

VPAM
Association of Test
Laboratories for Attack
Resistant Materials and
Constructions

Follow-on Document
**Ammunition Types for Special
Tests**

VPAM
AND-SoM
Edition: 15 March 2021

FOLLOW-ON DOCUMENT

to VPAM-APR

"Ammunition Types for Special Tests"

AND-SoM

As of: 15 March 2021

Englische Übersetzung, es gilt immer die deutsche Originalfassung!
English translation, however the original German version always prevails!

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Change Record

(for previous versions see www.vpam.eu in the guideline archive)

No.	Change Date	Changes were implemented in the following paragraphs

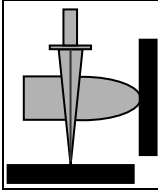
Introduction

In this follow-on document ammunition types are specified for the test performed in accordance with VPAM-APR paragraph 4.2.

In case of justified requirements accepted by VPAM the table may be expanded. In this case the date of the document will be adjusted.

The test results with the projectiles specified here cannot be allocated to test levels 1 to 10 of VPAM-APR.

The basics of ballistic testing and/or conformity assessment of materials, constructions, and products which offer protection against attacks with firearms are described in "Allgemeine Prüfrichtlinie für ballistische Material-, Konstruktions- und Produktprüfungen" (General test guideline for ballistic material, design and product tests), VPAM-APR.



Standardization of Ammunition Types for Special Tests

Table 1: Test Conditions of Ballistic Special Tests

Ammunition and projectile				Test conditions	
Caliber	Type	Nominal mass [g]	Manufacturer/ type	Firing distance ⁷⁾ [m]	Impact velocity [m/s]
Short weapons					
7.62 x 25 Tokarev	FMJ/RN/SC	5.5	Russian manufacturing	5 ± 0.5	450 ± 10
7.62 x 25 Tokarev	FMJ/RN/FeC	5.5	Czech manufacture	5 ± 0.5	530 ± 10
9 mm Makarov	FMJ/RN/FeC	6.0	GDR manufacturing	5 ± 0.5	350 ± 10
9 mm Luger ^{3) 4)}	FMs/HP/PT	6.1	RUAG/Action 4	5 ± 0.5	460 ± 10
9 mm Luger ^{3) 4)}	FMs/HP	6.1	RUAG/Green Range	5 ± 0.5	460 ± 10
9 mm Luger ^{3) 4)}	Cu/HP/PT	6.0	MEN/QD-PEP M/s	5 ± 0.5	460 ± 10
9 mm Luger ^{3) 4)}	FMJ/RN/SC	6.8	Vanäs, m39B	5 ± 0.5	420 ± 10
9 mm Luger ^{3) 4)}	FMJ/RN/SC	8.0	Pist Pat 41 (PP41)	5 ± 0.5	415 ± 10
9 mm Luger ^{3) 4)}	FMs/HP/PT	6.1	RUAG/Action NP	5 ± 0.5	440 ± 10
9 mm Luger ^{3) 4)}	FMs/RN	7.0	RUAG/Penetrator	5 ± 0.5	405 ± 10
32 S&W long Wad Cut.	Wadcutter	6.5	RUAG/Geco	5 ± 0.5	220 ± 10
38 Special	Wadcutter	9.6	RUAG/Geco	5 ± 0.5	225 ± 10
4.6 x 30	FMJ/PB/SC	2.6	RUAG/SINTOX Ball	10 ± 0.5	600 ± 10
4.6 x 30	Cu/HP	2.0	RUAG/Action	10 ± 0.5	685 ± 10
4.6 x 30	Cu/PB/HC	2.0	RUAG/DM 11 (Penetrator)	10 ± 0.5	685 ± 10
5.7 x 28	FMJ/St/Alu	2.0	FNB	10 ± 0.5	700 ± 10

The twist rates can be gathered from the dimension sheets (TDCC) of the C.I.P.
Deviating twist rates and dimensions are marked with exponents in the column "Caliber".

