

Document Summary

Detail Type	Detail
Event ID	0000003424
Commodity	Ammunition and Explosives
Attachment	2
Group-Class	13-02
Bid Specification	1305-3762
Revision Level	A
Revision Date	November 16, 2017
Agency Name	Statewide

Revision History

Bid Spec	Rev Level	Revision Date	Author	Summary of Changes
1305-3762	A	Nov. 16, 2016	Mora, D.	Initial release

Table of Contents

Document Summary..... 1

Revision History 1

Table of Contents 2

1.0 SCOPE 3

2.0 APPLICABLE LAWS and INDUSTRY STANDARDS..... 3

 2.1 STANDARDS 3

3.0 TECHNICAL REQUIREMENTS..... 3

 Table 1: Ammunition Requirements 3

4.0 TESTING PROTOCOL 4

 Table 2: Testing Protocol Methods..... 4

5.0 SHIPPING/PACKAGING 4

 5.1 AMMUNITION FURNISHED SHALL COMPLY WITH THE FOLLOWING
 REQUIREMENTS: 4

 Table 3: Requirements for Ammunition by Quantity..... 4

Attachment 1 - Training Ammunition Requirements 5

 Table 4: Training Ammunition Requirements by Caliber, Application, Type, and Weight..... 5

 1.0 Velocity Requirements..... 6

 2.0 Accuracy Requirements 6

Attachment 2 - Duty Ammunition Requirements 7

 Table 5: Duty Ammunition Requirements by Caliber, Application, Type, and Weight 7

 1.0 Velocity Requirements..... 8

 2.0 Accuracy Requirements 8

 3.0 Penetration Requirements..... 8

 4.0 Expansion Requirements..... 8

Attachment 3 - Visual Inspection/Velocity/Accuracy/Test Protocol..... 10

 Scope..... 10

 Procedure 10

Attachment 4 - Ammunition Quality Control Visual Inspection/Velocity/Accuracy 11

 Table 6: Ammunition Quality Control..... 11

Attachment 5 - FBI Penetration Test Protocol for Duty Ammunition 12

 Background..... 12

 Test Criteria 12

 Penetration Test Procedure 12

Attachment 6 - Ammunition Quality Control Terminal Ballistics..... 14

 Test Data Sheet Example: 14

 Test Procedure/Expectations: 14

 Test Firearm..... 14

 Table 7: Table for Bare Gelatin Testing 15

 Table 8: Table for Heavy Clothing Testing 15

 Table 9: Table for Steel Testing 16

 Table 10: Table for Wallboard Testing 16

 Table 11: Table for Plywood Testing..... 17

 Table 12: Table for Automobile Glass Testing 17

1.0 SCOPE

This specification describes the minimum requirements for ammunition to be utilized by various State of California agencies. It also sets forth test criteria for new suppliers who have not provided qualified products tested using *Visual Inspection/Velocity Accuracy/Test Protocol* and the *FBI Penetration Test Protocol* for Duty Ammunition.

2.0 APPLICABLE LAWS and INDUSTRY STANDARDS

Specifications, standards and regulations referenced in this document in effect on the opening of the invitation for bid, form a part of this specification.

2.1 STANDARDS

- 2.1.1 Sporting Arms and Ammunition Manufacturer’s Institute (SAAMI) Standards
- 2.1.2 Federal Motor Vehicle Safety Standards (FMVSS)
- 2.1.3 Military Specification (MIL-SPEC)
- 2.1.4 American National Standards Institute (ANSI)
- 2.1.5 Military Standard (MIL-STD)
- 2.1.6 Federal Bureau of Investigation (FBI) Penetration Test Protocol

3.0 TECHNICAL REQUIREMENTS

Training ammunition requirements were determined to provide ammunition that meets agency target and range requirements for law enforcement personnel to qualify and maintain annual marksmanship/readiness requirements.

Duty ammunition requirements were determined using specific application, type, weight, velocity, accuracy, penetration and expansion requirements using test controls to ensure acceptable products qualify for duty use.

Note: Ammunition shall be placed on the Duty Ammunition Qualified Product List (QPL) after passing the *Visual Inspection/Velocity Accuracy/Test Protocol* and the *FBI Penetration Test Protocol* for Duty Ammunition tests.

The California Department of Fish and Wildlife (DFW) compiled a list of approved [Certified Non-Lead Ammunition](#).

