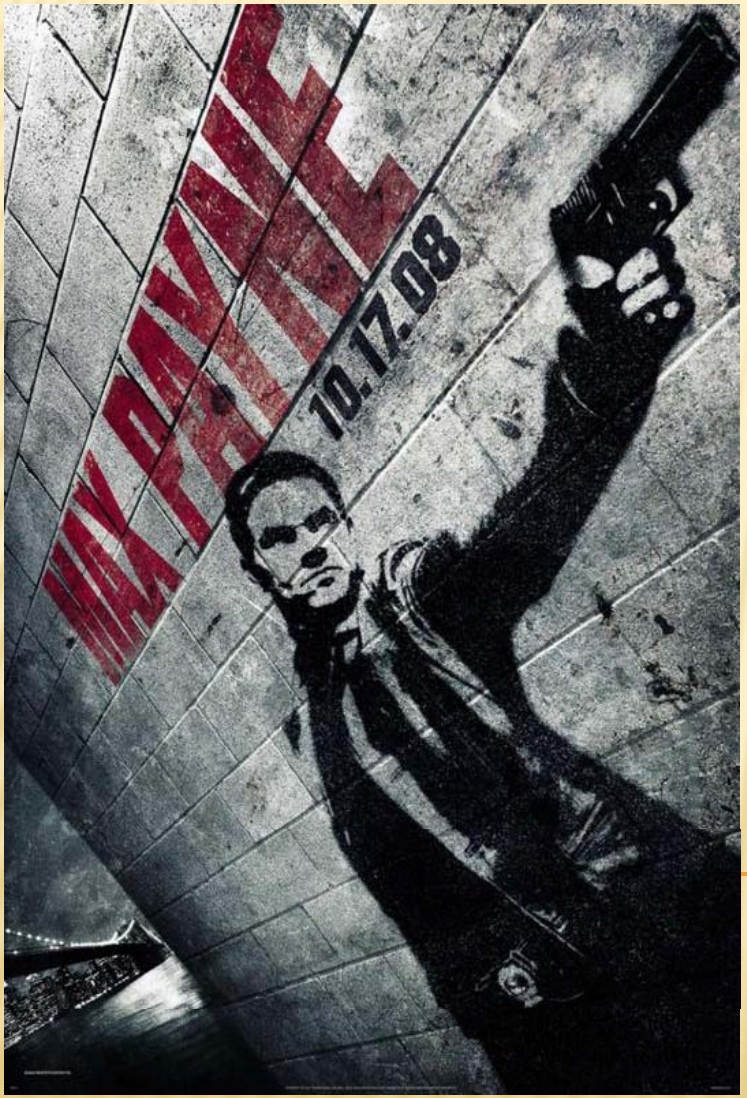
Estimating the shooting distance of a 9-mm Parabellum Bullet Via ballistic experiment



F.Bresson, O.Frank
INPS,Laboratoire de Police Scientifique,France

Forensic Science International 192 (2009)

