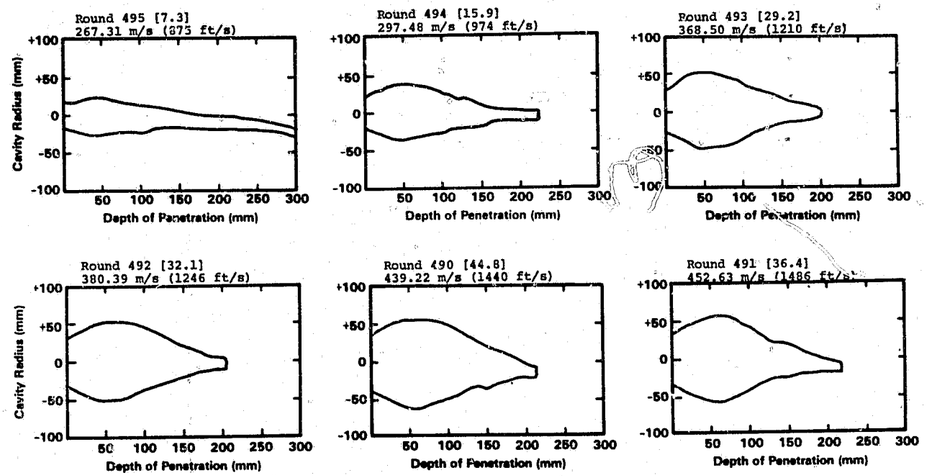


Relative Incapacitation Index as a function of velocity for 100 gr., JHP, 9 mm bullets manufactured by Smith & Wesson and Speer.

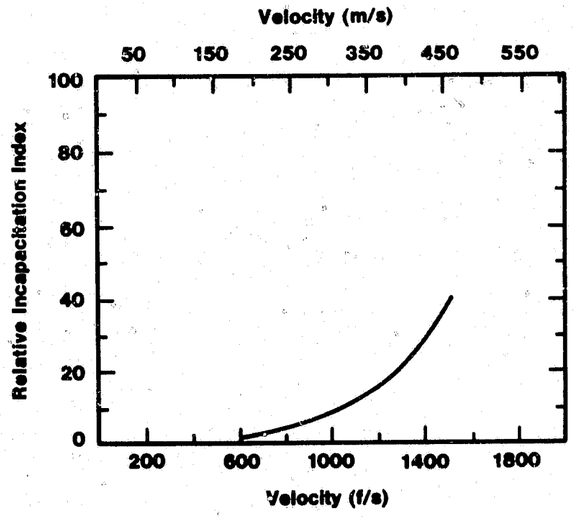
SMITH & WESSON
100 grain, jacketed hollow point, 9 mm



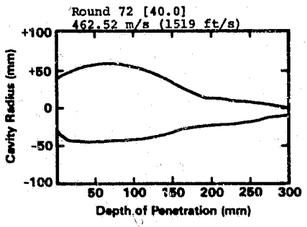
SPEER
100 grain, jacketed hollow point, 9 mm



APPENDIX A6
100 Grain, Jacketed Soft Point, 9 mm

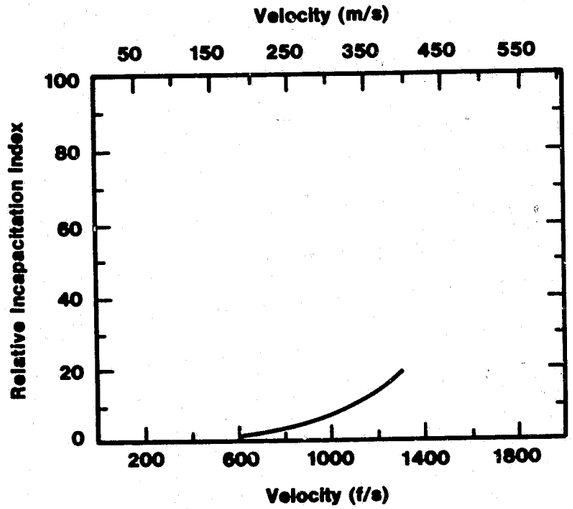


SMITH & WESSON
100 grain, jacketed soft point, 9 mm

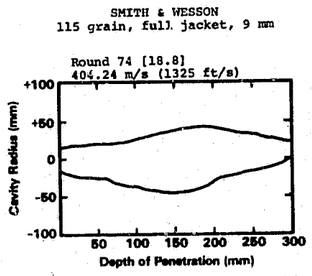


Relative Incapacitation Index as a function of velocity for 100 gr., JSP, 9 mm bullet manufactured by Smith & Wesson.

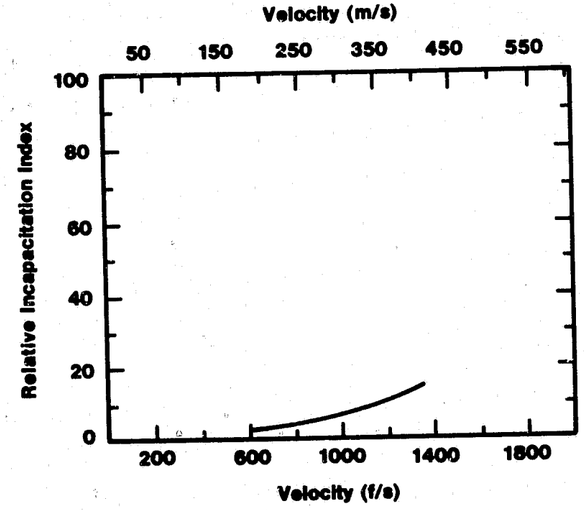
APPENDIX A7
115 Grain, Full Jacket, 9 mm



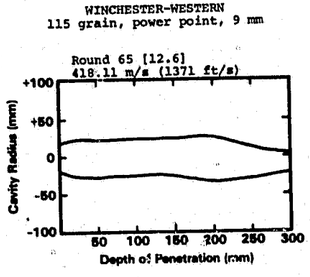
Relative Incapacitation Index as a function of velocity for 115 gr., FJ, 9 mm bullet manufactured by Smith & Wesson.



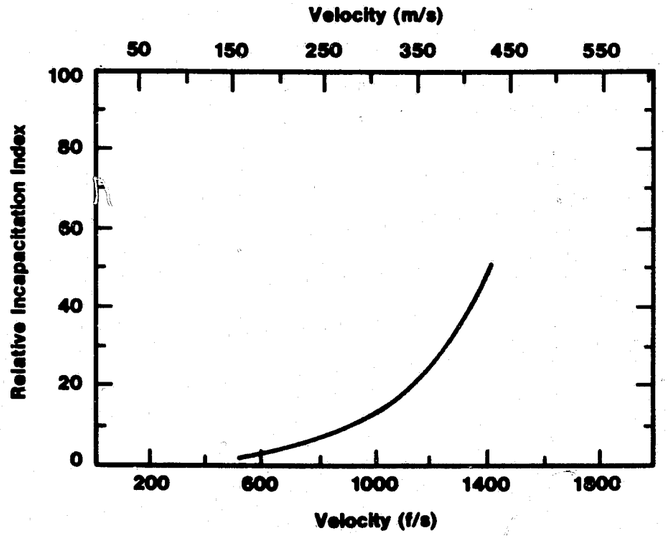
APPENDIX A8
115 Grain, Power Point, 9 mm



Relative Incapacitation Index as a function of velocity for 115 gr., PP, 9 mm bullet manufactured by Winchester-Western.

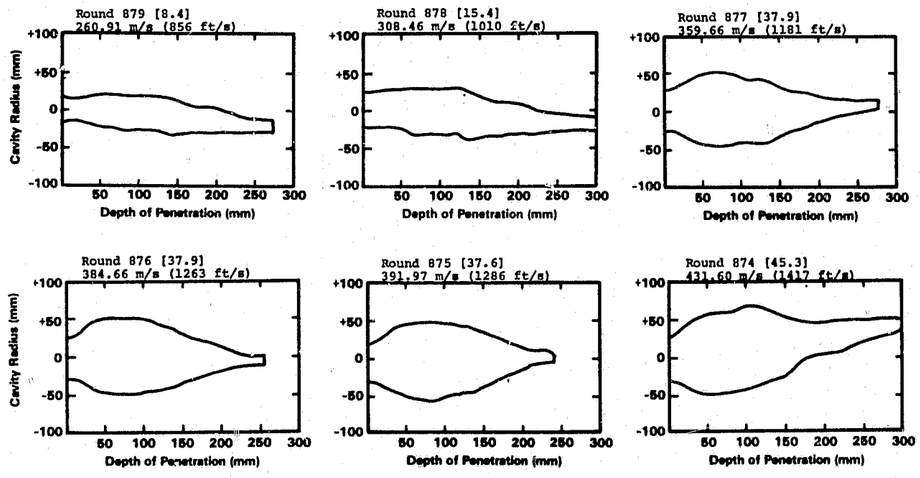


APPENDIX A9
115 Grain, Jacketed Hollow Point, 9 mm

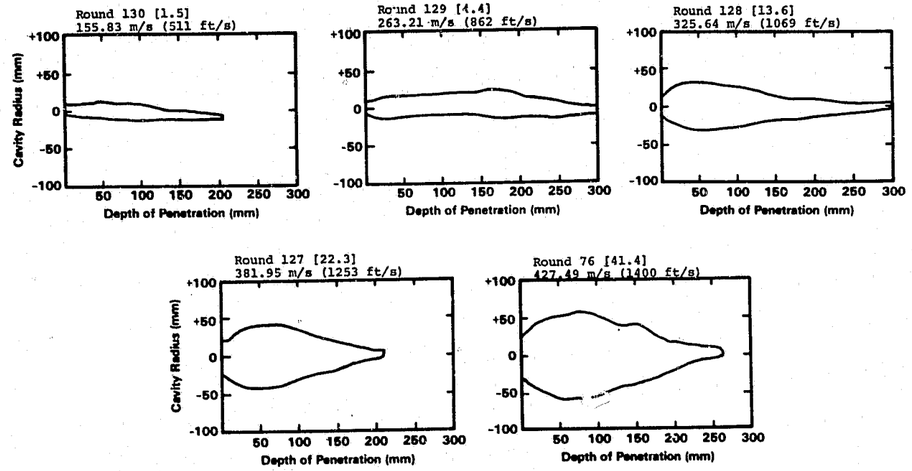


Relative Incapacitation Index as a function of velocity for 115 gr., JHP, 9 mm bullets manufactured by Remington and Smith & Wesson.

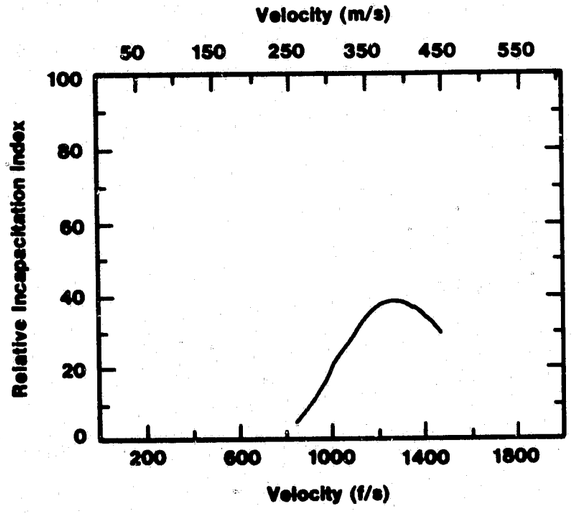
REMINGTON
115 grain, jacketed hollow point, 9 mm



SMITH & WESSON
115 grain, jacketed hollow point, 9 mm

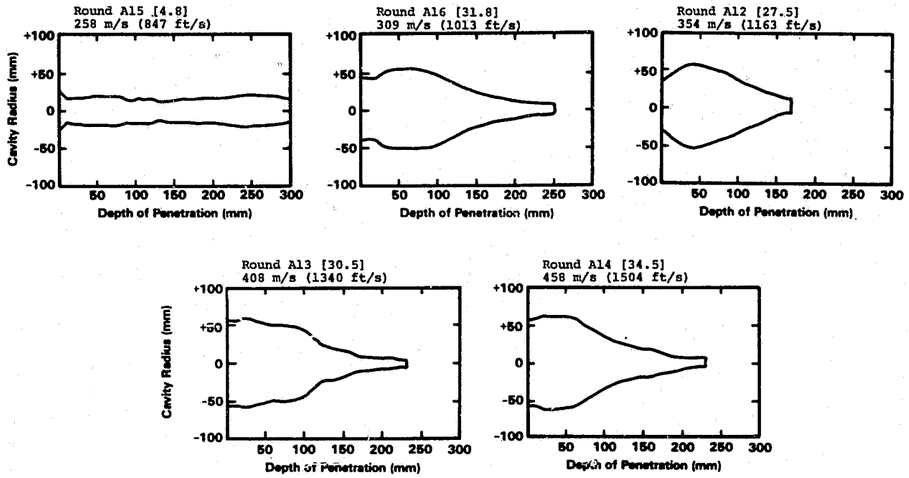


APPENDIX A10
115 Grain, Jacketed Hollow Point (Silvertip), 9 mm

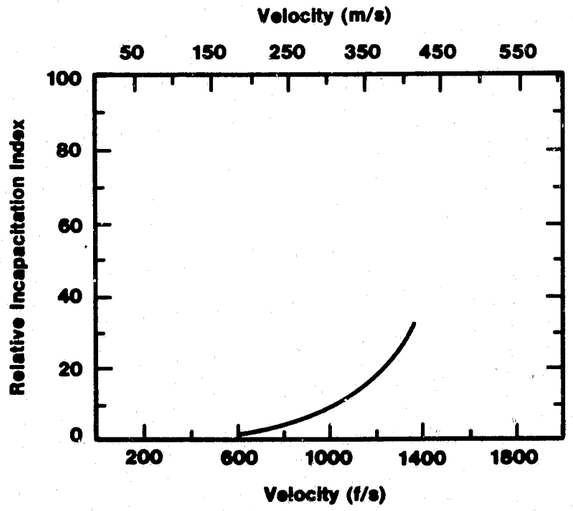


Relative Incapacitation Index as a function of velocity for 115 gr., JHP (Silvertip), 9 mm bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
115 grain, jacketed hollow point, 9mm

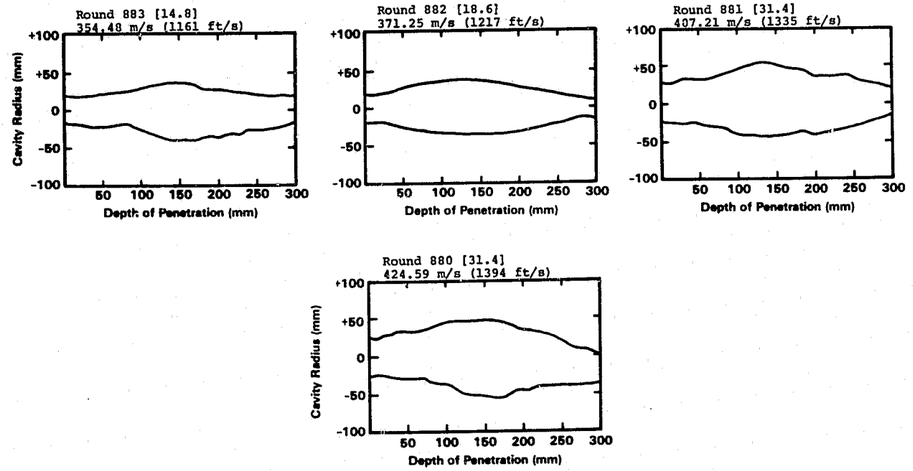


APPENDIX A11
124 Grain, Full Jacket, 9 mm

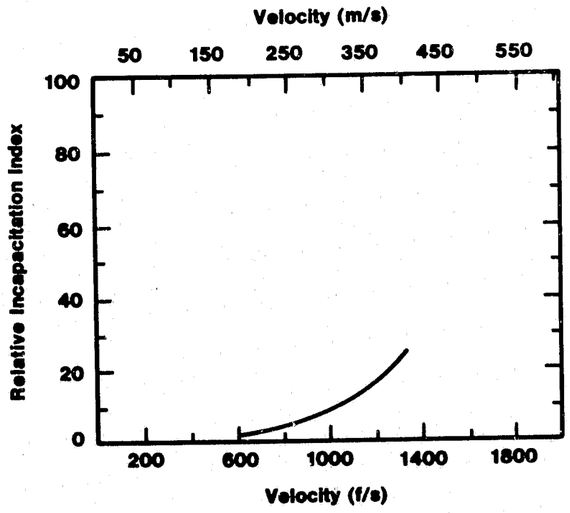


Relative Incapacitation Index as a function of velocity for 124 gr., FJ, 9 mm bullet manufactured by Remington.

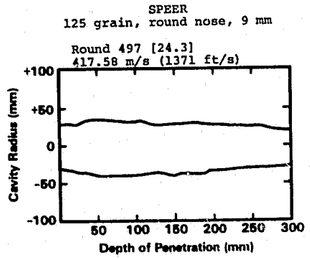
REMINGTON
124 grain, full jacket, 9 mm



APPENDIX A12
125 Grain, Round Nose, 9 mm

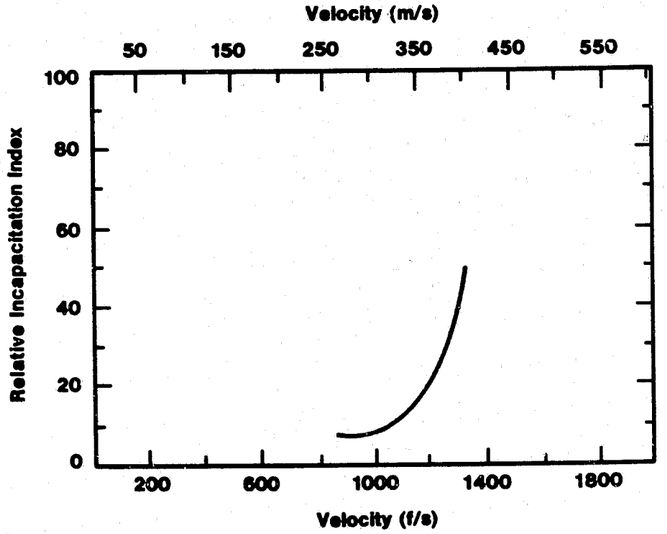


SPEER
125 grain, round nose, 9 mm



Relative Incapacitation Index as a function of velocity for 125 gr., RN, 9 mm bullet manufactured by Speer.

APPENDIX A13
125 Grain, Jacketed Soft Point, 9 mm

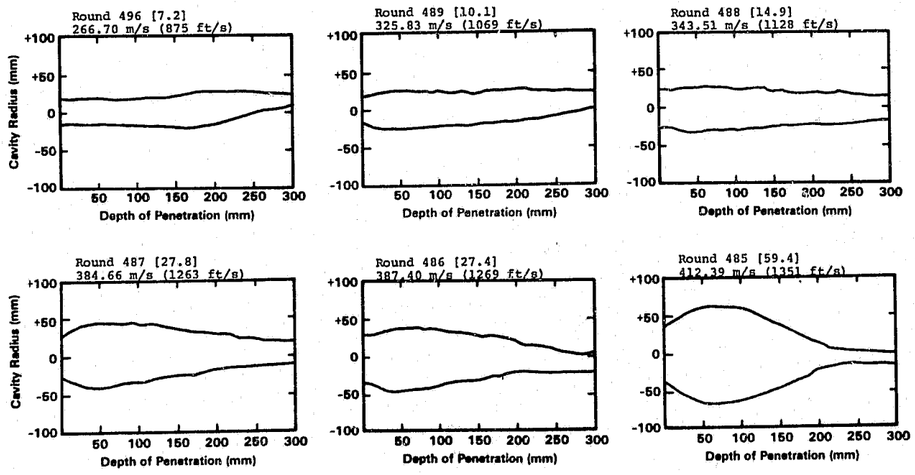


Relative Incapacitation Index as a function of velocity

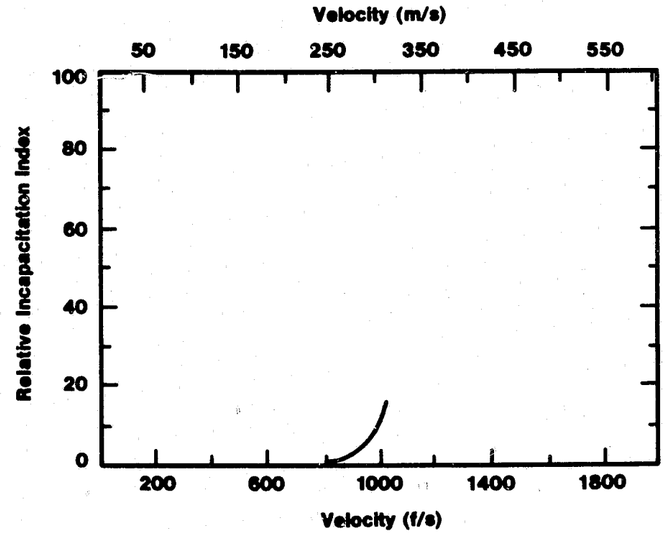
Velocity (f/s)

Relative Incapacitation Index as a function of velocity for 125 gr., JSP, 9 mm bullet manufactured by Speer.

SPEER
125 grain, jacketed soft point, 9 mm



APPENDIX A14
63.9 Grain, Short Stop, 38 Caliber

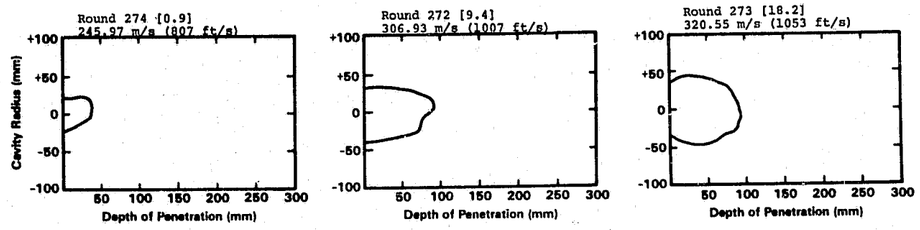


Relative Incapacitation Index as a function of velocity

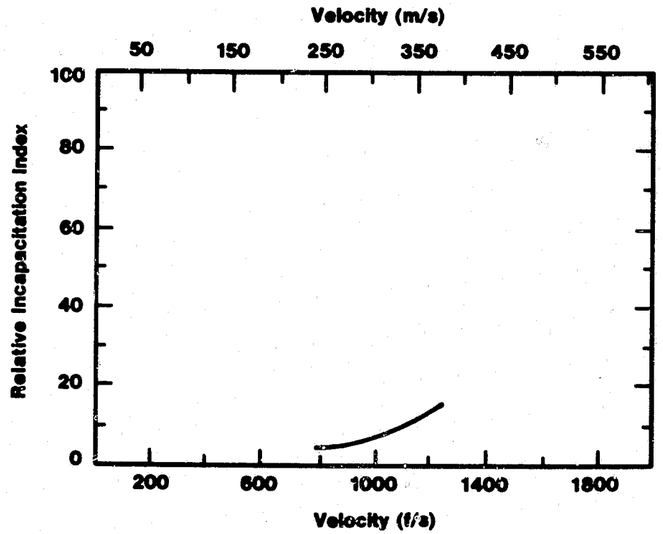
Velocity (f/s)

Relative Incapacitation Index as a function of velocity for 63.9 gr., Short Stop, 38 caliber bullet manufactured by MB Associates.

MB ASSOCIATES
63.9 grain, Short Stop, 38 caliber

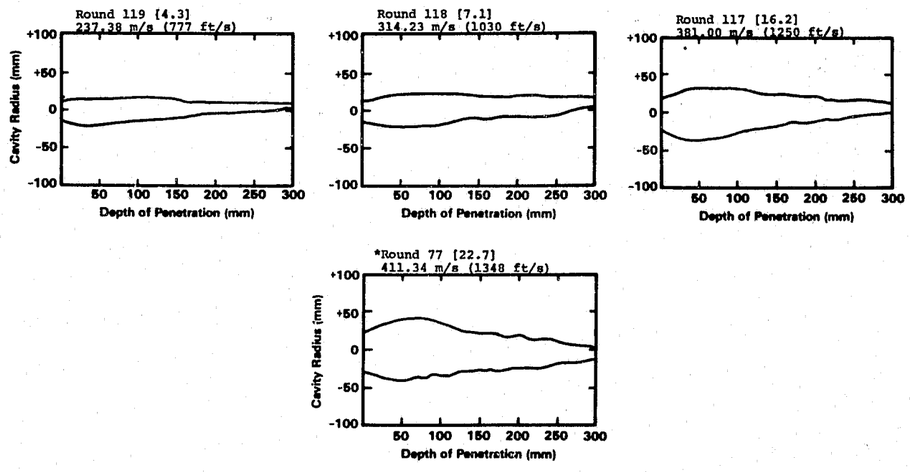


APPENDIX A15
90 Grain, Hemispherical Jacketed Soft Point, 38 Caliber

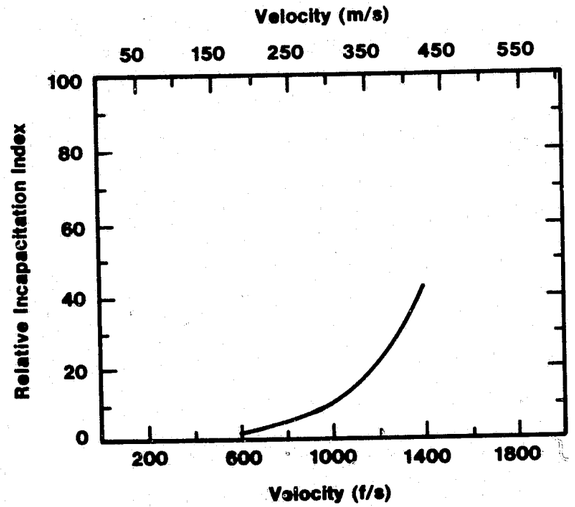


Relative Incapacitation Index as a function of velocity for 90 gr., Hemi/JSP, 38 caliber bullet manufactured by Smith & Wesson.

SMITH & WESSON
90 grain, hemispherical jacketed soft point, 38 caliber

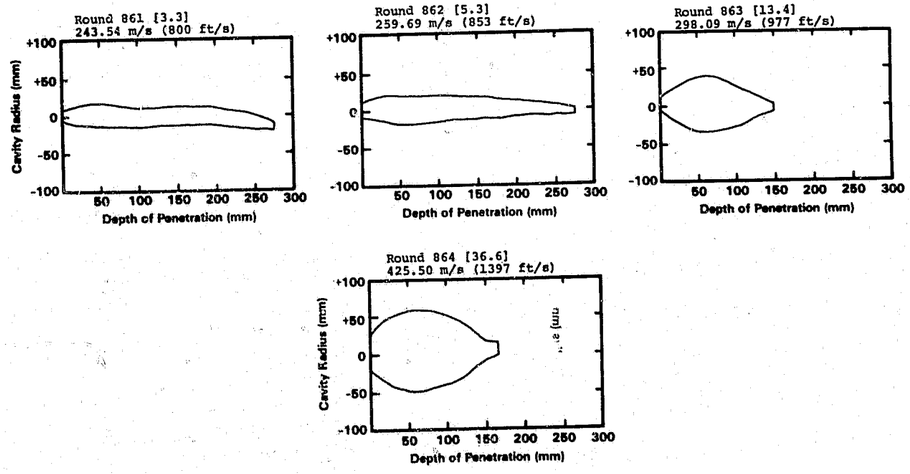


APPENDIX A16
95 Grain, Jacketed Hollow Point, 38 Caliber

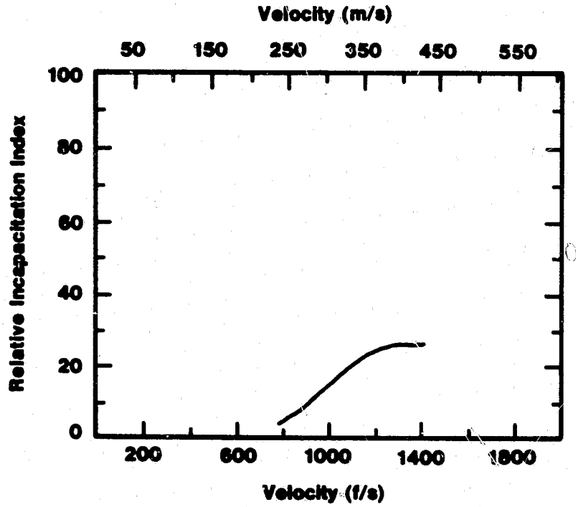


Relative Incapacitation Index as a function of velocity for 95 gr., JHP, 38 caliber bullet manufactured by Remington.

REMINGTON
95 grain, jacketed hollow point, 38 caliber

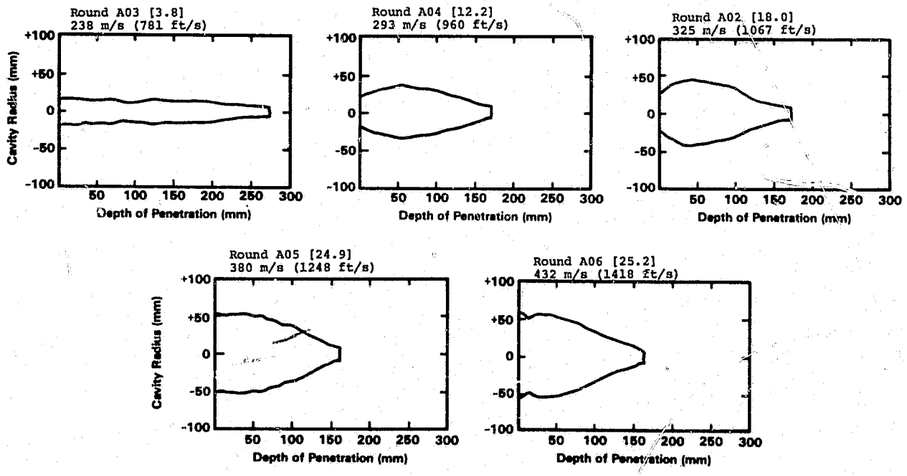


APPENDIX A17
95 Grain, Jacketed Hollow Point (Silvertip), 38 Caliber

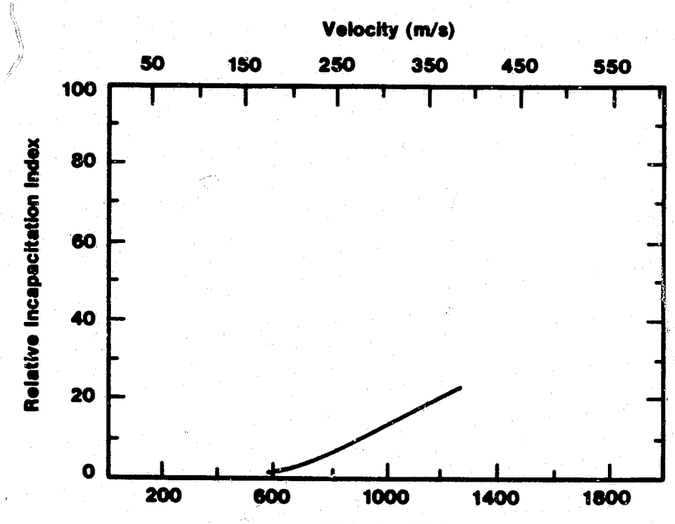


Relative Incapacitation Index as a function of velocity for 95 gr., JHP (Silvertip), 38 caliber bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
95 grain, jacketed hollow point, 38 caliber

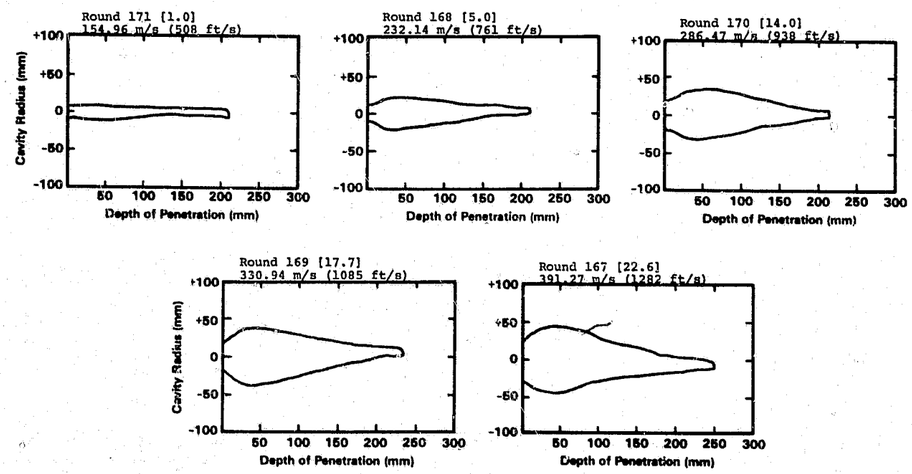


APPENDIX A18
100 Grain, Jacketed Hollow Point, 38 Caliber

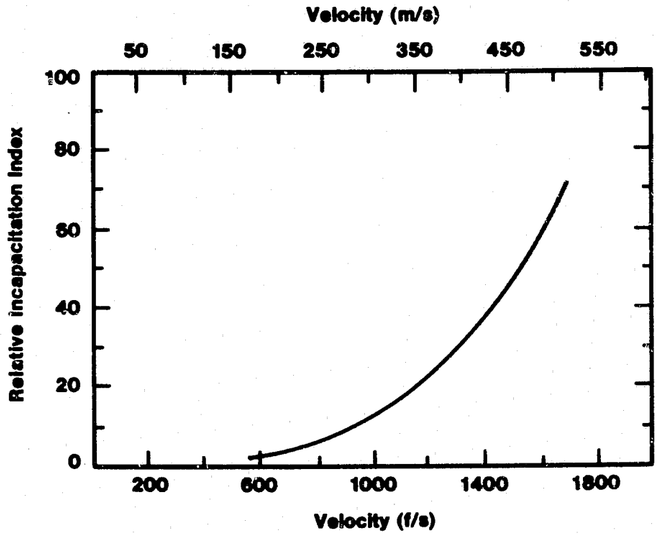


Relative Incapacitation Index as a function of velocity for 100 gr., JHP, 38 caliber bullet manufactured by Zero.

ZERO
100 grain, jacketed hollow point, 38 caliber

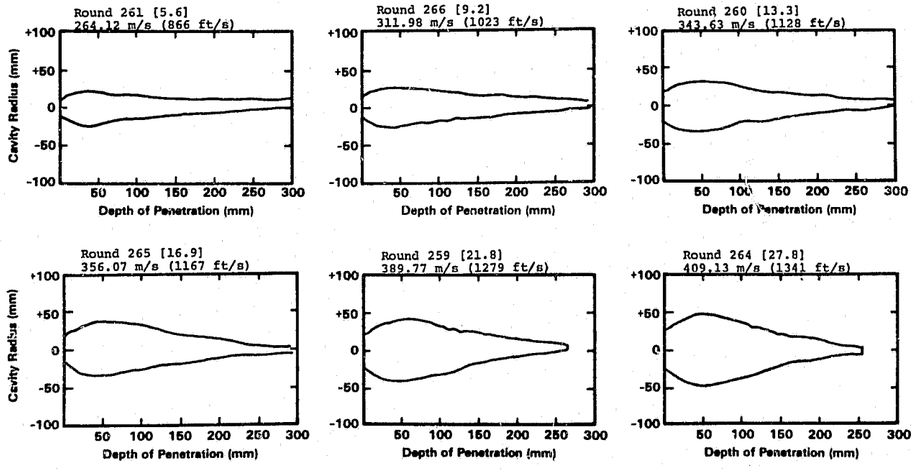


APPENDIX A19
110 Grain, Jacketed Hollow Point, 38 Caliber

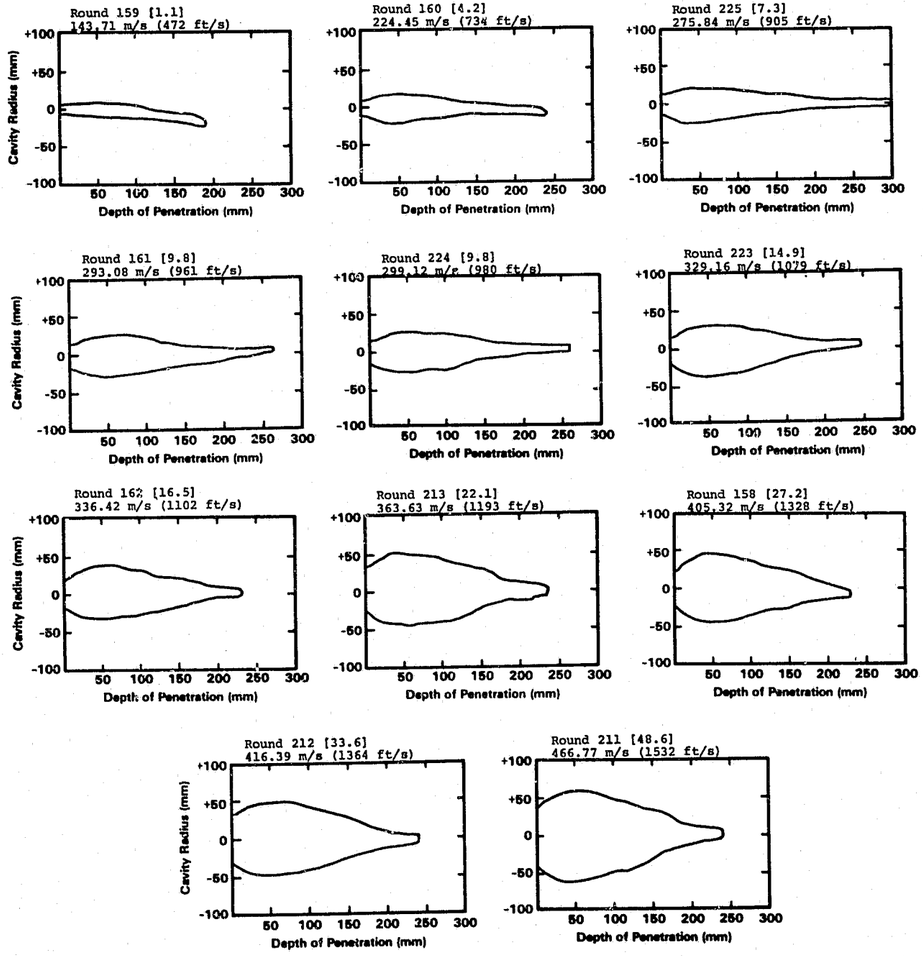


Relative Incapacitation Index as a function of velocity for 110 gr., JHP, 38 caliber bullets manufactured by Hi-Precision, Hornady, Sierra, Smith & Wesson, Speer, Supervel, Winchester-Western, and Zero.

