HK MP5

Accuracy at 100m range with 6.5x25 CBJ and 9x19mm

CBJ Tech – Test protocol

Date: 2021-11-01	**Location**: Kungsbacka, rifle shooting range.	**Weather conditions**: Outdoor, 10 deg C, slight cross wind.
Weapon systems tested: HK MP5 in 6.5x25 CBJ and HK MP5 in 9x19mm.		
Ammunition tested: 6.5x25 CBJ APDS, 6.5x25 CBJ HET, 6.5x25 CBJ HET3, 6.5x25 CBJ Frangible, 9x19mm Speer Gold Dot, 9x19mm M/39 B and 9x19mm Frangible.		
Targets tested: Paper target national pistol precision target insert (rings 6 to 10).		
People present: Mikael Johansson, Bertil Johansson.		
Additional information: Targets were shot at 100m range.		

Background, Purpose and Goal

This test was done to determine the practically achievable accuracy when shooting the HK MP5 under field conditions, *i.e.* not in a laboratory but on an outdoor shooting range.

A newly developed prototype HK MP5 in caliber 6.5x25 CBJ was tested side by side with a standard HK MP5 in caliber 9x19mm, in order to compare the accuracy of both under the exact same conditions.

The goal was to prove that the accuracy is better, or at least identical when shooting the prototype HK MP5 in 6.5x25 CBJ compared to the standard one in 9x19mm at 100 m range.

Test Setup

The 6.5x25 CBJ cartridges used in the test are showed in the picture. From left to right they are:

- 6.5x25 CBJ APDS – 2g tungsten core in a 0.5g sabot. V_0=875m/s, E_0= 765.6J
- 6.5x25 CBJ HET – 2.5g solid brass projectile. V_0=875m/s, E_0= 957.0J
- 6.5x25 CBJ HET3 – 3g solid brass projectile. V_0=800m/s, E_0= 960.0J
- 6.5x25 CBJ Frangible – 2.5g sintered metal projectile. V_0=865m/s, E_0= 935.3J

The 9x19mm cartridges used from left to right were:

- 9x19mm Speer Gold Dot – 9.5g (147gr) hollow point jacketed lead core. V_0=328m/s, E_0= 511.0J
- 9x19mm M/39 B – 6.75g steel jacketed lead core. V_0=420m/s, E_0= 595,4 J
- 9x19mm Frangible – 6.16g (95gr) sintered metal projectile. V_0=430m/s, E_0= 569,5J

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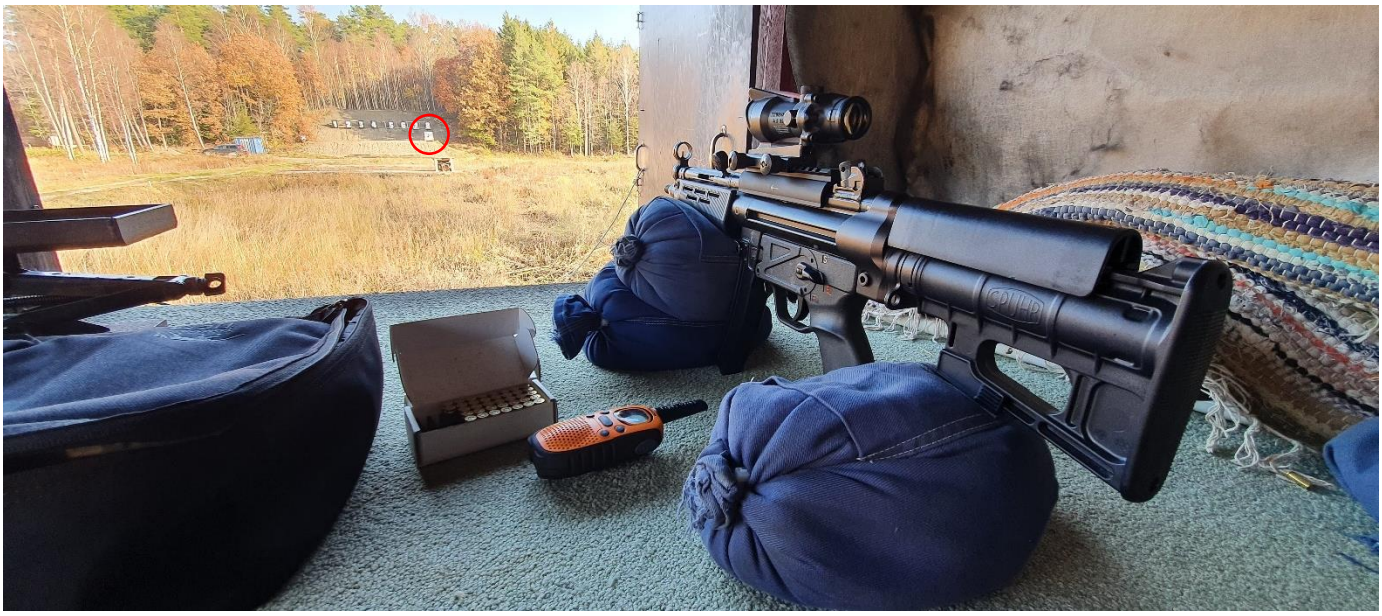
The location of the test was a rifle shooting range with fixed shooting positions at 25m, 50m, 100m, 200m and 300m. The position at 100m was used for the test. The picture shows the shooting position and target, indicated by the red ring. The weapons were supported by sandbags and fired from the shoulder.