Mr. Kamchai Sritham 52312302

Introduction

Introduction

- Machine Gun

Introduction

- Sub-machine Gun

Introduction

- Rifle

Introduction

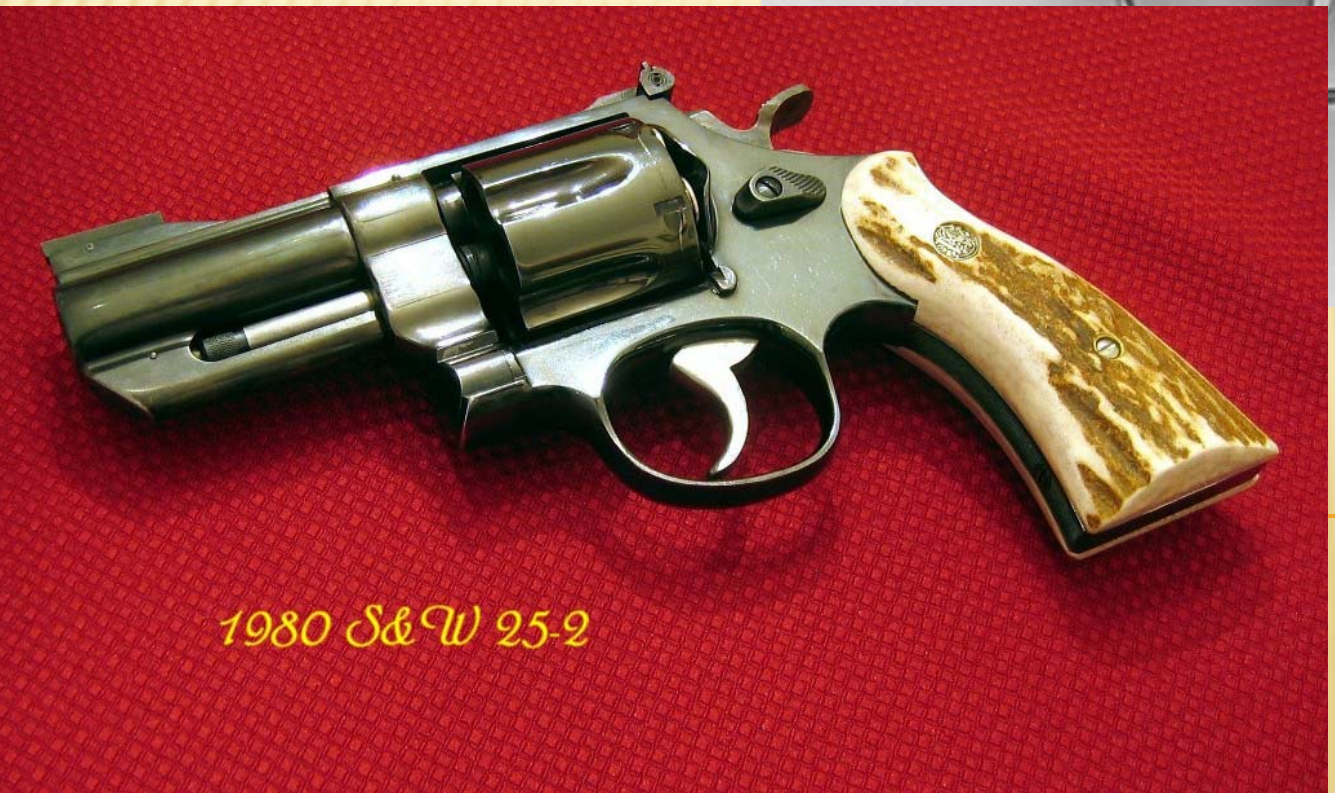
- Short gun

Introduction

- Pistol

Introduction

- Revolver

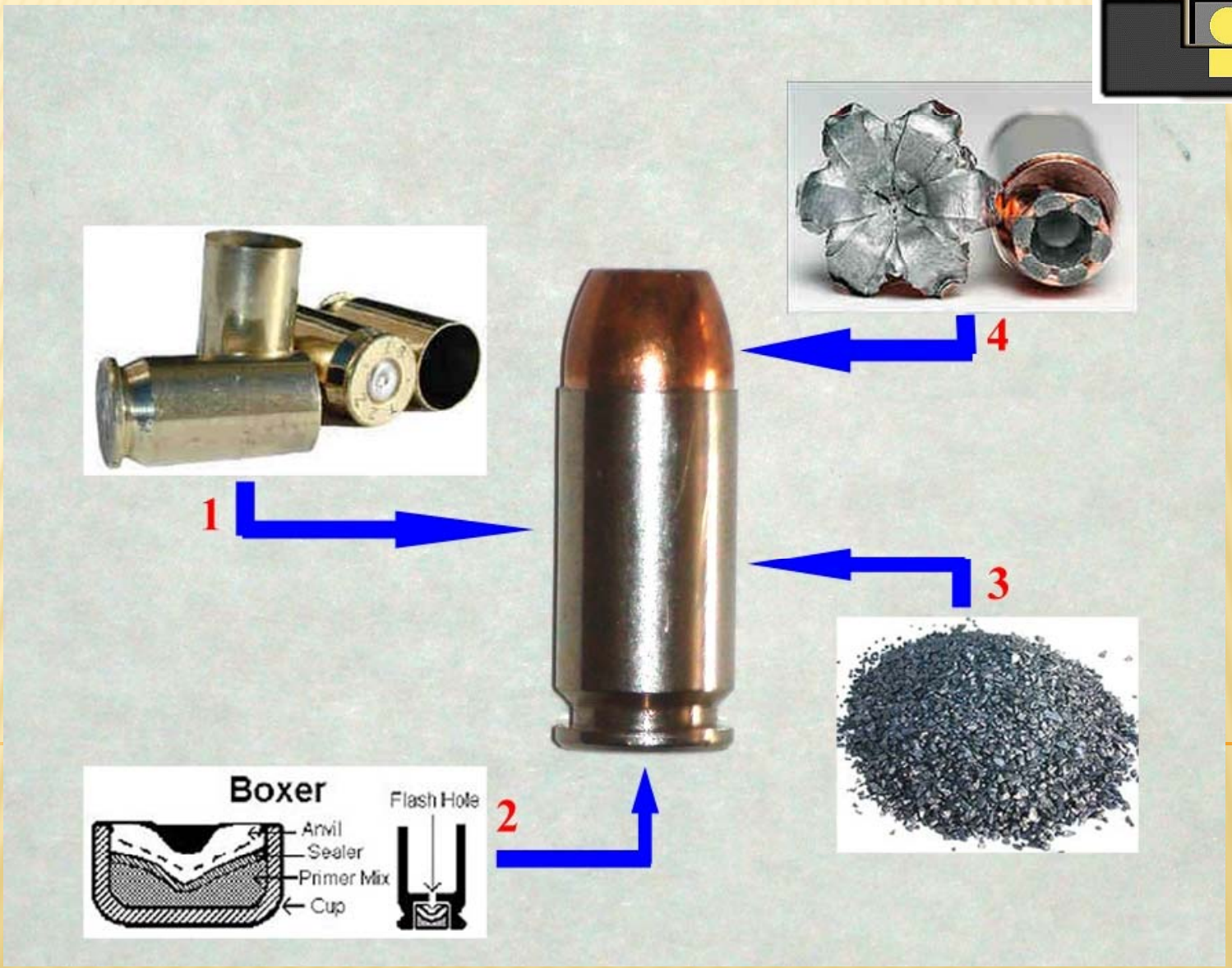


Introduction

- Semi-automatic

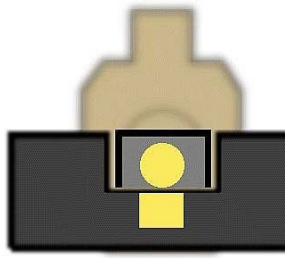
Introduction

Introduction

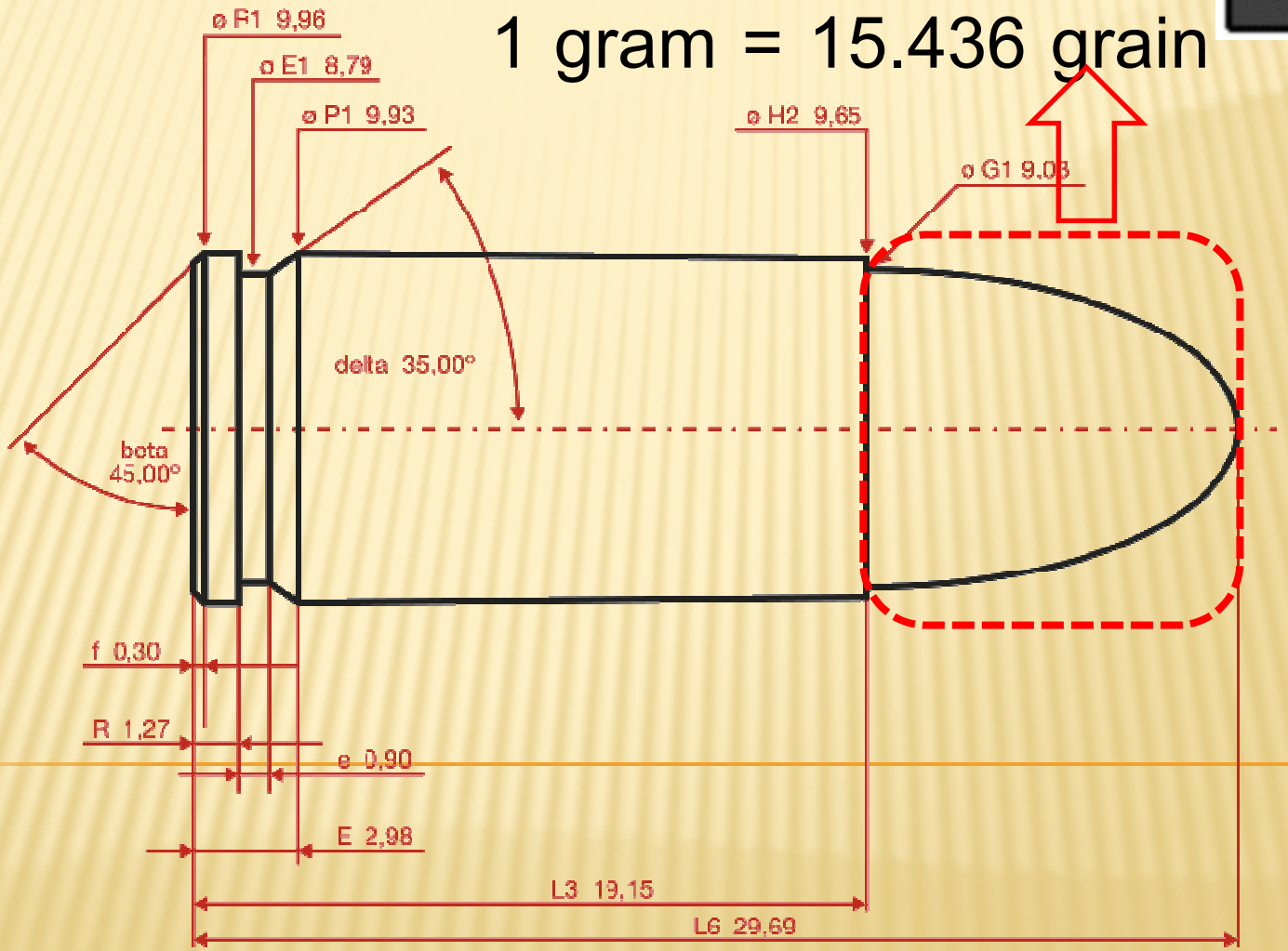


Introduction

Grain