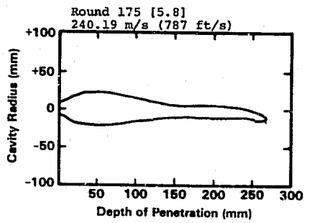
HI-PRECISION
110 grain, jacketed hollow point, 38 caliber

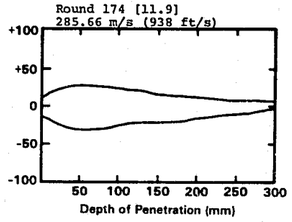


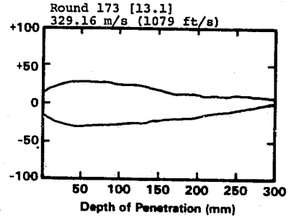
HORNADY
110 grain, jacketed hollow point, 38 caliber

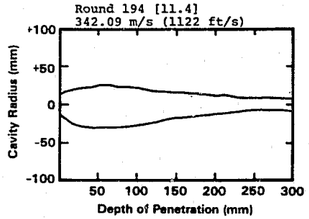


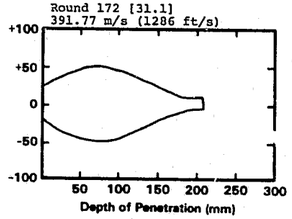
SIERRA
110 grain, jacketed hollow point, 38 caliber

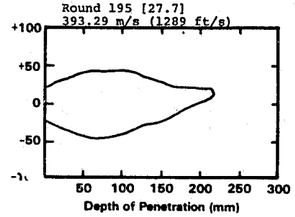


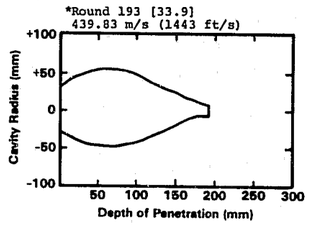




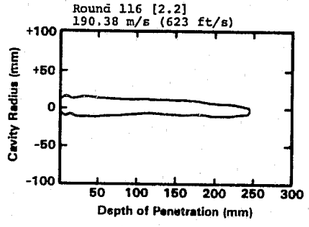


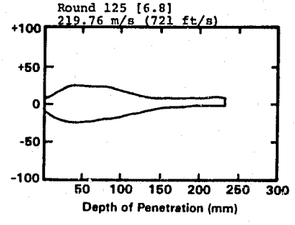


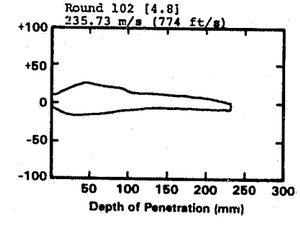


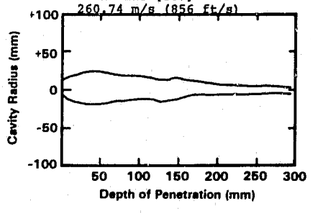


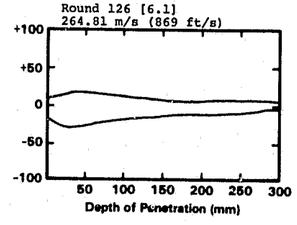
SMITH & WESSON
110 grain, jacketed hollow point, 38 caliber

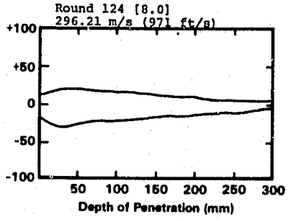




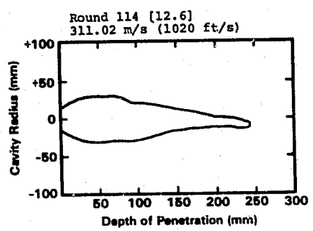


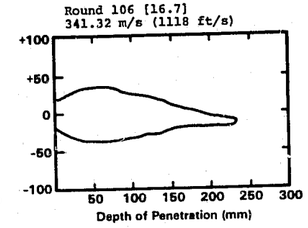


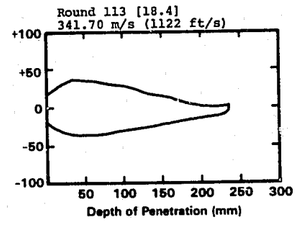


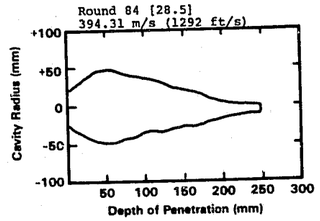


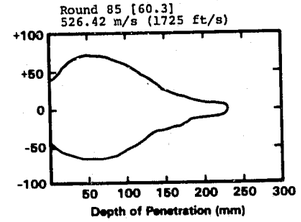
SMITH & WESSON (cont.)
110 grain, jacketed hollow point, 38 caliber



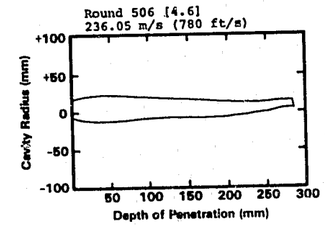


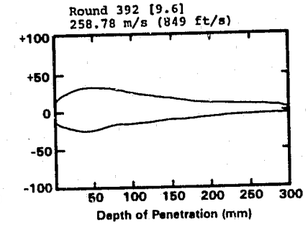


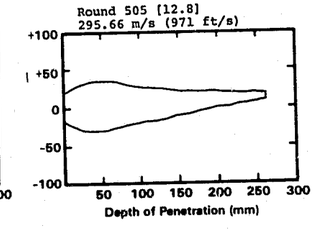


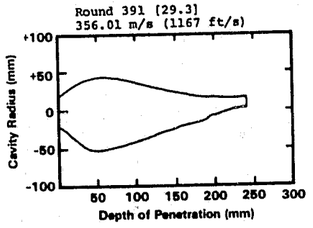


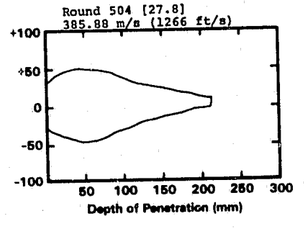
SPEER
110 grain, jacketed hollow point, 38 caliber

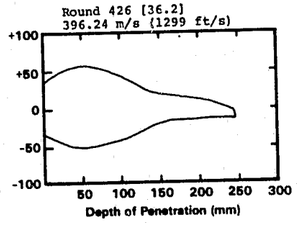


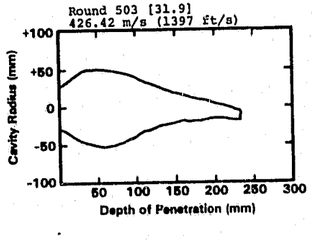


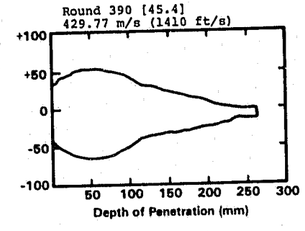


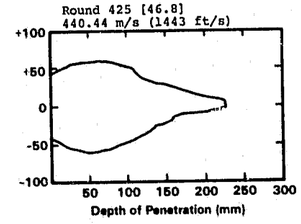




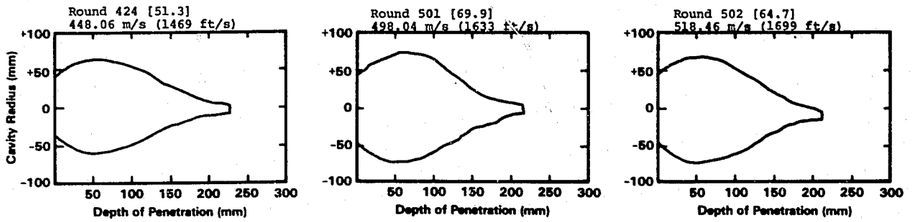




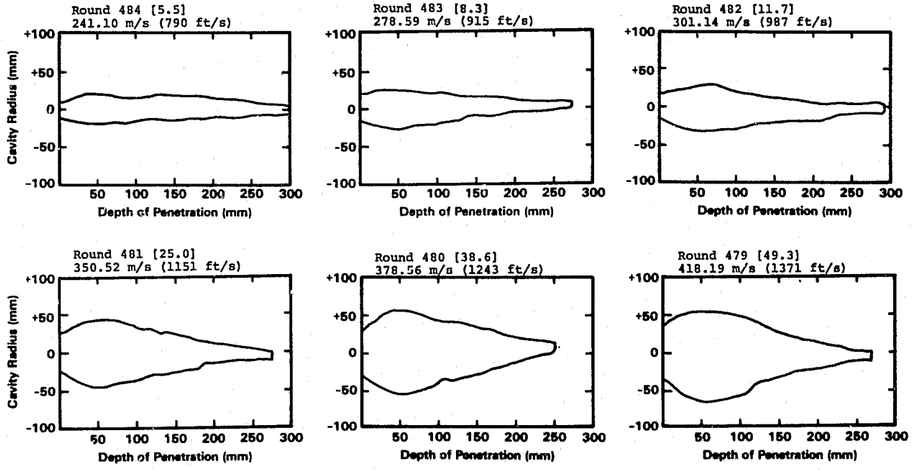




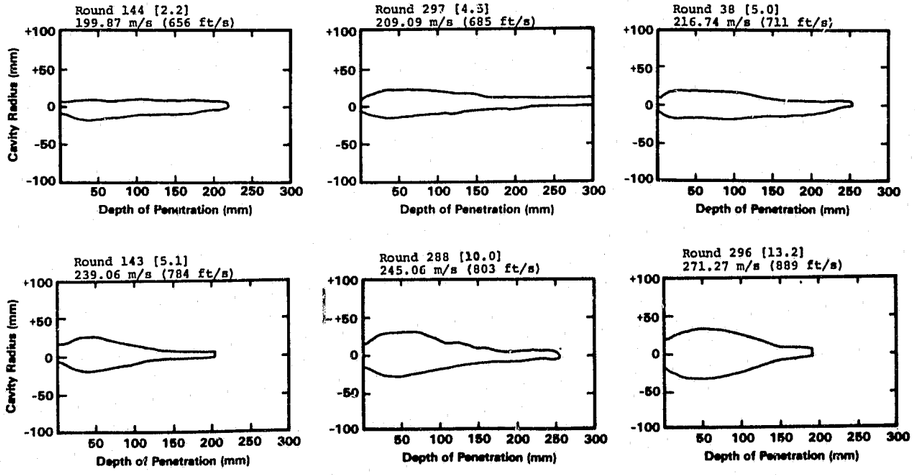
SPEER (cont.)
110 grain, jacketed hollow point, 38 caliber



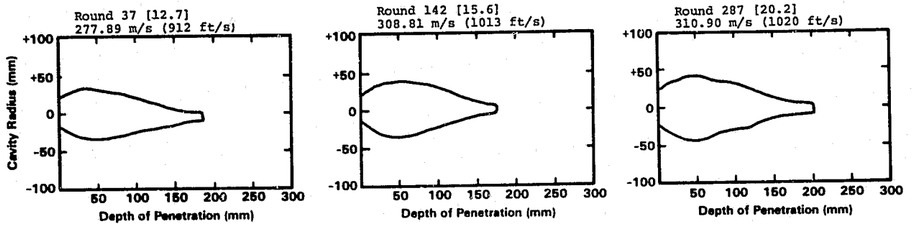
SUPERVEL
110 grain, jacketed hollow point, 38 caliber

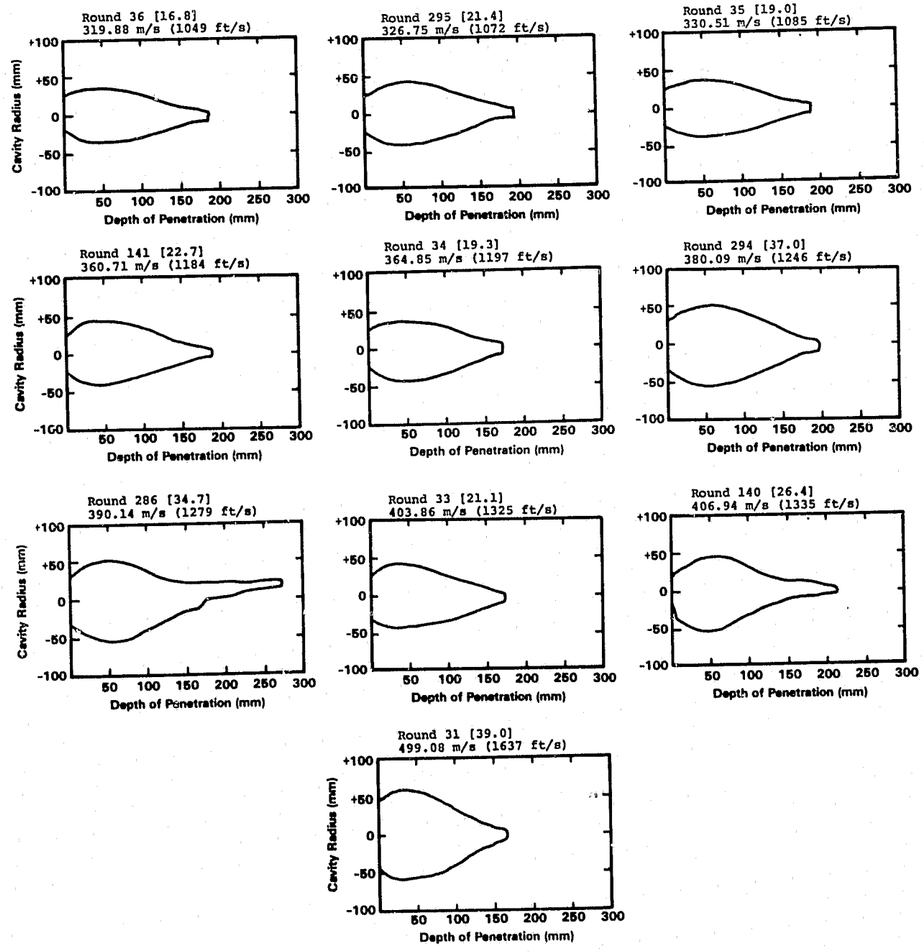


WINCHESTER-WESTERN
110 grain, jacketed hollow point, 38 caliber

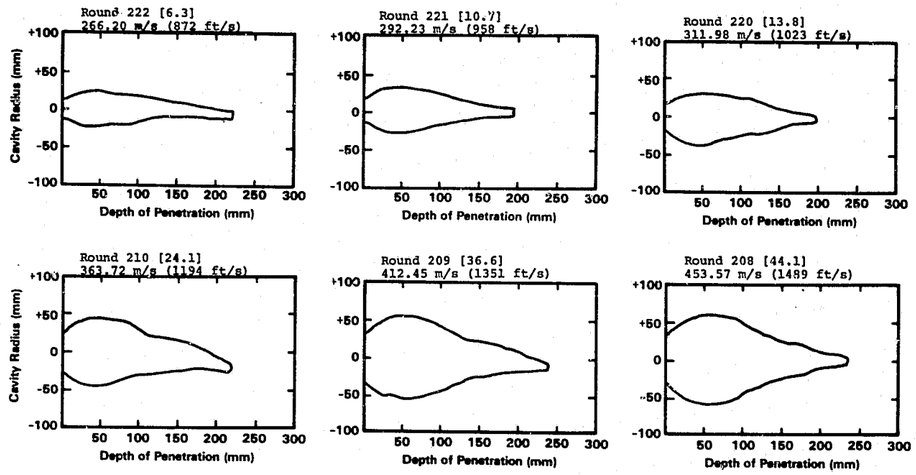


WINCHESTER-WESTERN (cont.)
110 grain, jacketed hollow point, 38 caliber

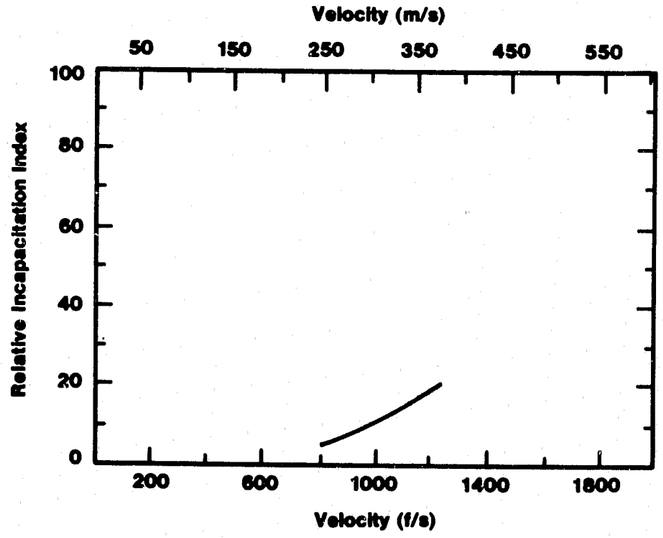




ZERO
110 grain, jacketed hollow point, 38 caliber

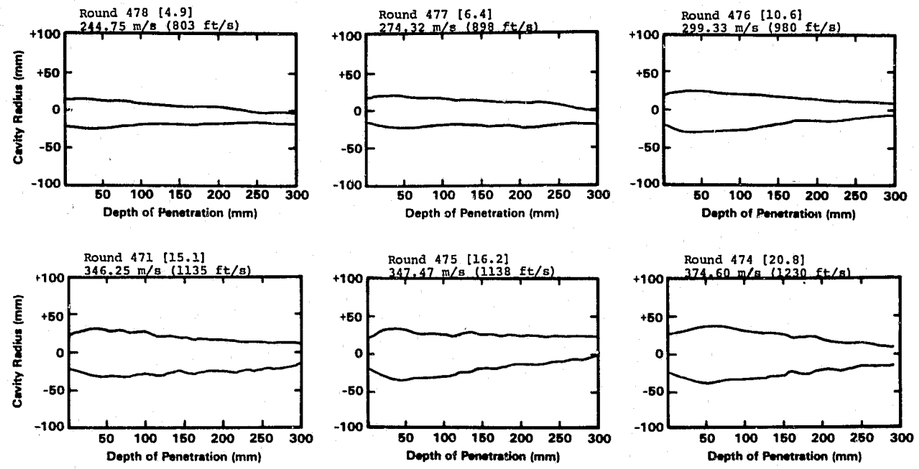


APPENDIX A20
110 Grain, Jacketed Soft Point, 38 Caliber

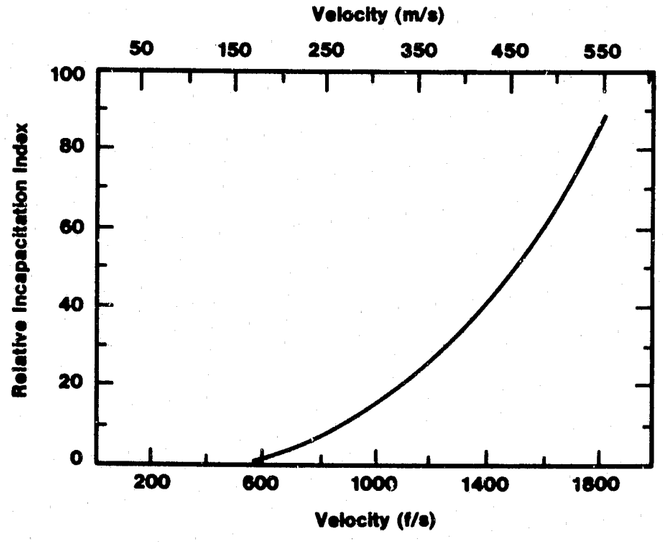


Relative Incapacitation Index as a function of velocity for 110 gr., JSP, 38 Caliber bullet manufactured by Supervel.

SUPERVEL
110 grain, jacketed soft point, 38 caliber

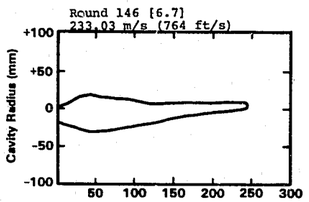


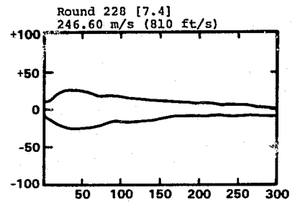
APPENDIX A21
125 Grain, Jacketed Hollow Point, 38 Caliber

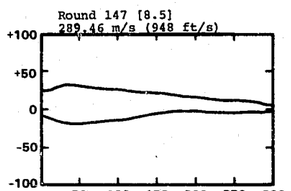


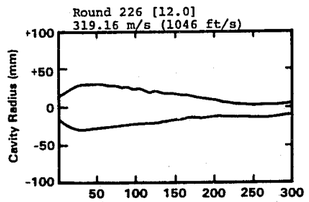
Relative Incapacitation Index as a function of velocity for 125 gr., JHP, 38 caliber bullets manufactured by Hornady, Remington, Sierra, Smith & Wesson, Speer, and Zero.

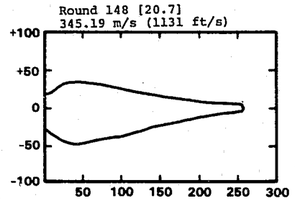
HORNADY
125 grain, jacketed hollow point, 38 caliber

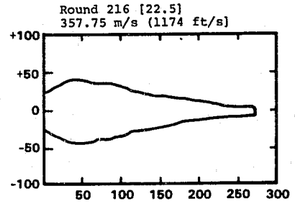


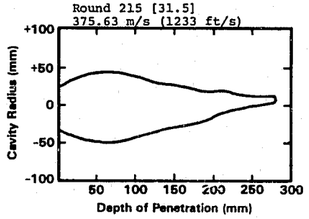


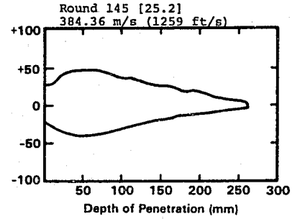


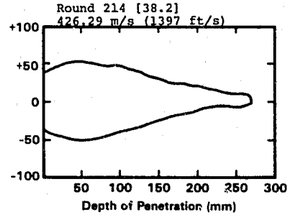




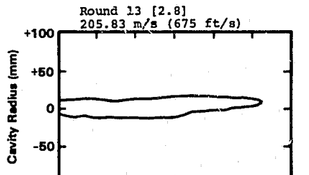


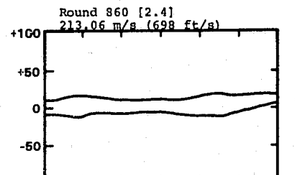


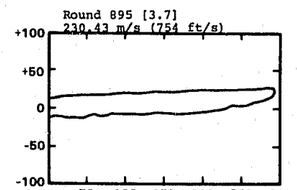


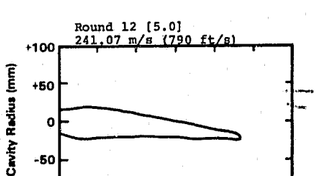


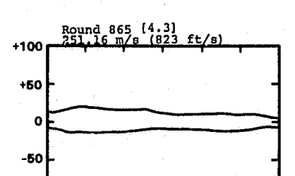
REMINGTON
125 grain, jacketed hollow point, 38 caliber

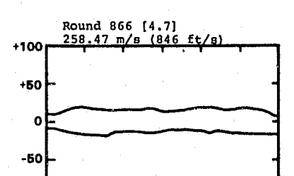




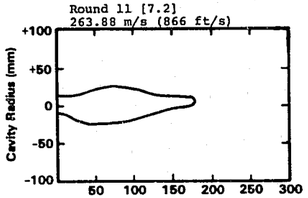


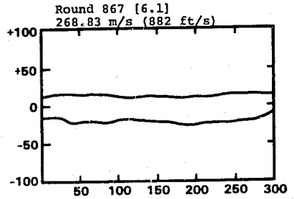


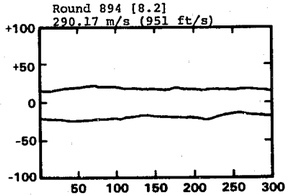


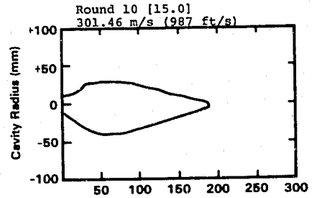


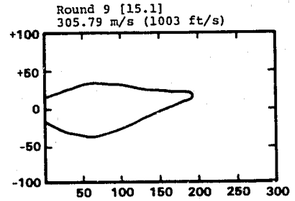
REMINGTON (cont.)
125 grain, jacketed hollow point, 38 caliber

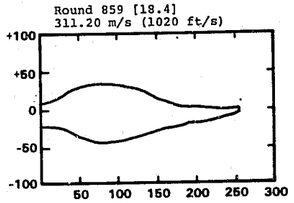


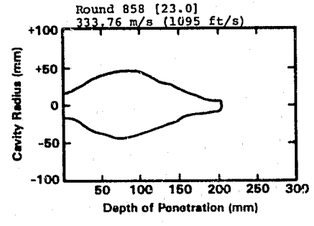


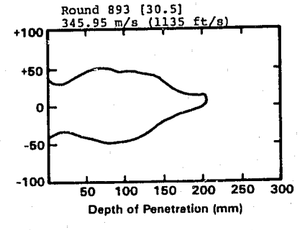


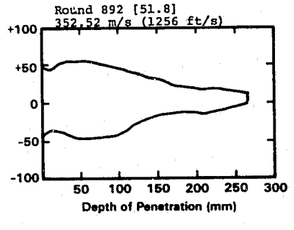


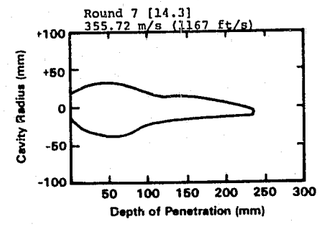


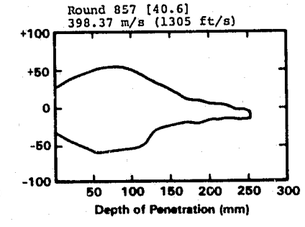


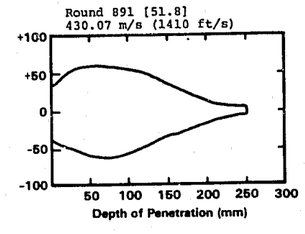




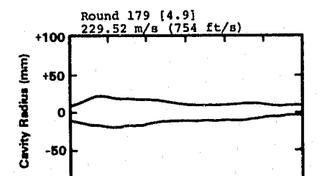


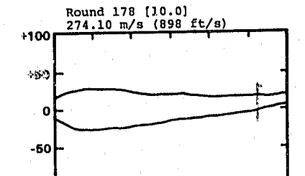


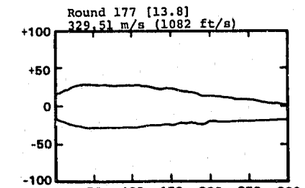




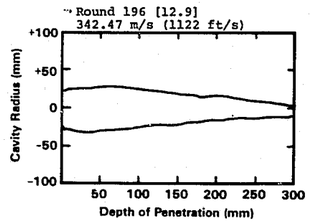
SIERRA
125 grain, jacketed hollow point, 38 caliber

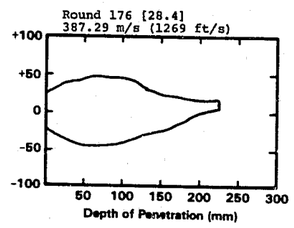


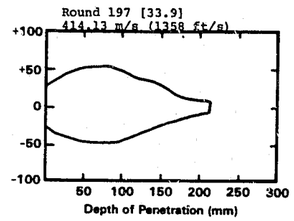




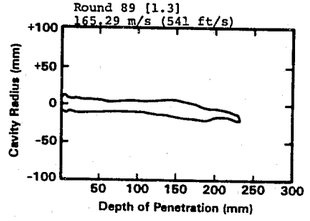
SIERRA (cont.)
125 grain, jacketed hollow point, 38 caliber

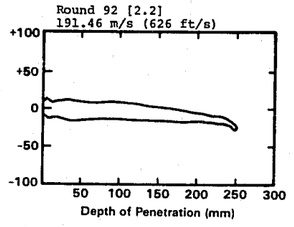


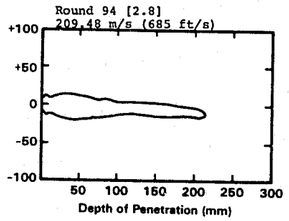


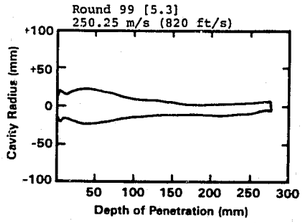


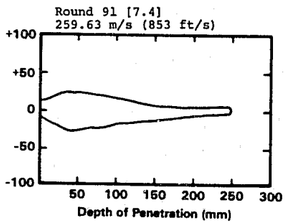
SMITH & WESSON
125 grain, jacketed hollow point, 38 caliber

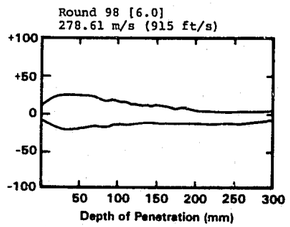


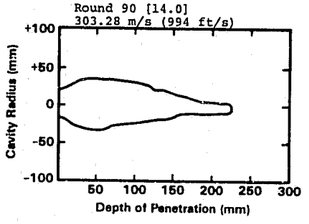


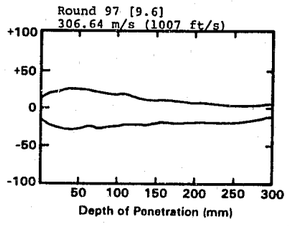


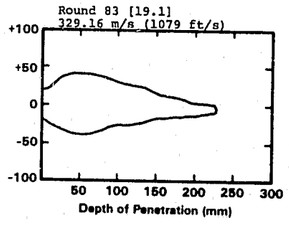


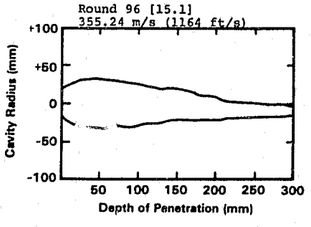


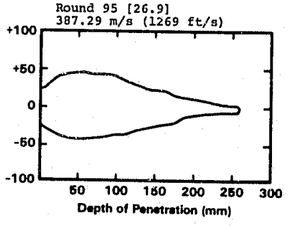


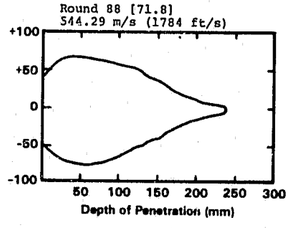




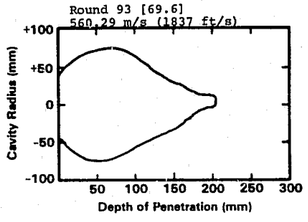




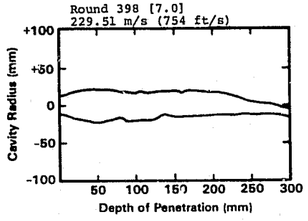


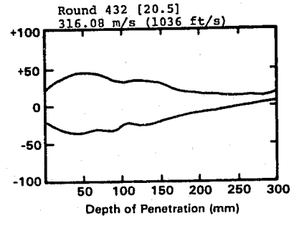


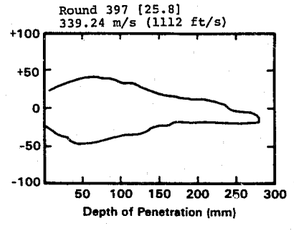
SMITH & WESSON (cont.)
125 grain, jacketed hollow point, 38 caliber

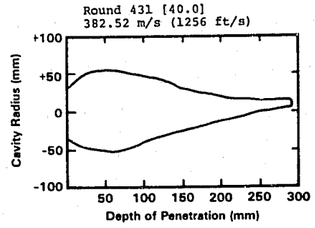


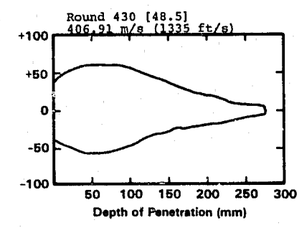
SPEER
125 grain, jacketed hollow point, 38 caliber

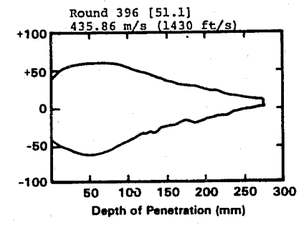




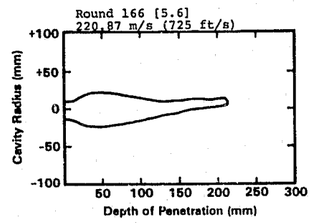


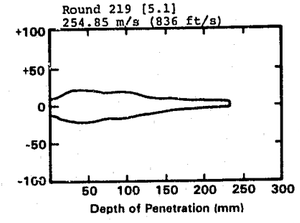


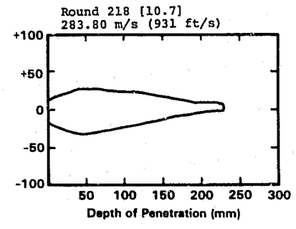


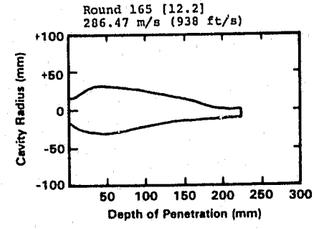


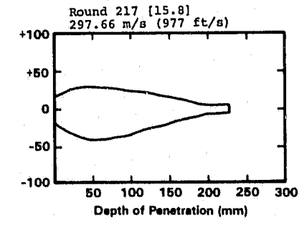
ZERO
125 grain, jacketed hollow point, 38 caliber

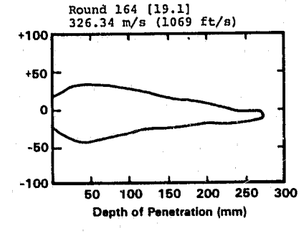




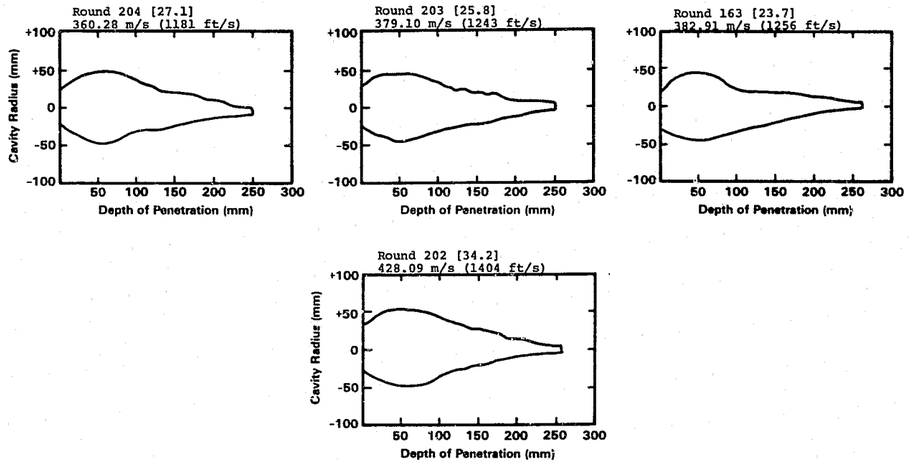




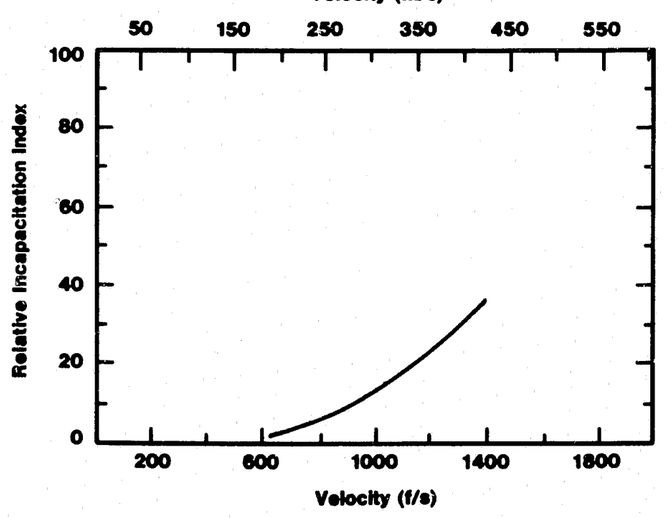




ZERO (cont.)
125 grain, jacketed hollow point, 38 caliber

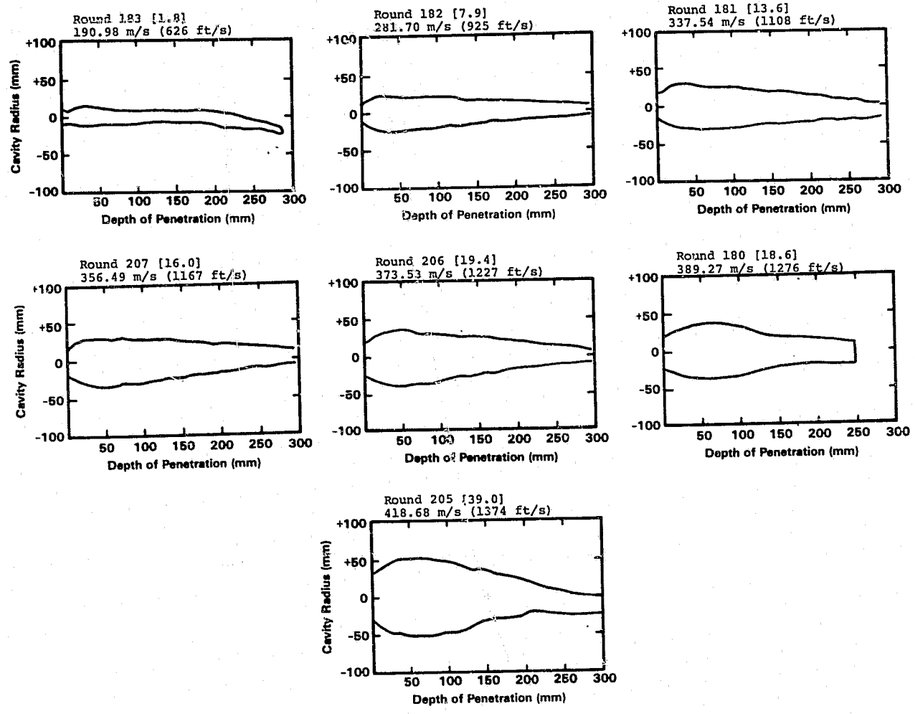


APPENDIX A22
125 Grain, Jacketed Soft Point, 38 Caliber

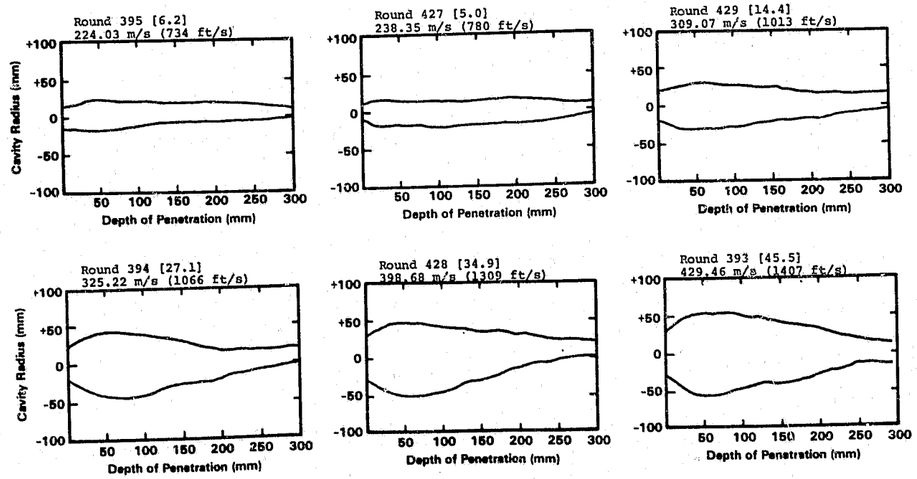


Relative Incapacitation Index as a function of velocity for 125 gr., JSP, 38 caliber bullets manufactured by Sierra and Speer.