Table 1: Ammunition Requirements

SECTION	DESCRIPTION	ATTACHMENT/REFERENCE
3.1	Training Ammunition Requirements	1
3.2	Duty Ammunition Requirements	2
3.3	Lead-Free (Non-Lead) Acceptable Product List	DFW List of Certified Non-Lead Ammunition

4.0 TESTING PROTOCOL

The following testing protocol methods shall be used to add products to the QPL:

Table 2: Testing Protocol Methods

SECTION	DESCRIPTION	ATTACHMENT
4.1	<i>Visual Inspection/Velocity/Accuracy/Test Protocol</i>	3
4.2	<i>Ammunition Quality Control Visual Inspection/Velocity/Accuracy - Test Data Sheet</i>	4
4.3	<i>FBI Penetration Test Protocol for Duty Ammunition</i>	5
4.4	<i>Ammunition Quality Control Terminal Ballistics - Test Data Sheet</i>	6

5.0 SHIPPING/PACKAGING

Count per box and count per case may vary depending on manufacturer's standard case count size.

5.1 AMMUNITION FURNISHED SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:

Table 3: Requirements for Ammunition by Quantity

APPLICATION	COUNT PER BOX	COUNT PER CASE
Rifle	20 or 50	200 or 500
Handgun	20 or 25 or 50	200 or 500 or 1000
Shotgun	5 or 25	250

Attachment 1 - Training Ammunition Requirements

Table 4: Training Ammunition Requirements by Caliber, Application, Type, and Weight

Caliber	Application	Type	Weight (grams)
0.223 Remington 5.56 mm NATO	Rifle	Full Metal Jacket	55 and 62
0.223 Remington 5.56 mm NATO	Rifle	Penetrator	62
0.223 Remington 5.56 mm NATO	Rifle	Soft Point	62 or 64
0.223 Remington 5.56 mm NATO	Rifle	Lead-Free	55
300 Winchester Magnum	Rifle	Controlled Expansion	180 to 190
300 Winchester Magnum	Rifle	Lead-Free, Controlled Expansion	180 to 190
300 Winchester Magnum	Rifle	Open Tip Match	180 to 190
0.308 Winchester 7.62 mm NATO	Rifle	Full Metal Jacket	147 to 150
0.308 Winchester 7.62 mm NATO	Rifle	Controlled Expansion	150 to 155, 165 to 168, 175 to 180
0.308 Winchester 7.62 mm NATO	Rifle	Lead-Free	150
0.308 Winchester 7.62 mm NATO	Rifle	Controlled Expansion, Lead-Free	165 to 168, 175 to 180
0.308 Winchester 7.62 mm NATO	Rifle	Open Tip Match	168, 175 to 180
0.38 Special	Handgun	Full Metal Jacket	130 to 135
0.38 Special	Handgun	Controlled Expansion	125 to 130
0.38 Special	Handgun	Lead-Free, Controlled Expansion	110
0.38 Special	Handgun	Lead-Free Frangible	100 or 101
357 Sig	Handgun	Full Metal Jacket	125
357 Sig	Handgun	Controlled Expansion	125
357 Sig	Handgun	Lead-Free Frangible	100
9mm Luger	Handgun	Standard	124
9mm Luger	Handgun	Controlled Expansion	124, 147
9mm Luger	Handgun	Lead-Free Hollow-Pt	115
9mm Luger	Handgun	Lead-Free Frangible	100
9mm Luger	Handgun	Full Metal Jacket	147
0.40 Smith & Wesson	Handgun	Standard-Lead	180

Caliber	Application	Type	Weight (grams)
0.40 Smith & Wesson	Handgun	Standard Non-Lead	125 to 160
0.45 Automatic Colt Pistol (ACP)	Handgun	Full Metal Jacket	230
0.45 Automatic Colt Pistol (ACP)	Handgun	Controlled Expansion	220 to 230
0.45 Automatic Colt Pistol (ACP)	Handgun	Lead-Free Controlled Expansion	185
0.45 Automatic Colt Pistol (ACP)	Handgun	Lead-Free Frangible	155 to 175
12 Gauge	Shotgun	Buck Copper Plated	9 pellets 00
12 Gauge	Shotgun	Slug	1 ounce

1.0 Velocity Requirements

- a. Shotgun, Buck Copper Plated shall have a manufacturer’s advertised velocity of ≥ 1300 feet per second and ≤ 1600 feet per second.
- b. Shotgun, slug type shall have a manufacturer’s advertised velocity of ≥ 1300 feet per second and ≤ 1600 feet per second.