1 gram = 15.436 grain



Introduction

-Type

FMJ

JHP

Introduction

-Type

JSP

LRN

Introduction

-Type

LWC

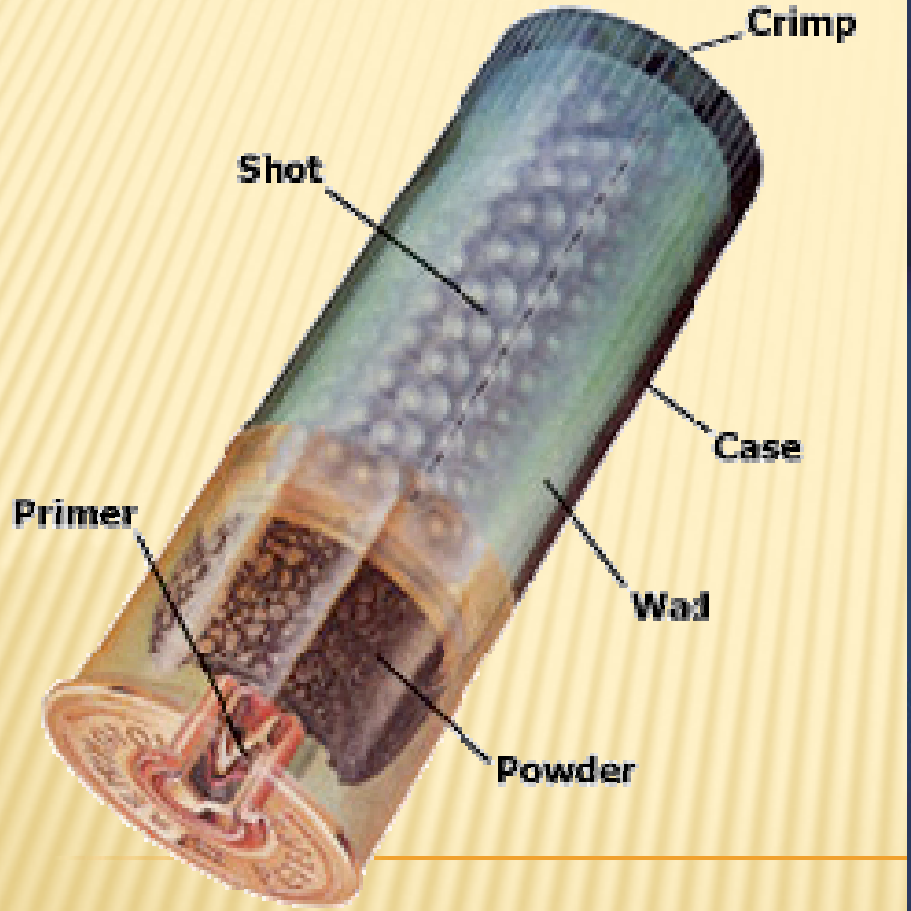
LSWC

Introduction

-Type

Black Talon

Introduction



Introduction

Eight Different 9mm Cartridges
Corbon Powrball
S & B
Winchester Whitebox
Speer GoldDot
Federal HydraShok
Fed EFMJ
Winchester SXT
Remington Golden Saber
100 grain
115 grain
115 grain
115 grain
135 grain
105 grain
147 grain
124 grain