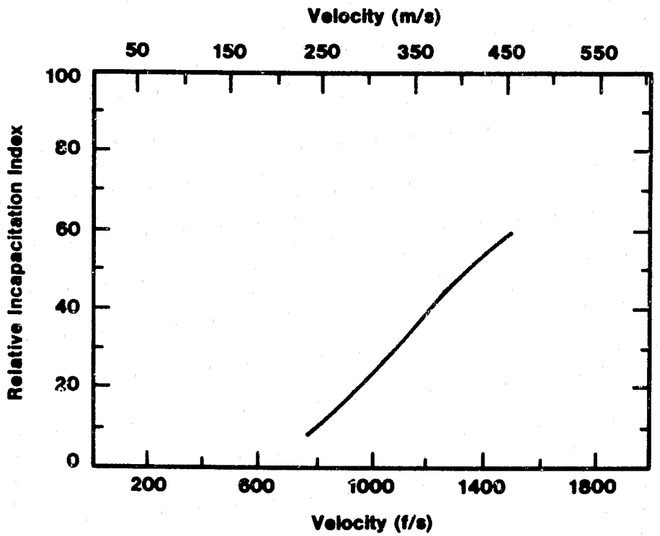
SIERRA
125 grain, jacketed soft point, 38 caliber



SPEER
125 grain, jacketed soft point, 38 caliber

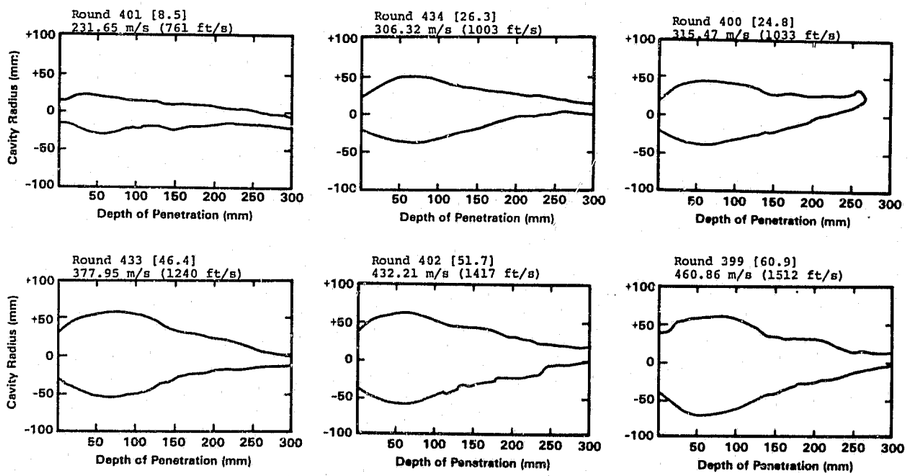


APPENDIX A23
140 Grain, Jacketed Hollow Point, 38 Caliber

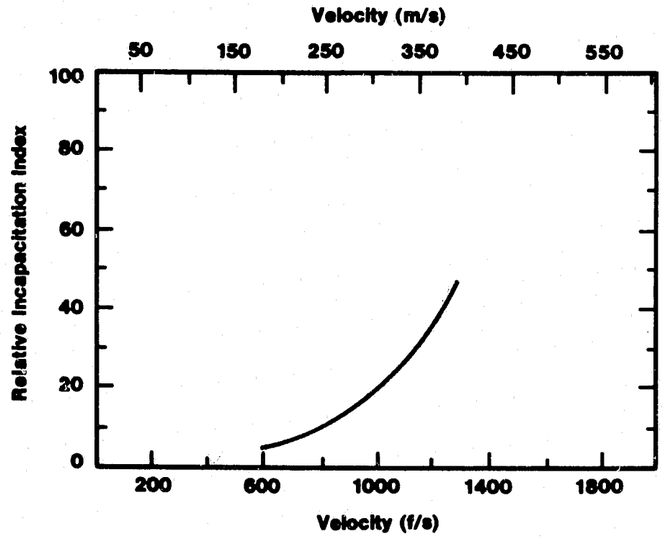


Relative Incapacitation Index as a function of velocity
for 140 gr., JHP, 38 caliber bullet manufactured by Speer.

SPEER
140 grain, jacketed hollow point, 38 caliber

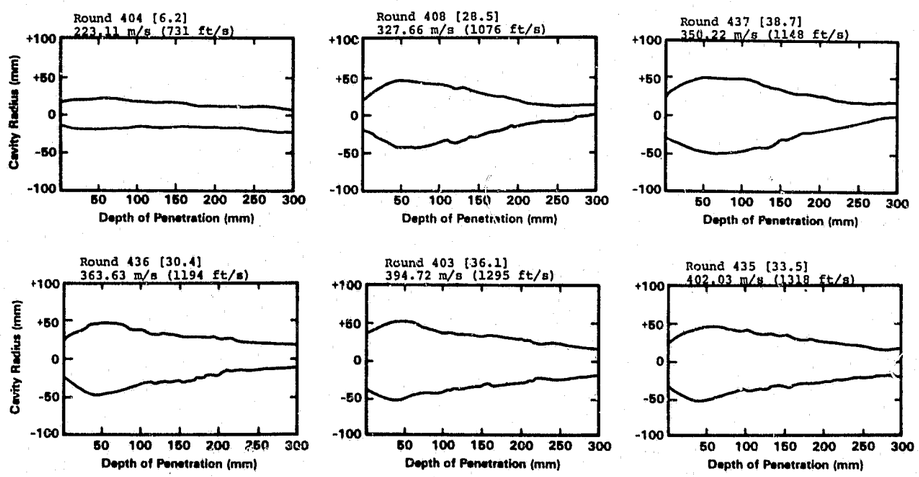


APPENDIX A24
146 Grain, Jacketed Hollow Point, 38 Caliber

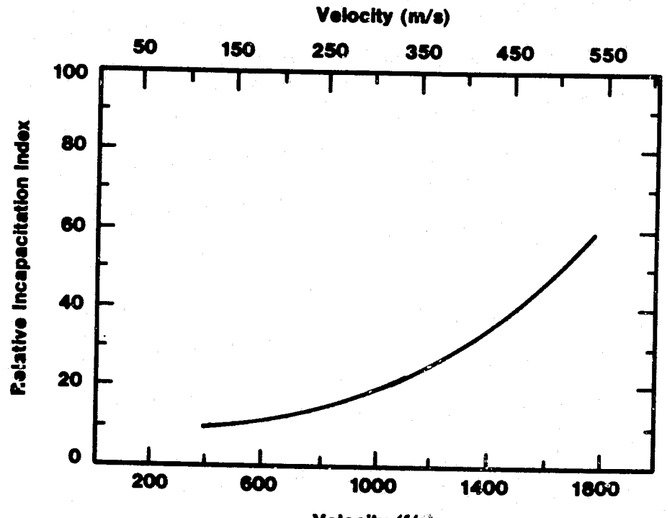


Relative Incapacitation Index as a function of velocity
for 146 gr., JHP, 38 caliber bullet manufactured by Speer.

SPEER
146 grain, jacketed hollow point, 38 caliber

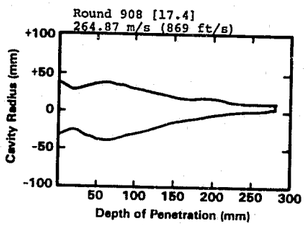


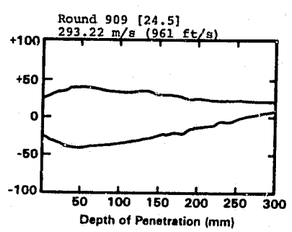
APPENDIX A25
148 Grain, Wadcutter, 38 Caliber

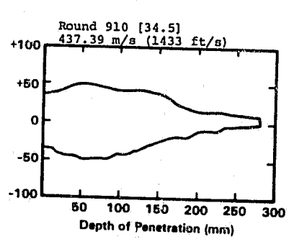


Relative Incapacitation Index as a function of velocity for 148 gr., WC, 38 caliber bullets manufactured by Remington, Smith & Wesson, Speer, and Winchester-Western.

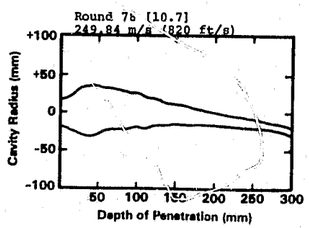
REMINGTON
148 grain, wadcutter, 38 caliber



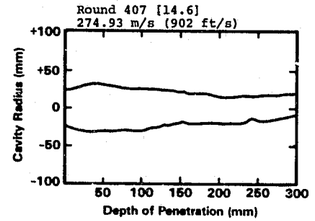


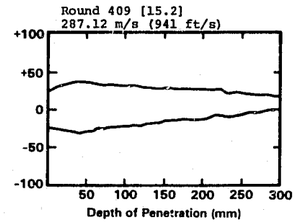


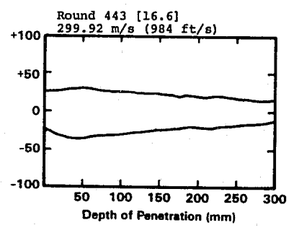
SMITH & WESSON
148 grain, wadcutter, 38 caliber

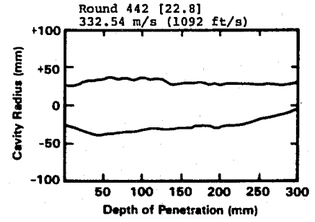


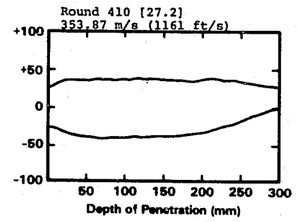
SPEER
148 grain, wadcutter, 38 caliber

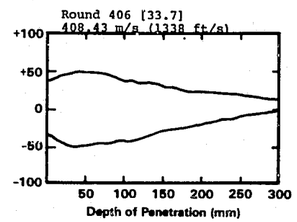


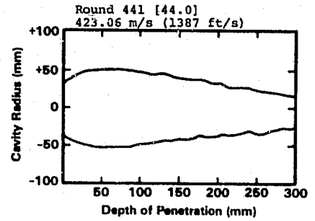


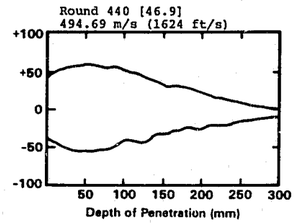


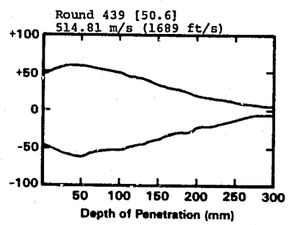


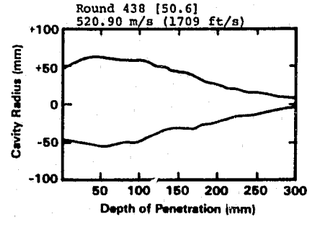


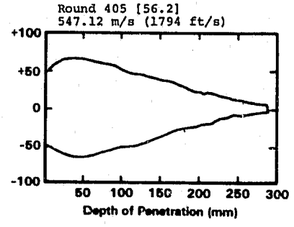




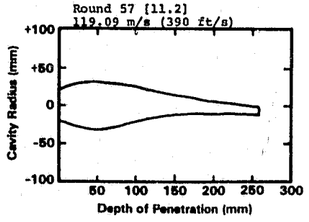


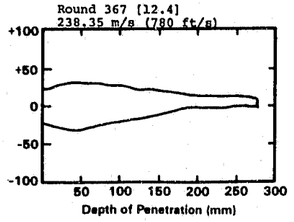


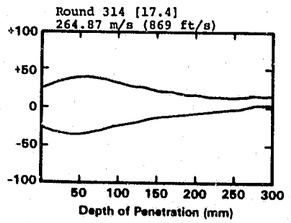




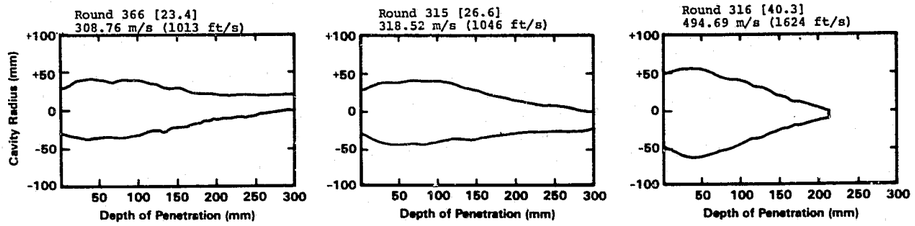
WINCHESTER-WESTERN
148 grain, wadcutter, 38 caliber



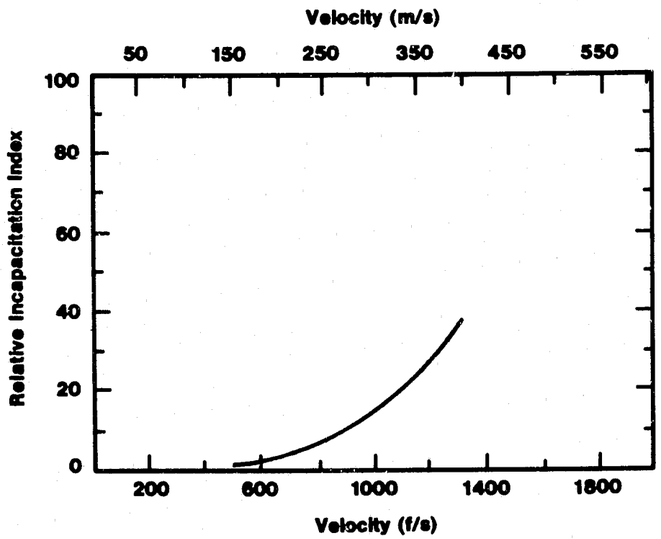




WINCHESTER-WESTERN (cont.)
148 grain, wadcutter, 38 caliber

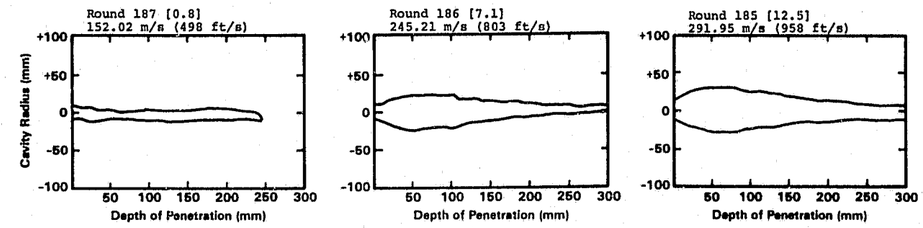


APPENDIX A26
150 Grain, Jacketed Hollow Point, 38 Caliber

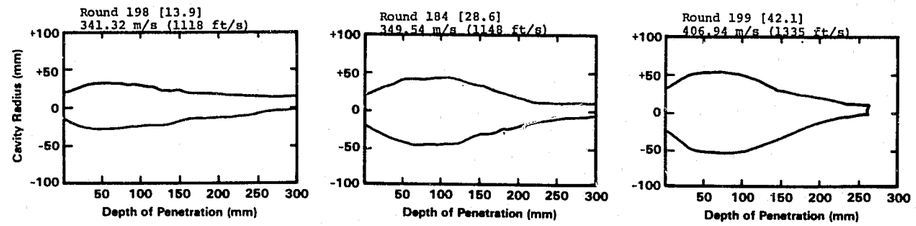


Relative Incapacitation Index as a function of velocity for 150 gr., JHP, 38 caliber bullet manufactured by Sierra.

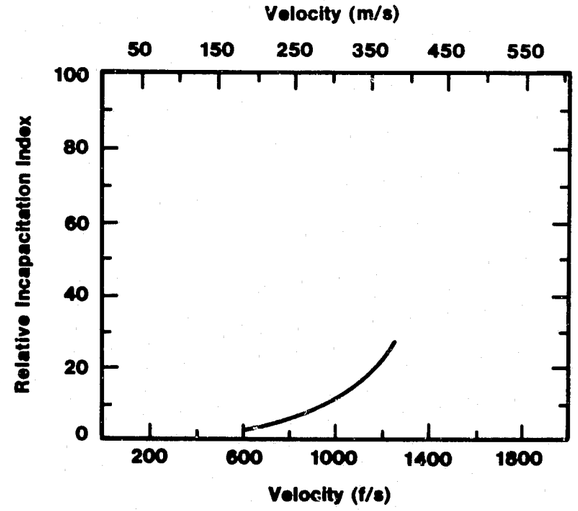
SIERRA
150 grain, jacketed hollow point, 38 caliber



SIERRA (cont.)
150 grain, jacketed hollow point, 38 caliber

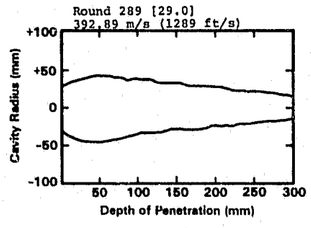


APPENDIX A27
150 Grain, Jacketed Soft Point, 38 Caliber

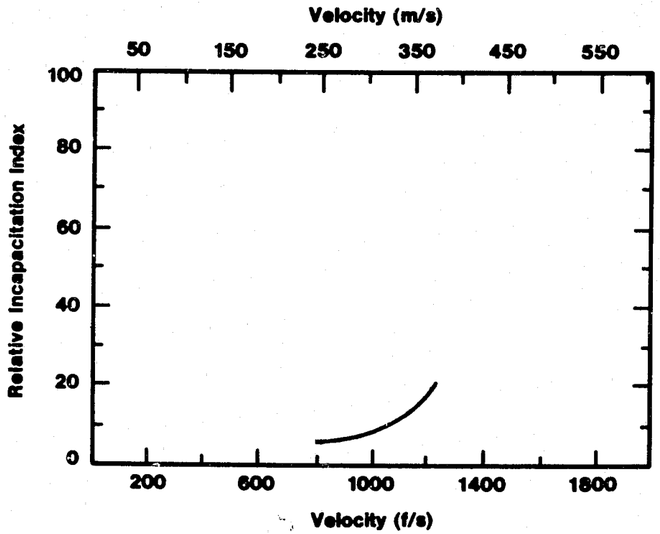


Relative Incapacitation Index as a function of velocity for 150 gr., JSP, 38 caliber bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
150 grain, jacketed soft point, 38 caliber

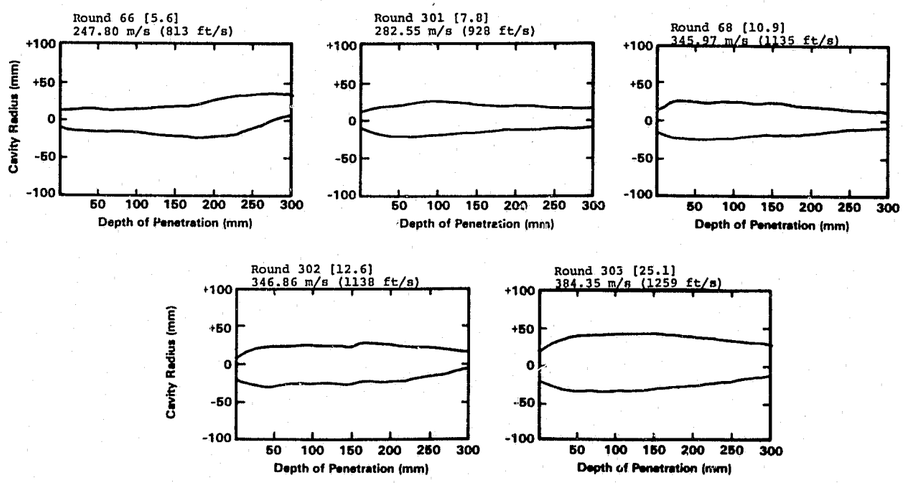


APPENDIX A28
150 Grain, Lead Round Nose, 38 Caliber

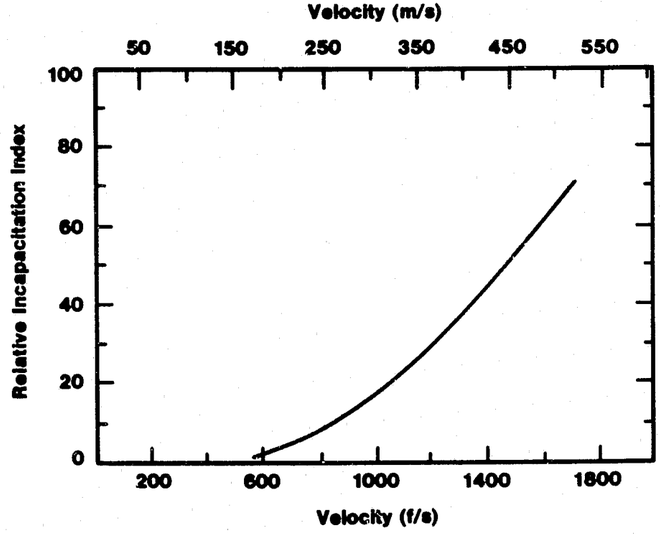


Relative Incapacitation Index as a function of velocity for 150 gr., LRN, 38 caliber bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
150 grain, lead round nose, 38 caliber

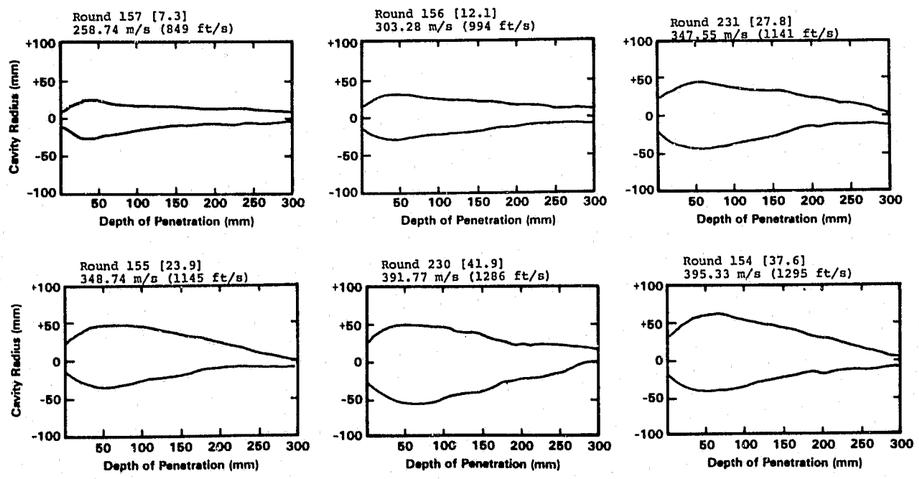


APPENDIX A29
158 Grain, Jacketed Hollow Point, 38 Caliber

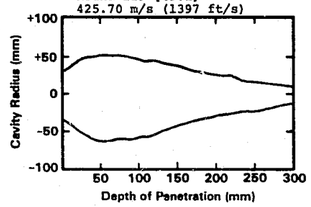


Relative Incapacitation Index as a function of velocity for 158 gr., JHP, 38 caliber bullets manufactured by Hornady, Remington, Smith & Wesson, and Winchester-Western.

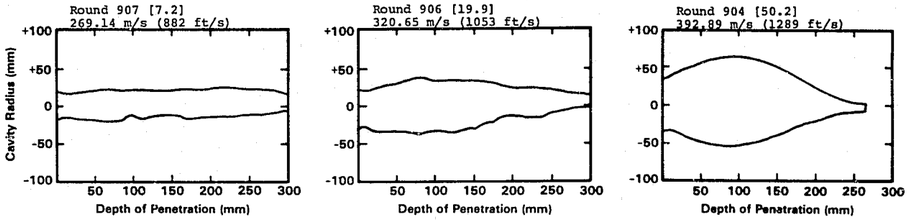
HORNADY
158 grain, jacketed hollow point, 38 caliber



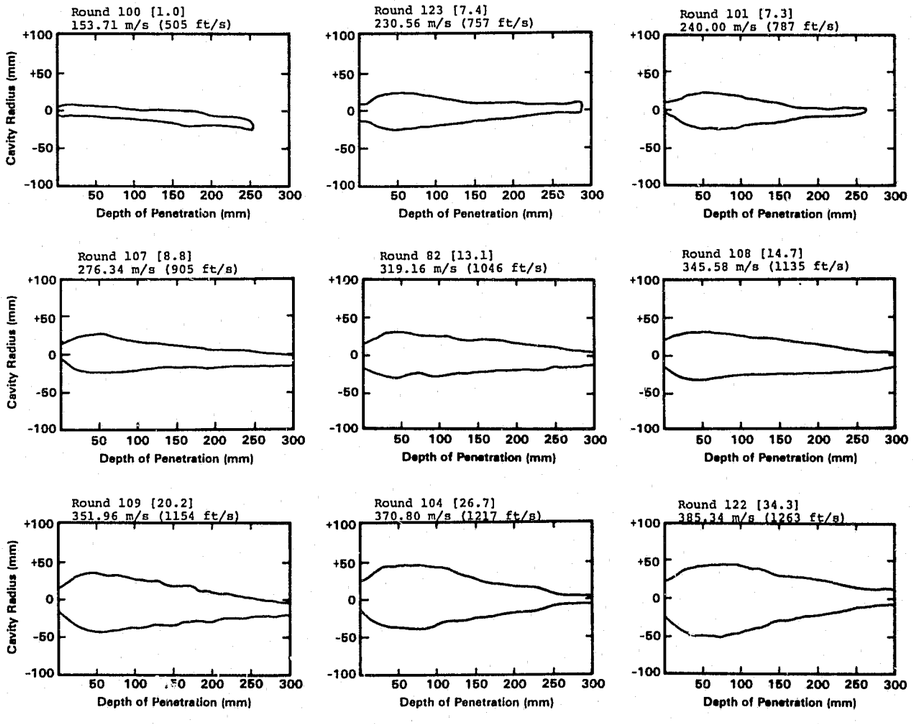
HORNADY (cont.)
158 grain, jacketed hollow point, 38 caliber



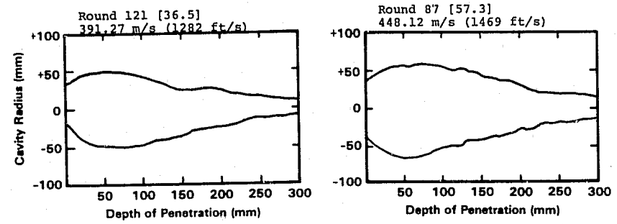
REMINGTON
158 grain, jacketed hollow point, 38 caliber



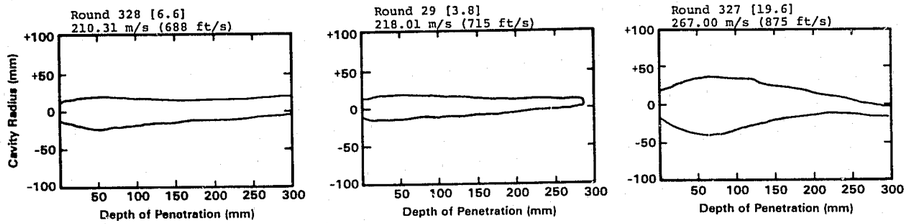
SMITH & WESSON
158 grain, jacketed hollow point, 38 caliber

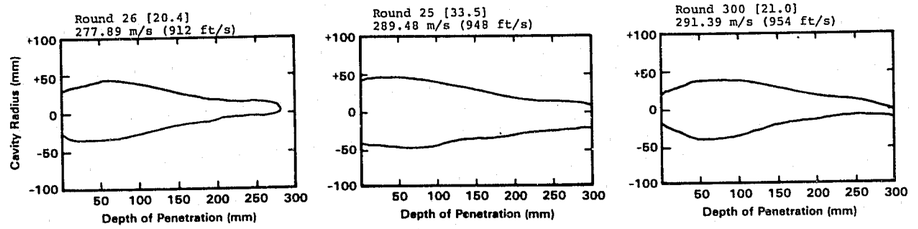


SMITH & WESSON (cont.)
158 grain, jacketed hollow point, 38 caliber

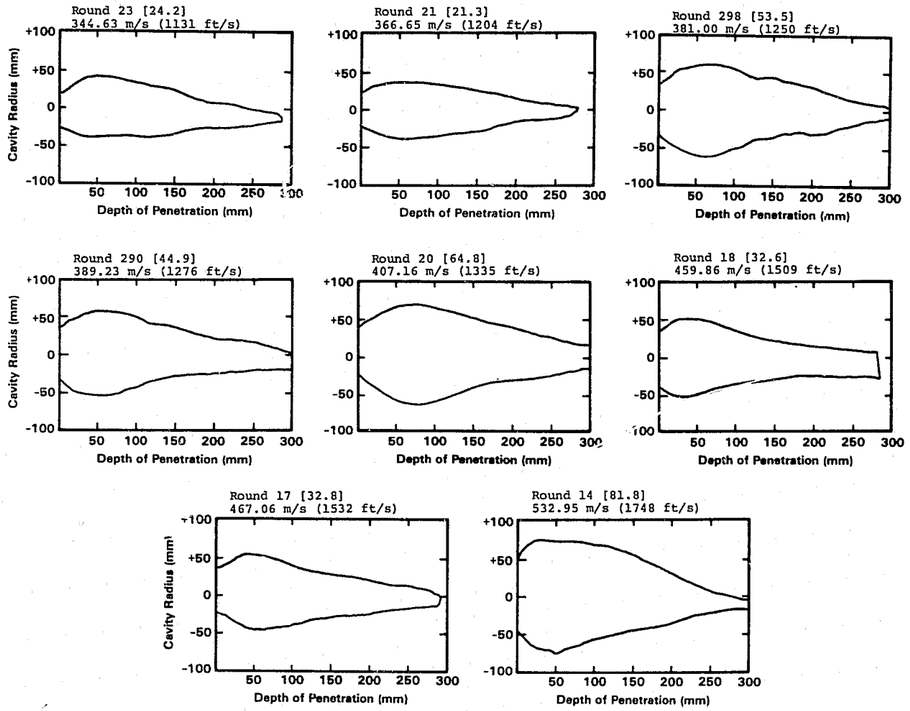


WINCHESTER-WESTERN
158 grain, jacketed hollow point, 38 caliber

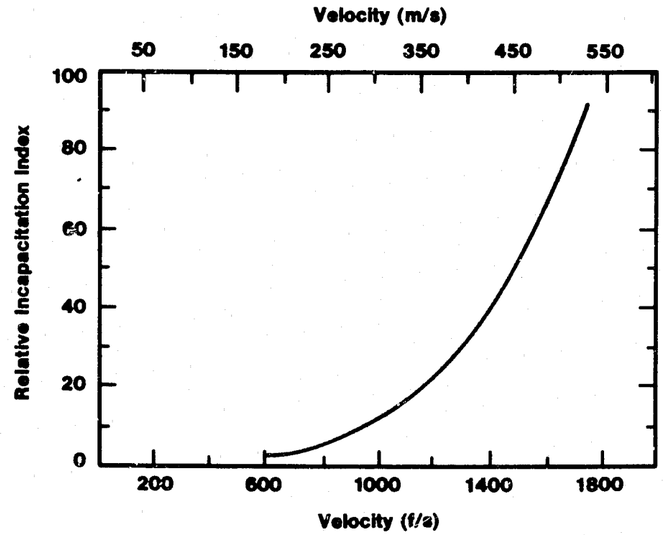




WINCHESTER-WESTERN (cont.)
158 grain, jacketed hollow point, 38 caliber

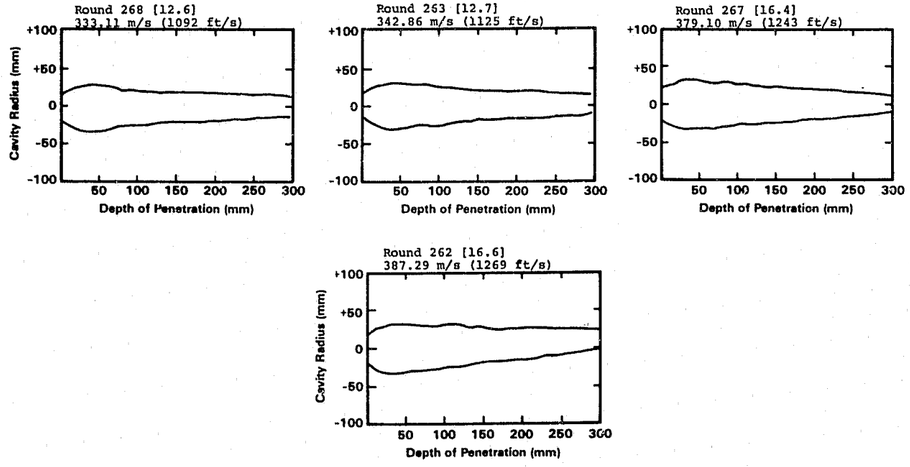


APPENDIX A30
158 Grain, Jacketed Soft Point, 38 Caliber



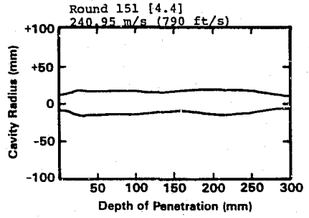
Relative Incapacitation Index as a function of velocity for 158 gr., JSP, 38 caliber bullets manufactured by Hi-Precision, Hornady, Remington, Sierra, Smith & Wesson, Speer, and Winchester-Western.

HI-PRECISION
158 grain, jacketed soft point, 38 caliber

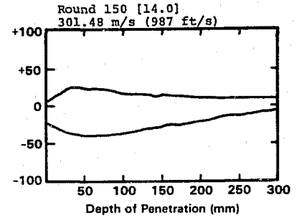


HORNADY
158 grain, jacketed soft point, 38 caliber

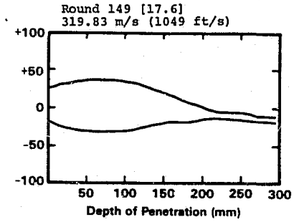
Round 151 [4.4]
240.95 m/s (790 ft/s)



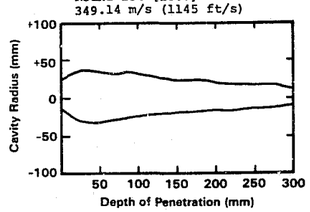
Round 150 [14.0]
301.48 m/s (987 ft/s)



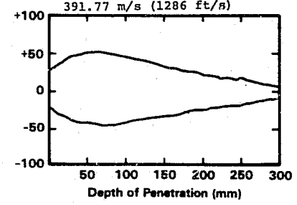
Round 149 [17.6]
319.83 m/s (1049 ft/s)



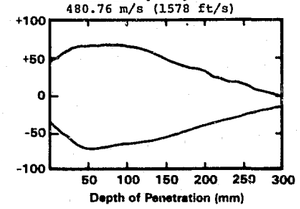
Round 234 [16.7]
349.14 m/s (1145 ft/s)



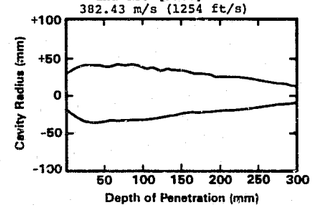
Round 152 [32.1]
391.77 m/s (1286 ft/s)



Round 232 [75.8]
480.76 m/s (1578 ft/s)

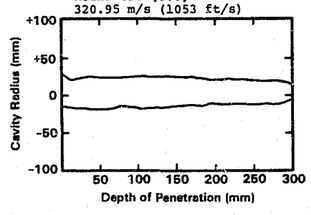


*Round 233 [22.7]
382.43 m/s (1254 ft/s)

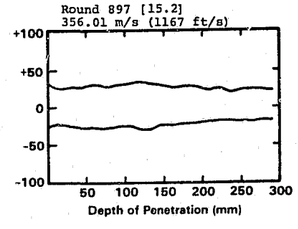


REMINGTON
158 grain, jacketed soft point, 38 caliber

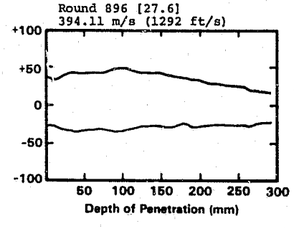
Round 898 [8.6]
320.95 m/s (1053 ft/s)



Round 897 [15.2]
356.01 m/s (1167 ft/s)

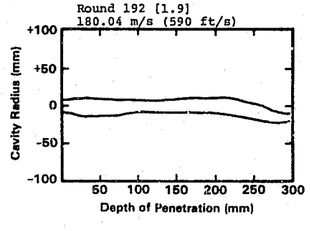


Round 896 [27.6]
394.11 m/s (1292 ft/s)

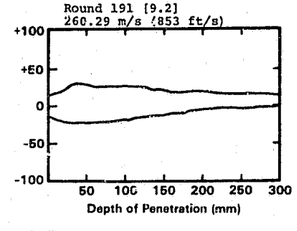


SIERRA
158 grain, jacketed soft point, 38 caliber

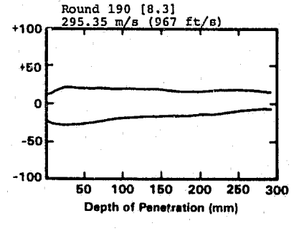
Round 192 [1.9]
180.04 m/s (590 ft/s)



Round 191 [9.2]
260.29 m/s (853 ft/s)

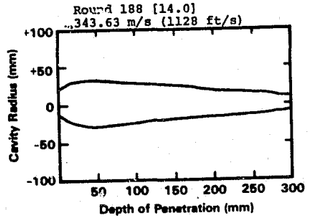


Round 190 [8.3]
295.35 m/s (967 ft/s)

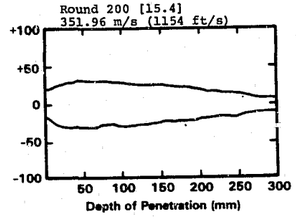


SIERRA (cont.)
158 grain, jacketed soft point, 38 caliber

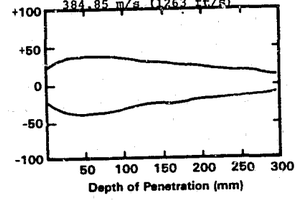
Round 188 [14.0]
343.63 m/s (1128 ft/s)



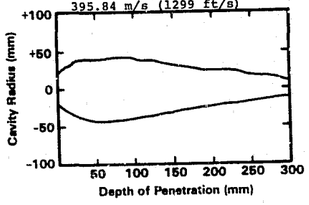
Round 200 [15.4]
351.96 m/s (1154 ft/s)



Round 189 [21.4]
384.85 m/s (1263 ft/s)

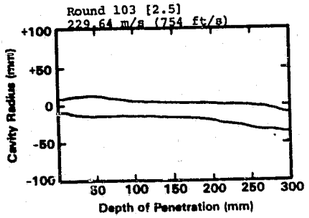


Round 201 [27.6]
395.84 m/s (1299 ft/s)

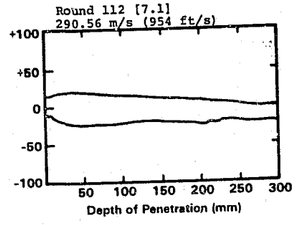


SMITH & WESSON
158 grain, jacketed soft point, 38 caliber

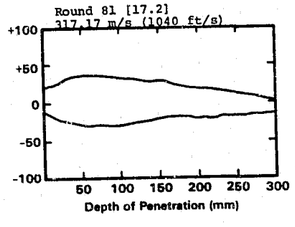
Round 103 [2.5]
229.64 m/s (754 ft/s)



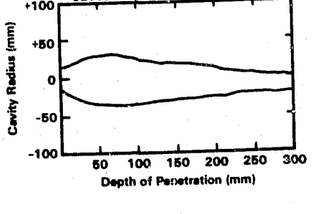
Round 112 [7.1]
290.56 m/s (954 ft/s)



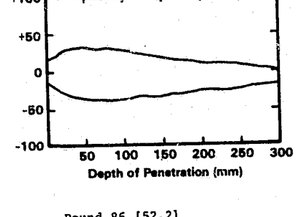
Round 81 [17.2]
317.17 m/s (1040 ft/s)



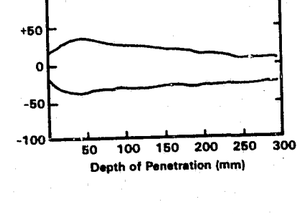
Round 111 [16.9]
317.50 m/s (1041 ft/s)



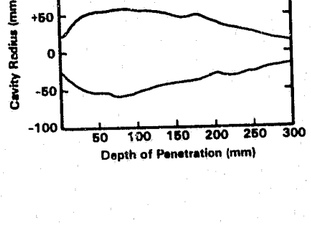
Round 110 [18.8]
328.09 m/s (1076 ft/s)