The configuration of the HK MP5 in 6.5x25 CBJ during the tests can be seen in the picture below.

The sight used was a Trijicon ACOG 4x32. The same sight was used for both the 6.5x25 CBJ and the 9x19mm tests. The 4 times magnification gave a better ability to achieve a high accuracy, compared to the non-magnifying red dot sights that are commonly used with this weapon.

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The target used was the Swedish national pistol target insert, which consists of the inner 6 scoring circles (from 6 to 10). The target size is 260 x 260 mm. The picture shows the target at 1:2 scale.

NATO reference: AEP-97 MULTI-CALIBRE MANUAL OF PROOF AND INSPECTION FOR NATO SMALL ARMS AMMUNITION (MC-MOPI).

AEP-97 MC-MOPI requirement for 5,56x45mm NATO: Horizontal and vertical SD at 550m ≤ 200mm (ref. MC-MOPI vol. 18). Scaling linearly (which should be defensible, since both 5,56x45mm NATO and 6,5x25mm CBJ remain supersonic beyond 550m), this equals a requirement at 100m for horizontal and vertical SD ≤ 36,4mm.

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Test 1

The ammunition tested was the 6.5x25 CBJ APDS (formerly known as Ball). 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 107mm. The slight offset center of the pattern is due to the sight not being zeroed 100% due to time constraints during the test.

Horizontal standard deviation: 26,19mm
Vertical standard deviation: 31,12mm

CBJ Tech – Test protocol

Test 2

The ammunition tested was the 6.5x25 CBJ HET. 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 142mm. The slight offset center of the pattern is due to the sight not being zeroed 100% due to time constraints during the test.

Horizontal standard deviation: 30,71mm
Vertical standard deviation: 31,13mm

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Test 3

The ammunition tested was the 6.5x25 CBJ HET3. 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 103mm.

Horizontal standard deviation: 33,05mm
Vertical standard deviation: 11,41mm

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Test 4

The ammunition tested was the 6.5x25 CBJ Frangible. 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 150mm. The slight offset center of the pattern is due to the sight not being zeroed 100% due to time constraints during the test.

Horizontal standard deviation: 16,17mm
Vertical standard deviation: 42,61mm

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Test 5

The ammunition tested was the 9x19mm Speer Gold Dot. 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 124mm. The slight offset center of the pattern is due to the sight not being zeroed 100% due to time constraints during the test.

Horizontal standard deviation: 26,78mm
Vertical standard deviation: 37,43mm

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Test 6

The ammunition tested was the 9x19mm M/39 B (Swedish standard military 9x19mm FMJ). 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 179mm.

Horizontal standard deviation: 26,24mm
Vertical standard deviation: 44,64mm

Test 7

The ammunition tested was the 9x19mm Frangible made by Kingshill Ballistics. 10 shots were fired in semiautomatic mode in 1 minute's time. The result is shown here in 1:1 scale with the picture cropped to fit the A4 paper size.

The maximum distance between the outer hits (red arrow) is 110mm.

Horizontal standard deviation: 26,26mm
Vertical standard deviation: 16,81mm

Summary

After analyzing the hit patterns of the different cartridges fired during the test, it can be concluded that the 6.5x25 CBJ cartridge has similar, and in some cases superior accuracy compared to 9x19 mm, when fired from the HK MP5 at a 100 meters range.

The properties of the 6.5x25 CBJ APDS, with its subcaliber tungsten core and high muzzle velocity, allows for a good accuracy at a range of 100 m and more, and does fulfill the Nato MC-MOPI accuracy requirements for the 5.56x45 Nato (scaled from 550m to 100m), when fired from the HK MP5.

The projectiles of the 6.5x25 CBJ HET and Frangible are designed to have a reduced lethal range, and therefore decelerates faster. They are potentially more affected by external factors, like wind, which explains why they may have a somewhat lower accuracy at long range. However, the 6.5x25 CBJ HET3 is slightly heavier and more suited for shooting at 100m range, while still having a limited maximum lethal range.