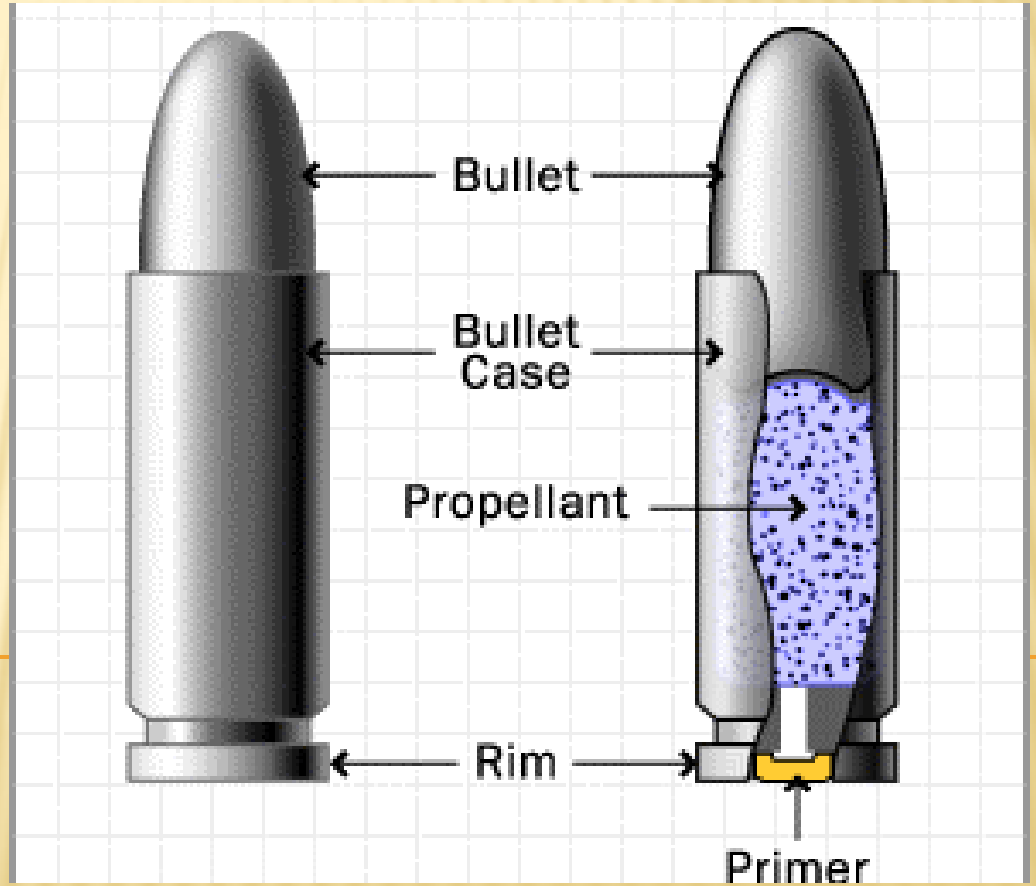
Materials and methods

1. Semi-Automatic Pistol, Glock 26

Materials and methods

2. 9-mm Parabellum cartridges

115 gr



Materials and methods

3. Propellent (Vectan Ba9)

Materials and methods

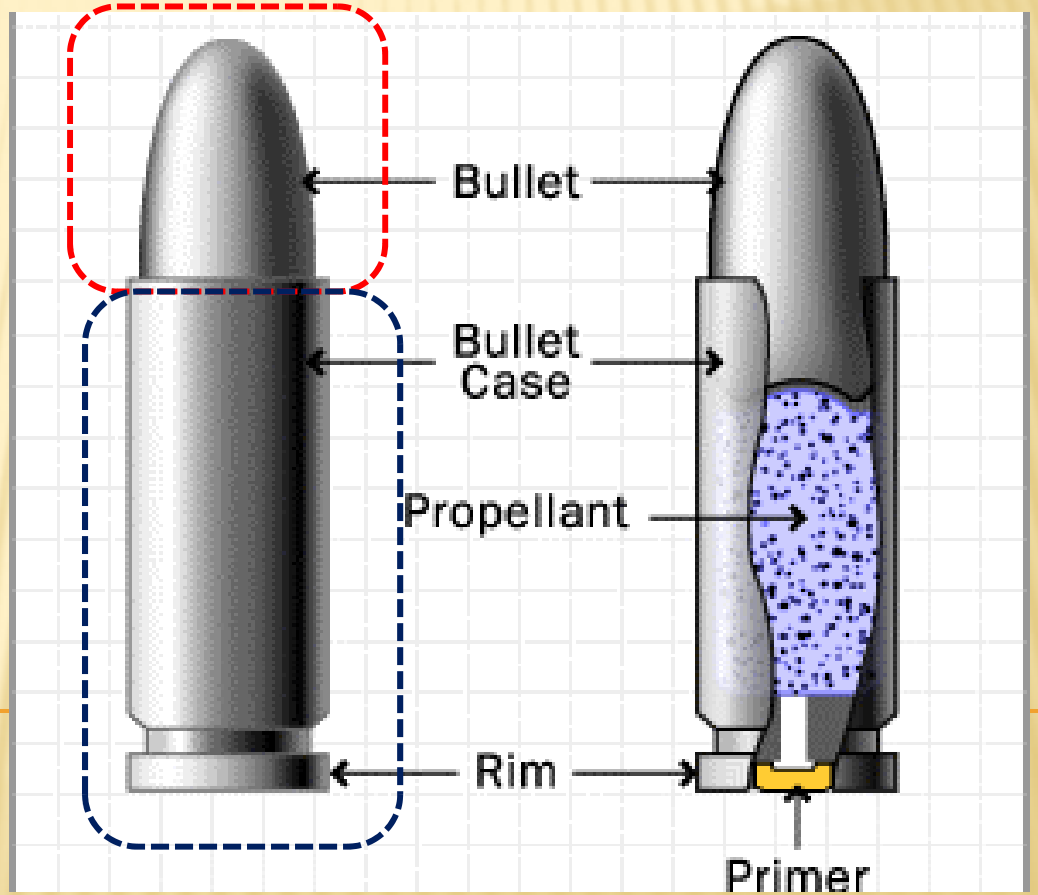
4. 50 mm thick concrete plate