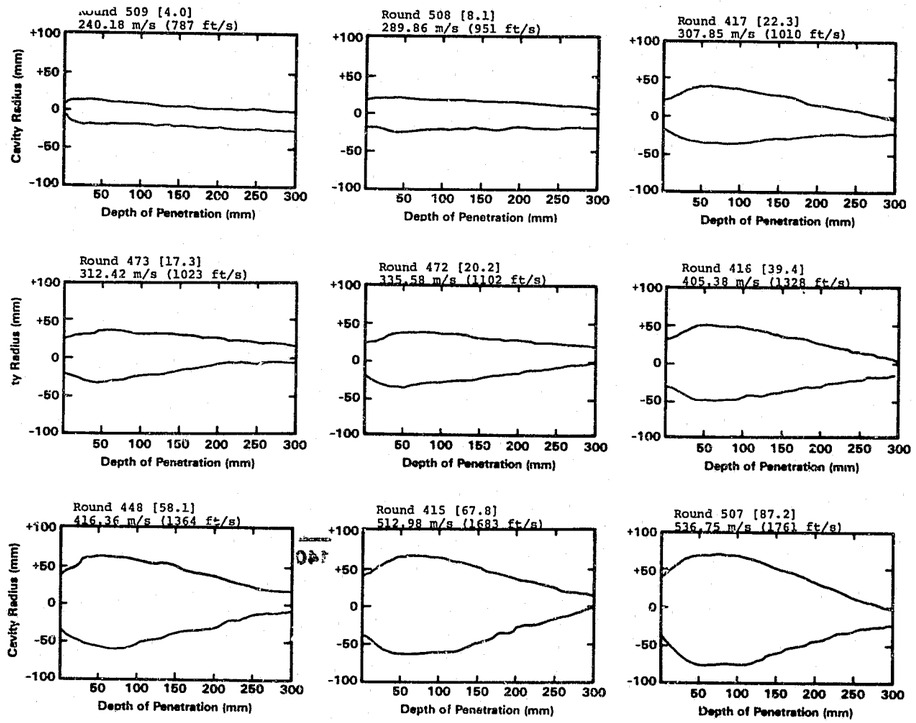
Round 105 [17.3]
371.71 m/s (1220 ft/s)



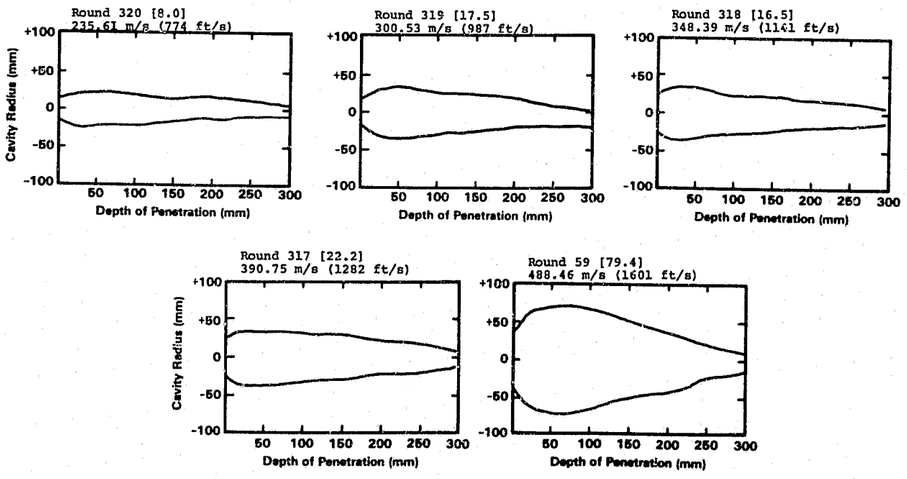
Round 86 [52.2]
475.51 m/s (1561 ft/s)



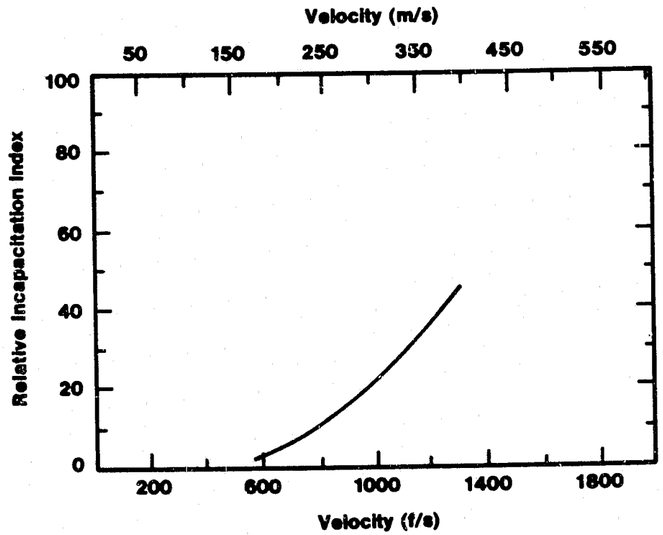
SPEER
158 grain, jacketed soft point, 38 caliber



WINCHESTER-WESTERN
158 grain, jacketed soft point, 38 caliber

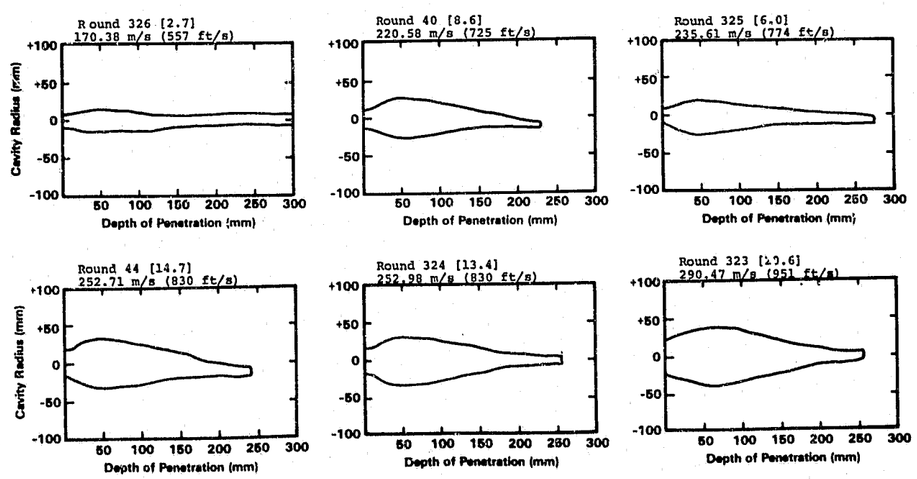


APPENDIX A31
158 Grain, Lead Hollow Point, 38 Caliber

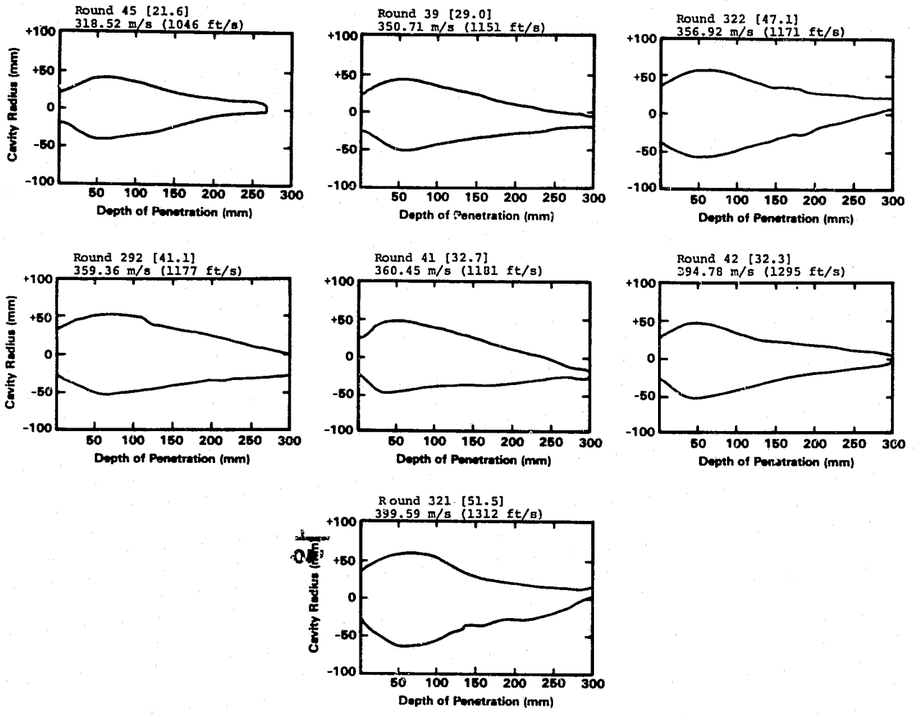


Relative Incapacitation Index as a function of velocity for 158 gr., LHP, 38 caliber bullet manufactured by Winchester-Western.

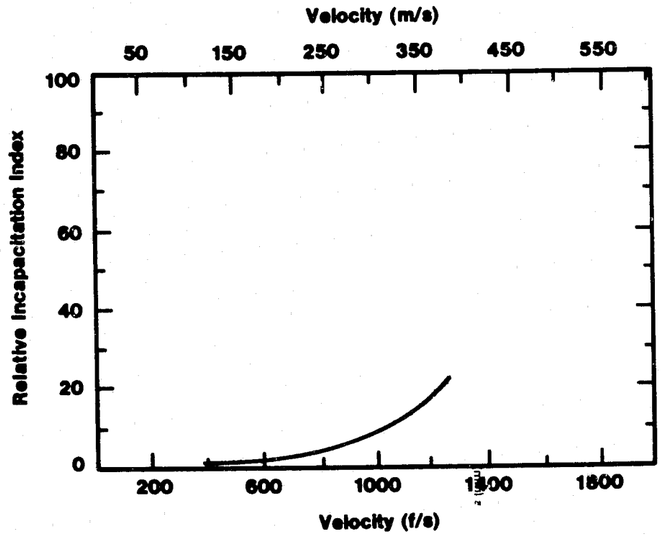
WINCHESTER-WESTERN
158 grain, lead hollow point, 38 caliber



WINCHESTER-WESTERN (cont.)
158 grain lead hollow point, 38 caliber

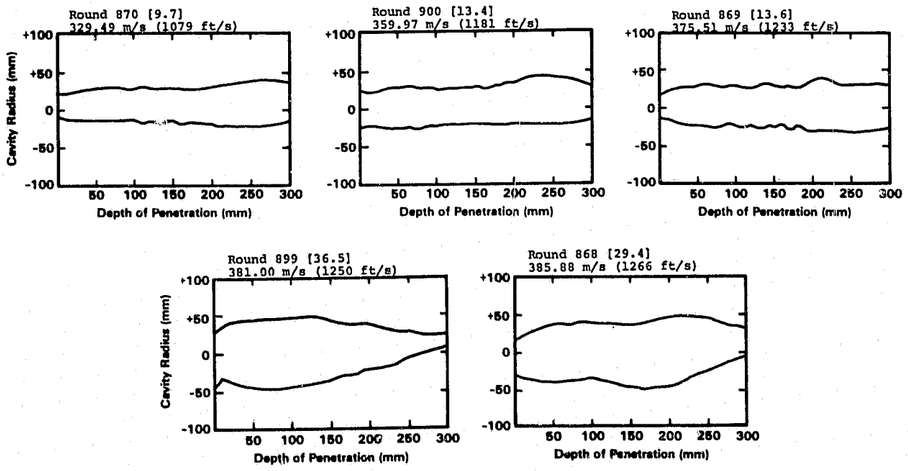


APPENDIX A32
158 Grain, Lead Round Nose, 38 Caliber

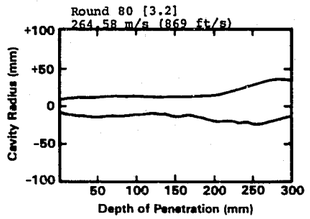


Relative Incapacitation Index as a function of velocity for 158 gr., LRN, 38 caliber bullets manufactured by Remington, Smith & Wesson, and Winchester-Western.

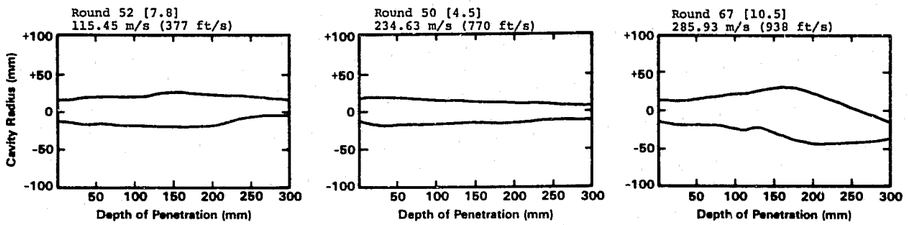
REMINGTON
158 grain, lead round nose, 38 caliber

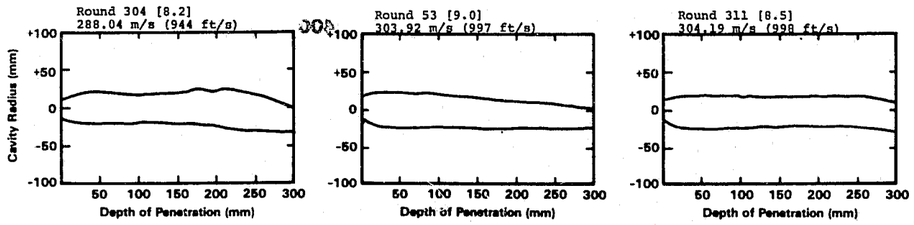


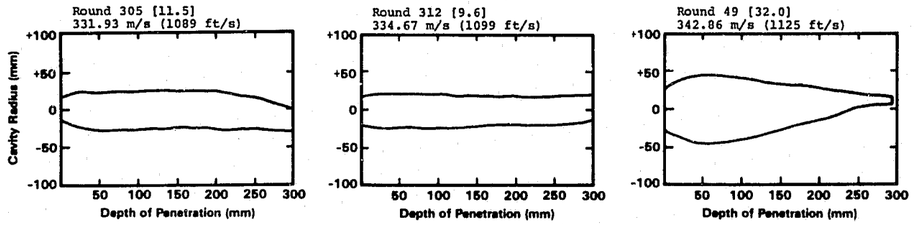
SMITH & WESSON
158 grain, lead round nose, 38 caliber

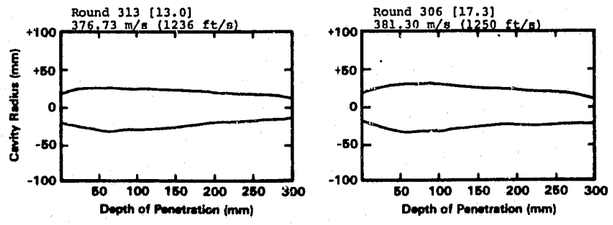


WINCHESTER-WESTERN
158 grain, lead round nose, 38 caliber

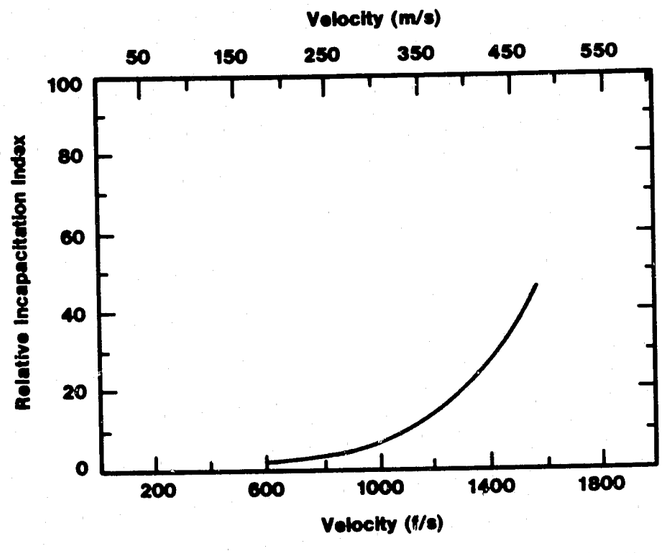






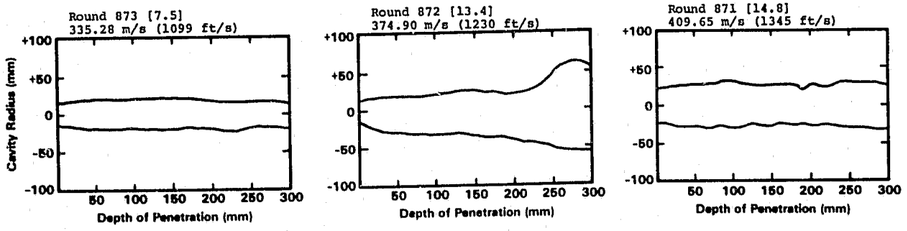


APPENDIX A33
158 Grain, Metal Piercing, 38 Caliber

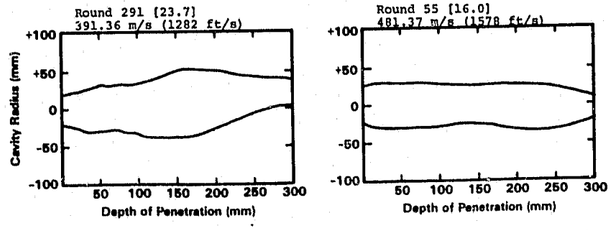


Relative Incapacitation Index as a function of velocity for 158 gr., MP, 38 caliber bullets manufactured by Remington and Winchester-Western.

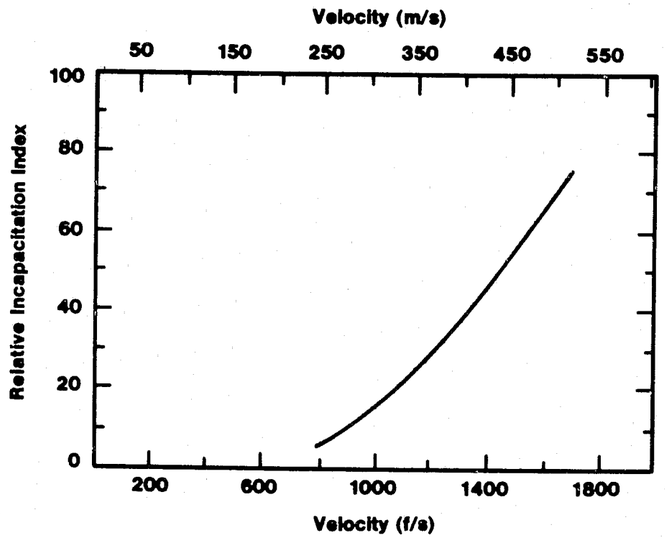
REMINGTON
158 grain, metal piercing, 38 caliber



WINCHESTER-WESTERN
158 grain, metal piercing, 38 caliber

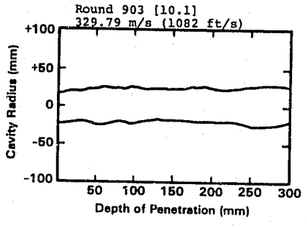


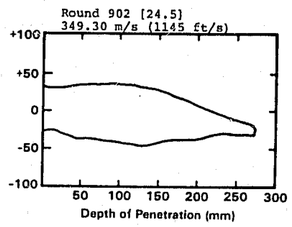
APPENDIX A34
158 Grain, Semi-Wadcutter, 38 Caliber

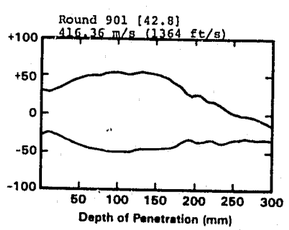


Relative Incapacitation Index as a function of velocity for 158 gr., SWC, 38 caliber bullets manufactured by Remington, Smith & Wesson, Speer, and Winchester-Western.

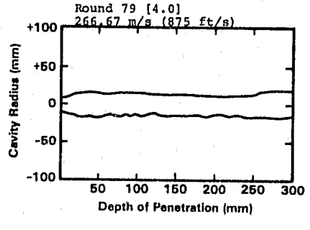
REMINGTON
158 grain, semi-wadcutter, 38 caliber



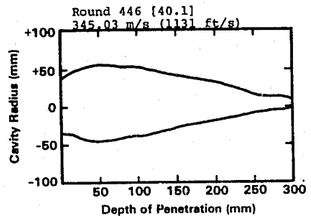


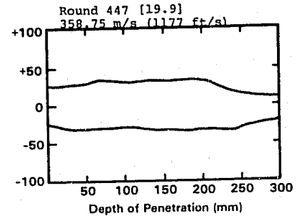


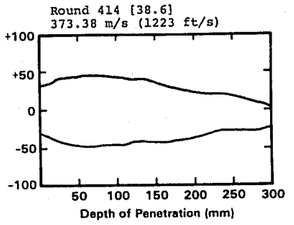
SMITH & WESSON
158 grain, semi-wadcutter, 38 caliber

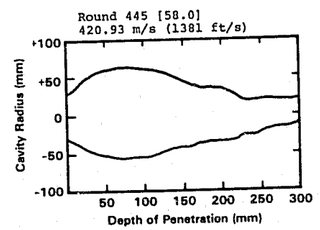


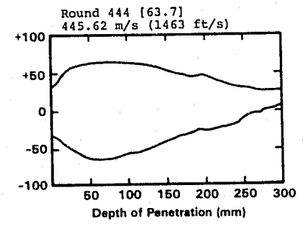
SPEER
158 grain, semi-wadcutter, 38 caliber

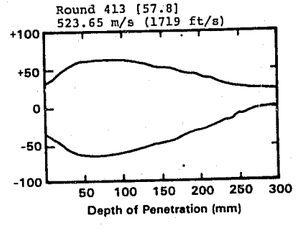




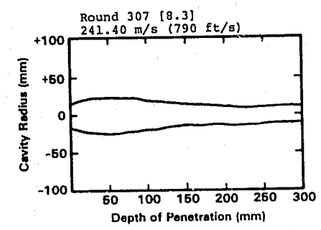


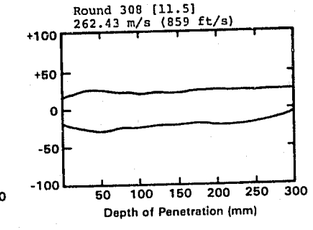


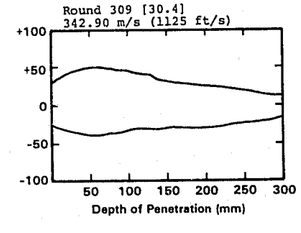


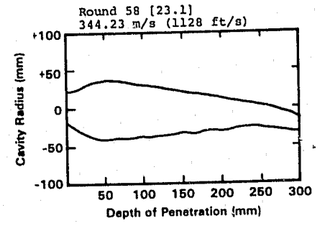


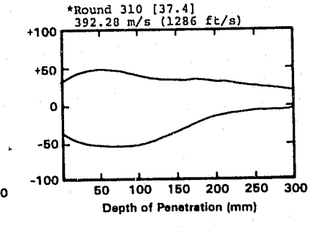
WINCHESTER-WESTERN
158 grain, semi-wadcutter, 38 caliber



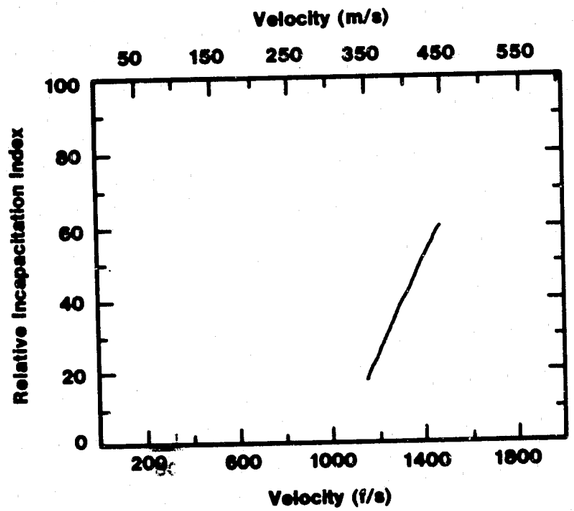






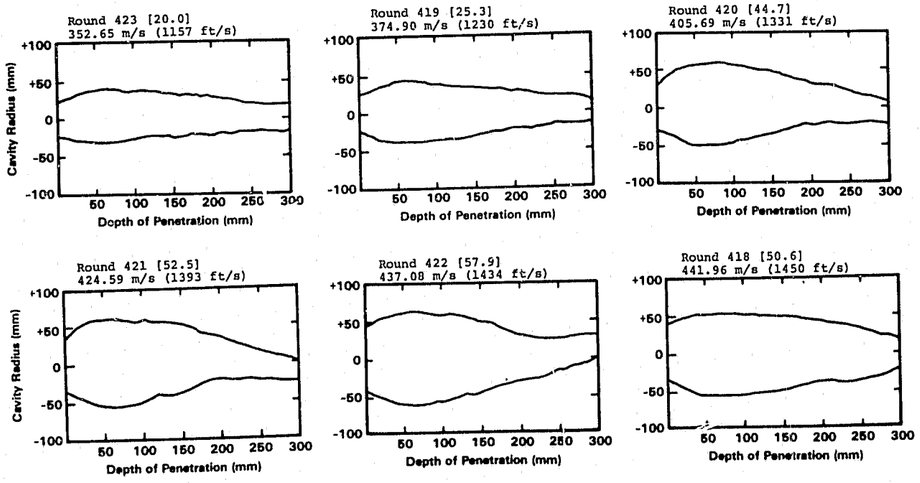


APPENDIX A35
160 Grain, Jacketed Soft Point, 38 Caliber

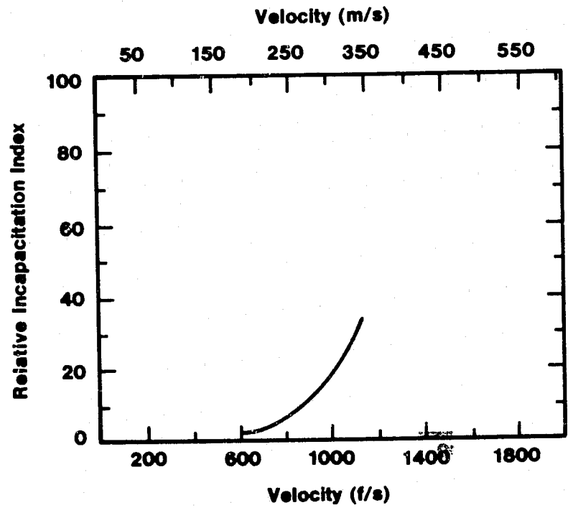


Relative Incapacitation Index as a function of velocity for 160 gr., JSP, 38 caliber bullet manufactured by Speer.

SPEER
160 grain, jacketed soft point, 38 caliber

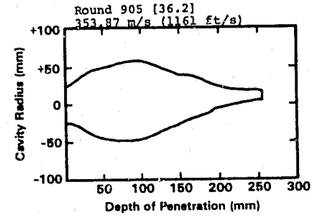


APPENDIX A36
185 Grain, Jacketed Hollow Point, 38 Caliber

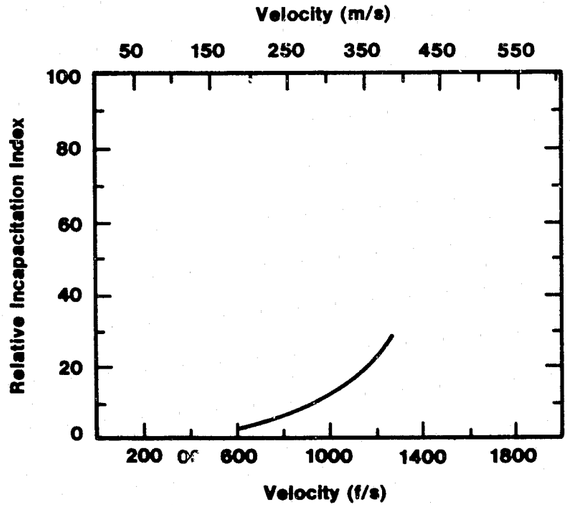


Relative Incapacitation Index as a function of velocity for 185 gr., JHP, 38 caliber bullet manufactured by Remington.

REMINGTON
185 grain, jacketed hollow point, 38 caliber

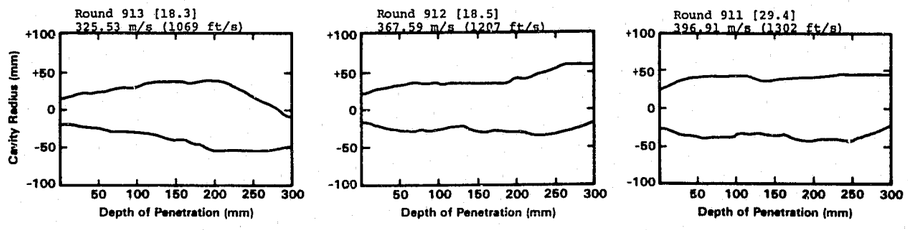


APPENDIX A37
200 Grain, Lead Round Nose, 38 Caliber

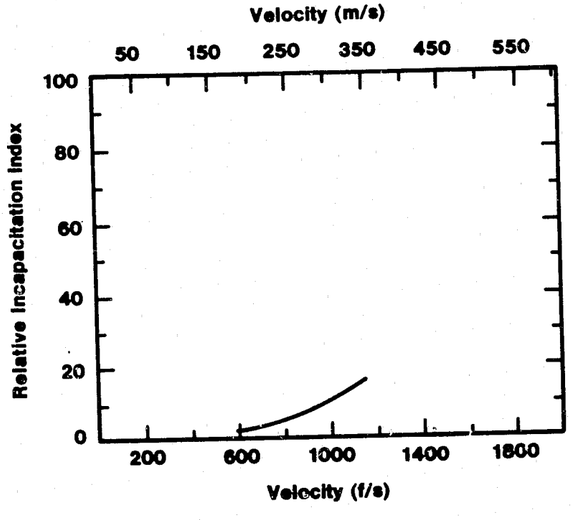


Relative Incapacitation Index as a function of velocity for 200 gr., LRN, 38 caliber bullet manufactured by Remington.

REMINGTON
200 grain, lead round nose, 38 caliber

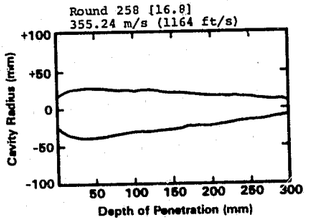


APPENDIX A38
170 Grain, Jacketed Hollow Point, 41 Caliber

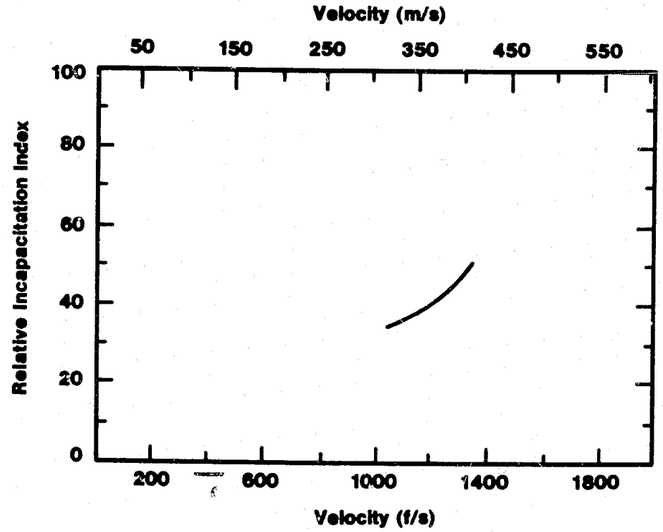


Relative Incapacitation Index as a function of velocity for 170 gr., JHP, 41 caliber bullet manufactured by Sierra.

SIERRA
170 grain, jacketed hollow point, 41 caliber

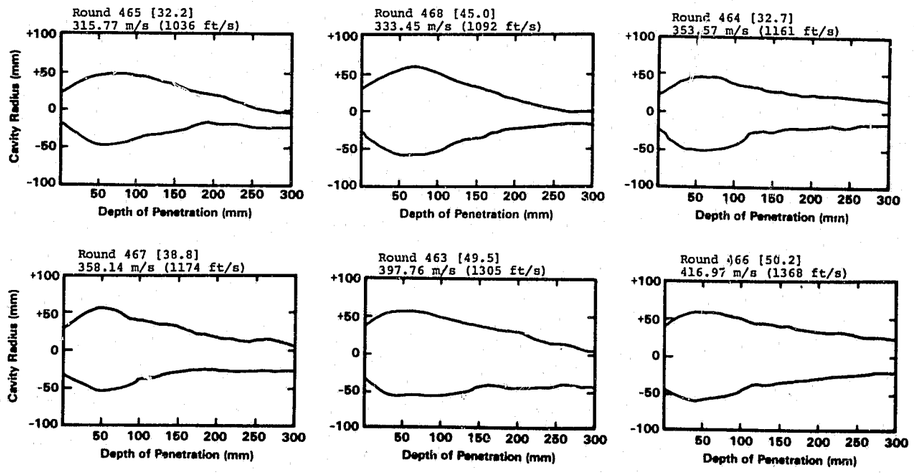


APPENDIX A39
200 Grain, Jacketed Hollow Point, 41 Caliber

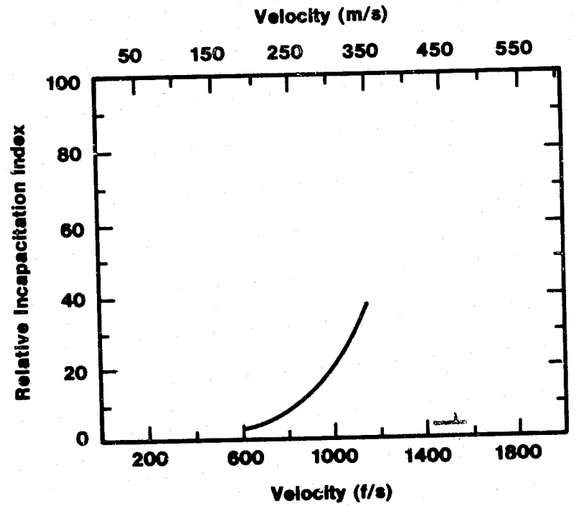


Relative Incapacitation Index as a function of velocity for 200 gr., JHP, 41 caliber bullet manufactured by Speer.

SPEER
200 grain, jacketed hollow point, 41 caliber

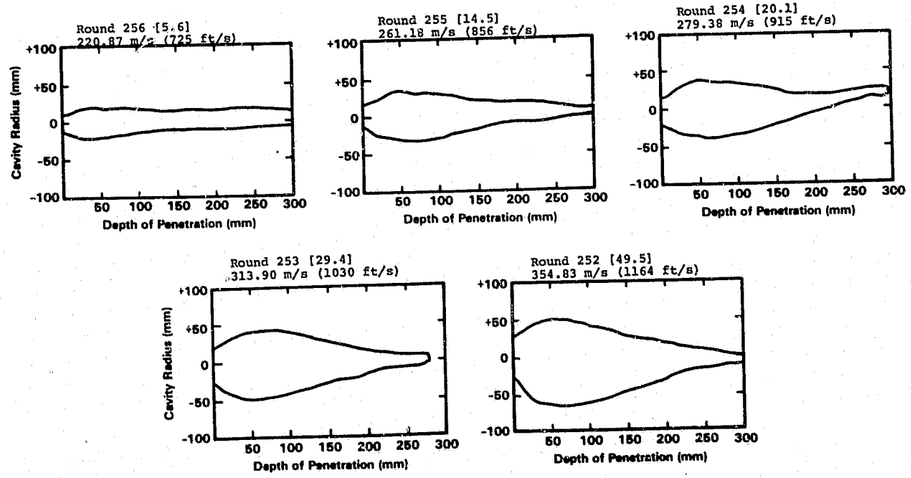


APPENDIX A40
210 Grain, Jacketed Hollow Point, 41 Caliber

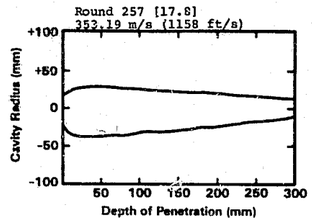


Relative Incapacitation Index as a function of velocity for 210 gr., JHP, 41 caliber bullets manufactured by Hornady and Sierra.

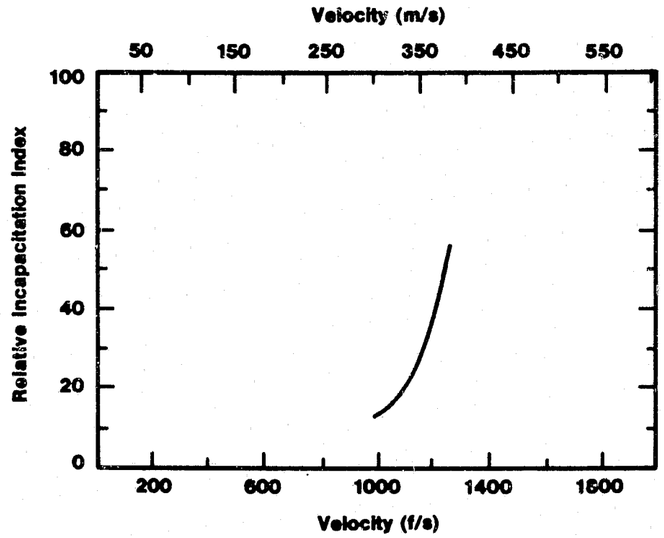
HORNADY
210 grain, jacketed hollow point, 41 caliber



SIERRA
210 grain, jacketed hollow point, 41 caliber

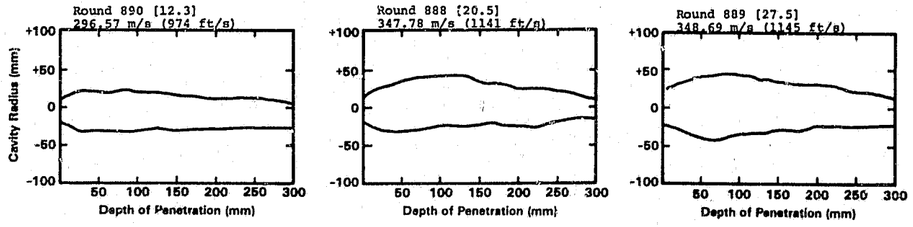


APPENDIX A41
210 Grain, Jacketed Soft Point, 41 Caliber

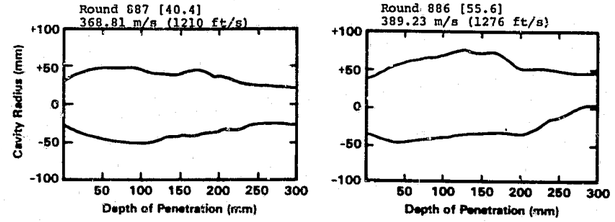


Relative Incapacitation Index as a function of velocity for 210 gr., JSP, 41 caliber bullet manufactured by Remington.

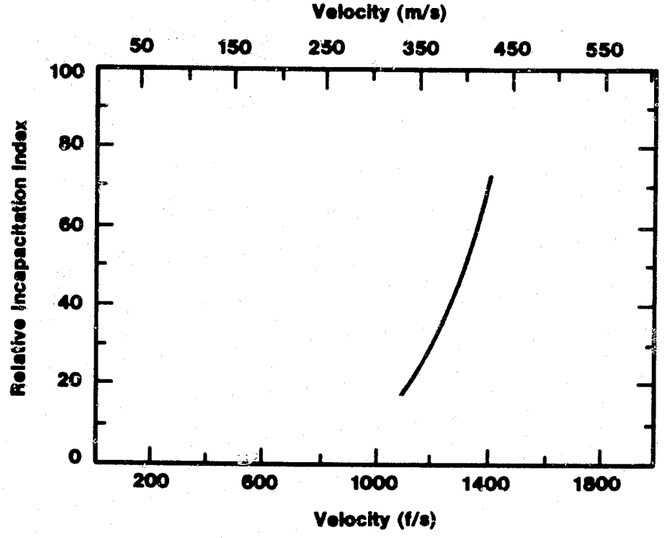
REMINGTON
210 grain, jacketed soft point, 41 caliber



REMINGTON (cont.)
210 grain, jacketed soft point, 41 caliber

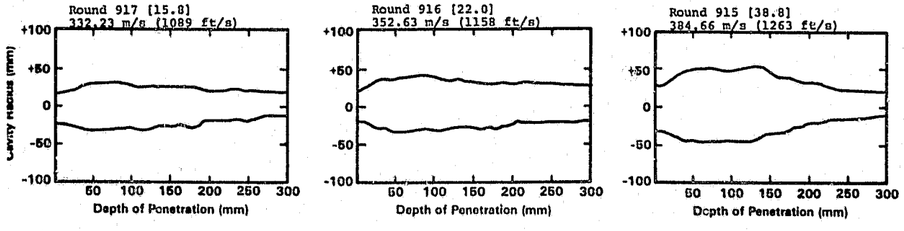


APPENDIX A42
210 Grain, Semi-Wadcutter, 41 Caliber

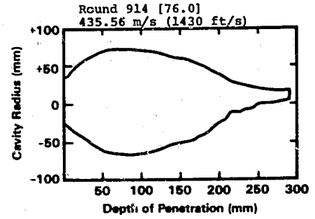


Relative Incapacitation Index as a function of velocity for 210 gr., SWC, 41 caliber bullet manufactured by Remington.