Table 1 abbreviations

Ammunition and projectile				Test conditions	
Caliber	Type	Nominal mass [g]	Manufacturer/ type	Firing distance ⁷⁾ [m]	Impact velocity [m/s]
Long firearms					
4.5 mm	Doppelkelch Blei o.g.Ü.	0.53	RUAG/RWS/ Meisterkugel (high-performance pellet)	3 ± 0.5	175 ± 10
4.5 mm	Doppelkelch Blei o.g.Ü.	0.53	RUAG/RWS/ Meisterkugel	3 ± 0.5	250 ± 10
4.4 mm	Club Blei m.g.Ü.	0.45	RUAG/RWS/ Rundkugel (round pellet)	3 + 0.5	175 ± 10
5.45 x 39	FMJ/PB/FeC	3.45	Russian manufacturing	10 ± 0.5	900 ± 10
223 Rem. ^{1) 5)}	FMJ/PB/SC	3.6	RUAG/M193	10 ± 0.5	980 ± 10
223 Rem. ^{1) 5)}	FMJ/PB/SC	3.6	MEN/M193	10 ± 0.5	1000 ± 10
223 Rem. ^{1) 5)}	FMJ/PB/SC	4.1	GP90	10 ± 0.5	950 ± 10
223 Rem. ^{1) 5)}	FMJ/PB/SC	4.0	DM41	10 ± 0.5	950 ± 10
7.5 x 55 Suisse	FMJ/PB/SC	11.3	GP11	10 ± 0.5	815 ± 10
308 Win. ^{2) 6)}	FMJ/PB/WC	8.4	NAMMO/AP8	10 ± 0.5	930 ± 10
308 Win. ⁶⁾	FMJ/PB/WC	12.7	RUAG CH/ Swiss P AP	10 ± 0.5	810 ± 10
308 Win. ⁶⁾	FMs/HP	10.8	BARNES/TSX	10 ± 0.5	810 ± 10
8 x 68 S	JSP/CB	14.5	RUAG/KS	10 ± 0.5	870 ± 10
8 x 68 S	JSP/CB	11.7	RUAG/KS	10 ± 0.5	970 ± 10
300 Win. Mag.	FMJ/PB/WC	12.8	MEN	10 ± 0.5	855 ± 10
30-06 Spring.	FMJ/PB/HC	10.8	M2 AP	10 0.5	870 ± 10
338 Lapua Mag.	FMJ/PB/SC	16.2	LAPUA	10 ± 0.5	870 ± 10
338 Lapua Mag.	FMJ/PB/SC	16.2	LAPUA/Scenar	10 ± 0.5	900 ± 10
338 Lapua Mag.	FMJ/PB/WC	16.2	LAPUA	10 ± 0.5	870 ± 10
338 Lapua Mag.	FMJ/PB/WC	16.8	RU AG/AP	10 ± 0.5	830 ± 10
<p>The twist rates can be gathered from the dimension sheets (TDCC) of the C.I.P. Deviating twist rates and dimensions are marked with exponents in the column "Caliber".</p>					

Table 1 abbreviations

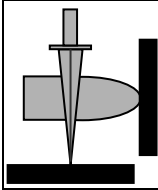
Ammunition and projectile				Test conditions	
Caliber	Type	Nominal mass [g]	Manufacturer/ type	Firing distance ⁷⁾ [m]	Impact velocity [m/s]
Long firearms					
50 Browning	FMJ/PB/HC	45.5	CBC/M2 AP	10 ± 0.5	860 ± 20
14.5x114	FMJ/PB/HCI	63.4	B32	10 ± 0.5	911 ± 20
The twist rates can be gathered from the dimension sheets (TDCC) of the C.I.P. Deviating twist rates and dimensions are marked with exponents in the column "Caliber".					

Table 1 abbreviations

Ammunition types				Test conditions	
Caliber	Type	Nominal mass [g]	Manufacturer/type	Firing distance ⁷⁾ [m]	Impact velocity [m/s]
Shotgun					
12/70	Lead shotgun ammunition	31.0 ± 0.5	BRENNEKE	10 ± 0.5	420 ± 20

Table 1 abbreviations

Ammunition types				Test conditions	
Caliber	Type	Nominal mass [g]	Manufacturer/type	Firing distance ⁷⁾ [m]	Impact velocity [m/s]
Fragment Simulating Projectile					
3.6 mm FSP ⁸⁾	FSP	0.325	diverse	5 ± 0.5	220 ± 5



Key to the abbreviations used in Table 1

CB	Coned Bullet	BARNES	Barnes Bullets, USA
Cu	Copper solid projectile	BRENNEKE	Brenneke Ammunition GmbH, Germany
FeC	Fe Core	CBC	Companhia Brasileiro de Cartuchos, Brazil
FMJ	Full Metal Jacket	C.I.P.	Permanent International Commission for the Proof of Small Arms
FMJ*)	Full Metal Jacket, Copper Jacket	FNB	Fabrique Nationale, Belgium
FMs	Full Brass (Ms)	Geco	Product of RUAG
FN	Flat Nose	LAPUA	Nammo Lapua, Finland
HC	Hard Core	MEN	Metallwerk Elisenhütte Nassau, Germany
HCI	Hard Core Incendiary	RUAG	RUAG Ammotec, Germany
HP	Hollow Point Bullet	RUAG CH	RUAG AG, Switzerland
JSP	Jacketed Soft Point	RWS	Product of RUAG
L	Lead	TDCC	C.I.P. dimension sheets
PB	Pointed Bullet	DMxx	Deutsches Modell xx (German model)
PT	Plastic Tip	Pist Pat xx	Pistol cartridge xx (PPxx)
RN	Round Nose	GPxx	Rifle cartridge xx (Gw Pat xx)
SC	Soft Core	o./m.g.Ü.	without/with electroplated coating
SCP	Soft Core Penetrator		
WC	Tungsten Carbide		The model designations are: Action4, Green Range, QD-PEP II/s, m39B, Pist Pat 41, Action NP, Penetrator, SINTOX Ball, Action, DM 11 (Penetrator), Meisterkugel, Rundkugel, M193, GP11, DM 41, DM 111, AP8, Swiss P AP, TSX, KS, M2 AP, Scenar, AP, ...
1)	Twist rate 178 mm \pm 5 %		
2)	Twist rate 254 mm \pm 5 %		
3)	Test barrel with a transition of 7.5 mm, see VPAM-APR Annex 2		
4)	9x19 mm NATO respectively		
5)	5.56 x 45 mm NATO respectively		
6)	7.62 x 51 mm NATO respective		
7)	As a rule, the firing distances have to be complied with in accordance with table 1. The firing distance may be adjusted if it is necessary regarding the required velocity, the angle of attack and impact location of the projectile or due to any other technical necessity.		
8)	This corresponds to FSP A3/6723/6 IAW drawing A3/6723 pursuant to STANAG 2920, see VPAM-BSB, Annex 2.		