Materials and methods

5. Commercial chronograph

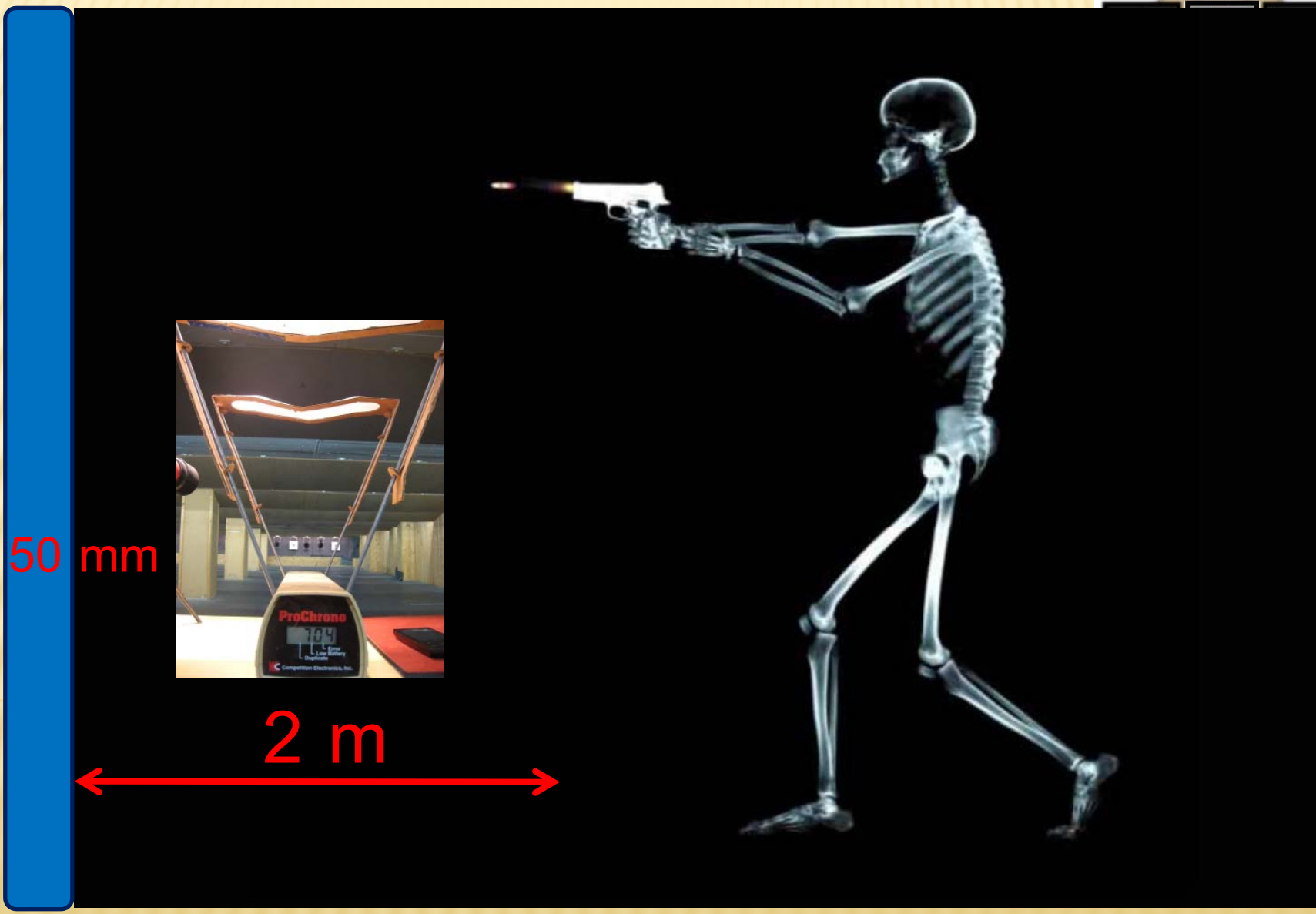
Materials and methods

9-mm Parabellum cartridges



Materials and methods

Materials and methods



Results

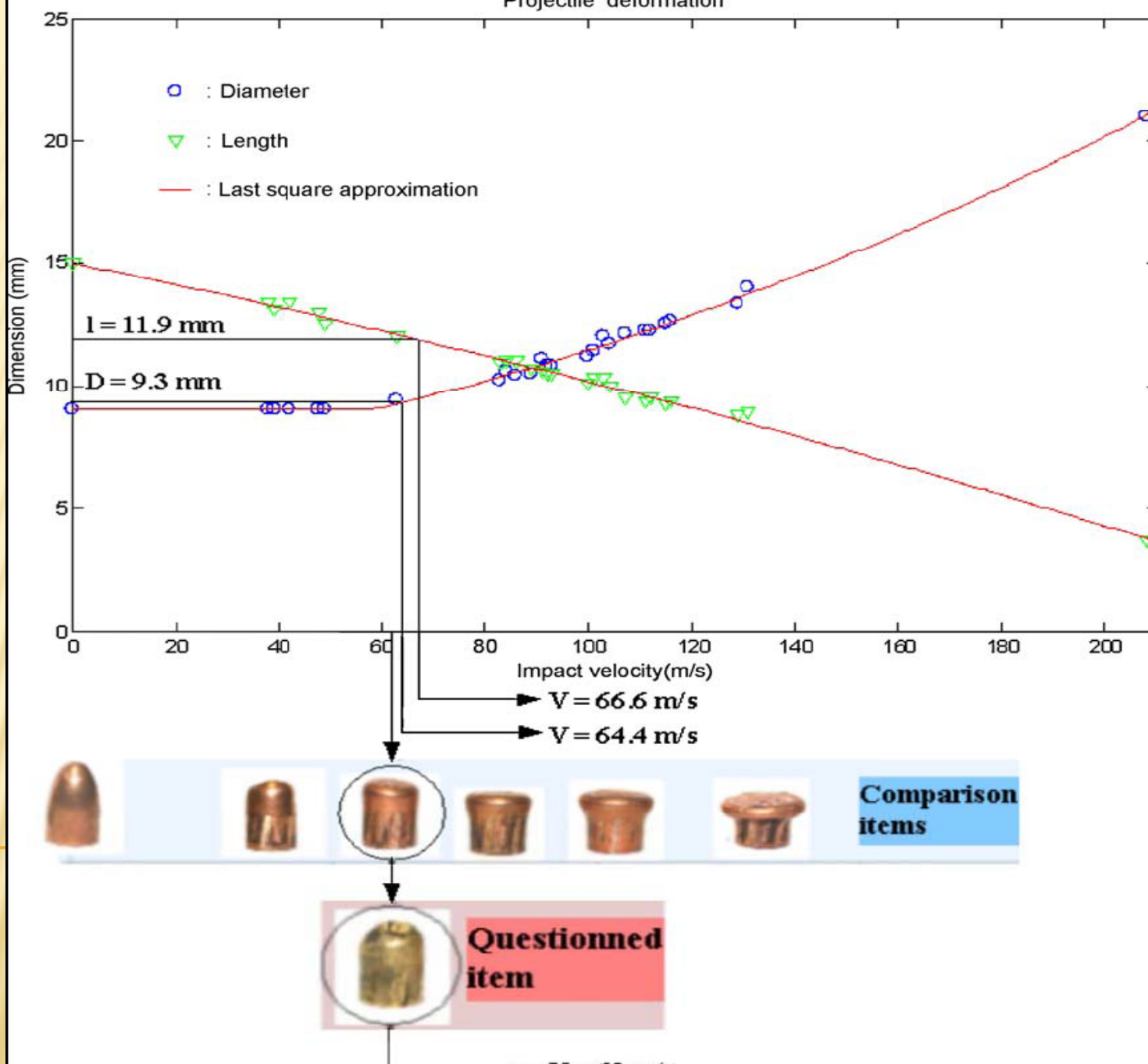
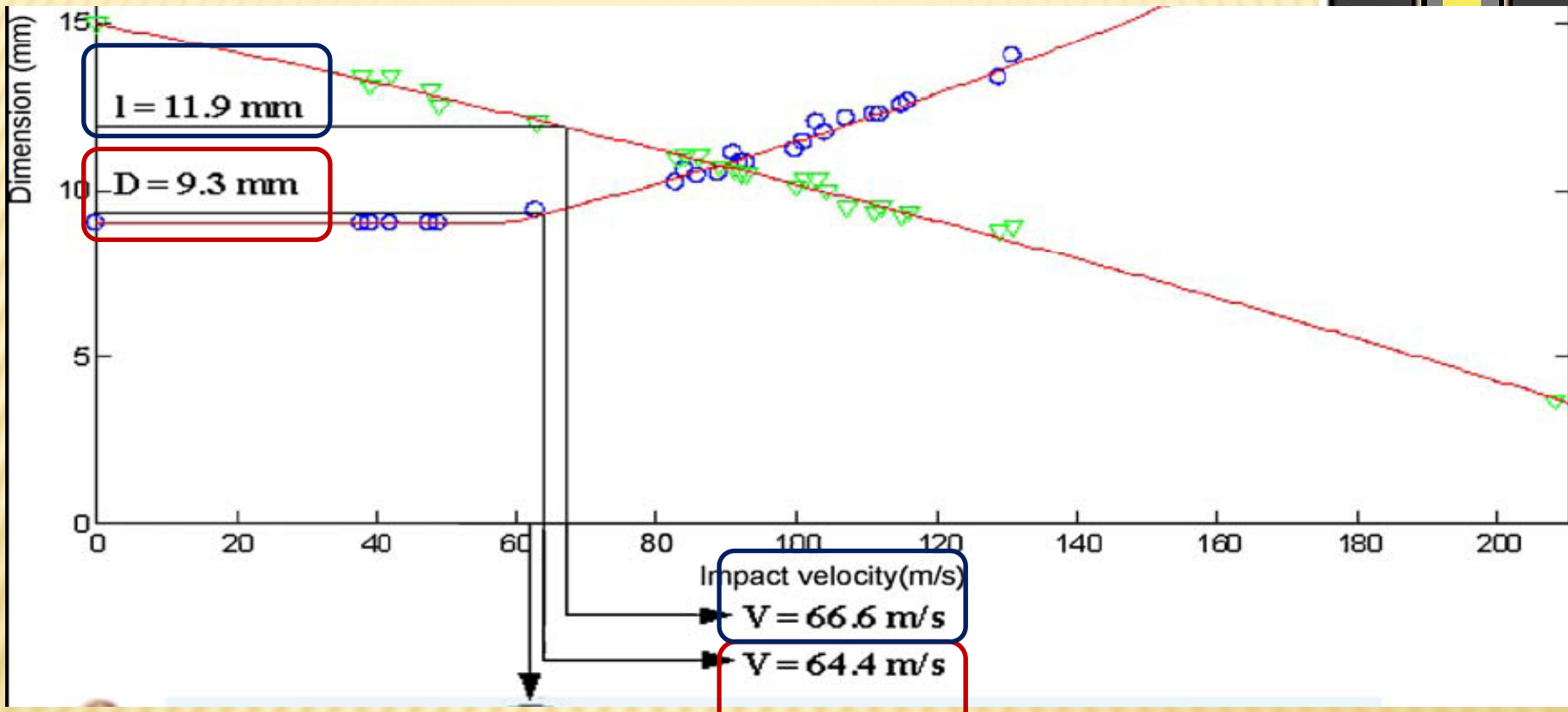