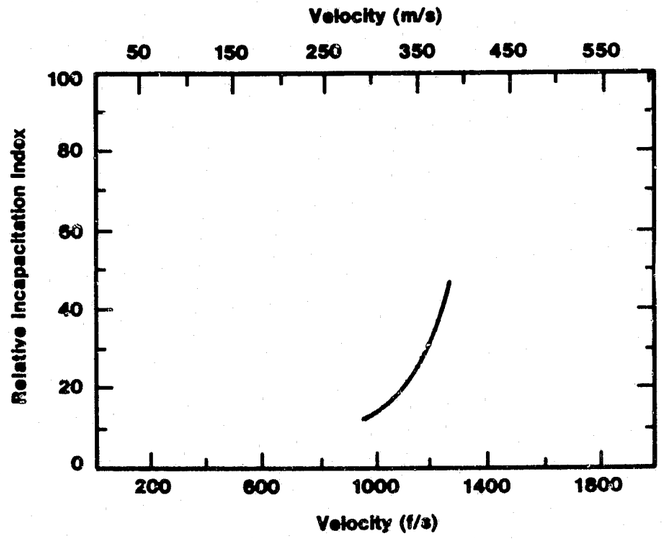
REMINGTON
210 grain, semi-wadcutter, 41 caliber



REMINGTON (cont.)
210 grain, semi-wadcutter, 41 caliber

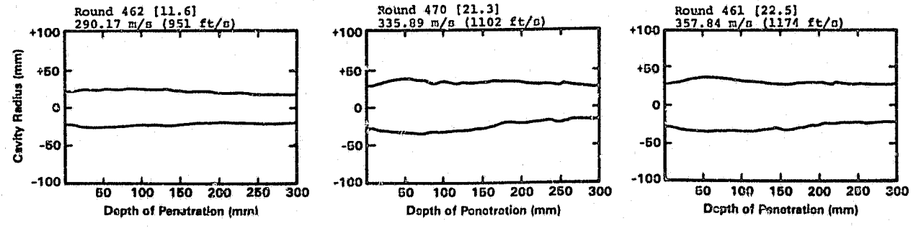


APPENDIX A43
220 Grain, Jacketed Soft Point, 41 Caliber

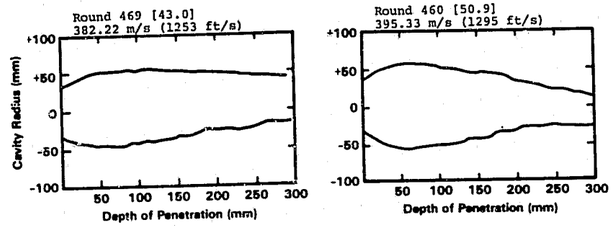


Relative Incapacitation Index as a function of velocity for 220 gr., JSP, 41 caliber bullet manufactured by Speer.

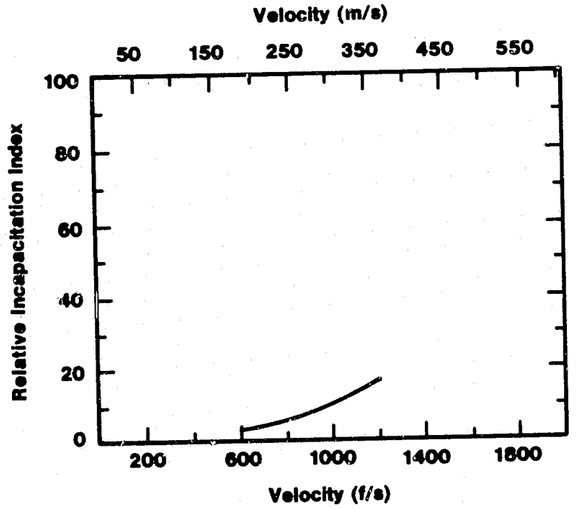
SPEER
220 grain, jacketed soft point, 41 caliber



SPEER (cont.)
220 grain, jacketed soft point, 41 caliber

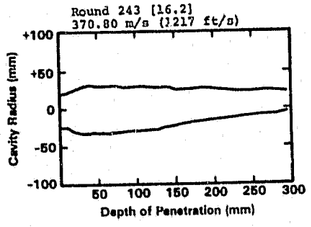


APPENDIX A44
180 Grain, Jacketed Hollow Point, 44 Caliber

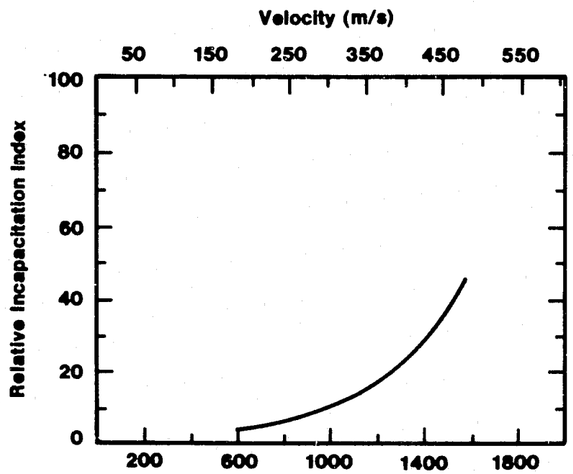


Relative Incapacitation Index as a function of velocity for 180 gr., JHP, 44 caliber bullet manufactured by Sierra.

SIERRA
180 grain, jacketed hollow point, 44 caliber

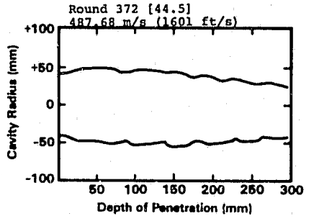


APPENDIX A45
180 Caliber, Jacketed Soft Point, 44 Caliber

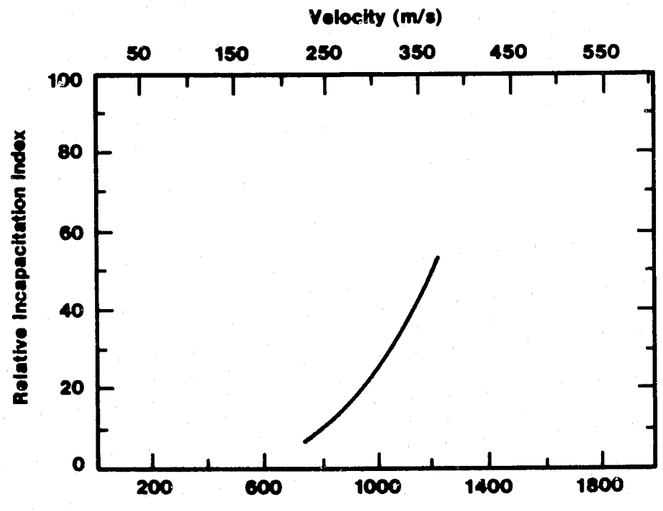


Relative Incapacitation Index as a function of velocity for 180 caliber, JSP, 44 caliber bullet manufactured by Supervel.

SUPERVEL
180 grain, jacketed soft point, 44 caliber

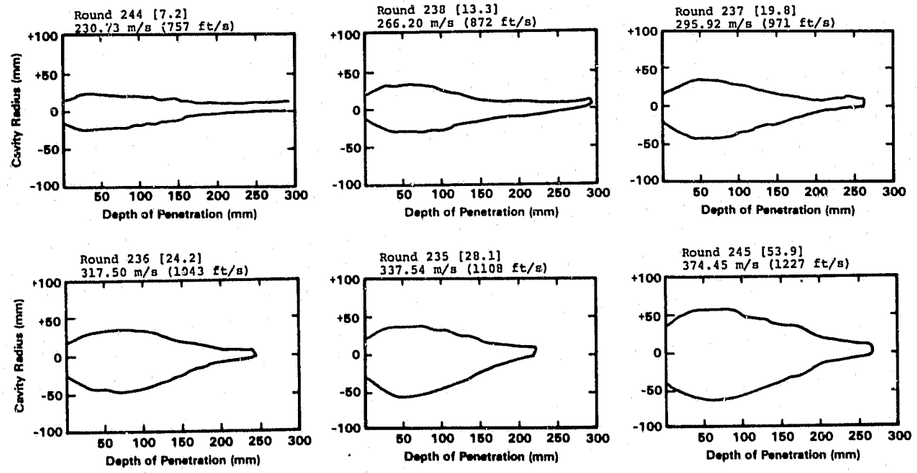


APPENDIX A46
200 Grain, Jacketed Hollow Point, 44 Caliber

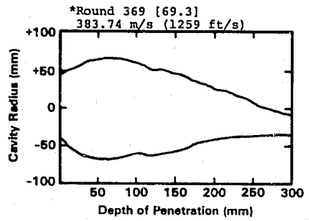


Relative Incapacitation Index as a function of velocity for 200 gr., JHP, 44 caliber bullets manufactured by Hornady and Speer.

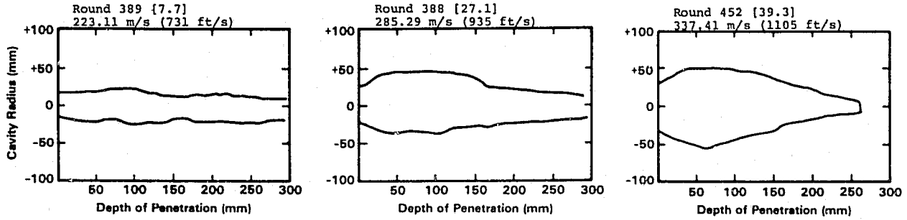
HORNADY
200 grain, jacketed hollow point, 44 caliber

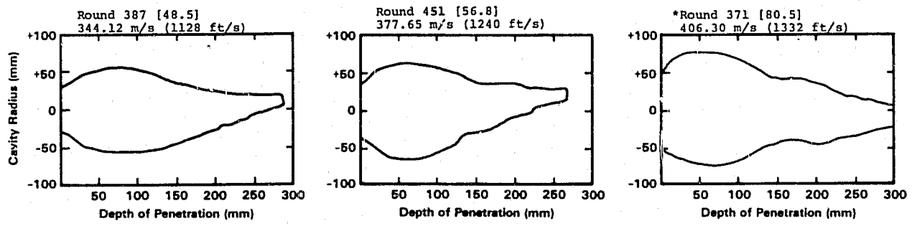


HORNADY (cont.)
200 grain, jacketed hollow point, 44 caliber

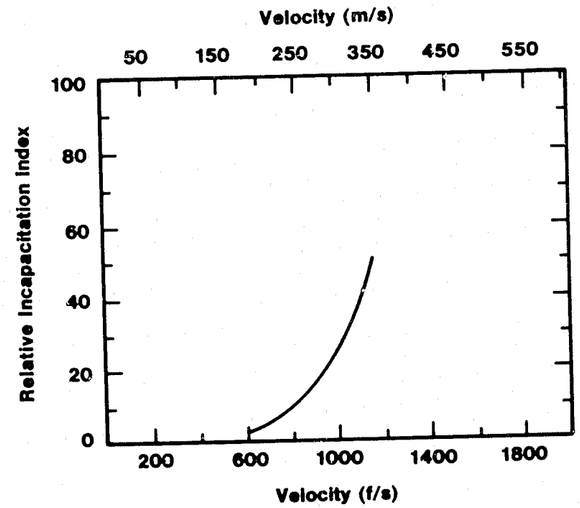


SPEER
200 grain, jacketed hollow point, 44 caliber



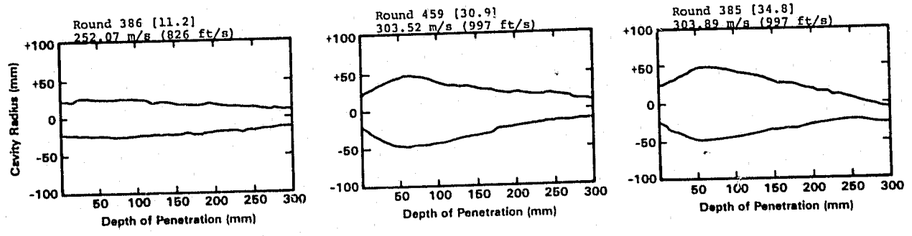


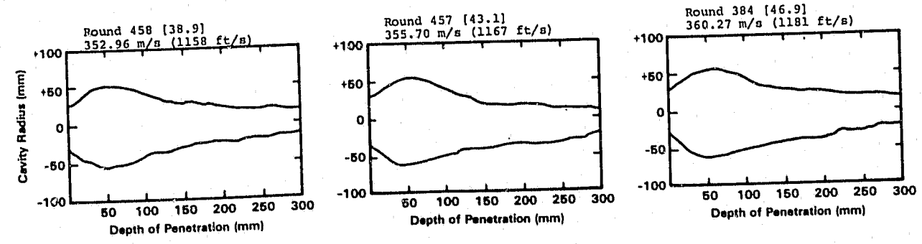
APPENDIX A47
225 Grain, Jacketed Hollow Point, 44 Caliber



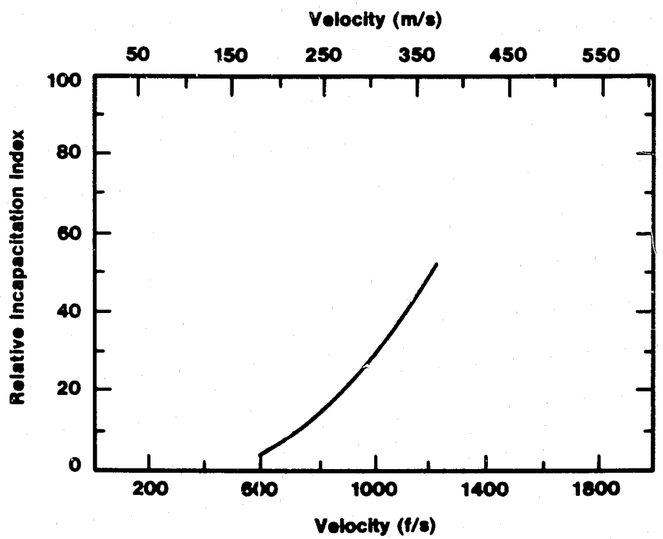
Relative Incapacitation Index as a function of velocity for 225 gr., JHP, 44 caliber bullet manufactured by Speer.

SPEER
225 grain, jacketed hollow point, 44 caliber



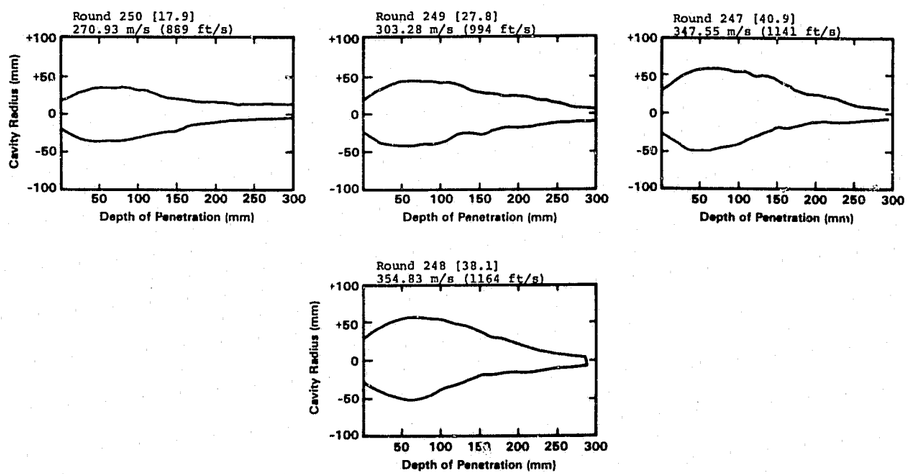


APPENDIX A.48
240 Grain, Jacketed Hollow Point, 44 Caliber

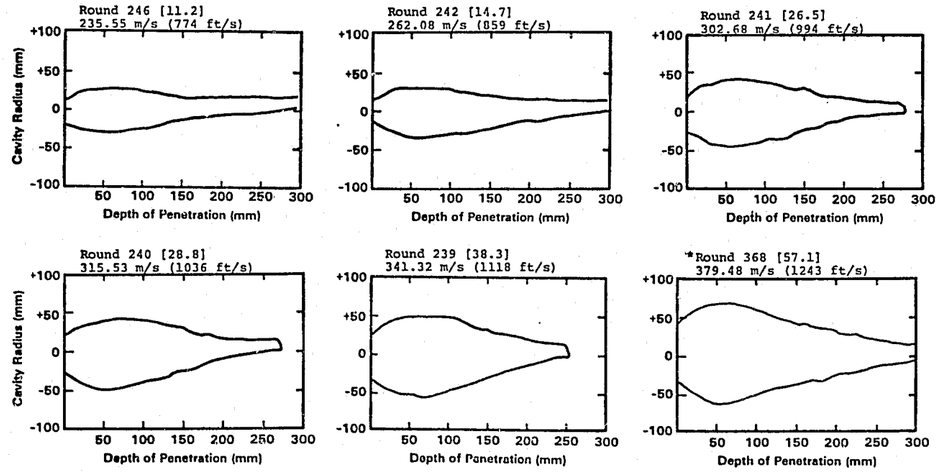


Relative Incapacitation Index as a function of velocity for 240 gr., JHP, 44 caliber bullets manufactured by Hi-Precision, Hornady, and Sierra.

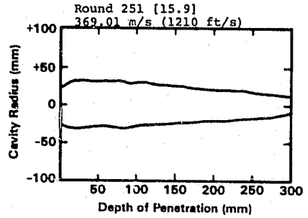
HI-PRECISION
240 grain, jacketed hollow point, 44 caliber



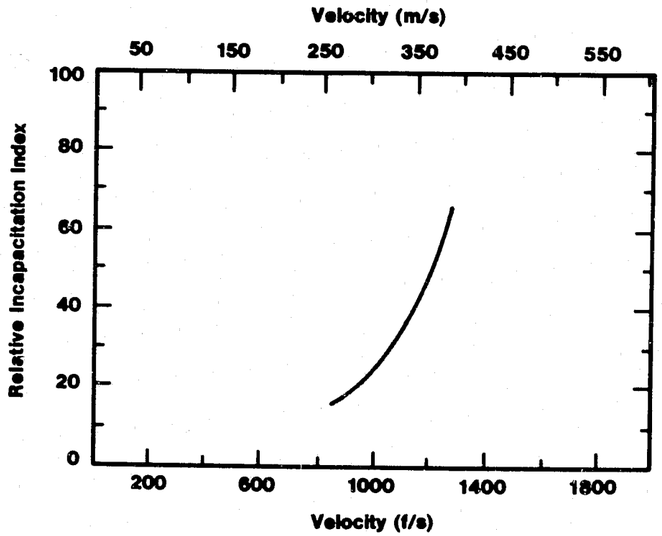
HORNADY
240 grain, jacketed hollow point, 44 caliber



SIERRA
240 grain, jacketed hollow point, 44 caliber

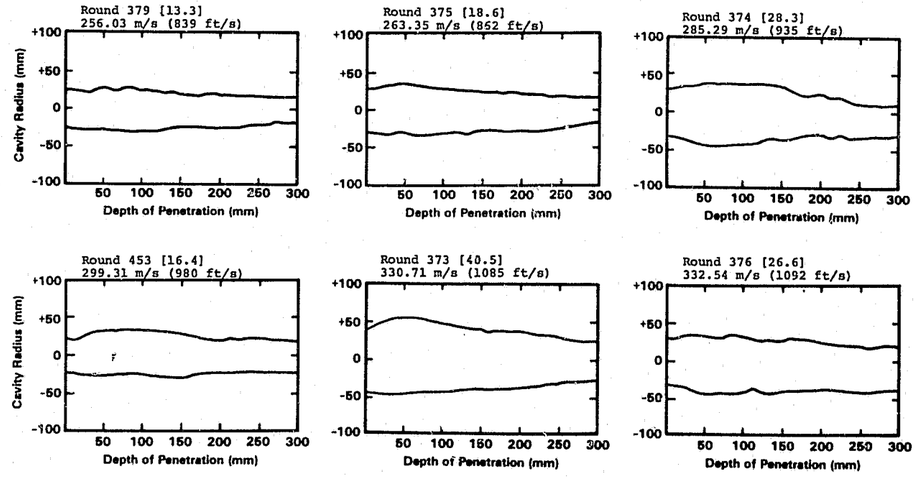


APPENDIX A49
240 Grain, Jacketed Soft Point, 44 Caliber

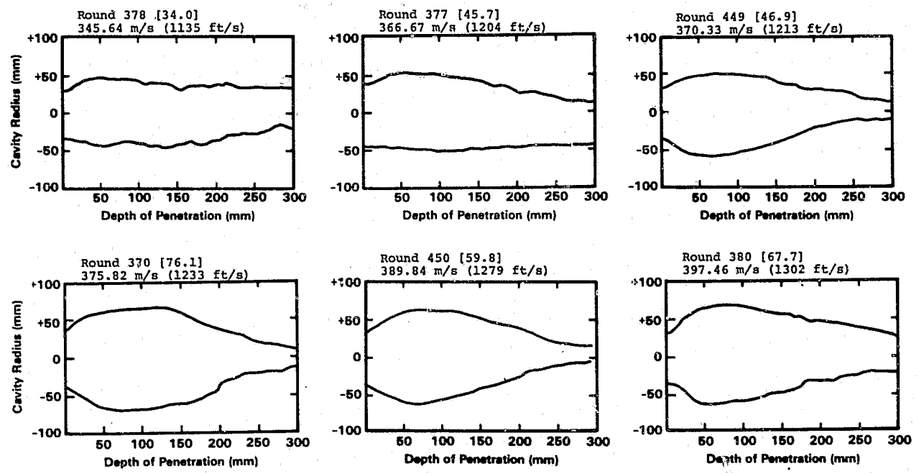


Relative Incapacitation Index as a function of velocity for 240 gr., JSP, 44 Caliber bullet manufactured by Speer.

SPEER
240 grain, jacketed soft point, 44 caliber



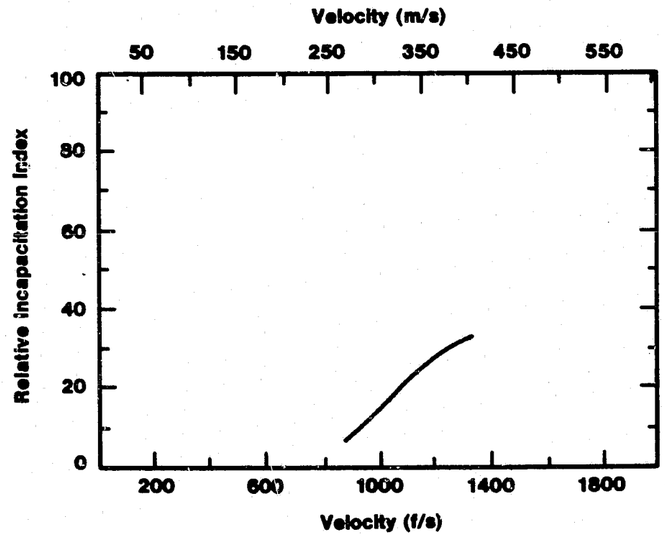
SPEER (cont.)
240 grain, jacketed soft point, 44 caliber



CONTINUED

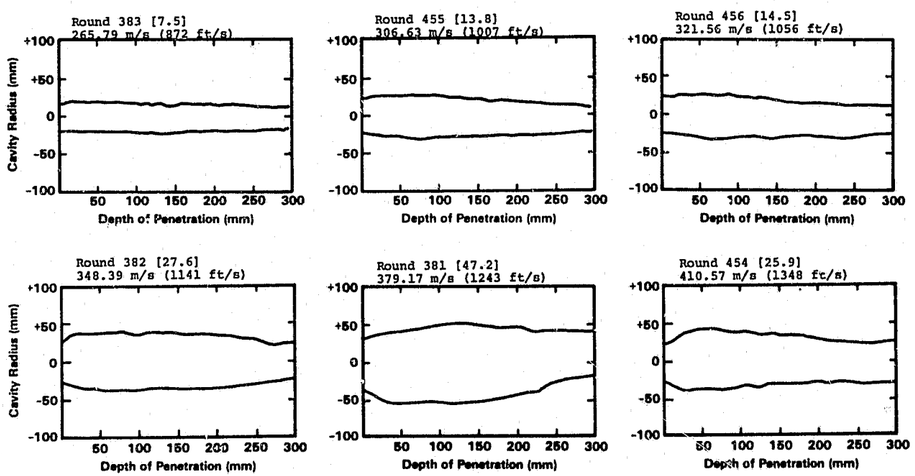
1 OF 2

APPENDIX A50
240 Grain, Semi-Wadcutter, 44 Caliber

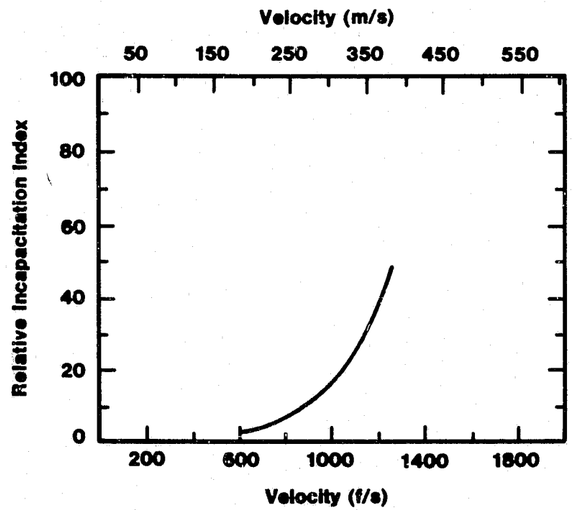


Relative Incapacitation Index as a function of velocity for 240 gr., SWC, 44 caliber bullet manufactured by Speer.

SPEER
240 grain, semi-wadcutter, 44 caliber

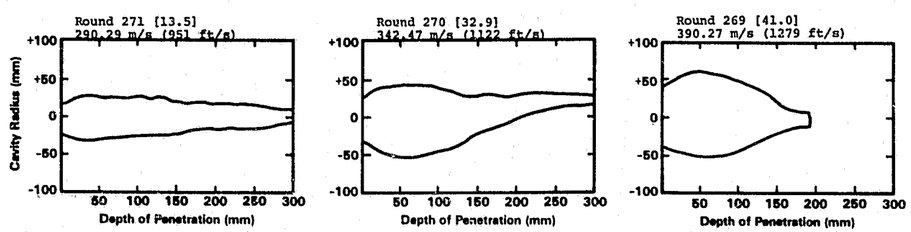


APPENDIX A51
170 Grain, Hemispherical Jacketed Hollow Point, 45 Caliber

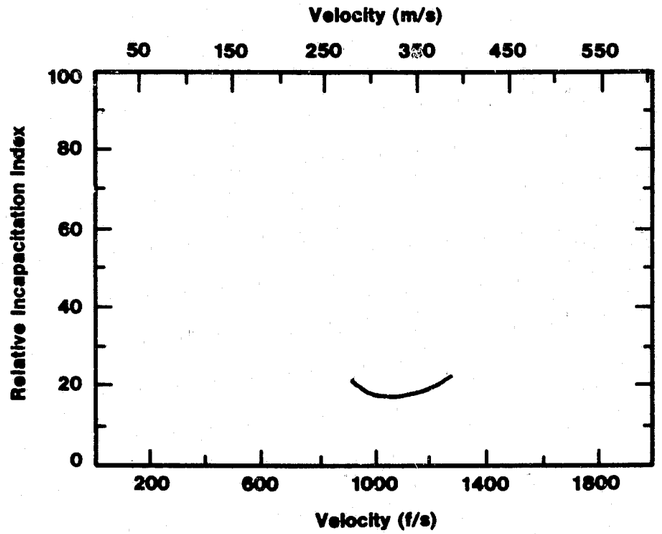


Relative Incapacitation Index as a function of velocity for 170 gr., Hemi/JHP, 45 caliber bullet manufactured by Hi-Precision.

HI-PRECISION
170 grain, hemispherical jacketed hollow point, 45 caliber

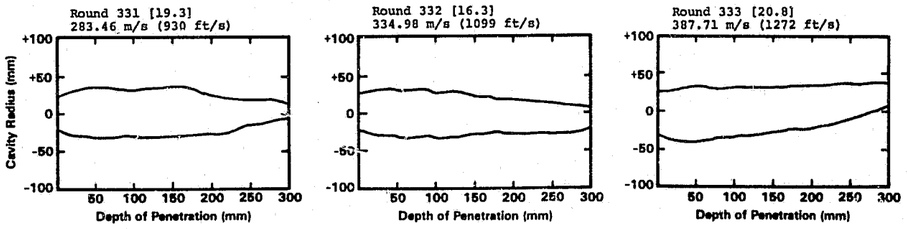


APPENDIX A52
185 Grain, Full Jacket, 45 Caliber

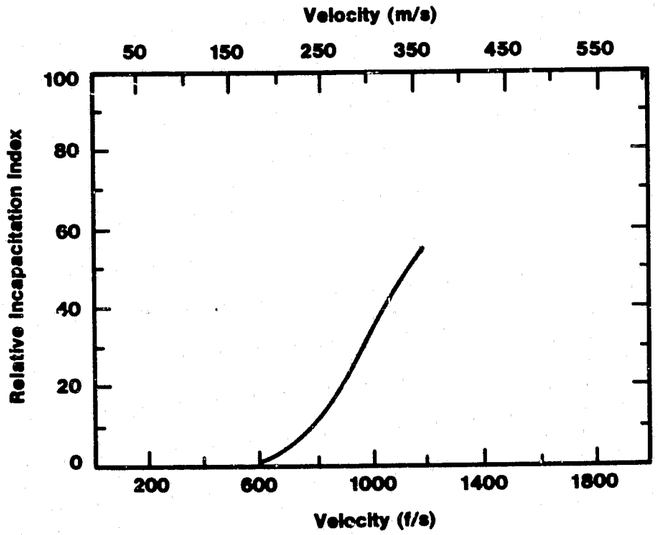


Relative Incapacitation Index as a function of velocity for 185 gr., FJ, 45 caliber bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
185 grain, full jacket, 45 caliber

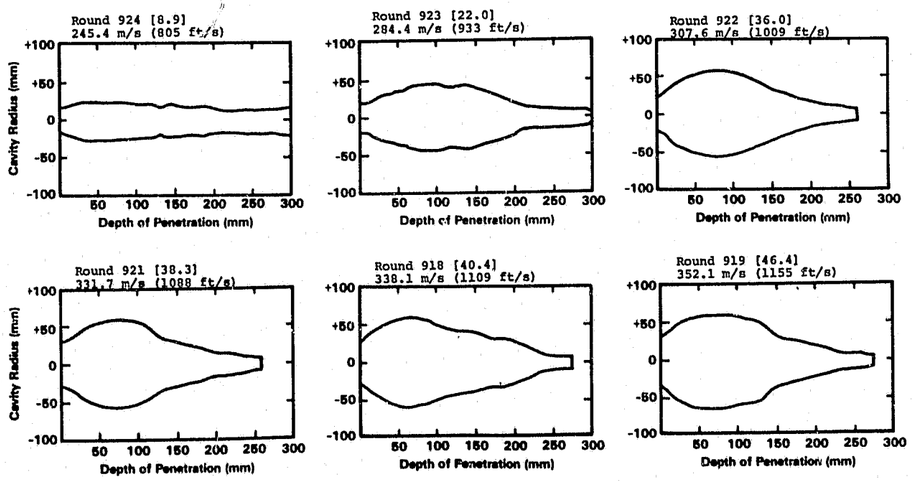


APPENDIX A53
185 Grain, Jacketed Hollow Point, 45 Caliber

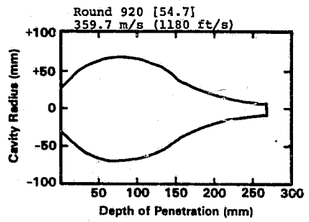


Relative Incapacitation Index as a function of velocity for 185 gr., JHP, 45 caliber bullet manufactured by Remington.

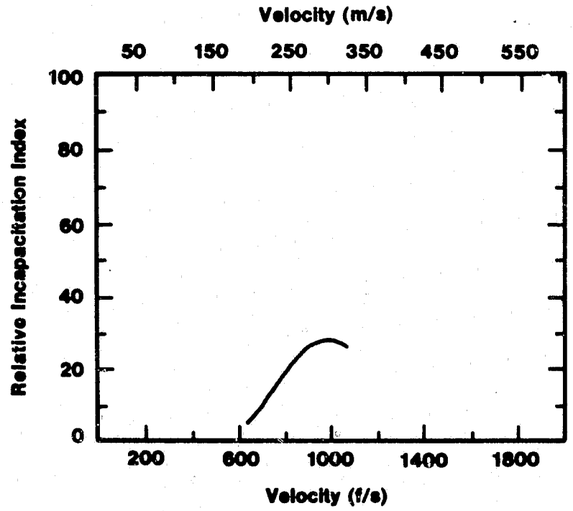
REMINGTON
185 grain, jacketed hollow point, 45 caliber



REMINGTON (cont.)
185 grain, jacketed hollow point, 45 caliber

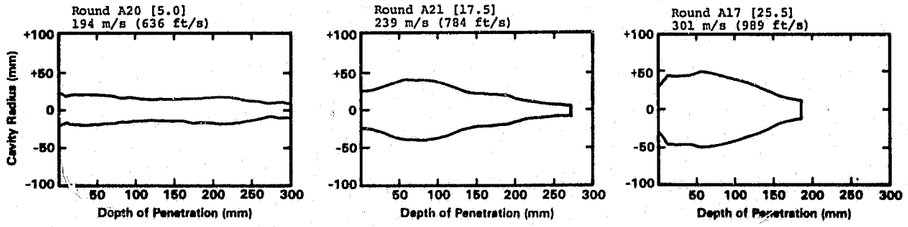


APPENDIX A54
185 Grain, Jacketed Hollow Point (Silvertip), 45 Caliber

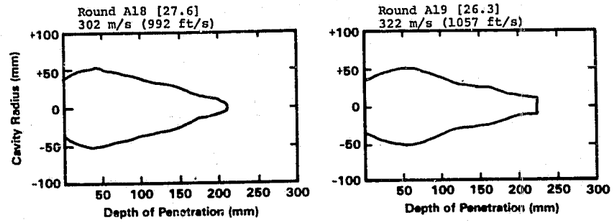


Relative Incapacitation Index as a function of velocity for 185 gr., JHP (Silvertip), 45 caliber bullet manufactured by Winchester-Western.

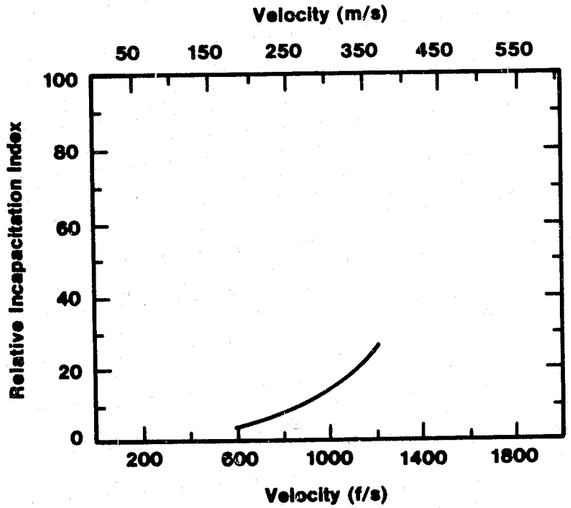
WINCHESTER-WESTERN
185 grain, jacketed hollow point, 45 caliber



WINCHESTER-WESTERN (cont.)
185 grain, jacketed hollow point, 45 caliber

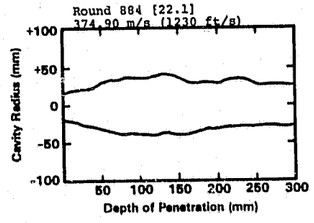


APPENDIX A55
185 Grain, Wadcutter, 45 Caliber

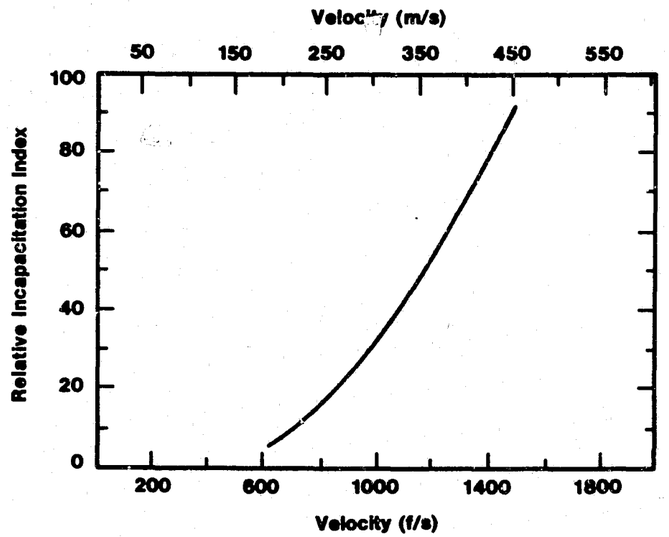


Relative Incapacitation Index as a function of velocity for 185 gr., WC, 45 caliber bullet manufactured by Remington.

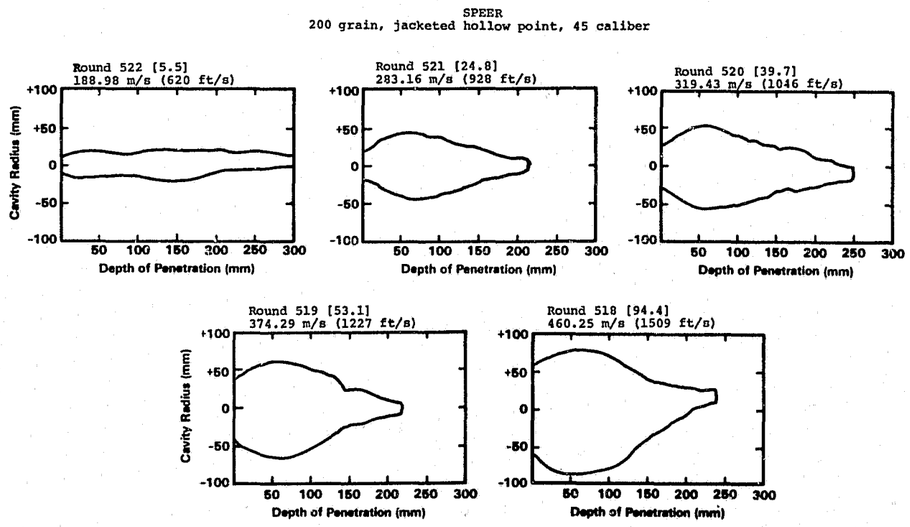
REMINGTON
185 grain, wadcutter, 45 caliber



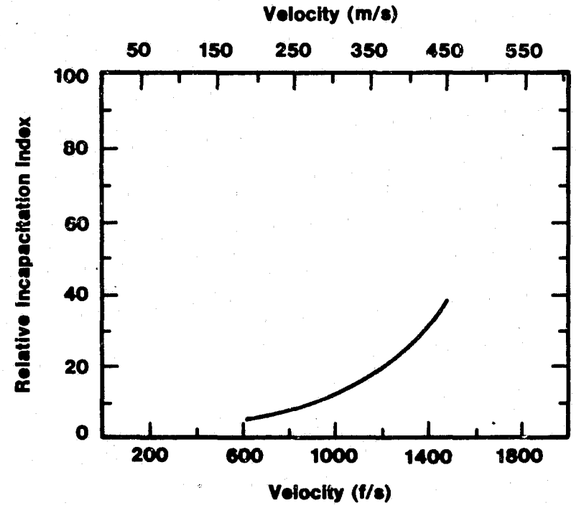
APPENDIX A56
200 Grain, Jacketed Hollow Point, 45 Caliber



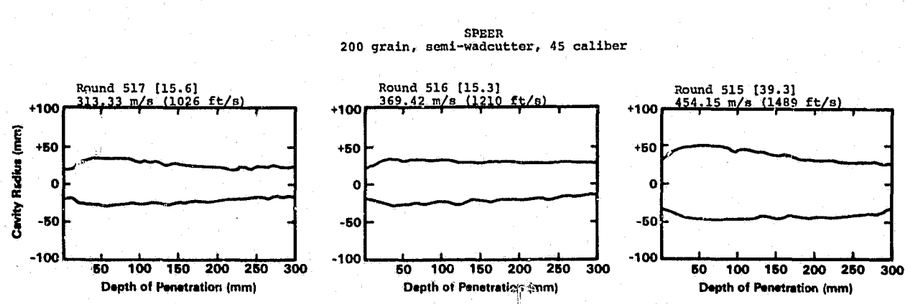
Relative Incapacitation Index as a function of velocity for 200 gr., JHP, 45 caliber bullet manufactured by Speer.



