

Lethality of Air/Gas Operated Weapons

English abstract

Introduction

The Israeli law defines "weapon" freely as: "an object that can emit a projectile, or bullet, which can cause a lethal damage to a person". In firearms that are operated by gunpowder, there is no problem to define them as weapons, since the lethality of the bullet is mainly dependent on its velocity, which obtained by the burning of the gunpowder. This velocity is repeated from one bullet to another. In air or gas operated firearms, the case is different.

In these firearms the velocity of the projectile is dependent on the mechanism of the firearms, so we can see great variances in velocities between two firearms of the same make and model. These variances can be created, for example, due to air pressure loss.

Because of the above mentioned changes, every air operated weapon, which is brought to the Weapons Laboratory of the Israeli police, is tested by firing pellets over a chronograph, which record their velocity. Later, their kinetic energy is calculated in order to determine if they are lethal or not.

In other countries, such as Germany and England, air and gas operated firearms are considered to be weapons by law, so there is no necessity to make the examination which are done in Israel.

In Israel, air operated firearms can be sold to teenagers over the age of sixteen. That gives the impression, to people without knowledge, we are dealing with toys. The following incident will show this is not the case.

The case story

Two people, one a teenager, who owned a WEIHRAUCH model HW30, caliber 4.5mm airgun, and the other an adult, fired at bystanders from a car. More than 20 people were injured and suffered from bullet wounds in different degrees of severity. The most serious injuries included an eye loss and pellet penetration to the liver. The severity of the injuries was due to the uses of "Spitz" pellets, which have the highest penetration capability from all other airgun pellets.

When the shooters were brought to trial, their attorney claimed that the airgun is merely a "toy". It was up to the Weapons Laboratory expert to prove differently.

The test

While the evidence gun was examined, it was found that its muzzle velocity varies from 145[m/s] to 161[m/s]. The penetration energies, which are received by dividing the kinetic energy in the base area of the pellet, were 36.15[J/cm²] and 45.65[J/cm²], respectively. This is the place to mention that

in the professional literature, penetration energy from 32[J/cm²] and above, is considered to be lethal. This factor is dependent on impact velocity, which in turn relies on the distance between the muzzle of the gun and the target.

Wounds description and depth of penetration, as they were received from hospitals where the victims been treated, agreed with known data from tests on human bodies, done in England. Never the less, in order to convince the court beyond any doubt, it was decided to perform a test in Israel.

With the assistance of the forensic coroner office, a skull of a human, in her 30's, was filled with brain of a cow's calf. Then it was placed 3 meters from a test gun. This gap was needed to allow the pellets to go over a chronograph.

Five shots were fired from an airgun, made by **FeinWerkBau**, which was chosen from two reasons: it has the same muzzle velocity as the evidence gun and it is cocked by a side lever. The side lever made it possible to keep the gun on test pod at all times.

Of the five shots, three penetrated the skull bone and the brain tissue, one remained stuck in the skull after fragmenting it and the last one did not penetrate the skull. All in All, it was established that the weapon is indeed lethal.

When the results of the test were presented in court, they convinced the judge that the evidence gun was indeed a lethal weapon and he convicted the Shooters.