Fig.1

Result

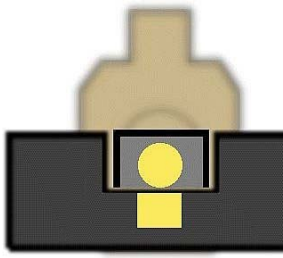

Dimension (mm)
15
10
5
0
l = 11.9 mm
D = 9.3 mm
0
20
40
60
80
100
120
140
160
180
200
Impact velocity(m/s)
V = 66.6 m/s
V = 64.4 m/s

Results

Table 1
Characteristics of the comparison bullets and the questioned bullet.

Velocity (m/s)	Length (mm)	Diameter (mm)
0	15,0	9,0
38	13.4	9.0
39	13.1	9.0
42	13.4	9.0
48	13.0	9.0
49	12.5	9.0
63	12.0	9.4
Questioned bullet	11.9	9.3
83	10.9	10.2
84	11.0	10.6
86	11.0	10.4
89	10.7	10.5
91	10.6	11.1
92	10.5	10.8
93	10.5	10.8
100	10.1	11.2
101	10.3	11.4
103	10.3	12.0
104	10	11.7
107	9.5	12.1
111	9.3	12.2
112	9.5	12.2
115	9.2	12.5
116	9.3	12.6
129	8.8	13.3
131	8.9	14.0
208	3.7	21.0

Results



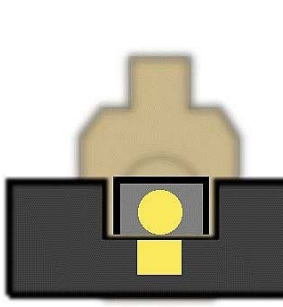
Questioned bullet

Length 11.9 mm Diameter 9.3 mm

Table 1
Characteristics of the comparison bullets and the questioned bullet.

Velocity (m/s)	Length (mm)	Diameter (mm)
0	15,0	9,0
38	13.4	9.0
39	13.1	9.0
42	13.4	9.0
48	13.0	9.0
49	12.5	9.0
63	12.0	9.4
Questioned bullet	11.9	9.3