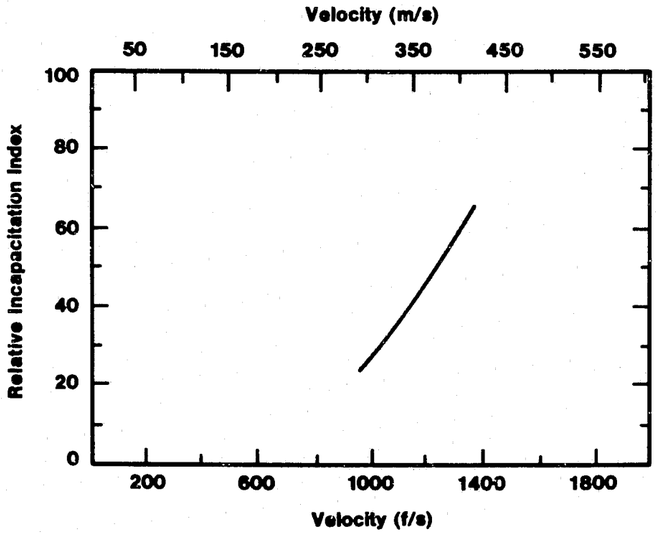
APPENDIX A57
200 Grain, Semi-Wadcutter, 45 Caliber



Relative Incapacitation Index as a function of velocity for 200 gr., SWC, 45 caliber bullet manufactured by Speer.

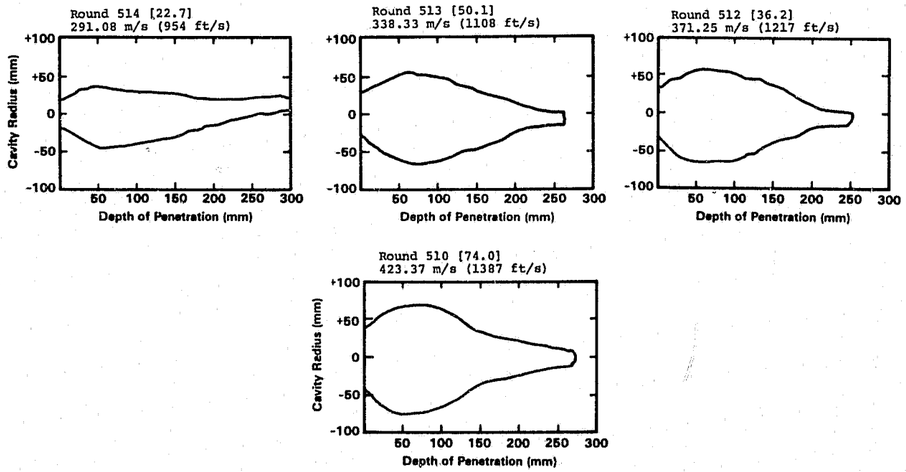


APPENDIX A58
225 Grain, Jacketed Hollow Point, 45 Caliber

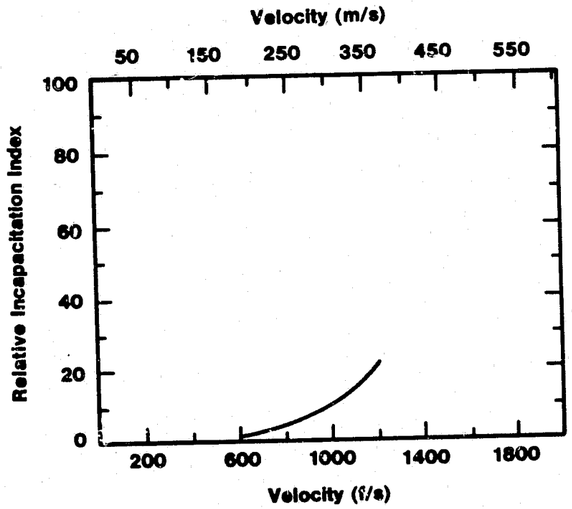


Relative Incapacitation Index as a function of velocity for 225 gr., JHP, 45 caliber bullet manufactured by Speer.

SPEER
225 grain, jacketed hollow point, 45 caliber

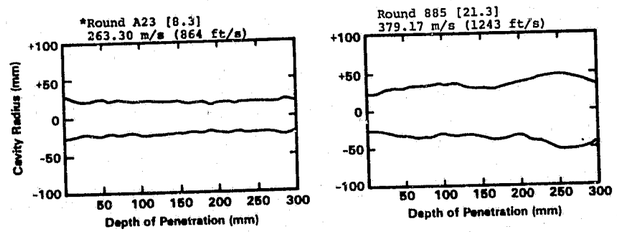


APPENDIX A59
230 Grain, Full Jacket, 45 Caliber

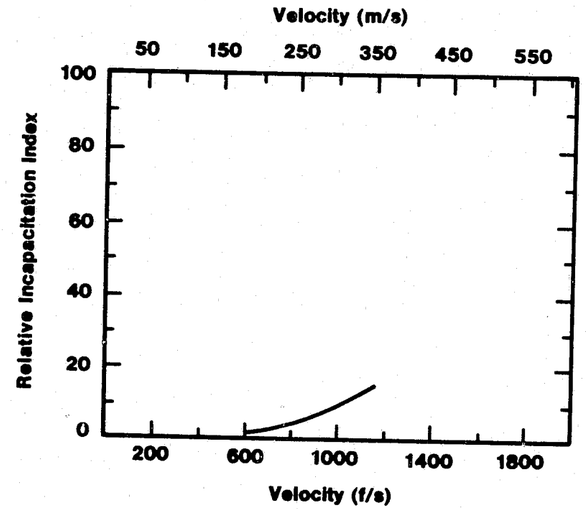


Relative Incapacitation Index as a function of velocity for 230 gr., FJ, 45 caliber bullet manufactured by Remington.

REMINGTON
230 grain, full jacket, 45 caliber

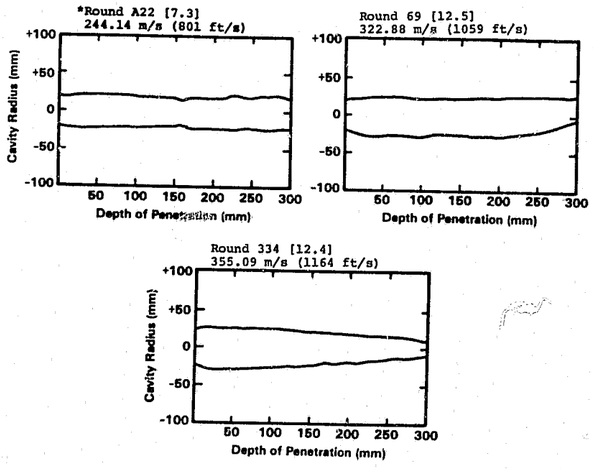


APPENDIX A60
230 Grain, Full Jacket, 45 Caliber

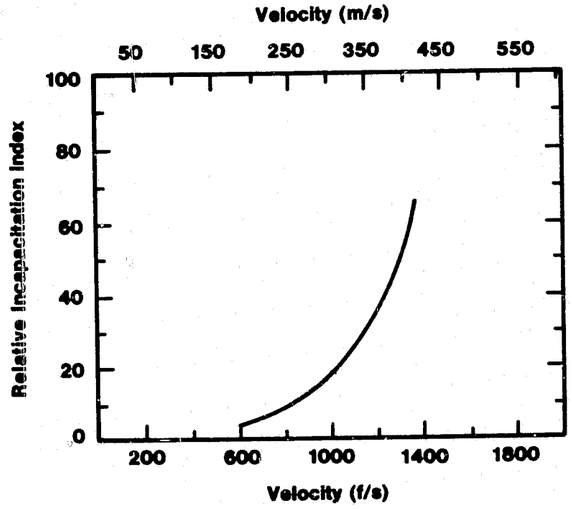


Relative Incapacitation Index as a function of velocity for 230 gr., FJ, 45 caliber bullet manufactured by Winchester-Western.

WINCHESTER-WESTERN
230 grain, full jacket, 45 caliber

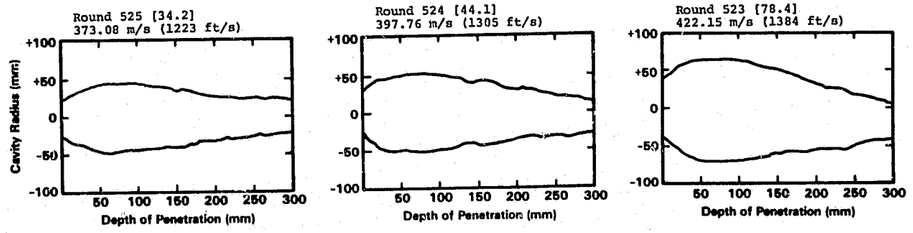


APPENDIX A61
250 Grain, Semi-Wadcutter, 45 Caliber

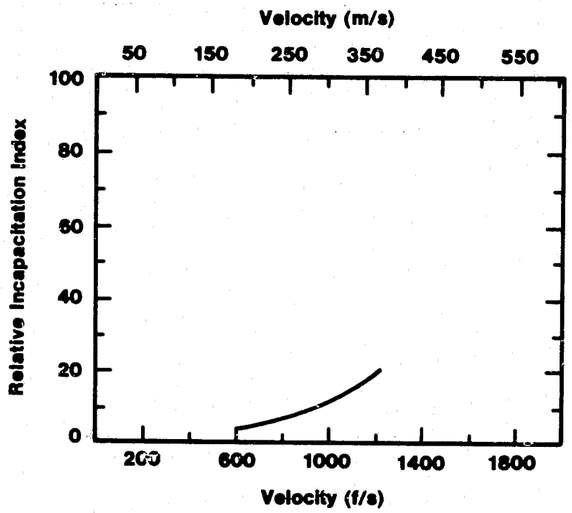


Relative Incapacitation Index as a function of velocity for 250 gr., SWC, 45 caliber bullet manufactured by Speer.

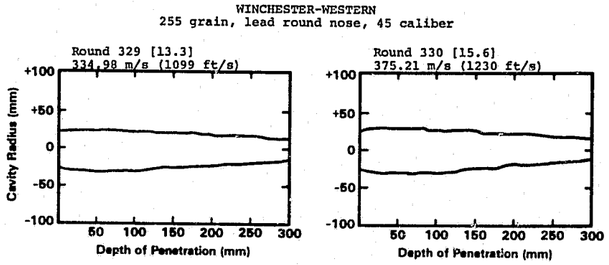
SPEER
250 grain, semi-wadcutter, 45 caliber



APPENDIX A62
255 Grain, Lead Round Nose, 45 Caliber



Relative Incapacitation Index as a function of velocity for 255 gr., LRN, 45 caliber bullet manufactured by Winchester-Western.



APPENDIX

B

NUMERICAL TABULATION

OF

TISSUE SIMULANT CAVITY MAXIMAL DIMENSIONS

Round Number	Penetration Depth (in cm)																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
7	2.3	2.8	3.2	3.5	3.5	3.5	3.3	2.9	2.5	2.1	1.9	1.7	1.6	1.6	1.5	1.4	1.3	1.1	1.0	0.9	0.7	0.6
9	2.1	2.6	2.9	3.1	3.4	3.6	3.5	3.4	3.2	2.9	2.6	2.1	1.8	1.5	1.3	1.0	0.7	0.6	0.5	0.0	0.0	0.0
10	1.6	2.1	2.8	3.2	3.5	3.5	3.5	3.3	3.1	2.8	2.6	2.3	2.1	1.6	1.4	1.1	0.8	0.6	0.5	0.0	0.0	0.0
11	1.2	1.6	1.9	2.2	2.3	2.5	2.5	2.5	2.2	2.0	1.8	1.4	1.1	0.9	0.7	0.6	0.6	0.2	0.0	0.0	0.0	0.0
12	1.6	1.9	2.0	2.0	2.0	1.9	1.7	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.6	0.5	0.4
13	1.0	1.2	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.3	1.4	1.3	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7
14	5.9	7.0	7.3	7.3	7.5	7.1	7.1	6.9	6.5	6.4	6.1	5.8	5.5	5.2	4.9	4.7	4.4	4.0	3.6	3.3	2.9	2.5
17	3.4	3.9	4.4	4.8	5.0	4.9	4.7	4.5	4.2	3.9	3.6	3.2	3.1	2.9	2.8	2.7	2.6	2.4	2.2	2.0	1.8	1.7
18	4.4	4.8	5.1	5.2	5.1	4.8	4.5	4.2	3.7	3.5	3.3	3.1	2.9	2.6	2.5	2.2	2.1	2.0	2.0	1.9	1.8	1.8
20	3.9	4.8	5.4	6.0	6.4	6.6	6.7	6.6	6.3	6.2	5.8	5.4	5.0	4.9	4.5	4.2	3.9	3.7	3.6	3.4	3.2	3.0
21	2.8	3.1	3.4	3.6	3.7	3.7	3.7	3.6	3.6	3.4	3.3	3.1	3.0	2.8	2.7	2.5	2.2	1.9	1.6	1.5	1.3	1.2
22	2.9	3.8	4.3	4.6	4.7	4.7	4.6	4.5	4.3	4.1	3.8	3.6	3.3	3.0	2.6	2.3	2.1	1.9	1.7	1.5	1.4	1.2
23	2.8	3.4	3.8	4.1	4.1	4.0	3.8	3.6	3.5	3.5	3.5	3.4	3.2	3.0	2.8	2.4	2.1	1.9	1.7	1.7	1.6	1.4
24	2.5	2.8	3.1	3.4	3.6	3.6	3.5	3.4	3.3	3.1	3.0	2.6	2.4	2.1	1.9	1.6	1.5	1.2	1.0	0.8	0.7	0.6
25	4.3	4.5	4.6	4.6	4.6	4.5	4.4	4.4	4.3	4.2	4.0	3.8	3.5	3.5	3.2	3.1	2.9	2.8	2.5	2.4	2.2	2.1
26	3.2	3.5	3.7	3.8	3.8	3.8	3.8	3.6	3.3	3.1	2.8	2.6	2.5	2.3	2.1	1.9	1.7	1.6	1.5	1.3	1.2	1.0
27	2.5	2.6	2.7	2.8	2.8	2.7	2.6	2.6	2.4	2.2	2.0	1.9	1.7	1.5	1.4	1.3	1.3	1.2	1.0	0.9	0.8	0.6
28	2.5	2.8	3.2	3.6	3.7	3.8	3.8	3.8	3.7	3.6	3.5	3.3	3.0	2.7	2.2	1.9	1.6	1.4	1.3	1.2	1.0	0.9
29	1.5	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.8	0.8
30	2.4	2.9	3.4	3.8	4.0	4.1	4.0	3.9	3.9	3.6	3.4	3.2	3.0	2.9	2.7	2.5	2.4	2.2	2.1	1.9	1.7	1.5
31	5.3	5.7	5.9	5.9	5.8	5.6	5.4	4.8	4.3	3.7	3.1	2.6	2.1	1.7	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0
33	3.6	4.0	4.2	4.3	4.2	4.0	3.9	3.5	3.2	2.9	2.6	2.3	2.0	1.6	1.3	1.0	0.7	0.0	0.0	0.0	0.0	0.0
34	3.1	3.5	3.8	3.9	3.9	3.9	3.8	3.6	3.3	3.0	2.7	2.3	2.0	1.5	1.2	0.9	0.6	0.0	0.0	0.0	0.0	0.0
35	3.0	3.4	3.7	3.8	3.8	3.9	3.7	3.5	3.3	3.0	2.7	2.4	2.2	1.7	1.5	1.2	1.0	0.8	0.6	0.0	0.0	0.0
36	2.9	3.3	3.5	3.7	3.7	3.7	3.5	3.3	3.0	2.8	2.4	2.1	1.7	1.4	1.2	0.9	0.8	0.7	0.5	0.0	0.0	0.0
37	2.4	2.9	3.2	3.3	3.3	3.2	2.9	2.7	2.5	2.3	2.1	1.8	1.6	1.2	1.0	0.8	0.6	0.6	0.5	0.0	0.0	0.0
38	1.4	1.8	1.9	1.9	1.8	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.6
39	2.8	3.5	4.1	4.4	4.6	4.6	4.5	4.2	3.9	3.7	3.5	3.3	3.2	3.0	2.8	2.6	2.3	2.1	2.0	1.9	1.8	1.5
40	1.4	1.9	2.3	2.6	2.7	2.6	2.5	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.9	0.8	0.6	0.6	0.6	0.4	0.4
41	3.0	4.1	4.6	4.8	4.8	4.6	4.5	4.3	4.0	3.9	3.7	3.6	3.5	3.3	3.2	3.0	2.7	2.5	2.3	2.2	2.0	1.8
42	3.5	4.3	4.7	4.9	5.0	4.9	4.6	4.3	4.1	3.8	3.5	3.1	2.9	2.8	2.6	2.5	2.3	2.1	2.0	1.8	1.7	1.6
44	2.0	2.7	3.1	3.3	3.3	3.3	3.2	3.0	2.9	2.7	2.5	2.3	2.0	1.9	1.7	1.4	1.3	1.1	1.0	0.9	0.8	0.6
45	2.3	2.9	3.4	3.8	4.0	4.0	3.9	3.8	3.6	3.4	3.2	2.9	2.7	2.5	2.2	2.0	1.7	1.5	1.3	1.2	1.0	0.9
49	3.4	3.9	4.3	4.5	4.6	4.7	4.6	4.5	4.3	4.1	3.8	3.6	3.3	3.1	3.0	2.8	2.7	2.4	2.3	2.1	1.9	1.7
50	1.6	1.7	1.7	1.7	1.6	1.6	1.5	1.6	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0
52	1.4	1.7	1.8	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.0	1.9	1.8
53	2.0	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.6
55	2.7	2.9	2.9	3.0	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.5	2.5	2.5	2.5	2.5	2.6	2.8	2.9	3.0	3.0	3.0
57	2.4	2.7	2.9	3.0	3.0	2.9	2.7	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.1	1.0	0.9	0.8	0.7	0.7	0.6
58	2.5	3.0	3.4	3.8	3.8	3.9	3.9	3.8	3.6	3.4	3.4	3.2	3.1	2.9	2.7	2.6	2.6	2.4	2.2	2.2	2.0	1.8
59	5.3	6.2	6.6	6.9	7.0	7.1	7.1	6.9	6.8	6.5	6.2	5.9	5.7	5.4	5.0	4.8	4.6	4.4	4.1	3.8	3.5	3.2
60	4.3	5.0	5.4	5.6	5.7	5.8	5.8	5.7	5.5	5.3	5.0	4.7	4.1	3.7	3.2	2.8	2.6	2.1	1.7	1.3	1.1	1.0
61	1.1	1.4	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.2
62	1.7	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.0

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
63	1.9	2.3	2.5	2.5	2.6	2.6	2.4	2.4	2.3	2.2	2.1	2.1	2.0	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.6	1.5
64	2.8	3.4	3.9	4.2	4.4	4.5	4.6	4.6	4.5	4.3	4.1	3.8	3.6	3.2	3.1	3.0	2.9	2.6	2.2	1.8	1.5	1.4
65	2.1	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.5	2.7	2.9	2.9	2.9	2.8	2.6
66	1.3	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.8	1.9	1.9	1.9	1.9	2.1	2.2	2.3	2.4	2.5	2.5
67	1.5	1.7	1.8	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.5	2.7	2.9	3.1	3.2	3.3	3.3	3.2	3.1	2.9
68	1.9	2.3	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.7	1.7
69	2.1	2.4	2.5	2.6	2.6	2.6	2.6	2.5	2.6	2.5	2.4	2.3	2.3	2.2	2.4	2.4	2.4	2.5	2.5	2.6	2.5	2.4
72	3.9	4.5	4.8	4.9	5.1	5.2	5.2	5.1	5.0	4.8	4.5	4.2	4.1	3.6	3.1	2.7	2.5	2.2	2.0	1.7	1.7	1.6
73	3.1	3.7	3.9	4.0	4.1	4.0	4.0	3.9	3.8	3.8	3.9	3.8	3.8	3.7	3.7	3.7	3.6	3.7	3.8	3.6	3.5	3.4
74	1.6	2.0	2.1	2.1	2.3	2.3	2.5	2.8	3.0	3.1	3.4	3.6	3.8	4.0	4.2	4.2	4.1	4.0	3.9	3.5	3.2	2.9
75	4.0	4.9	5.4	5.7	5.9	5.9	5.8	5.6	5.2	4.4	4.1	3.5	3.2	2.8	2.4	2.0	1.6	1.4	1.0	0.8	0.7	0.6
76	3.3	4.2	4.8	5.1	5.3	5.4	5.5	5.3	5.2	4.6	4.4	3.9	3.7	3.7	3.5	3.0	2.5	2.1	1.7	1.5	1.3	0.8
77	2.7	3.3	3.8	3.9	4.0	3.8	3.8	3.9	3.6	3.3	3.3	2.9	2.6	2.4	2.4	2.3	2.3	2.2	2.0	2.0	1.9	1.9
78	1.9	2.4	3.1	3.1	2.9	2.7	2.6	2.5	2.3	2.1	1.8	1.7	1.5	1.3	1.3	1.1	1.0	0.9	0.8	0.7	0.7	0.7
79	1.1	1.4	1.5	1.4	1.5	1.4	1.4	1.5	1.6	1.4	1.5	1.2	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3
80	0.8	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.2	1.3	1.3	1.3	1.3	1.5	1.8	1.9	1.9
81	1.8	2.4	2.9	3.2	3.3	3.4	3.2	3.3	3.2	3.2	3.0	2.8	2.5	2.4	2.4	2.4	2.1	2.0	1.8	2.0	1.7	1.8
82	1.9	2.5	2.9	3.1	3.0	2.7	2.5	2.7	2.7	2.5	2.5	2.2	2.1	2.2	2.2	2.0	1.9	2.0	1.7	1.6	1.6	1.6
83	2.3	3.1	3.7	3.8	3.9	3.9	3.8	3.6	3.0	2.8	2.7	2.5	2.1	1.9	1.7	1.3	1.3	1.2	1.0	0.7	0.6	0.5
84	2.8	3.7	4.3	4.5	4.7	4.7	4.4	4.2	4.0	3.5	3.4	3.3	2.9	2.5	2.4	2.2	2.1	1.6	1.4	1.1	1.0	0.8
85	4.8	5.9	6.5	6.7	6.8	6.8	6.6	6.5	6.0	5.4	5.1	4.3	3.5	3.2	2.7	2.1	1.8	1.6	1.2	1.0	0.9	0.7
86	2.9	4.2	4.9	5.2	5.5	5.5	5.8	5.8	5.7	5.3	5.2	5.1	4.8	4.6	4.5	4.3	4.3	4.3	3.9	3.3	3.2	3.2
87	4.2	5.1	5.7	5.9	6.2	6.2	6.1	5.9	5.7	5.3	5.1	5.0	4.6	4.5	4.3	4.0	3.7	3.6	3.4	2.8	2.6	2.4
88	5.0	6.1	6.8	7.0	7.1	7.2	7.0	6.9	6.5	6.1	5.9	5.4	4.9	4.1	3.9	3.4	2.7	2.4	1.8	1.3	0.9	0.7
89	1.1	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.1	1.0	0.9	0.7	0.6	0.5	0.4
90	1.9	2.7	3.3	3.4	3.4	3.2	3.0	2.9	2.7	2.5	2.4	2.2	1.9	1.6	1.5	1.1	0.9	0.7	0.6	0.5	0.5	0.5
91	1.4	1.9	2.5	2.6	2.5	2.4	2.2	2.1	1.8	1.6	1.6	1.5	1.3	1.0	1.0	0.9	0.7	0.7	0.6	0.5	0.4	0.4
92	1.2	1.0	1.3	1.3	1.1	1.0	1.0	1.0	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.5	0.5	0.4	0.4
93	5.0	6.3	6.9	7.1	7.3	7.4	7.3	6.9	6.4	6.0	5.4	4.4	4.1	3.3	2.8	2.3	1.9	1.2	0.8	0.7	0.0	0.0
94	1.3	1.2	1.6	1.7	1.6	1.4	1.1	1.1	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.0
95	2.6	3.6	4.2	4.4	4.4	4.4	4.2	4.2	4.0	3.7	3.6	3.2	2.7	2.6	2.2	2.1	2.0	1.6	1.1	0.9	0.8	0.7
96	2.1	2.8	3.2	3.3	3.2	3.2	3.0	2.9	2.9	2.6	2.5	2.5	2.2	2.1	2.0	1.9	1.8	1.8	1.5	1.5	1.2	1.1
97	1.7	2.3	2.7	2.7	2.7	2.4	2.4	2.4	2.1	1.9	2.0	1.8	1.7	1.7	1.5	1.4	1.4	1.5	1.4	1.2	1.1	1.2
98	1.3	2.0	2.2	2.2	2.1	2.0	1.8	1.7	1.8	1.6	1.5	1.3	1.3	1.2	1.2	1.2	1.2	1.0	1.0	0.9	0.9	0.9
99	1.6	1.8	2.3	2.3	2.3	1.9	1.8	1.5	1.3	1.1	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
100	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.0	0.7	0.6	0.6	0.6
101	0.9	1.5	2.1	2.3	2.4	2.3	2.4	2.3	2.1	1.9	1.7	1.5	1.4	1.3	1.3	0.9	0.6	0.6	0.6	0.5	0.5	0.5
102	1.0	1.6	2.0	2.0	2.1	1.9	1.8	1.6	1.5	1.3	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
103	0.9	1.3	1.4	1.4	1.2	1.2	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.2
104	2.3	3.4	4.0	4.1	4.2	4.4	4.2	4.3	4.1	3.8	3.5	3.3	2.8	2.8	2.7	2.3	2.1	1.9	1.9	1.8	1.6	1.6
105	2.2	3.0	3.4	3.5	3.4	3.2	3.1	3.1	2.8	2.8	2.8	2.7	2.5	2.4	2.3	2.4	2.4	2.1	2.2	2.0	2.0	2.0
106	2.1	2.9	3.3	3.4	3.6	3.6	3.4	3.4	3.0	2.8	2.8	2.5	2.3	2.2	1.6	1.4	1.1	1.0	0.8	0.6	0.6	0.5
107	1.6	2.2	2.5	2.6	2.7	2.5	2.2	2.1	2.0	1.9	1.9	1.8	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.2	1.1	1.1
108	2.1	2.8	3.1	3.2	3.3	3.1	2.9	2.7	2.6	2.6	2.5	2.2	2.4	2.2	2.2	2.1	2.0	1.9	1.8	1.8	1.7	1.6
109	2.1	3.0	3.5	3.7	3.8	3.5	3.6	3.4	3.3	3.0	3.1	2.9	2.9	2.7	2.4	2.3	2.2	2.0	2.1	2.0	1.7	1.5

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
110	1.8	2.6	3.1	3.2	3.5	3.4	3.5	3.6	3.5	3.2	3.0	2.8	2.8	2.7	2.5	2.3	2.3	2.1	2.0	1.9	1.7	1.8
111	1.7	2.3	2.9	3.0	3.2	3.4	3.4	3.3	3.2	3.1	2.8	2.6	2.4	2.6	2.4	2.4	2.3	2.2	1.9	1.9	1.7	1.5
112	1.4	1.9	2.1	2.1	2.2	2.0	2.0	2.0	1.8	1.9	1.8	1.7	1.6	1.5	1.6	1.6	1.6	1.6	1.5	1.6	1.3	1.3
113	2.2	3.0	3.6	3.7	3.7	3.7	3.6	3.4	3.2	3.1	2.9	2.4	2.2	2.1	1.7	1.6	1.3	1.1	0.9	0.8	0.6	0.5
114	1.8	2.6	3.0	3.0	3.0	3.0	3.1	2.9	2.6	2.5	2.4	2.2	1.8	1.6	1.5	1.2	1.1	0.8	0.7	0.5	0.5	0.4
115	1.4	1.9	2.2	2.2	2.1	1.9	1.7	1.7	1.5	1.5	1.5	1.3	1.4	1.4	1.3	1.0	0.9	0.9	0.7	0.7	0.6	0.5
116	1.4	1.1	1.4	1.3	1.2	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7
117	2.4	2.8	3.3	3.3	3.3	3.3	3.3	3.2	3.0	2.8	2.7	2.4	2.2	2.2	2.0	1.9	1.8	1.8	1.7	1.5	1.4	1.3
118	1.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.6	1.4	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.4
119	1.3	1.7	1.8	1.8	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.3	1.2	1.1	1.0	1.0	0.8	0.8	0.7	0.7	0.6
121	3.2	4.2	4.7	4.8	4.9	5.0	5.0	4.8	4.7	4.4	4.0	3.8	3.5	3.2	3.0	2.8	2.7	2.6	2.6	2.4	2.1	1.9
122	3.1	3.9	4.3	4.6	4.7	4.7	4.9	4.8	4.6	4.3	3.9	3.8	3.7	3.2	2.8	2.9	2.8	2.6	2.6	2.4	2.2	1.9
123	1.2	1.9	2.2	2.3	2.4	2.3	2.3	2.2	2.0	1.8	1.6	1.6	1.4	1.2	1.1	1.1	1.0	1.1	1.1	1.0	0.8	0.7
124	2.0	2.4	2.6	2.5	2.4	2.1	2.0	2.0	2.0	1.9	1.9	1.7	1.7	1.5	1.4	1.3	1.3	1.2	1.2	1.1	0.9	0.8
125	1.4	1.9	2.3	2.4	2.4	2.4	2.3	2.1	1.9	1.6	1.4	1.2	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5
126	1.7	2.2	2.4	2.3	2.2	2.0	1.9	1.8	1.6	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9	0.8	0.9	0.9	0.9	0.9
127	2.6	3.4	3.8	4.1	4.1	4.2	4.1	3.9	3.6	3.3	3.0	2.7	2.4	2.0	1.8	1.5	1.2	0.9	0.7	0.6	0.5	0.0
128	2.1	2.6	3.0	3.2	3.1	3.1	3.0	2.9	2.8	2.6	2.4	2.2	2.1	1.9	1.6	1.4	1.3	1.4	1.3	1.2	1.1	0.9
129	1.1	1.4	1.5	1.5	1.4	1.5	1.4	1.3	1.3	1.5	1.4	1.4	1.4	1.4	1.6	1.7	1.8	1.8	1.7	1.6	1.3	1.2
130	0.7	0.8	0.8	0.9	0.8	0.9	1.0	1.1	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.0
131	3.6	4.2	4.4	4.6	4.7	4.6	4.4	4.1	3.9	3.5	3.2	2.9	2.5	2.1	1.8	1.4	1.1	0.9	0.7	0.5	0.0	0.0
132	2.5	3.0	3.3	3.5	3.4	3.3	3.2	3.0	2.8	2.5	2.4	2.3	2.1	2.0	1.6	1.4	1.2	1.0	0.8	0.7	0.6	0.5
133	1.2	1.5	1.6	1.5	1.4	1.4	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.2	1.3	1.5	1.5	1.4	1.3	1.2	1.0
134	0.8	1.0	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.9	0.8	0.7	0.6	0.5	0.4
135	3.1	3.8	4.3	4.6	4.7	4.8	4.8	4.7	4.5	4.2	3.9	3.5	3.2	2.7	2.4	2.0	1.7	1.4	1.1	0.9	0.7	0.0
136	2.5	3.0	3.3	3.6	3.6	3.5	3.2	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.7	2.6	2.4	2.1	1.8	1.6	1.5	1.4
137	1.6	1.8	2.1	2.2	2.2	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.2	1.1
138	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
139	1.3	1.5	1.6	1.6	1.7	1.6	1.5	1.5	1.4	1.3	1.2	1.3	1.3	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8
140	3.3	4.1	4.5	4.7	4.9	4.8	4.6	4.0	3.6	3.1	2.6	2.1	1.7	1.3	1.2	1.0	1.0	1.0	0.8	0.6	0.5	0.0
141	3.2	3.9	4.2	4.3	4.3	4.3	4.1	3.7	3.4	3.1	2.8	2.6	2.2	1.7	1.3	1.0	0.8	0.6	0.5	0.0	0.0	0.0
142	2.1	3.1	3.4	3.6	3.6	3.7	3.5	3.3	2.9	2.5	2.2	1.8	1.5	1.2	1.0	0.7	0.6	0.3	0.0	0.0	0.0	0.0
143	1.3	1.9	2.2	2.3	2.2	2.0	1.8	1.6	1.5	1.3	1.0	0.8	0.7	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.0
144	0.8	1.2	1.3	1.4	1.2	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.3
145	2.9	3.6	4.0	4.3	4.4	4.3	4.2	4.0	3.7	3.4	3.2	2.9	2.6	2.4	2.2	2.1	1.9	1.6	1.5	1.5	1.2	0.9
146	1.3	1.8	2.1	2.4	2.4	2.3	2.2	1.9	1.9	1.7	1.5	1.4	1.2	1.1	1.0	0.8	0.8	0.7	0.6	0.6	0.5	0.5
147	1.9	2.3	2.5	2.6	2.5	2.4	2.3	2.2	2.0	2.0	1.9	1.7	1.6	1.5	1.3	1.2	1.1	1.0	1.0	1.0	0.9	0.8
148	2.6	3.3	3.8	4.0	4.0	3.8	3.7	3.5	3.3	3.2	2.9	2.6	2.5	2.3	1.9	1.8	1.6	1.4	1.2	1.0	0.9	0.6
149	2.5	2.9	3.1	3.3	3.4	3.5	3.5	3.5	3.4	3.3	3.1	2.8	2.5	2.2	1.9	1.6	1.4	1.2	1.1	0.8	0.5	0.5
150	1.9	2.4	2.8	3.0	3.1	3.2	3.1	2.9	2.8	2.6	2.4	2.3	2.2	2.0	2.0	1.9	1.9	1.7	1.6	1.5	1.3	1.3
151	1.1	1.5	1.7	1.6	1.6	1.5	1.5	1.4	1.5	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.5	1.5	1.5	1.6	1.6
152	3.1	3.7	4.1	4.4	4.5	4.6	4.7	4.5	4.4	4.1	3.9	3.7	3.6	3.3	3.1	3.0	2.8	2.5	2.4	2.4	2.0	2.0
154	3.2	4.1	4.7	4.9	5.1	5.2	5.1	4.8	4.5	4.3	4.2	3.7	3.6	3.5	3.3	3.1	2.8	2.5	2.3	2.3	2.1	1.8
155	2.4	3.2	3.7	3.9	4.1	4.0	4.0	3.9	3.7	3.6	3.3	3.1	3.0	2.9	2.6	2.3	2.1	2.0	1.7	1.7	1.5	1.3
156	1.8	2.5	2.9	3.0	3.0	2.8	2.7	2.5	2.4	2.3	2.3	2.1	2.0	1.9	1.8	1.7	1.8	1.7	1.5	1.4	1.4	1.3