2.0 Accuracy Requirements

- a. Rifles application: < 1.0 inches center-to-center at 25 yards.
- b. Handguns application: < 3.0 inches center-to-center at 25 yards.
- c. Shotgun slug application: < 3.0 inches center-to-center at 25 yards

Attachment 2 - Duty Ammunition Requirements

Table 5: Duty Ammunition Requirements by Caliber, Application, Type, and Weight

Caliber	Application	Type	Weight (gr)
0.223 Remington 5.56 mm NATO	Rifle	Full Metal Jacket	55 and 62
0.223 Remington 5.56 mm NATO	Rifle	Penetrator	62
0.223 Remington 5.56 mm NATO	Rifle	Soft Point	62 or 64
0.223 Remington 5.56 mm NATO	Rifle	Lead-Free	55
300 Winchester Magnum	Rifle	Controlled Expansion	180 to 190
300 Winchester Magnum	Rifle	Lead-Free, Controlled Expansion	180 to 190
300 Winchester Magnum	Rifle	Open Tip Match	180 to 190
0.308 Winchester 7.62 mm NATO	Rifle	Full Metal Jacket	147 to 150
0.308 Winchester 7.62 mm NATO	Rifle	Controlled Expansion	150 to 155, 165 to 168, 175 to 180
0.308 Winchester 7.62 mm NATO	Rifle	Lead-Free	150
0.308 Winchester 7.62 mm NATO	Rifle	Controlled Expansion, Lead-Free	165 to 168, 175 to 180
0.308 Winchester 7.62 mm NATO	Rifle	Open Tip Match	168, 175 to 180
0.38 Special	Handgun	Full Metal Jacket	130 to 135
0.38 Special	Handgun	Controlled Expansion	125 to 130
0.38 Special	Handgun	Lead-Free, Controlled Expansion	110
0.38 Special	Handgun	Lead-Free Frangible	100 or 101
357 Sig	Handgun	Full Metal Jacket	125
357 Sig	Handgun	Controlled Expansion	125
357 Sig	Handgun	Lead-Free Frangible	100
9mm Luger	Handgun	Standard	124
9mm Luger	Handgun	Controlled Expansion	124, 147
9mm Luger	Handgun	Lead-Free Hollow-Pt	115
9mm Luger	Handgun	Lead-Free Frangible	100
9mm Luger	Handgun	Full Metal Jacket	147
0.40 Smith & Wesson	Handgun	Standard-Lead	180

Caliber	Application	Type	Weight (gr)
0.40 Smith & Wesson	Handgun	Standard Non-Lead	125 to 160
0.45 Automatic Colt Pistol (ACP)	Handgun	Full Metal Jacket	230
0.45 Automatic Colt Pistol (ACP)	Handgun	Controlled Expansion	220 to 230
0.45 Automatic Colt Pistol (ACP)	Handgun	Lead-Free Controlled Expansion	185
0.45 Automatic Colt Pistol (ACP)	Handgun	Lead-Free Frangible	155 to 175
12 Gauge	Shotgun	Buck Copper Plated	9 pellets 00
12 Gauge	Shotgun	Slug	1 ounce

1.0 Velocity Requirements

- a. Shotgun, Buck Copper Plated shall have a manufacturer’s advertised velocity of ≥ 1300 feet per second and ≤ 1600 feet per second.
- b. Shotgun, slug type shall have a manufacturer’s advertised velocity of ≥ 1300 feet per second and ≤ 1600 feet per second.

2.0 Accuracy Requirements

- a. Rifles application: <1.0 inches center-to-center at 25 yards.
- b. Handgun application: <3.0 inches center-to-center at 25 yards.
- c. Shotgun slug application: <3.0 inches center-to-center at 25 yards.

3.0 Penetration Requirements

- a. Rifle application: A minimum of 12.0 inches of penetration into 10% gelatin shall be achieved at 10 feet from the front edge of the gelatin block on all six stages of the FBI Ballistics Test Protocol.
- b. Handgun application: A minimum of 12.0 inches of penetration into 10% gelatin shall be achieved at 10 feet from the front edge of the gelatin block on all six stages of the FBI Ballistics Test Protocol.
- c. Shotgun application (buck and slug): A minimum of 12.0 inches of penetration into 10% gelatin shall be achieved @ 10 feet from the front edge of the gelatin block on all six stages of the FBI Ballistics Test Protocol.

4.0 Expansion Requirements

- a. Rifle application (bare gelatin): Expansion $\geq 100\%$ increase in diameter, into 10% gelatin at 10 feet.

- b. Handgun application (bare gelatin): Expansion \geq 50% increase, fired into 10% gelatin at 10 feet.

Attachment 3 - Visual Inspection/Velocity/Accuracy/Test Protocol

Scope

The testing standard will apply to all training and duty pistol, revolver and rifle ammunition.

Procedure

1. Five rounds of ammunition shall be pulled randomly from each lot number.
2. The five rounds will be visually inspected for manufacturing defects and overall consistency.

Note: Inconsistent bullet seat depth, case length, primer seat depth, and inconsistent rim thickness shall be disqualifying features. Results shall be noted on *Ammunition Quality Control Visual Inspection/Velocity/Accuracy* - **Attachment 4**.