Results



2^{nd} Degree Polynomial Function

$$f(x) = ax^2 + bx + c$$

Results

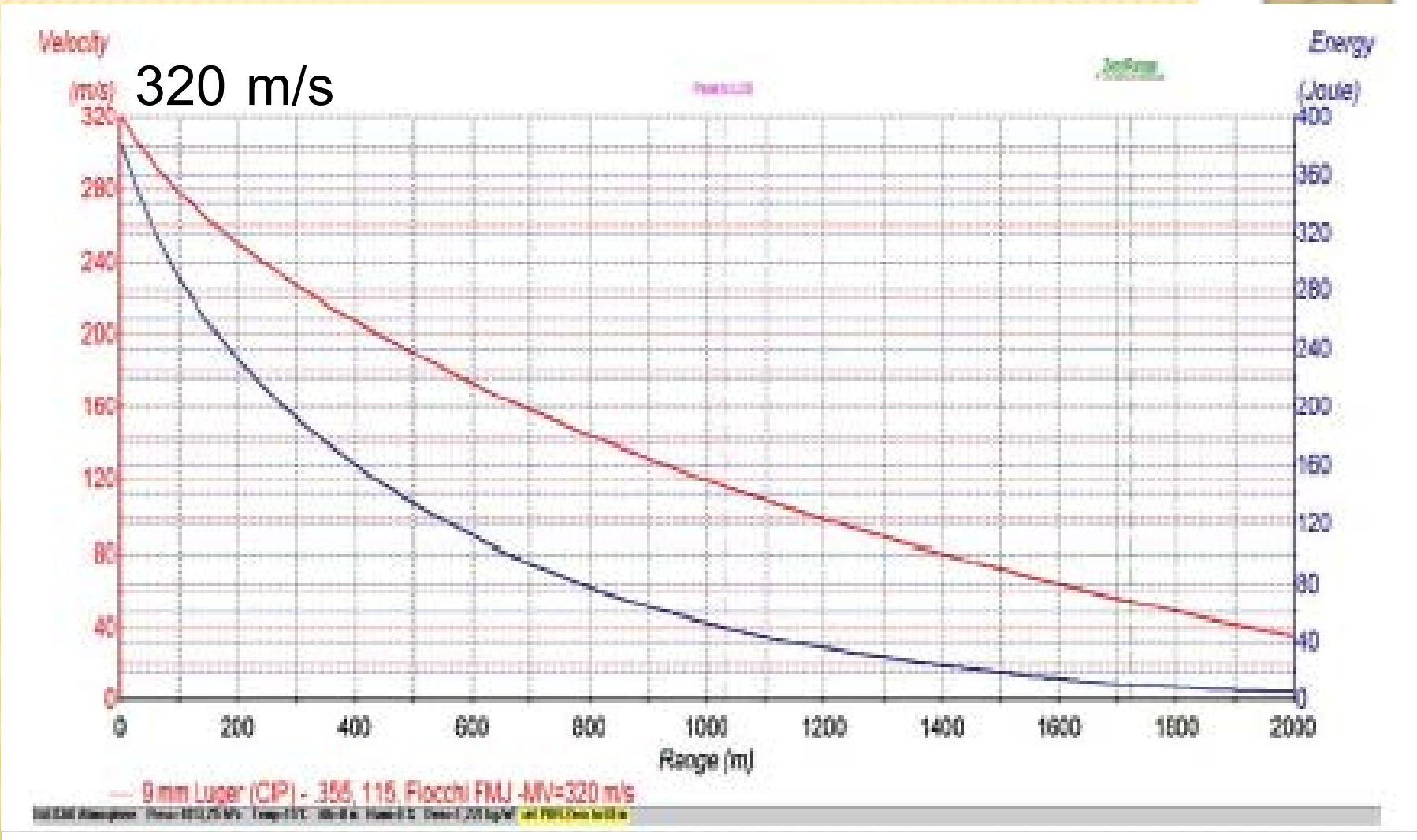


Fig.2a,compact pistol

Results

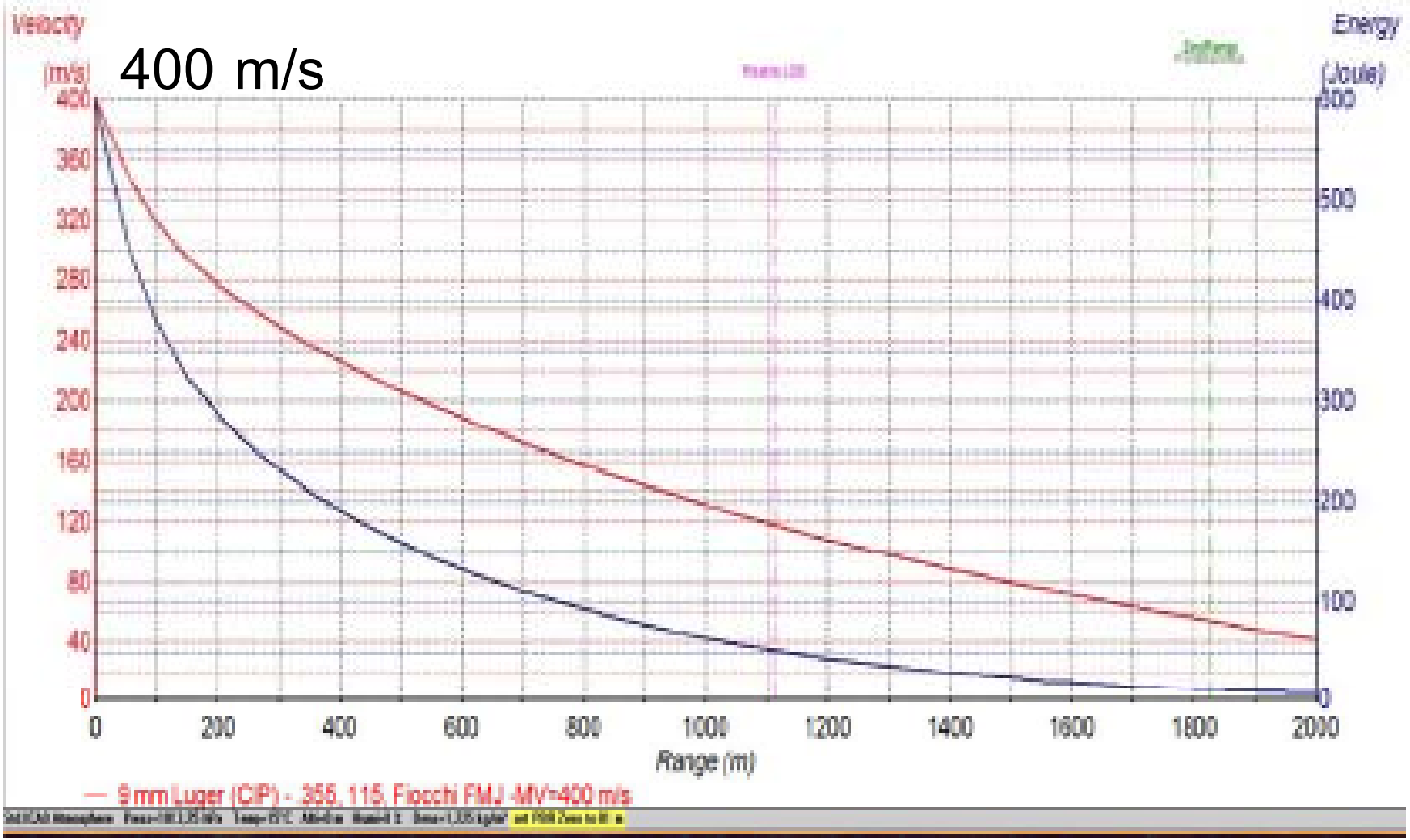
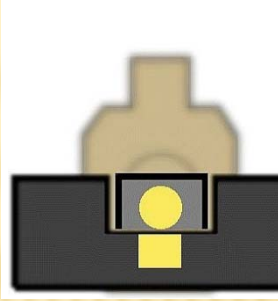


Fig.2b,sub machine gun

Result



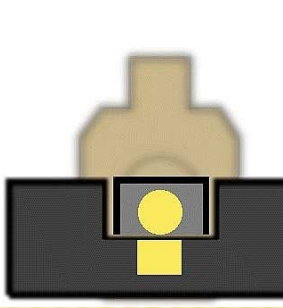
Range 58-72 m/s

63-5

66+5

Intersect D= 9mm at V = 58.33 m/s.