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
157	1.5	2.1	2.5	2.6	2.5	2.2	2.0	1.8	1.6	1.6	1.5	1.5	1.4	1.3	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.9
158	3.2	3.8	4.3	4.5	4.6	4.5	4.3	4.1	3.8	3.6	3.2	2.9	2.7	2.7	2.4	2.0	1.8	1.5	1.2	0.9	0.7	0.5
159	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.1	0.0	0.0	0.0
160	1.2	1.5	1.8	1.9	1.9	1.8	1.6	1.5	1.5	1.3	1.2	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.5	0.6	0.5	0.4
161	1.8	2.3	2.6	2.6	2.7	2.7	2.7	2.4	2.3	2.2	2.1	1.9	1.7	1.4	1.2	1.2	1.1	1.0	0.9	0.7	0.7	0.6
162	2.4	3.0	3.3	3.5	3.5	3.5	3.4	3.1	3.0	2.9	2.6	2.4	2.2	2.1	1.9	1.5	1.3	1.0	0.8	0.6	0.5	0.5
163	3.1	3.9	4.2	4.4	4.5	4.4	4.0	3.7	3.3	2.8	2.6	2.4	2.3	2.2	2.0	1.8	1.6	1.5	1.4	1.2	1.0	0.8
164	2.7	3.4	3.7	3.9	3.9	3.8	3.6	3.2	3.0	2.8	2.6	2.4	2.3	2.1	1.8	1.8	1.7	1.5	1.4	1.2	1.1	0.9
165	2.1	2.6	2.9	3.1	3.2	3.1	2.9	2.7	2.5	2.3	2.1	1.9	1.7	1.6	1.4	1.2	1.0	0.9	0.6	0.5	0.5	0.5
166	1.2	1.7	2.1	2.3	2.3	2.1	2.0	1.8	1.6	1.4	1.2	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.0
167	3.5	4.0	4.3	4.4	4.4	4.2	3.9	3.5	3.1	2.8	2.5	2.4	2.2	2.0	1.8	1.7	1.5	1.2	1.1	0.9	0.8	0.6
168	1.3	1.8	2.1	2.2	2.1	1.9	1.8	1.6	1.5	1.4	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.0
169	2.6	3.3	3.8	3.9	3.9	3.7	3.3	3.1	2.9	2.7	2.5	2.1	1.9	1.7	1.6	1.4	1.2	1.0	0.9	0.7	0.5	0.5
170	2.3	2.9	3.2	3.4	3.5	3.4	3.2	2.8	2.6	2.4	2.2	1.9	1.7	1.5	1.2	1.0	0.9	0.7	0.6	0.5	0.5	0.0
171	0.7	0.9	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.0
172	2.6	3.3	4.0	4.4	4.6	4.9	4.9	4.9	4.8	4.3	4.1	3.7	3.1	2.6	2.3	1.7	1.2	0.8	0.7	0.6	0.6	0.0
173	1.9	2.5	2.8	2.9	2.9	2.9	2.9	2.9	2.6	2.6	2.6	2.3	2.4	2.1	2.0	1.8	1.6	1.6	1.6	1.3	1.2	1.2
174	1.6	2.2	2.7	2.8	2.9	2.9	2.8	2.7	2.6	2.4	2.1	2.1	2.0	1.9	1.8	1.7	1.7	1.6	1.6	1.3	1.1	1.0
175	1.0	1.8	2.2	2.2	2.2	2.1	2.1	1.8	1.6	1.5	1.4	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7
176	2.6	3.3	3.8	4.0	4.3	4.6	4.6	4.5	4.4	4.2	4.0	3.7	3.0	2.7	2.5	2.2	1.9	1.7	1.2	0.8	0.6	0.6
177	1.8	2.4	2.8	2.9	2.9	2.7	2.9	2.9	2.8	2.8	2.6	2.5	2.5	2.3	2.3	2.2	2.1	1.8	1.9	1.6	1.6	1.5
178	1.4	2.0	2.4	2.5	2.7	2.7	2.5	2.5	2.5	2.2	2.0	1.9	1.8	1.7	1.6	1.6	1.5	1.5	1.4	1.3	1.3	1.3
179	1.0	1.5	1.8	2.0	1.9	1.8	1.8	1.7	1.6	1.6	1.3	1.2	1.1	1.1	1.0	1.0	1.0	0.9	1.1	1.1	1.0	1.0
180	2.5	3.0	3.4	3.4	3.6	3.6	3.6	3.5	3.4	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.5
181	2.0	2.6	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.7	2.6	2.5	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.8	1.7	1.5
182	1.7	2.3	2.3	2.3	2.3	2.0	2.1	2.2	2.1	2.0	2.0	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.3	1.3	1.2	1.2
183	0.8	1.2	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.9	0.9
184	2.3	2.9	3.4	3.5	4.1	4.4	4.4	4.3	4.4	4.4	4.3	4.1	3.6	3.4	3.1	2.9	2.8	2.3	2.0	1.9	1.6	1.3
185	1.6	2.2	2.7	2.8	2.9	3.0	2.9	2.9	2.5	2.5	2.4	2.3	2.2	1.9	1.9	1.6	1.6	1.6	1.5	1.5	1.3	1.3
186	1.0	1.7	2.0	2.1	2.3	2.2	2.2	2.1	2.1	2.1	2.0	1.6	1.5	1.4	1.2	1.1	1.1	1.0	0.9	0.8	0.7	0.6
187	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.8	0.7	0.6	0.6	0.6	0.6
188	2.2	2.8	3.1	3.1	3.1	3.0	2.7	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.0	2.0	1.9	1.8	1.7	1.7	1.7
189	2.7	3.3	3.6	3.8	3.7	3.6	3.7	3.5	3.5	3.2	3.0	2.8	2.8	2.6	2.6	2.5	2.5	2.4	2.2	2.1	2.1	1.9
190	1.8	2.4	2.5	2.5	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.7	1.6	1.5	1.5	1.5	1.5
191	1.6	2.1	2.5	2.7	2.4	2.4	2.4	2.2	2.1	2.2	2.0	2.0	1.9	1.8	1.6	1.4	1.3	1.3	1.2	1.2	1.0	0.9
192	0.8	1.1	1.2	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.8	0.7	0.8	0.8	0.9	0.8	0.8	0.9	1.0	1.1	1.0	1.1
193	3.4	4.1	4.6	4.8	5.0	5.1	5.1	5.0	4.7	4.5	4.0	3.4	2.8	2.5	2.0	1.3	1.0	0.7	0.7	0.0	0.0	0.0
194	1.9	2.5	2.7	2.7	2.8	2.9	2.7	2.6	2.6	2.4	2.4	2.0	1.9	1.7	1.7	1.6	1.4	1.3	1.2	1.1	1.1	1.0
195	2.5	3.2	3.7	3.9	4.3	4.5	4.5	4.4	4.4	4.3	3.9	3.4	3.2	3.0	2.6	2.3	1.7	1.2	1.0	0.8	0.7	0.6
196	2.0	2.7	2.9	2.9	3.0	2.8	2.9	2.7	2.6	2.5	2.4	2.2	2.2	2.1	2.0	1.9	1.8	1.5	1.5	1.7	1.4	1.3
197	3.0	3.8	4.4	4.6	4.9	4.9	5.0	5.0	4.9	4.4	4.2	3.7	3.3	3.0	2.5	2.0	1.7	1.1	0.8	0.7	0.5	0.0
198	1.9	2.6	2.9	3.0	3.1	3.1	3.1	2.8	2.8	2.7	2.6	2.4	2.2	2.1	2.0	1.6	1.6	1.5	1.5	1.5	1.4	1.2
199	3.1	4.0	4.8	5.0	5.3	5.3	5.3	5.4	5.3	5.0	4.8	4.5	3.9	3.7	3.3	2.8	2.5	2.3	1.9	1.7	1.6	1.3
200	2.1	2.7	3.0	3.1	3.2	3.1	3.0	3.0	2.7	2.8	2.6	2.6	2.5	2.5	2.4	2.1	2.0	2.2	2.1	1.9	1.7	1.7
201	2.6	3.4	3.8	4.0	4.1	4.1	4.1	4.2	4.2	3.9	3.8	3.8	3.3	3.3	3.0	2.7	2.7	2.6	2.4	2.4	2.2	2.2

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
202	3.5	4.3	4.9	5.0	5.1	5.1	5.0	4.8	4.4	4.1	3.5	3.0	2.8	2.6	2.3	2.1	2.0	1.6	1.3	1.2	1.1	0.8
203	2.9	3.8	4.2	4.4	4.5	4.6	4.5	4.0	3.6	3.2	3.0	2.5	2.5	2.3	2.0	1.9	1.7	1.6	1.2	1.1	1.0	0.8
204	2.8	3.7	4.3	4.4	4.7	4.7	4.5	4.1	3.7	3.4	3.0	2.8	2.5	2.4	2.2	2.0	1.9	1.6	1.2	1.2	1.0	0.7
205	3.6	4.4	4.8	4.9	5.0	5.1	5.1	4.9	4.8	4.7	4.4	4.0	3.7	3.5	3.1	3.0	2.9	2.7	2.6	2.2	1.8	1.8
206	2.6	3.2	3.5	3.6	3.7	3.5	3.3	3.4	3.3	3.0	2.9	2.6	2.7	2.7	2.4	2.3	2.3	2.0	1.9	1.8	1.7	1.5
207	2.2	2.9	3.1	3.2	3.2	3.0	3.1	3.0	2.9	2.9	2.8	2.8	2.6	2.4	2.4	2.2	2.2	1.9	1.9	1.8	1.8	1.7
208	3.7	4.8	5.4	5.5	5.8	5.8	5.8	5.5	5.2	4.9	4.0	3.7	3.1	3.0	2.4	2.2	2.2	1.8	1.2	1.0	0.8	0.6
209	3.7	4.7	5.0	5.2	5.4	5.3	5.2	5.0	4.5	4.2	3.6	3.0	2.7	2.3	2.3	2.2	1.8	1.6	1.5	1.2	0.9	0.7
210	3.2	3.9	4.4	4.5	4.5	4.3	4.0	3.8	3.3	2.9	2.6	2.4	2.3	2.2	2.1	1.8	1.6	1.4	1.1	0.8	0.6	0.4
211	4.4	5.3	5.7	5.9	6.0	5.9	5.7	5.5	5.1	4.8	4.7	4.3	3.9	3.7	3.3	2.7	2.5	2.0	1.5	1.2	1.1	0.8
212	3.6	4.3	4.7	4.8	4.9	4.8	4.8	4.6	4.4	4.2	3.9	3.6	3.4	3.0	2.6	2.5	2.0	1.6	1.4	1.1	0.8	0.7
213	3.0	3.6	4.0	4.1	4.0	3.9	3.9	3.7	3.4	3.3	3.2	2.8	2.5	2.3	2.1	1.7	1.5	1.3	1.2	1.1	0.9	0.9
214	4.0	4.7	5.1	5.3	5.3	5.2	5.0	4.9	4.5	4.3	4.1	3.8	3.4	3.1	2.8	2.3	2.0	2.0	1.7	1.6	1.4	1.1
215	3.3	4.0	4.4	4.5	4.7	4.8	4.8	4.5	4.2	4.0	3.6	3.3	3.1	2.9	2.8	2.6	2.3	2.1	1.9	1.7	1.5	1.3
216	2.7	3.5	4.0	4.2	4.3	4.1	3.6	3.6	3.5	3.2	3.1	2.6	2.4	2.2	2.0	1.9	1.7	1.5	1.3	1.2	1.0	0.9
217	2.1	2.8	3.2	3.4	3.5	3.3	3.3	3.2	3.0	2.9	2.7	2.4	2.3	2.0	1.6	1.4	1.1	0.9	0.8	0.6	0.5	0.5
218	1.7	2.3	2.7	2.8	2.9	2.9	2.8	2.5	2.4	2.2	2.1	1.9	1.7	1.6	1.4	1.2	1.1	0.8	0.6	0.5	0.5	0.5
219	1.2	1.8	2.2	2.2	2.0	1.9	1.6	1.6	1.6	1.5	1.5	1.2	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4
220	2.1	2.8	3.2	3.4	3.4	3.3	3.2	2.8	2.6	2.3	2.4	2.1	1.8	1.6	1.2	0.9	0.8	0.5	0.6	0.5	0.0	0.0
221	1.7	2.6	3.0	3.1	3.0	2.9	2.8	2.5	2.2	2.1	1.8	1.5	1.4	1.1	0.9	0.8	0.6	0.5	0.5	0.4	0.0	0.0
222	1.4	2.1	2.3	2.3	2.3	2.0	2.0	2.0	1.9	1.7	1.5	1.2	1.0	1.0	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5
223	2.1	2.8	3.2	3.4	3.4	3.3	3.2	3.2	3.0	2.6	2.5	2.3	2.1	1.8	1.4	1.1	1.0	0.8	0.6	0.6	0.6	0.5
224	1.7	2.2	2.6	2.7	2.7	2.7	2.4	2.4	2.4	2.4	2.3	1.9	1.7	1.5	1.2	1.0	0.9	0.9	0.7	0.6	0.5	0.5
225	1.5	2.0	2.4	2.4	2.4	2.2	2.2	2.1	1.9	1.8	1.6	1.6	1.5	1.2	1.2	1.1	0.9	0.9	0.7	0.7	0.6	0.6
226	2.0	2.7	3.0	3.0	3.0	2.8	2.7	2.6	2.5	2.3	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.1	1.1	1.0	0.9
228	1.1	2.2	2.5	2.6	2.6	2.3	2.1	1.8	1.6	1.6	1.6	1.4	1.4	1.3	1.1	1.1	1.0	0.9	0.8	0.8	0.7	0.7
229	3.6	4.5	5.2	5.3	5.7	5.7	5.6	5.5	5.4	5.2	4.9	5.0	4.5	4.2	4.0	3.6	3.2	3.0	2.8	2.6	2.6	2.5
230	3.3	4.2	4.8	5.0	5.2	5.3	5.2	5.2	5.1	4.9	4.6	4.1	4.1	4.0	3.6	3.1	3.0	2.6	2.3	2.4	2.2	2.2
231	2.8	3.5	4.0	4.2	4.4	4.4	4.3	4.1	3.8	3.7	3.5	3.4	3.2	3.1	2.9	2.8	2.6	2.2	1.9	1.8	1.8	1.5
232	4.7	5.5	6.4	6.6	6.8	6.9	6.9	6.8	6.7	6.5	6.3	6.0	5.9	5.5	5.0	4.7	4.4	4.0	4.0	3.7	3.2	2.8
233	3.0	3.6	3.8	3.7	3.7	3.6	3.7	3.7	3.6	3.5	3.4	3.0	3.0	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.1
234	2.4	3.2	3.5	3.5	3.4	3.1	3.0	3.0	2.9	2.7	2.6	2.5	2.4	2.3	2.1	2.2	2.1	2.2	1.9	1.8	1.7	1.7
235	2.8	3.6	4.2	4.6	4.6	4.6	4.5	4.4	4.0	3.7	3.6	3.2	2.8	2.6	2.3	1.7	1.4	1.2	1.0	0.7	0.5	0.5
236	2.5	3.2	3.7	3.9	4.0	4.1	4.2	4.2	3.9	3.9	3.6	3.2	3.0	2.4	2.2	2.0	1.6	1.3	1.1	0.8	0.7	0.7
237	2.2	3.0	3.5	3.7	4.0	3.8	3.8	3.7	3.4	3.1	2.9	2.5	2.4	2.0	2.0	1.8	1.5	1.2	1.0	0.7	0.7	0.7
238	2.0	2.6	3.1	3.1	3.1	3.2	3.1	3.1	2.7	2.6	2.3	2.0	1.8	1.6	1.3	1.2	1.0	1.0	0.9	1.0	0.9	0.8
239	3.1	4.0	4.5	4.8	5.1	5.2	5.2	5.2	4.9	4.6	4.5	4.2	3.6	3.4	3.1	2.6	2.4	2.3	1.9	1.7	1.4	1.1
240	2.8	3.5	4.0	4.2	4.5	4.5	4.5	4.4	4.1	4.0	3.7	3.4	3.4	3.0	2.7	2.6	2.1	1.8	1.6	1.3	1.0	1.0
241	2.6	3.2	3.8	4.0	4.3	4.3	4.3	4.1	4.0	3.9	3.5	3.4	3.3	2.8	2.7	2.6	2.1	1.7	1.6	1.5	1.2	1.1
242	1.7	2.3	2.8	3.0	3.2	3.2	3.1	3.1	2.9	2.9	2.7	2.6	2.4	2.2	2.0	1.9	1.7	1.4	1.3	1.3	1.3	1.1
243	2.2	2.7	3.1	3.2	3.3	3.1	3.0	2.9	2.9	3.0	2.9	2.7	2.6	2.6	2.2	2.2	2.1	2.1	2.1	2.0	2.0	1.8
244	1.6	2.1	2.4	2.4	2.3	2.2	2.1	2.1	2.0	1.8	1.7	1.6	1.3	1.3	1.2	1.1	0.8	0.8	0.7	0.6	0.6	0.5
245	4.3	4.9	5.6	5.8	6.1	6.0	6.0	6.0	5.6	5.4	4.9	4.7	4.5	4.1	3.8	3.5	3.3	3.1	2.5	1.7	1.6	1.3
246	1.7	2.4	2.6	2.7	2.9	2.9	2.8	2.7	2.6	2.3	2.4	2.0	1.8	1.5	1.4	1.3	1.3	1.2	1.1	1.2	1.1	1.1
247	3.3	4.1	4.9	5.2	5.3	5.4	5.2	5.1	4.9	4.7	4.4	4.2	3.8	3.5	3.2	3.0	2.6	2.2	2.0	1.9	1.7	1.5

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
248	3.1	3.9	4.6	4.8	5.2	5.3	5.3	5.1	4.8	4.5	4.3	3.9	3.5	3.4	3.0	2.6	2.4	2.1	2.0	1.9	1.7	1.4
249	2.5	3.4	3.9	4.1	4.3	4.4	4.3	4.2	4.2	4.0	3.8	3.4	3.0	2.8	2.7	2.6	2.4	2.2	2.0	2.0	1.9	1.8
250	2.1	2.8	3.2	3.4	3.6	3.6	3.5	3.5	3.3	3.0	2.9	2.7	2.4	2.3	2.2	1.8	1.6	1.4	1.3	1.3	1.1	1.0
251	2.6	3.1	3.1	3.1	3.0	3.0	3.0	3.1	2.9	2.7	2.8	2.7	2.5	2.6	2.5	2.4	2.3	2.2	2.0	2.0	2.0	2.0
252	3.2	4.6	5.4	5.6	5.8	5.8	5.8	5.6	5.3	5.0	4.9	4.6	4.3	4.1	3.6	3.4	3.2	3.0	2.6	2.3	2.1	1.7
253	2.6	3.5	4.0	4.2	4.5	4.5	4.5	4.5	4.3	4.0	3.9	3.5	3.2	3.1	2.8	2.5	2.3	2.1	1.8	1.6	1.3	1.0
254	2.1	2.9	3.5	3.6	3.7	3.7	3.7	3.6	3.5	3.4	3.2	2.9	2.7	2.5	2.2	2.0	1.7	1.4	1.2	1.1	0.9	0.9
255	1.7	2.4	2.8	3.0	3.2	3.3	3.1	3.1	3.0	2.9	2.7	2.5	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.3	1.3	1.3
256	1.2	1.7	2.0	2.0	2.0	1.9	1.8	1.8	1.7	1.5	1.5	1.4	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.3
257	2.5	3.1	3.4	3.4	3.3	3.2	3.2	3.2	3.1	2.9	2.8	2.7	2.6	2.5	2.5	2.4	2.3	2.4	2.3	2.1	2.0	1.9
258	2.5	3.1	3.3	3.4	3.3	3.2	3.2	2.9	2.8	2.7	2.8	2.8	2.7	2.5	2.3	2.2	2.1	2.0	1.9	2.0	2.0	1.8
259	2.6	3.5	3.9	4.1	4.2	4.0	3.9	3.6	3.3	3.1	2.9	2.7	2.3	2.3	2.0	1.7	1.7	1.4	1.2	1.0	0.9	0.8
260	2.3	2.8	3.1	3.2	3.2	3.1	3.0	2.9	2.5	2.3	2.1	2.0	2.0	1.8	1.7	1.5	1.4	1.3	1.1	1.1	1.1	0.9
261	1.4	2.0	2.3	2.3	2.1	1.8	1.6	1.6	1.5	1.5	1.5	1.2	1.2	1.1	1.0	1.0	0.9	1.0	0.9	0.9	0.8	0.8
262	2.5	3.1	3.3	3.3	3.3	3.1	3.1	3.0	2.9	2.8	2.8	2.7	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.0	1.9
263	2.1	2.6	2.9	3.0	3.0	2.8	2.7	2.6	2.6	2.4	2.3	2.1	2.1	2.1	1.8	1.9	1.8	1.7	1.8	1.7	1.7	1.7
264	3.1	3.8	4.4	4.6	4.7	4.6	4.4	4.1	3.9	3.6	3.4	3.0	2.6	2.4	2.0	1.7	1.5	1.5	1.4	1.3	0.9	0.7
265	2.2	3.1	3.5	3.6	3.5	3.4	3.2	3.2	3.1	2.8	2.6	2.2	2.2	2.1	1.9	1.8	1.7	1.5	1.3	1.1	1.0	0.9
266	1.9	2.4	2.6	2.7	2.6	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.6	1.7	1.5	1.4	1.4	1.3	1.2	1.1	1.0	1.0
267	2.6	3.1	3.3	3.4	3.3	3.1	3.1	3.0	2.9	2.6	2.5	2.6	2.4	2.3	2.3	2.3	2.3	2.2	2.0	1.9	1.9	1.8
268	2.1	2.7	3.1	3.1	3.0	2.9	2.5	2.3	2.4	2.2	2.3	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.6
269	4.1	4.8	5.2	5.4	5.5	5.5	5.4	5.3	5.1	4.9	4.4	3.9	3.2	2.9	2.2	1.5	1.3	1.0	0.9	0.0	0.0	0.0
270	3.1	3.8	4.4	4.5	4.8	4.9	4.7	4.7	4.5	4.2	4.1	3.9	3.2	3.0	2.6	2.5	2.3	2.1	1.8	1.6	1.5	1.3
271	2.1	2.6	2.9	3.0	2.9	2.9	2.8	2.6	2.6	2.7	2.6	2.4	2.4	2.4	2.1	2.0	1.8	1.7	1.7	1.6	1.7	1.6
272	3.6	3.5	3.4	3.3	3.1	2.9	2.7	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
273	3.8	4.3	4.6	4.6	4.4	4.0	3.4	3.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
274	2.2	1.9	1.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
286	4.0	4.6	4.9	5.2	5.4	5.4	5.2	4.8	4.3	3.7	3.3	2.9	2.5	2.0	1.9	1.8	1.6	1.0	1.0	1.0	0.8	0.6
287	2.9	3.4	3.9	4.1	4.2	4.1	3.7	3.4	3.2	3.0	2.8	2.3	2.0	1.6	1.4	1.1	0.8	0.7	0.7	0.7	0.0	0.0
288	1.9	2.5	2.8	2.9	2.9	2.8	2.7	2.5	2.2	1.9	1.7	1.7	1.4	1.2	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.5
289	3.6	4.0	4.3	4.4	4.4	4.3	4.1	3.9	3.7	3.7	3.5	3.5	3.2	3.2	3.0	3.1	2.9	2.9	2.7	2.6	2.5	2.3
290	4.3	4.9	5.3	5.5	5.6	5.7	5.6	5.4	5.0	4.8	4.0	3.8	3.7	3.5	3.2	3.0	2.7	2.6	2.5	2.4	2.2	2.0
291	2.2	2.3	2.6	2.9	2.9	3.0	3.0	3.1	3.2	3.2	3.6	3.8	4.1	4.4	4.4	4.5	4.5	4.3	4.1	3.9	3.5	3.2
292	3.6	4.0	4.5	4.8	5.0	5.2	5.1	5.1	5.0	4.7	4.5	4.2	4.1	4.0	3.7	3.7	3.5	3.3	3.0	2.9	2.8	2.6
294	3.8	4.4	4.9	5.2	5.3	5.4	5.2	5.0	4.7	4.4	4.0	3.4	3.1	2.7	2.3	1.9	1.2	0.9	0.7	0.6	0.0	0.0
295	3.0	3.4	3.8	4.0	4.2	4.2	4.0	3.7	3.4	3.4	2.8	2.5	2.2	1.8	1.5	1.2	0.8	0.7	0.6	0.0	0.0	0.0
296	2.4	2.9	3.2	3.3	3.3	3.3	3.2	2.9	2.6	2.3	2.2	1.7	1.5	1.1	0.8	0.7	0.6	0.6	0.5	0.0	0.0	0.0
297	1.2	1.6	1.8	1.9	1.9	1.7	1.7	1.6	1.5	1.5	1.3	1.3	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.5
298	4.2	4.9	5.3	5.7	6.0	6.1	6.1	6.0	5.7	5.3	4.9	4.4	3.9	4.1	4.1	3.7	3.4	3.2	3.2	3.1	2.9	2.4
299	3.4	3.9	4.4	4.7	4.8	5.0	5.0	5.1	5.1	5.0	4.6	3.9	3.7	3.6	3.3	2.9	2.6	2.4	2.2	2.0	1.7	1.5
300	2.4	2.8	3.2	3.6	3.9	3.9	3.7	3.6	3.5	3.4	3.3	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.6	1.4	1.3
301	1.4	1.6	1.9	2.0	2.1	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5
302	1.9	2.2	2.4	2.6	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.4	2.3	2.2
303	2.4	2.8	3.2	3.5	3.5	3.6	3.7	3.7	3.7	3.7	3.7	3.8	3.7	3.7	3.6	3.5	3.4	3.4	3.3	3.2	3.1	3.0
304	1.6	1.9	2.0	2.1	2.1	2.1	2.0	1.9	2.0	1.8	1.8	1.9	2.0	1.9	2.0	2.0	2.1	2.2	2.3	2.2	2.5	2.5

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
305	1.9	2.1	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.4
306	2.2	2.5	2.8	3.1	3.2	3.2	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.3	2.3
307	1.9	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.1	1.9	1.9	1.8	1.7	1.5	1.3	1.4	1.3	1.3	1.2	1.2	1.2	1.2
308	2.1	2.4	2.6	2.7	2.7	2.6	2.4	2.4	2.4	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.3	2.2	2.2
309	3.4	3.9	4.2	4.4	4.5	4.4	4.3	4.1	4.0	3.8	3.6	3.6	3.5	3.2	3.1	2.9	2.9	2.9	2.9	2.8	2.7	2.5
310	4.0	4.4	4.7	4.8	4.9	4.9	4.9	4.8	4.7	4.5	4.3	4.0	3.7	3.6	3.4	3.1	2.9	2.6	2.4	2.2	2.0	1.9
311	1.7	1.9	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.0	2.1	1.9	1.9	1.9	1.9	1.9	1.8	2.0	2.0	2.0	2.0
312	2.1	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8
313	2.2	2.4	2.6	2.7	2.8	2.8	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.0	1.9
314	2.9	3.1	3.4	3.5	3.6	3.7	3.5	3.3	3.1	2.9	2.5	2.4	2.2	1.9	1.7	1.6	1.5	1.4	1.2	1.1	1.1	1.0
315	3.1	3.5	3.8	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.7	3.6	3.3	3.2	3.1	2.9	2.5	2.4	2.3	2.1	2.0	1.8
316	5.3	5.6	5.8	5.8	5.7	5.5	4.9	4.6	4.5	4.3	3.8	3.2	3.1	2.7	2.3	1.9	1.5	1.3	1.1	0.8	0.6	0.0
317	3.3	3.6	3.8	3.8	3.7	3.6	3.5	3.5	3.3	3.2	3.1	3.0	3.1	3.0	2.9	2.8	2.6	2.4	2.3	2.3	2.3	2.2
318	2.8	3.3	3.5	3.5	3.4	3.3	3.0	2.7	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.2	2.1	1.9	1.9	1.8	1.8	1.7
319	2.3	2.9	3.3	3.4	3.5	3.3	3.3	3.1	3.0	2.9	2.7	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.6
320	1.8	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.0	2.1	2.0	2.0	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.3	1.2
321	4.2	5.0	5.5	5.9	6.1	6.1	6.0	5.9	5.6	5.2	4.5	4.1	3.8	3.4	3.3	3.1	2.9	2.6	2.6	2.5	2.4	2.2
322	4.4	5.0	5.3	5.6	5.8	5.7	5.6	5.4	5.2	4.8	4.5	4.1	3.9	3.7	3.3	3.3	3.0	2.9	2.7	2.3	2.1	1.9
323	2.6	3.0	3.4	3.7	3.8	3.9	3.8	3.7	3.6	3.4	3.1	2.8	2.6	2.3	2.1	1.8	1.7	1.4	1.2	1.0	0.8	0.7
324	1.9	2.4	2.9	3.1	3.2	3.2	3.1	2.9	2.9	2.6	2.4	2.2	1.9	1.8	1.6	1.4	1.1	0.9	0.8	0.7	0.7	0.6
325	1.3	1.7	2.1	2.2	2.3	2.2	2.0	1.8	1.7	1.5	1.4	1.2	1.1	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.6
326	0.9	1.1	1.3	1.5	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6
327	2.3	2.7	3.1	3.5	3.7	3.7	3.7	3.6	3.5	3.4	3.2	3.1	2.6	2.3	2.1	2.0	1.9	1.7	1.5	1.4	1.3	1.1
328	1.5	1.6	1.9	2.1	2.2	2.2	2.1	2.0	1.9	1.7	1.6	1.5	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3
329	2.5	2.6	2.7	2.7	2.8	2.8	2.8	2.7	2.6	2.6	2.6	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.0	1.9	1.9
330	2.8	2.9	3.0	3.0	3.0	2.9	3.0	3.0	2.9	2.8	2.8	2.7	2.7	2.4	2.5	2.3	2.3	2.3	2.1	1.9	2.0	2.0
331	2.5	2.9	3.1	3.1	3.3	3.3	3.2	3.0	2.9	2.9	3.1	3.2	3.3	3.2	3.2	3.2	3.1	3.0	2.8	2.6	2.5	2.3
332	2.6	2.8	3.0	3.0	3.0	3.1	3.1	3.1	3.0	2.9	2.9	2.9	2.8	2.6	2.4	2.4	2.4	2.1	2.1	2.1	2.2	2.1
333	3.0	3.2	3.4	3.5	3.5	3.5	3.3	3.1	3.2	3.2	3.2	3.1	3.0	3.0	3.0	2.9	2.8	2.8	2.8	2.8	2.8	2.7
334	2.5	2.7	2.7	2.7	2.7	2.7	2.7	2.5	2.6	2.5	2.5	2.4	2.3	2.2	2.1	2.1	1.9	2.0	1.9	1.8	1.8	1.7
366	3.2	3.6	3.9	3.9	3.9	3.8	3.7	3.8	3.8	3.6	3.5	3.1	2.8	2.7	2.5	2.4	2.2	1.9	1.7	1.7	1.5	1.4
367	2.3	2.7	3.1	3.2	3.1	3.0	2.9	2.6	2.4	2.3	2.1	2.0	1.7	1.7	1.5	1.4	1.2	1.1	0.8	0.7	0.7	0.7
368	4.1	5.0	5.7	5.9	6.2	6.3	6.2	6.0	5.9	5.4	5.0	4.9	4.5	4.2	3.9	3.8	3.4	3.5	3.1	2.6	2.5	2.5
369	4.4	5.3	6.1	6.3	6.6	6.7	6.6	6.5	6.2	6.0	5.7	5.7	5.6	5.3	5.1	4.7	4.3	4.1	3.8	3.3	3.2	3.0
370	4.1	5.0	5.7	6.0	6.4	6.5	6.5	6.6	6.7	6.7	6.7	6.6	6.5	6.3	6.1	6.0	5.4	4.8	4.5	4.1	3.2	3.0
371	5.6	6.3	6.8	7.0	7.2	7.3	7.4	7.3	7.1	6.7	6.2	5.8	5.2	4.5	4.3	4.0	4.0	4.1	4.1	4.1	3.9	3.5
372	4.2	4.4	4.7	4.8	4.8	4.9	4.9	4.7	4.5	4.8	4.9	4.7	4.7	4.4	4.8	4.9	4.7	4.1	4.4	4.5	4.2	4.0
373	4.3	4.6	4.8	4.9	4.8	4.9	4.8	4.8	4.6	4.6	4.3	4.2	4.1	3.9	3.9	3.7	3.8	3.7	3.7	3.6	3.6	3.4
374	3.1	3.4	3.6	3.8	4.1	4.2	4.1	4.1	4.0	4.0	3.8	3.8	3.7	3.5	3.5	3.4	3.1	2.7	2.5	2.7	2.7	2.6
375	2.9	3.1	3.3	3.3	3.3	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.8	2.7	2.5	2.5	2.5	2.4	2.6	2.5	2.3	2.3
376	3.1	3.4	3.6	3.8	3.9	3.8	3.7	3.7	4.0	3.8	3.5	3.4	3.5	3.5	3.3	3.3	3.5	3.3	3.3	3.2	3.1	3.1
377	4.1	4.3	4.5	4.7	5.0	5.0	5.0	5.1	5.1	5.1	5.0	5.0	4.9	4.7	4.5	4.5	4.1	4.0	4.2	3.9	3.6	3.5
378	3.3	3.8	4.2	4.3	4.5	4.4	4.3	4.1	4.0	4.1	4.0	4.1	4.2	4.1	3.7	3.5	3.6	3.9	3.9	3.7	3.5	3.3
379	2.6	2.5	2.5	2.5	2.8	2.8	2.7	2.8	2.9	2.7	2.7	2.7	2.5	2.3	2.3	2.0	2.0	2.1	2.1	2.2	2.1	2.1
380	3.6	4.7	5.4	6.0	6.3	6.4	6.5	6.5	6.4	6.2	6.1	5.9	5.5	5.2	5.1	5.2	4.8	4.6	3.9	4.0	3.9	3.8

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
381	3.8	4.1	4.4	4.7	4.8	4.8	4.9	4.9	5.0	5.1	5.2	5.2	5.2	5.2	5.0	4.9	4.9	4.8	4.5	4.5	4.3	4.1
382	3.0	3.5	3.6	3.6	3.9	3.8	3.8	3.9	3.8	3.6	3.8	3.7	3.6	3.8	3.8	3.6	3.6	3.6	3.6	3.4	3.4	3.4
383	1.8	2.0	1.9	2.0	1.9	2.0	2.0	2.1	1.9	2.0	1.9	1.9	2.0	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7
384	3.2	4.3	5.2	5.4	5.8	5.9	5.7	5.4	5.2	4.7	4.3	4.1	3.8	3.7	3.5	3.4	3.3	3.1	3.1	3.1	3.0	2.6
385	2.7	3.3	3.9	4.5	4.7	4.8	4.9	4.8	4.6	4.4	4.3	4.0	3.8	3.6	3.3	3.1	3.0	2.9	2.6	2.4	2.1	2.1
386	2.3	2.3	2.6	2.6	2.6	2.6	2.5	2.6	2.4	2.4	2.4	2.1	2.1	2.1	1.9	1.9	1.7	1.9	1.8	1.9	1.7	1.6
387	3.4	4.2	4.8	5.0	5.4	5.6	5.6	5.7	5.6	5.4	5.2	5.0	4.7	4.4	4.1	3.8	3.4	3.1	2.7	2.5	2.2	2.1
388	2.7	3.3	3.8	4.0	4.0	4.0	3.9	3.9	4.1	4.1	4.1	3.7	3.5	3.4	3.2	2.8	2.5	2.4	2.4	2.2	2.1	2.1
389	1.7	1.8	2.0	2.0	2.1	1.9	2.0	2.0	2.2	2.4	2.3	2.0	1.8	1.7	1.4	1.4	1.4	1.8	1.8	1.8	1.9	1.8
390	4.5	5.1	5.5	5.8	5.9	5.9	5.7	5.6	5.2	4.4	3.8	3.3	3.3	2.9	2.7	2.6	2.3	2.2	1.8	1.6	1.3	1.1
391	2.7	3.6	4.2	4.7	4.8	4.8	4.6	4.3	4.0	3.7	3.4	3.1	2.8	2.6	2.5	2.2	1.9	1.5	1.2	1.0	0.8	0.7
392	1.8	2.2	2.6	2.8	2.8	2.7	2.4	2.2	2.2	1.9	1.8	1.8	1.8	1.5	1.4	1.4	1.2	1.0	1.0	0.9	1.0	0.8
393	3.7	4.5	5.0	5.3	5.3	5.3	5.3	5.2	5.0	4.8	4.6	4.4	4.2	4.2	4.1	3.9	3.8	3.6	3.3	3.0	2.8	2.5
394	2.8	3.4	3.8	4.0	4.3	4.3	4.3	4.1	4.1	4.0	3.8	3.3	3.2	2.9	2.7	2.5	2.1	2.2	2.1	1.8	1.5	1.6
395	1.5	1.7	1.9	2.1	2.1	2.1	2.0	1.8	1.8	1.7	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
396	4.8	5.5	5.9	6.1	6.1	6.0	5.9	5.7	5.4	5.0	4.6	4.1	3.7	3.4	3.1	2.8	2.5	2.3	2.4	2.1	1.8	1.6
397	2.7	3.4	3.7	4.3	4.4	4.4	4.3	4.2	3.9	3.4	3.5	3.3	2.9	2.5	2.1	2.0	1.6	1.6	1.5	1.5	1.4	1.4
398	1.4	1.8	2.0	2.1	2.2	2.1	1.9	1.7	1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.4	1.4	1.3
399	4.3	5.1	5.8	6.2	6.4	6.5	6.5	6.4	6.2	6.0	5.6	4.6	4.6	4.0	3.7	3.4	3.2	2.9	3.0	2.9	2.7	2.4
400	2.3	3.2	3.8	4.0	4.2	4.1	4.2	3.9	3.7	3.7	3.4	3.2	3.0	2.5	2.5	2.3	2.3	2.0	1.9	1.6	1.3	1.2
401	1.5	1.8	2.3	2.5	2.5	2.5	2.4	2.1	2.0	1.9	1.7	1.5	1.5	1.5	1.5	1.7	1.5	1.5	1.4	1.3	1.1	0.9
402	4.5	5.1	5.5	5.8	6.0	6.0	5.9	5.7	5.4	4.9	4.5	4.4	4.1	3.8	3.9	3.7	3.4	3.3	2.8	2.6	2.5	2.4
403	3.9	4.6	5.0	5.1	5.1	4.8	4.5	4.2	4.1	3.9	3.7	3.7	3.7	3.3	3.2	3.1	3.3	3.1	2.9	3.0	2.8	2.6
404	1.7	1.8	1.9	1.9	2.0	2.0	2.0	1.9	1.8	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.4	1.3	1.3	1.3	1.3	1.4
405	5.3	6.1	6.3	6.4	6.3	6.1	5.9	5.7	5.4	5.1	4.8	4.7	4.5	4.1	3.6	3.3	2.9	2.7	2.4	2.2	2.0	1.9
406	3.7	4.3	4.8	4.9	4.9	4.6	4.6	4.5	4.1	3.9	4.0	3.7	3.4	3.2	2.9	2.7	2.6	2.2	2.3	2.2	2.0	1.8
407	3.4	2.9	3.1	3.2	3.0	3.0	2.9	2.8	2.8	2.8	2.6	2.4	2.3	2.2	2.0	1.9	2.0	1.9	1.8	1.8	1.8	1.8
408	2.6	3.3	3.8	4.2	4.4	4.4	4.4	4.3	4.1	3.8	3.5	3.6	3.6	3.2	3.0	2.7	2.4	2.2	2.0	1.7	1.4	1.2
409	2.5	2.9	3.2	3.2	3.2	3.2	2.8	2.7	2.7	2.7	2.7	2.5	2.4	2.3	2.1	2.1	2.0	1.9	1.9	1.9	1.8	1.6
410	2.7	3.3	3.6	3.6	3.7	3.7	3.8	3.7	3.8	3.7	3.8	3.9	3.8	3.8	3.7	3.7	3.5	3.6	3.5	3.4	3.4	3.3
413	4.3	5.0	5.4	5.7	5.8	5.9	5.9	5.9	5.9	5.7	5.7	5.5	5.2	5.0	4.5	4.4	4.2	3.7	3.2	3.1	2.9	2.7
414	3.5	4.0	4.4	4.5	4.8	4.8	4.8	4.7	4.7	4.6	4.4	4.2	4.1	4.1	4.0	3.9	3.7	3.5	3.3	3.1	2.8	2.7
415	4.5	5.1	5.8	6.2	6.5	6.4	6.4	6.4	6.3	6.2	6.1	5.7	5.6	5.4	5.1	4.7	4.3	3.9	3.8	3.5	3.0	2.9
416	3.3	4.0	4.5	4.9	5.0	4.9	4.9	4.9	4.8	4.5	4.4	4.3	4.1	3.8	3.7	3.5	3.5	3.1	3.1	2.8	2.5	2.3
417	2.4	3.0	3.4	3.5	3.8	3.9	3.7	3.7	3.6	3.5	3.3	3.1	3.0	2.8	2.8	2.7	2.5	2.4	2.1	1.9	1.8	1.7
418	3.9	4.4	4.8	5.1	5.3	5.3	5.3	5.3	5.3	5.2	5.1	5.2	5.0	5.0	4.9	4.8	4.4	4.3	4.2	4.1	3.8	3.7
419	2.8	3.2	3.5	3.7	3.9	4.0	3.9	3.8	3.7	3.7	3.6	3.5	3.4	3.3	3.2	3.0	3.0	2.8	2.7	2.4	2.5	2.3
420	3.5	4.1	4.6	5.0	5.2	5.3	5.4	5.4	5.3	4.9	4.9	4.7	4.4	4.3	4.1	3.8	3.4	3.1	2.8	2.6	2.6	2.4
421	4.1	4.9	5.3	5.5	5.7	5.8	5.7	5.5	5.4	5.3	5.2	4.7	4.8	4.7	4.6	4.3	4.0	3.3	3.1	2.8	2.6	2.4
422	4.6	5.2	5.5	5.8	5.9	6.0	6.0	5.9	5.7	5.7	5.5	5.3	5.0	4.9	4.6	4.4	4.1	3.5	3.2	3.0	2.9	2.6
423	2.6	2.9	3.1	3.3	3.5	3.5	3.6	3.5	3.2	3.1	3.1	3.0	2.9	2.9	2.9	2.7	2.7	2.5	2.6	2.4	2.3	2.3
424	4.3	5.3	5.8	6.1	6.3	6.1	6.0	5.8	5.6	5.4	4.9	4.1	3.5	2.7	2.8	2.4	2.0	1.5	1.1	0.9	0.7	0.6
425	4.8	5.3	5.6	5.8	6.0	6.0	5.9	5.7	5.2	5.0	4.4	3.5	3.2	2.8	2.6	1.9	1.7	1.4	1.2	1.0	0.8	0.5
426	4.0	4.6	4.9	5.3	5.4	5.4	5.1	4.9	4.7	4.0	3.6	3.1	2.7	2.2	2.0	1.7	1.5	1.4	1.4	1.4	1.3	1.1
427	1.4	1.6	1.7	1.6	1.5	1.6	1.6	1.5	1.6	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.6	1.6