3. A firearm with a similar barrel length and rate of twist as the intended duty firearm shall be used to fire the ammunition being tested; the five rounds of ammunition are then to be fired over a chronograph.
4. The extreme spread of the five velocities of the ammunition shall not exceed 90 feet per second and noted on *Ammunition Quality Control Visual Inspection/Velocity/Accuracy* - **Attachment 4**.

Retest Criteria

If the extreme spread is greater than 90, one retest of five rounds from within that same lot shall be permitted.

5. **Rejection Criteria**

If the extreme spread is greater than 90 on the retest, that lot of ammunition will be rejected.

Attachment 4 - Ammunition Quality Control Visual Inspection/Velocity/Accuracy

Test Data Sheet Example:

AMMUNITION QUALITY CONTROL VISUAL INSPECTION/VELOCITY/ACCURACY

Table 6: Ammunition Quality Control

	TEST DATE	CALIBER	MAKE	LOT #	AVERAGE VELOCITY	EXTREME SPREAD	5 SHOT GROUP (CENTER TO CENTER)	COMMENTS
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

Test Firearm

Make: _____ Model: _____ Serial # _____ used for all lots tested.

Visual Inspection Notes:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

Attachment 5 - FBI Penetration Test Protocol for Duty Ammunition

Background

In 1989, the Federal Bureau of Investigation (FBI) began conducting handgun ammunition tests at the FBI Academy, Quantico, Virginia. This testing was initiated to assist in the selection of handgun ammunition to meet the specific needs of the Bureau. Since its inception, the Ballistic Research Facility (BRF) has tested a wide range of ammunition and freely distributes the results of these tests to law enforcement agencies. These tests are referred to as the "FBI PROTOCOLS."

Handgun ammunition testing consists of six different penetration/expansion tests. Testing also includes accuracy (test barrel and pistol), pressure (temperature: Ambient, hot +140 and cold -40 Fahrenheit) and functional reliability among other tests.

Test Criteria

In determining the suitability of any given ammunition for the service needs of the FBI or any law enforcement agency, preference is given to the two following components of projectile wounding:

1. Penetration depth
2. Permanent wound cavity. (Expansion)

Penetration is weighted most heavily in determining the adequacy of the round. To be considered as having adequate penetrative characteristics, a round should penetrate between 12 and 18 inches of the test gelatin in each of the six penetration/expansion tests (anything beyond 18 inches is deemed as inconsequential). Penetration is measured to the nearest $\frac{1}{4}$ of an inch.

Expansion is obtained by averaging the minimum and maximum diameter of the recovered rounds. The efficacy of ammunition is based upon its ability to penetrate a standard medium of Ballistic Gelatin (10% nominal) under a variety of controlled circumstances.

Each of the following six penetration/expansion tests requires five shots:

Penetration Test Procedure

All shots are fired 10 feet from the leading face of the gelatin block and are described as follows:

1. **Bare gelatin test:** Five shots are fired into bare gelatin. This test normally yields the best expansion results.
2. **Heavy clothing test:** Five shots are fired into gelatin covered by four layers of clothing. The clothing used is a cotton tee shirt, a cotton dress shirt, polar fleece and cotton denim.
3. **Steel:** Two pieces of 20 gauge galvanized steel, four inches apart, nearest sheet being

18 inches from the gelatin block. The gelatin is covered with one layer of a cotton tee shirt and one layer of a cotton dress shirt.

4. **Wallboard:** Two pieces of half-inch standard gypsum board are set 3.5 inches apart, with the closest wallboard being 18 inches from the gelatin block. The gelatin is covered with one layer of light clothing.
5. **Plywood:** One piece of three-quarter inch AA fir plywood is set 18 inches from the gelatin block. The gelatin is covered in one layer of light clothing.
6. **Automobile glass:** One piece of A.S.I. one-quarter inch laminated automobile safety glass is set at an angle of 45 degrees vertical, and a lateral offset of 15 degrees, approximating the conditions of a shot taken at the driver of a vehicle through the front windshield. The gelatin is covered with one layer of light clothing as previously described.

BARE GELATIN

Table 7: Table for Bare Gelatin Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

HEAVY CLOTHING

Table 8: Table for Heavy Clothing Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

STEEL

Table 9: Table for Steel Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

WALLBOARD

Table 10: Table for Wallboard Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

PLYWOOD

Table 11: Table for Plywood Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

AUTOMOBILE GLASS

Table 12: Table for Automobile Glass Testing

	TEST DATE	CALIBER	MAKE	LOT #	DEPTH (INCHES)	EXPANSION	PERMANENT WOUND CAVITY	BULLET WEIGHT (GRAINS)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								