Results



9 mm Parabellum 115 gr

Different cartridge manufacturers

Different type of weapon

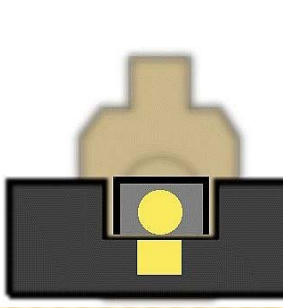
Muzzle velocity, 320 m/s – 400 m/s

Compact pistol

Sub-machine gun

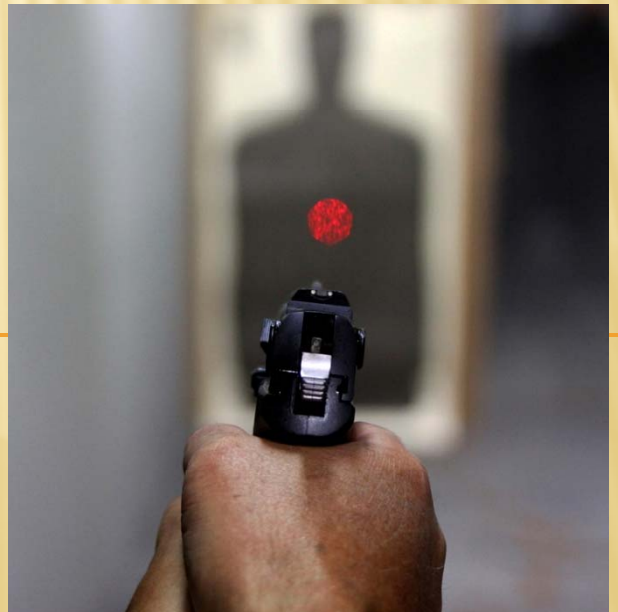
Cover range 1500-1800 m

Discussion

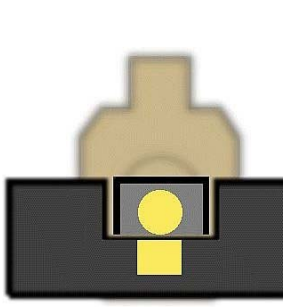


Muzzle velocity, ballistic coefficient

Expect range 1500 – 2000 m



Conclusion

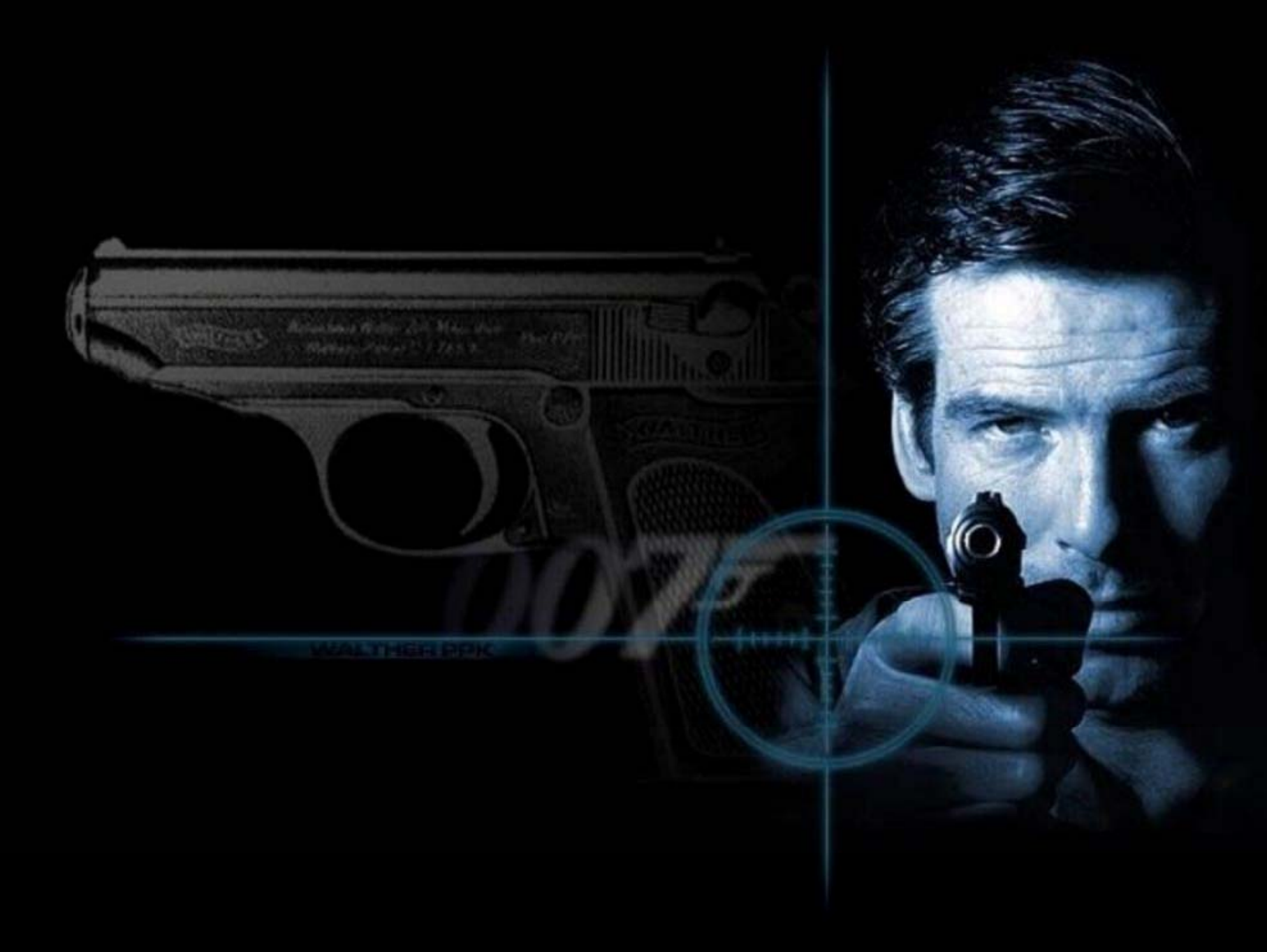


Experiments were quite easy.

Did not require any particular accuracy

On the impact position or incidence

Question


WALTHER PPK