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
428	3.2	3.9	4.3	4.6	4.8	4.9	4.8	4.7	4.4	4.3	4.1	3.8	3.6	3.4	3.2	3.1	3.0	2.9	2.4	2.3	2.1	1.7
429	2.2	2.5	2.8	2.9	3.0	3.1	3.1	2.9	2.8	2.8	2.6	2.6	2.4	2.3	2.2	2.0	2.0	1.9	1.8	1.7	1.7	1.6
430	4.4	5.0	5.5	5.8	5.9	5.9	5.8	5.7	5.4	4.9	4.5	4.1	3.7	3.4	3.2	2.8	2.7	2.4	2.1	1.9	1.8	1.5
431	3.9	4.6	5.0	5.3	5.4	5.4	5.2	5.1	4.8	4.3	4.0	3.8	3.5	3.3	3.1	2.7	2.3	2.2	1.8	1.6	1.3	1.2
432	2.6	3.2	3.5	3.9	3.9	3.8	3.6	3.5	3.3	2.7	2.7	2.9	3.0	2.8	2.5	2.2	1.9	1.5	1.4	1.2	1.1	1.1
433	3.6	4.6	5.0	5.4	5.4	5.7	5.7	5.6	5.5	5.2	5.0	4.8	3.9	3.5	3.1	2.8	2.8	2.5	2.4	2.1	2.0	1.9
434	2.6	3.1	3.6	3.9	4.2	4.4	4.3	4.3	4.2	4.0	3.4	3.3	3.0	2.8	2.6	2.5	2.1	1.8	1.8	1.5	1.4	1.3
435	3.5	4.1	4.5	4.8	4.7	4.7	4.6	4.3	4.0	3.9	3.9	3.6	3.6	3.3	3.2	3.3	3.0	2.8	2.8	2.7	2.5	2.3
436	3.1	3.8	4.3	4.7	4.7	4.6	4.5	4.2	3.8	3.5	3.4	3.2	3.1	3.1	2.9	2.9	2.8	2.7	2.4	2.4	2.1	2.2
437	3.4	3.9	4.4	4.7	5.0	5.0	5.0	5.0	5.0	4.8	4.5	4.3	4.1	3.7	3.3	3.2	3.0	2.6	2.4	2.2	2.1	1.9
438	4.9	5.3	5.6	5.8	5.8	5.8	5.6	5.3	5.4	5.3	5.0	4.5	4.2	3.8	3.6	3.6	3.3	2.9	2.7	2.4	2.1	1.8
439	5.1	5.5	5.8	6.0	6.0	5.8	5.6	5.3	5.2	5.1	4.6	4.4	4.2	3.9	3.6	3.2	2.9	2.7	2.6	2.3	1.8	1.8
440	4.7	5.2	5.5	5.6	5.7	5.7	5.6	5.3	5.2	4.6	4.6	4.5	4.0	3.5	3.2	2.9	3.0	2.7	2.5	2.3	1.9	1.8
441	3.9	4.4	4.8	5.0	5.1	5.2	5.1	5.1	4.9	4.8	4.6	4.6	4.4	4.3	3.9	3.9	3.9	3.6	3.6	3.5	3.1	3.1
442	2.7	3.0	3.4	3.6	3.6	3.8	3.6	3.6	3.5	3.4	3.2	3.3	3.2	2.9	3.0	2.9	3.0	2.9	2.8	2.8	2.7	2.7
443	2.6	2.9	3.3	3.4	3.4	3.1	3.1	3.0	2.9	2.8	2.7	2.7	2.5	2.4	2.2	2.2	2.0	2.0	2.0	2.0	1.9	2.0
444	3.7	5.0	5.6	5.9	6.2	6.4	6.4	6.3	6.1	6.0	6.0	5.6	5.5	5.0	4.7	4.4	4.1	3.7	3.6	3.7	3.3	3.2
445	3.5	4.5	5.2	5.5	5.8	6.0	6.2	6.2	6.0	5.9	5.8	5.5	5.2	4.8	4.6	4.1	3.6	3.7	3.5	3.5	3.4	2.9
446	3.7	4.3	4.8	5.0	5.2	5.1	5.1	4.9	4.7	4.6	4.3	4.1	4.0	3.8	3.5	3.2	3.0	2.9	2.7	2.5	2.3	2.0
447	2.5	2.7	3.0	3.0	3.0	3.2	3.2	3.2	3.0	3.1	3.1	3.2	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.2	3.1	3.0
448	4.3	5.0	5.7	5.9	6.1	6.1	6.1	5.9	5.7	5.6	5.2	5.1	5.0	4.6	4.2	4.0	3.8	3.7	3.6	3.5	3.0	2.6
449	3.5	4.1	4.9	5.1	5.4	5.4	5.4	5.3	5.3	5.1	4.9	4.8	4.7	4.4	4.4	3.9	3.5	3.4	2.9	2.5	2.6	2.4
450	3.7	4.4	5.2	5.5	6.0	6.2	6.2	6.1	6.0	5.9	5.8	5.6	5.3	5.0	4.7	4.5	4.1	3.8	3.7	3.4	2.7	2.4
451	3.9	5.1	5.7	6.0	6.3	6.3	6.3	6.1	5.9	5.7	5.3	4.8	4.6	3.7	3.3	3.2	3.0	2.7	2.6	2.3	1.9	1.6
452	3.2	4.0	4.6	4.8	5.1	5.3	5.2	5.1	4.8	4.6	4.3	4.1	4.1	3.8	3.4	3.1	2.6	2.3	2.1	2.0	1.6	1.5
453	2.2	2.4	2.9	3.0	3.0	3.0	2.9	2.9	3.0	3.0	3.0	3.0	2.9	2.8	2.8	2.8	2.4	2.3	2.2	2.2	2.1	2.3
454	2.7	3.4	3.8	3.8	3.9	3.9	3.9	3.8	3.7	3.7	3.5	3.4	3.4	3.3	3.1	3.2	3.1	2.9	2.9	2.8	2.9	2.8
455	2.3	2.5	2.7	2.7	2.7	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.6	2.4	2.5	2.3	2.3	2.2	2.1	2.1	2.0
456	2.4	2.5	2.8	2.7	2.9	2.9	2.9	2.9	3.0	2.7	2.6	2.5	2.5	2.7	2.4	2.3	2.3	2.2	2.1	2.2	2.3	2.3
457	3.5	4.4	5.2	5.5	5.7	5.7	5.6	5.2	4.8	4.5	4.1	3.6	3.3	3.3	3.0	2.9	2.6	2.5	2.5	2.6	2.6	2.5
458	3.4	4.2	4.9	5.0	5.3	5.4	5.3	5.1	4.6	4.4	3.8	3.5	3.3	3.2	2.9	2.9	2.7	2.5	2.4	2.4	2.3	2.3
459	2.6	3.4	3.9	4.2	4.6	4.7	4.5	4.5	4.3	4.1	3.8	3.6	3.4	3.3	3.1	2.9	2.8	2.4	2.3	2.3	2.1	1.9
460	3.6	4.4	5.1	5.3	5.6	5.7	5.7	5.4	5.2	5.3	4.9	4.9	4.8	4.4	4.3	4.4	4.1	3.7	3.7	3.3	2.9	2.9
461	2.9	3.1	3.4	3.5	3.7	3.7	3.6	3.6	3.4	3.4	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	2.8	2.9	2.7	2.6
462	2.2	2.4	2.6	2.6	2.6	2.5	2.5	2.4	2.5	2.4	2.3	2.3	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.0	1.9	2.0
463	3.7	4.7	5.3	5.4	5.5	5.5	5.5	5.4	5.3	5.2	5.0	4.7	4.6	4.4	3.9	3.8	3.6	3.7	3.7	3.6	3.5	3.2
464	2.6	3.6	4.5	4.7	4.9	4.9	4.9	4.9	4.4	3.9	3.7	3.0	2.9	2.6	2.7	2.4	2.4	2.2	2.1	2.2	2.2	2.0
465	2.3	3.2	4.0	4.3	4.6	4.8	4.8	4.6	4.5	4.3	4.0	3.6	3.5	3.4	3.1	3.0	2.5	2.2	2.0	1.8	1.9	1.7
466	4.4	5.1	5.7	5.9	5.8	5.7	5.6	5.5	5.1	5.0	4.5	4.0	4.1	4.1	3.7	3.6	3.5	3.4	3.2	3.0	2.9	2.9
467	3.4	4.2	5.0	5.2	5.5	5.4	5.3	4.8	4.4	4.1	3.9	3.6	3.4	3.2	2.9	2.8	2.4	2.3	2.4	2.1	2.2	2.1
468	3.3	4.2	4.8	5.2	5.5	5.8	5.7	5.6	5.4	5.0	4.7	4.2	3.7	3.6	3.3	3.1	2.8	2.6	2.1	1.9	1.8	1.6
469	3.7	4.2	4.4	4.7	4.9	4.9	4.9	5.0	4.8	4.9	4.7	4.8	4.7	4.5	4.3	4.3	4.1	4.0	3.7	3.7	3.8	3.8
470	2.9	3.2	3.4	3.5	3.6	3.6	3.5	3.3	3.1	3.3	3.0	3.1	3.0	3.0	2.9	3.1	2.8	2.8	2.7	2.8	2.6	2.6
471	2.4	2.8	3.1	3.2	2.9	3.0	3.1	2.8	2.8	2.8	2.6	2.6	2.4	2.3	2.2	2.3	2.2	2.0	1.9	1.9	2.0	1.9
472	2.6	2.9	3.4	3.5	3.7	3.6	3.4	3.4	3.3	3.1	3.1	3.2	2.9	2.7	2.5	2.6	2.5	2.2	2.1	2.1	2.0	1.8

Round Number	Penetration Depth (in cm)																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
473	2.5	2.8	3.1	3.3	3.5	3.5	3.4	3.1	2.9	2.8	2.7	2.8	2.6	2.4	2.4	2.1	2.1	1.9	1.8	1.8	1.6	1.4
474	2.8	3.2	3.5	3.7	3.7	3.6	3.5	3.4	3.2	3.2	3.0	3.0	3.0	2.8	2.7	2.3	2.3	2.5	2.4	2.0	1.8	1.8
475	2.3	2.9	3.3	3.4	3.3	3.0	2.9	2.9	2.8	2.8	2.7	2.5	2.6	2.6	2.2	2.3	2.2	2.1	2.0	1.8	1.9	1.9
476	2.1	2.6	2.7	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.3	2.1	2.1	2.0	1.8	1.8	1.5	1.5	1.4	1.4	1.2	1.2
477	1.7	1.9	2.1	2.1	1.9	1.9	1.9	1.8	1.7	1.7	1.5	1.6	1.6	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.6	1.6
478	1.8	1.9	2.0	1.9	1.8	1.7	1.7	1.6	1.4	1.3	1.3	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0	0.8
479	4.0	4.9	5.6	5.7	5.9	6.0	5.9	5.7	5.6	5.3	4.9	4.5	3.6	3.2	3.1	2.6	2.2	2.0	1.8	1.7	1.6	1.3
480	3.4	4.4	5.0	5.2	5.4	5.4	5.2	4.8	4.4	4.2	3.7	3.9	3.6	3.2	3.1	2.9	2.4	2.1	1.7	1.4	1.3	1.0
481	2.7	3.5	4.0	4.1	4.4	4.3	4.3	3.8	3.7	3.5	3.0	2.8	2.7	2.8	2.5	2.4	1.9	1.7	1.3	1.2	1.0	1.1
482	1.8	2.2	2.6	2.8	3.0	2.9	2.9	2.8	2.6	2.6	2.1	1.9	1.8	1.5	1.6	1.5	1.4	1.4	1.2	1.2	1.0	0.8
483	1.9	2.3	2.6	2.5	2.6	2.3	2.1	2.1	2.0	2.0	1.9	1.7	1.6	1.2	1.2	1.2	1.2	1.1	1.1	0.8	0.6	0.6
484	1.1	1.5	1.9	1.9	1.9	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.6	1.4	1.4	1.3	1.2	1.1	1.2
485	4.0	4.8	5.6	5.8	6.3	6.2	6.1	6.3	6.2	6.0	5.9	5.4	5.1	4.6	4.2	3.8	3.2	2.6	2.4	1.9	1.6	1.2
486	3.1	3.5	4.0	4.2	4.2	4.2	4.2	4.0	3.9	3.7	3.5	3.3	3.3	3.2	2.9	2.8	2.6	2.6	2.4	2.0	1.8	1.7
487	3.1	3.6	4.0	4.1	4.2	4.1	4.0	4.0	4.0	3.9	3.9	3.6	3.4	3.1	3.0	2.9	2.8	2.6	2.5	2.2	2.3	2.1
488	2.5	2.5	2.8	2.9	3.1	3.0	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.6	2.2	2.3	2.3	2.1	2.2	2.2	2.1	2.0
489	1.8	2.1	2.2	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.2	2.1	2.3	2.3	2.1	2.2	2.1	2.0	2.1	2.2	2.1	2.1
490	4.1	4.8	5.4	5.7	5.9	5.9	5.7	5.4	5.1	4.8	4.3	3.9	3.3	2.7	2.7	2.4	1.9	1.6	1.1	0.8	0.7	0.0
491	3.9	4.4	4.8	5.2	5.4	5.4	5.4	5.1	4.7	4.2	3.4	2.9	2.4	2.4	2.3	1.9	1.6	1.3	1.0	0.8	0.7	0.5
492	3.4	4.1	4.6	4.9	5.0	4.9	4.8	4.7	4.4	4.0	3.7	3.2	2.8	2.4	2.1	1.8	1.4	1.0	0.8	0.8	0.5	0.0
493	3.2	3.9	4.4	4.9	4.9	4.8	4.7	4.5	4.1	3.7	3.0	2.7	2.4	2.1	1.8	1.4	1.1	0.9	0.7	0.6	0.0	0.0
494	2.4	2.9	3.3	3.5	3.5	3.5	3.4	3.3	3.0	2.8	2.5	2.0	2.0	1.8	1.6	1.1	0.8	0.6	0.6	0.6	0.6	0.6
495	1.8	2.0	2.2	2.4	2.4	2.3	2.1	2.0	2.0	1.8	1.8	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.7
496	1.6	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.1	1.9
497	2.9	3.1	3.5	3.6	3.7	3.7	3.8	3.6	3.7	3.6	3.3	3.2	3.0	3.3	3.3	3.2	3.3	3.3	3.1	3.0	3.0	3.0
501	5.5	6.2	6.6	7.0	7.2	7.3	7.2	7.1	6.8	6.3	5.7	4.7	4.1	3.3	2.5	2.2	1.8	1.7	1.1	0.8	0.5	0.0
502	5.5	6.1	6.6	6.9	7.0	7.1	6.9	6.7	6.3	5.6	5.1	4.6	4.0	3.2	2.8	2.4	1.6	1.1	0.9	0.7	0.6	0.0
503	3.2	4.2	4.8	4.9	5.1	5.1	4.9	4.7	4.0	3.8	3.3	2.5	2.6	2.3	1.8	1.8	1.6	1.5	1.3	1.0	0.9	0.7
504	3.4	4.2	4.5	4.8	4.9	4.7	4.5	4.1	3.6	3.5	2.8	2.5	2.4	2.0	1.9	1.7	1.4	1.3	0.8	0.7	0.7	0.0
505	2.1	2.7	3.0	3.1	3.2	3.2	3.1	2.7	2.3	2.3	2.2	2.0	1.8	1.8	1.5	1.3	1.3	1.2	1.0	1.0	0.9	0.7
506	1.3	1.6	1.8	1.8	1.7	1.7	1.6	1.6	1.5	1.4	1.5	1.3	1.2	1.2	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9
507	4.5	5.6	6.6	6.9	7.2	7.3	7.4	7.3	7.2	7.2	7.0	6.7	6.4	5.9	5.5	5.3	4.8	4.6	4.4	4.0	3.6	3.3
508	1.8	1.9	2.2	2.3	2.2	2.1	2.1	1.9	1.9	2.0	2.0	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.7	1.4	1.6	1.5
509	1.3	1.5	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.2	1.3
510	4.6	5.7	6.7	6.9	7.2	7.2	7.3	7.2	6.8	6.5	6.1	5.4	5.0	4.2	3.5	3.0	3.1	2.7	2.5	2.2	2.0	1.8
512	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.0	3.4	3.2	2.8	1.9	1.8	1.4
513	3.1	4.1	4.9	5.1	5.7	6.0	6.0	5.8	5.6	5.5	5.4	4.8	4.6	4.2	3.7	3.5	3.1	2.7	2.5	1.9	1.5	1.3
514	2.0	2.8	3.4	3.6	4.0	4.0	3.9	3.7	3.5	3.4	3.3	3.2	3.1	2.9	2.9	2.6	2.4	2.2	1.8	1.8	1.6	1.4
515	3.5	4.1	4.4	4.6	4.8	4.9	4.8	4.7	4.6	4.3	4.5	4.3	4.2	4.1	4.0	4.0	3.8	3.8	3.7	3.7	3.7	3.6
516	2.1	2.6	3.0	3.1	2.9	2.9	2.9	2.9	2.6	2.7	2.7	2.8	2.6	2.4	2.4	2.5	2.6	2.5	2.4	2.5	2.5	2.4
517	1.9	2.3	2.9	2.9	3.1	3.1	3.1	2.9	2.7	2.8	2.8	2.7	2.6	2.7	2.6	2.5	2.3	2.3	2.3	2.1	2.0	2.0
518	6.4	7.2	7.7	7.9	8.1	8.2	8.1	7.9	7.8	7.3	6.8	6.3	5.4	4.8	4.0	3.3	3.1	2.5	2.0	1.9	1.3	1.1
519	4.3	5.1	5.8	6.0	6.3	6.4	6.2	6.1	5.6	5.4	5.0	4.4	4.0	3.1	2.4	2.3	2.2	1.8	1.3	1.1	0.8	0.6
520	3.1	4.0	4.8	5.0	5.3	5.4	5.4	5.0	4.7	4.6	4.2	3.9	3.7	3.4	2.9	2.8	2.6	2.7	2.3	2.1	1.8	1.5
521	2.0	2.8	3.6	3.9	4.1	4.5	4.5	4.2	3.9	3.8	3.5	3.1	2.8	2.6	2.2	1.9	1.6	1.2	1.1	1.0	0.8	0.5

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
522	1.3	1.5	1.7	1.7	1.7	1.6	1.5	1.4	1.4	1.5	1.7	1.8	1.8	1.9	1.9	1.9	1.8	1.7	1.6	1.4	1.3	1.1
523	4.2	5.4	6.2	6.5	6.8	6.9	6.8	6.8	6.8	6.7	6.4	6.2	5.9	5.7	5.4	5.3	5.2	5.0	4.6	4.4	4.1	4.0
524	3.4	4.3	4.7	4.9	5.0	5.2	5.2	5.2	5.0	4.9	4.7	4.5	4.2	4.0	4.1	4.3	4.2	3.7	3.5	3.2	3.2	3.1
525	2.7	3.4	3.8	4.1	4.5	4.7	4.6	4.4	4.4	4.3	4.3	4.2	4.1	3.9	3.7	3.9	3.5	3.2	3.1	2.9	2.8	2.7
857	3.3	4.0	4.5	4.8	5.4	5.6	5.6	5.6	5.4	5.1	4.9	4.1	3.1	2.9	2.4	1.9	1.7	1.4	1.4	1.1	1.0	0.8
858	1.6	2.1	3.0	3.3	3.9	4.2	4.4	4.4	4.3	4.0	3.8	3.3	2.8	2.4	2.2	1.6	1.1	1.0	0.8	0.6	0.0	0.0
859	1.6	1.9	2.5	2.7	3.3	3.6	3.8	3.9	3.8	3.7	3.5	3.2	3.1	2.5	2.1	1.8	1.5	1.2	1.1	0.9	0.9	0.7
860	0.9	1.1	1.3	1.3	1.3	1.2	1.2	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.3	1.3
861	0.8	1.2	1.4	1.4	1.5	1.4	1.4	1.3	1.2	1.2	1.2	1.0	1.0	1.2	1.4	1.2	1.2	1.1	1.1	1.0	0.9	1.0
862	1.1	1.3	1.7	1.7	1.8	1.9	1.8	1.7	1.6	1.6	1.5	1.6	1.6	1.5	1.5	1.4	1.3	1.3	1.3	1.1	1.0	0.9
863	1.4	2.2	2.8	3.1	3.5	3.6	3.5	3.2	2.9	2.6	2.1	1.4	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
864	3.0	4.1	4.7	4.9	5.4	5.5	5.5	5.2	4.8	4.6	4.3	3.6	3.0	1.9	1.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0
865	1.1	1.4	1.7	1.8	1.7	1.7	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.1	1.0	0.9	0.9	0.9	1.0	1.1	1.1	1.1
866	0.9	1.1	1.5	1.7	1.8	1.7	1.8	1.6	1.4	1.4	1.4	1.3	1.5	1.6	1.4	1.2	1.2	1.2	1.4	1.5	1.7	1.5
867	1.4	1.5	1.8	1.9	1.9	1.8	1.8	1.9	1.8	1.6	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.7	1.7	1.8
868	2.6	3.1	3.5	3.6	3.8	3.8	3.8	3.7	3.7	3.6	3.6	3.8	3.8	4.1	4.1	4.2	4.4	4.4	4.5	4.6	4.4	4.1
869	1.6	2.0	2.4	2.5	2.6	2.8	2.8	2.6	2.4	2.5	2.6	2.5	2.8	2.9	2.7	2.6	2.8	2.5	2.6	3.2	3.3	3.3
870	1.5	1.7	2.0	2.1	2.3	2.3	2.4	2.2	2.0	2.0	2.4	2.1	2.2	2.2	2.1	2.3	2.3	2.3	2.4	2.4	2.8	2.8
871	2.3	2.5	2.6	2.7	2.7	2.9	2.8	2.8	3.0	3.0	2.8	2.6	2.6	2.7	2.6	2.4	2.5	2.6	2.2	2.7	2.6	2.4
872	1.7	2.0	2.2	2.4	2.3	2.4	2.4	2.4	2.5	2.7	2.7	2.7	3.0	3.0	3.0	3.0	3.0	2.8	2.9	3.0	3.2	3.5
873	1.6	1.8	1.9	1.9	2.0	1.9	2.1	1.9	1.9	1.8	2.0	1.9	2.1	2.0	2.0	1.9	1.8	2.0	1.8	1.7	1.9	1.7
874	3.3	3.9	4.6	5.0	5.2	5.4	5.5	5.4	5.5	5.5	5.4	5.0	4.5	4.2	3.9	3.3	2.6	2.2	2.1	2.1	2.1	2.1
875	2.9	3.5	4.2	4.6	4.9	5.1	5.2	5.2	5.1	4.8	4.4	4.2	4.1	3.7	3.2	2.8	2.4	2.0	1.6	1.2	0.8	0.8
876	2.8	3.5	4.1	4.7	5.0	5.1	5.1	5.0	5.1	5.0	4.5	4.3	4.1	3.6	3.0	2.8	2.5	2.2	1.9	1.6	1.3	1.0
877	2.8	3.5	4.1	4.7	5.0	5.1	5.1	5.0	5.1	5.0	4.5	4.3	4.1	3.6	3.0	2.8	2.5	2.2	1.9	1.6	1.3	1.0
878	2.2	2.3	2.4	2.5	2.7	2.8	3.0	3.0	3.1	3.1	3.0	3.1	3.3	3.2	2.8	2.5	2.4	2.2	2.0	2.1	1.9	1.8
879	1.4	1.5	1.7	2.0	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.1	1.9	1.6	1.6	1.5	1.4	1.2	1.1
880	2.3	2.6	2.9	3.1	3.2	3.3	3.2	3.6	3.8	4.3	4.6	4.8	5.0	5.0	5.1	5.2	5.0	4.8	4.3	3.9	3.8	3.6
881	2.3	2.6	2.9	3.1	3.2	3.3	3.2	3.6	3.8	4.3	4.6	4.8	5.0	5.0	5.1	5.2	5.0	4.8	4.3	3.9	3.8	3.6
882	1.9	1.9	2.0	2.3	2.5	2.8	2.9	3.3	3.4	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.4	3.3	3.1	3.0	2.9	2.5
883	1.7	1.8	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.9	3.2	3.5	3.6	3.7	3.8	3.8	3.6	3.2	3.0	3.2	2.9	2.7
884	1.9	2.3	2.5	2.6	3.0	3.3	3.4	3.7	3.7	3.7	3.8	3.9	3.8	3.8	3.8	3.6	3.3	3.1	2.9	3.0	3.1	3.1
885	2.4	2.6	2.9	3.1	3.2	3.4	3.3	3.5	3.3	3.3	3.5	3.3	3.2	3.0	3.3	3.3	3.4	3.5	3.5	3.5	3.9	4.2
886	3.8	4.3	4.9	5.1	5.4	5.4	5.5	5.5	5.3	5.3	5.6	5.6	5.6	5.4	5.4	5.2	5.3	5.1	4.6	4.4	4.2	4.0
887	3.1	3.7	4.2	4.4	4.6	4.7	4.8	4.9	5.0	4.9	4.6	4.5	4.3	4.2	4.2	4.1	4.3	4.2	3.9	3.6	3.5	3.3
888	2.0	2.7	3.0	3.2	3.4	3.5	3.5	3.5	3.4	3.3	3.3	3.5	3.4	3.2	2.9	2.6	2.5	2.7	2.6	2.4	2.5	2.5
889	2.5	2.9	3.5	3.8	4.0	4.2	4.2	4.2	4.0	3.9	3.8	3.6	3.6	3.4	3.1	3.1	3.0	3.0	2.7	2.6	2.8	2.6
890	1.7	2.3	2.6	2.6	2.6	2.6	2.6	2.8	2.7	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.0	1.9	1.9	1.9
891	4.2	5.0	5.4	5.7	5.9	6.1	6.1	5.9	5.7	5.5	5.1	4.8	4.2	3.7	3.2	3.0	2.6	2.2	1.8	1.5	1.2	0.9
892	4.2	5.0	5.4	5.7	5.9	6.1	6.1	5.9	5.7	5.5	5.1	4.8	4.2	3.7	3.2	3.0	2.6	2.2	1.8	1.5	1.2	0.9
893	3.1	3.0	3.5	4.0	4.4	4.8	4.9	4.8	4.6	4.6	4.4	4.1	3.6	3.1	2.4	1.9	1.4	1.1	0.9	0.7	0.4	0.0
894	1.9	1.9	2.0	2.2	2.2	2.3	2.3	2.1	2.0	2.0	1.8	1.9	1.7	1.7	1.7	1.6	1.8	2.0	1.9	1.8	1.8	1.8
895	1.1	1.3	1.4	1.5	1.4	1.2	1.3	1.2	1.2	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.3	1.3
896	3.1	3.5	3.8	3.9	3.8	3.9	3.7	3.9	4.2	4.1	3.7	3.5	3.5	3.5	3.5	3.4	3.2	2.9	3.1	3.1	2.7	2.7
897	2.4	2.4	2.6	2.7	2.8	2.8	2.9	2.6	2.8	2.8	2.9	3.2	3.3	3.0	2.6	2.5	2.4	2.5	2.4	2.2	2.0	2.1
898	1.7	2.0	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.3	2.0	2.0	2.1	2.1	2.0	1.9	2.0	1.9	1.7	1.4	1.6	1.7

Penetration Depth (in cm)

Round Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
899	3.4	4.0	4.3	4.4	4.4	4.5	4.6	4.6	4.6	4.7	4.6	4.5	4.3	4.0	3.8	3.5	3.5	3.4	3.0	2.9	2.7	2.6
900	2.2	2.2	2.6	2.7	2.7	2.8	2.7	2.7	2.5	2.6	2.3	2.4	2.4	2.3	2.5	2.3	2.5	2.6	2.7	2.8	2.9	3.2
901	2.6	3.2	3.7	4.1	4.5	4.8	5.0	5.2	5.3	5.3	5.1	5.1	5.1	5.0	4.9	4.7	4.2	3.8	3.0	3.2	2.9	2.5
902	2.7	2.9	3.3	3.5	3.5	3.6	3.6	3.7	3.9	4.0	4.0	4.0	3.8	3.7	3.3	3.0	2.8	2.7	2.4	2.2	1.9	1.5
903	1.9	2.0	2.1	2.3	2.5	2.6	2.3	2.2	2.2	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.3	2.2	2.0	2.1
904	3.6	4.0	4.6	5.1	5.5	5.7	5.8	5.8	5.9	5.7	5.6	5.3	4.9	4.5	4.0	3.5	3.1	2.7	2.4	2.0	1.7	1.3
905	2.6	3.1	3.8	4.3	4.6	4.9	5.0	5.2	5.3	5.1	4.6	4.3	3.9	3.5	3.2	2.9	2.7	2.3	1.9	1.4	1.2	1.0
906	2.3	2.8	3.0	3.1	3.1	3.4	3.5	3.7	3.5	3.3	3.4	3.5	3.3	3.1	3.1	2.7	2.6	2.2	1.8	1.8	1.8	1.9
907	1.5	1.7	1.8	1.9	2.0	2.1	2.1	1.8	1.6	1.9	1.8	1.8	1.7	1.7	1.8	1.9	2.1	2.0	1.9	1.9	2.0	2.0
908	2.9	2.6	3.1	3.4	3.8	3.8	3.8	3.4	3.1	2.8	2.6	2.4	2.1	1.8	1.6	1.4	1.4	1.3	1.2	1.1	0.9	0.8
909	2.8	3.4	3.7	4.0	4.2	4.0	3.8	3.7	3.6	3.5	3.2	3.3	3.2	3.0	2.7	2.7	2.5	2.4	2.0	1.9	1.8	1.6
910	3.7	4.1	4.4	4.6	4.9	5.0	4.8	4.7	4.3	4.3	4.0	4.0	3.7	3.4	3.1	2.8	2.3	2.1	1.8	1.4	1.2	1.2
911	2.7	3.2	3.6	3.8	3.9	4.1	4.0	3.9	4.0	3.7	3.8	3.6	3.4	3.6	3.7	3.7	4.1	4.1	4.2	4.2	4.1	4.2
912	1.9	2.5	2.7	2.9	3.0	3.1	3.3	3.0	3.2	3.2	2.8	2.8	2.8	3.2	3.2	3.2	3.1	3.2	3.3	3.6	3.5	3.7
913	1.7	2.0	2.2	2.2	2.4	2.6	2.8	2.9	2.9	2.9	3.2	3.3	3.5	3.7	3.8	3.8	3.6	4.0	4.2	4.5	4.5	4.4
914	3.7	4.8	5.5	6.1	6.5	6.8	7.1	7.1	7.1	6.8	6.6	6.3	6.0	5.7	5.6	5.3	5.0	4.5	3.9	3.4	2.7	1.9
915	3.0	3.5	4.1	4.6	4.7	4.8	4.8	4.8	4.7	4.7	4.8	4.9	4.7	4.3	3.9	3.6	3.5	3.2	2.9	2.6	2.7	2.5
916	2.2	2.8	3.3	3.3	3.4	3.7	3.7	3.7	3.5	3.4	3.2	3.1	3.2	2.9	3.1	3.1	2.8	3.0	2.8	2.7	2.5	2.7
917	2.0	2.2	2.7	3.0	3.1	3.2	3.1	2.9	2.9	2.8	2.9	2.8	2.5	2.5	2.6	2.4	2.7	2.6	2.0	1.9	1.9	2.0
918	3.2	3.9	4.6	5.0	5.3	5.5	5.4	5.2	4.8	4.4	4.0	3.8	3.7	3.6	3.4	3.1	2.8	2.9	2.8	2.6	2.3	1.9
919	3.4	4.3	4.8	5.3	5.5	5.6	5.7	5.7	5.6	5.2	5.1	4.9	4.5	3.7	2.9	2.7	2.5	2.4	2.1	1.9	1.6	1.4
920	3.4	4.3	5.1	5.6	5.9	6.2	6.2	6.2	6.1	5.9	5.8	5.2	4.8	4.3	3.5	3.1	2.6	2.3	1.9	1.6	1.4	1.2
921	2.9	3.6	4.3	4.7	5.1	5.3	5.4	5.4	5.3	5.1	4.8	3.7	3.0	2.8	2.6	2.4	2.2	2.0	1.7	1.4	1.4	1.3
922	2.5	3.3	4.0	4.4	4.8	5.0	5.2	5.2	5.2	5.0	4.4	4.1	3.7	3.2	2.8	2.6	2.3	1.9	1.7	1.4	1.2	1.1
923	1.8	2.3	2.7	2.8	3.2	3.3	3.8	3.9	3.9	4.0	3.9	3.5	3.8	3.7	3.3	3.0	2.7	2.5	2.2	1.8	1.4	1.3
924	1.7	2.0	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.0	1.7	2.0	1.9	1.7	1.7	1.8	1.6	1.4	1.4	1.4	
A02	3.1	3.5	3.9	4.0	3.8	3.8	3.5	3.3	3.2	2.9	2.3	1.9	1.5	1.3	1.1	0.8	0.8	0.0	0.0	0.0	0.0	0.0
A03	1.5	1.6	1.4	1.5	1.5	1.4	1.4	1.1	1.2	1.3	1.3	1.5	1.4	1.3	1.4	1.4	1.3	1.4	1.3	1.2	1.1	0.9
A04	2.3	2.6	2.8	2.9	3.2	3.1	2.9	2.8	2.8	2.6	2.2	2.0	1.8	1.5	1.2	0.8	0.7	0.0	0.0	0.0	0.0	0.0
A05	4.6	4.5	4.8	4.6	4.4	4.4	4.0	3.9	3.4	3.3	2.8	2.4	1.9	1.3	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0
A06	4.3	4.9	4.8	4.9	4.7	4.5	4.2	3.8	3.3	2.8	2.4	1.9	1.6	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
A07	3.1	3.0	3.5	3.6	3.7	3.2	3.1	2.8	2.5	2.1	1.6	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A08	1.2	1.5	1.4	1.3	1.1	1.0	1.0	1.1	0.9	0.9	0.9	1.0	0.9	1.0	1.0	1.1	1.1	1.1	1.0	0.9	0.9	0.8
A09	1.7	1.8	2.2	2.3	2.3	2.3	2.1	1.8	1.8	1.7	1.7	1.5	1.4	1.2	1.1	1.1	1.0	0.9	0.8	0.7	0.6	0.4
A10	2.8	3.5	3.9	4.2	4.1	3.9	3.5	3.1	2.8	2.2	1.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A11	2.9	3.2	3.4	3.4	3.4	3.2	3.2	2.9	2.6	2.1	1.8	1.5	1.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A12	3.6	4.1	4.7	5.1	4.9	4.7	4.4	4.0	3.8	3.3	2.7	2.4	2.1	1.7	1.2	0.9	0.9	0.0	0.0	0.0	0.0	0.0
A13	5.0	5.3	5.4	4.9	4.6	4.4	4.6	4.4	4.3	4.1	3.3	2.2	2.1	2.0	1.7	1.2	0.9	0.9	0.8	0.6	0.8	0.4
A14	5.1	5.6	5.5	5.6	5.4	5.4	4.9	4.3	3.7	3.3	2.7	2.4	2.1	1.9	1.7	1.7	1.4	1.1	0.9	0.8	0.7	0.5
A15	1.4	1.6	1.5	1.7	1.8	1.7	1.7	1.7	1.3	1.5	1.4	1.5	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.4	1.6	1.7
A16	3.7	3.6	4.4	4.7	4.7	4.8	4.7	4.8	4.6	4.3	3.9	3.4	3.0	2.6	2.2	1.9	1.6	1.5	1.3	1.1	1.0	0.8
A17	4.1	4.1	4.1	4.1	4.5	4.4	4.3	4.2	3.9	3.6	3.2	2.9	2.6	2.2	1.9	1.5	1.2	1.1	0.0	0.0	0.0	0.0
A18	4.0	4.3	4.6	4.8	4.7	4.3	4.2	3.9	3.7	3.4	3.2	2.9	2.9	2.7	2.4	2.0	1.5	1.2	1.1	0.8	0.3	0.0
A19	3.4	3.9	4.3	4.5	4.6	4.6	4.2	3.9	3.6	3.3	2.9	2.6	2.5	2.4	2.2	2.2	1.9	1.6	1.4	1.1	1.0	1.0
A20	1.6	1.9	1.8	1.9	1.8	1.7	1.6	1.4	1.5	1.3	1.3	1.2	1.4	1.3	1.3	1.3	1.5	1.4	1.5	1.6	1.5	1.6
A21	2.2	2.5	2.8	3.1	3.5	3.6	3.5	3.6	3.5	3.2	3.0	2.6	2.3	2.1	2.0	2.0	1.9	1.7	1.7	1.3	1.1	0.9
A22	1.8	1.8	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.8	1.7	1.7	1.8	1.5	1.9	1.9	1.9	1.9	1.8	2.0
A23	2.4	2.2	2.0	2.2	2.3	2.0	2.2	2.0	1.9	2.1	2.1	2.0	1.9	1.9	2.0	1.7	1.8	1.9	1.6	1.8	1.9	1.7

APPENDIX

C

INDEX TO TEST BULLETS

BY

MANUFACTURER AND BULLET CHARACTERISTICS

HI-PRECISION

Caliber	Weight (grains)	Type	Appendix	Page
38	110	JHP	A19	32
38	158	JSP	A30	71
44	240	JHP	A48	82
45	170	Hemi/JHP	A51	87

HORNADY

Caliber	Weight (grains)	Type	Appendix	Page
38	110	JHP	A19	32
38	125	JHP	A21	39
38	158	JHP	A29	53
38	158	JSP	A30	57
41	210	JHP	A40	73
44	200	JHP	A46	79
44	240	JHP	A48	82

MB ASSOCIATES

Caliber	Weight (grains)	Type	Appendix	Page
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REMINGTON

Caliber	Weight (grains)	Type	Appendix	Page
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38	125	JHP	A21	39
38	148	WC	A25	48
38	158	JHP	A29	53
38	158	JSP	A30	57
38	158	LRN	A32	63
38	158	MP	A33	65
38	158	SWC	A34	66
38	185	JHP	A36	69
38	200	LRN	A37	70
41	210	JSP	A41	74
41	210	SWC	A42	75
45	185	JHP	A53	89
45	185	WC	A55	91
45	230	FJ	A59	95

SIERRA

Caliber	Weight (grains)	Type	Appendix	Page
38	110	JHP	A19	32
38	125	JHP	A21	39
38	125	JSP	A22	44
38	150	JHP	A26	50
38	158	JSP	A30	57
41	170	JHP	A38	71
41	210	JHP	A40	73
44	180	JHP	A44	77
44	240	JHP	A48	82

SMITH & WESSON

Caliber	Weight (grains)	Type	Appendix	Page
9 mm	90	JSP	A2	15
9 mm	100	FJ	A3	16
9 mm	100	JHP	A5	18
9 mm	100	JSP	A6	19
9 mm	115	FJ	A7	20
9 mm	115	JHP	A9	22
38	90	Hemi/JSP	A15	28
38	110	JHP	A19	32
38	125	JHP	A21	39
38	148	WC	A25	48
38	158	JHP	A29	53
38	158	JSP	A30	57
38	158	LRN	A32	63
38	158	SWC	A34	66

SPEER

Caliber	Weight (grains)	Type	Appendix	Page
9 mm	100	JHP	A5	18
9 mm	125	RN	A12	25
9 mm	125	JSP	A13	26
38	110	JHP	A19	32
38	125	JHP	A21	39
38	125	JSP	A22	44
38	140	JHP	A23	46
38	146	JHP	A24	47
38	148	WC	A25	48
38	158	JSP	A30	57
38	158	SWC	A34	66
38	160	JSP	A35	68
41	200	JHP	A39	72
41	220	JSP	A43	76
44	200	JHP	A46	79
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44	240	JSP	A49	84
44	240	SWC	A50	86
45	200	JHP	A56	92
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Caliber	Weight (grains)	Type	Appendix	Page
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38	110	JSP	A20	38
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WINCHESTER-WESTERN

Caliber	Weight (grains)	Type	Appendix	Page
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9 mm	115	JHP	A10	23
38	95	JHP	A17	30
38	110	JHP	A19	32
38	148	WC	A25	48
38	150	JSP	A27	51
38	150	LRN	A28	52
38	158	JHP	A29	53
38	158	JSP	A30	57
38	158	LHP	A31	61
38	158	LRN	A32	63
38	158	MP	A33	65
38	158	SWC	A34	66
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45	230	FJ	A60	96
45	255	LRN	A62	98

ZERO

Caliber	Weight (grains)	Type	Appendix	Page
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38	110	JHP	A19	32
38	125	JHP	A21	39

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