

# ARCHIVED REPORT

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## Small Arms Ammunition

### Outlook

- Combined output from European manufacturers will average about 8 billion rounds per year
- Combined output from non-U.S. and non-European manufacturers will average nearly 7 billion rounds per year
- U.S. DoD requirements will maintain a base sustainment level of U.S. production averaging 1 billion rounds per year

### Orientation

**Description.** Ammunition for military small arms, 5.5x15mm (.22 Long Rifle) to 15.5x106mm, and 12-gauge shotgun shells.

**Sponsor.** In the European and international markets, both individual contractors and various governments sponsor the development of small arms ammunition.

The U.S. Army sponsors the development and U.S. procurement of small arms ammunition.

**Licensees.** Due to the unique nature of this market, licensing arrangements are rarely, if ever, made.

**Status.** Development through serial production.

**Total Produced.** Through 2022, we estimate that the various European contractors produced over 372 billion rounds of small arms ammunition since 1980 inclusive.

Through 2022, we estimate that the various non-U.S. and non-European contractors produced more than 255 billion rounds of small arms ammunition since 1980 inclusive.

Through 2022, we estimate that the various U.S. contractors produced over 131 billion rounds of small arms ammunition since 1980 inclusive.

**Application.** Ammunition for military small arms – including sidearms (pistols), submachine guns, shoulder arms (rifles, assault weapons, and shotguns), and crew-served machine guns.

**Price Range.** In 2023 U.S. dollars, the unit prices of new-production European small arms cartridges range from \$0.08 for the 5.5x15mm (.22 Long Rifle) cartridge to \$6.54 for the 15.2x186mm cartridge.

In 2023 U.S. dollars, the unit prices of new-production non-U.S. and non-European small arms cartridges range from \$0.08 for the 5.5x15mm (.22 Long Rifle) cartridge to \$2.47 for the 14.5x114mm cartridge.

According to the U.S. Army's budget request documentation, unit prices for basic small arms ammunition types are as follows:

#### 5.56x45mm NATO (.223 Remington)

- Dummy (DDI), M199A1: \$0.78
- Test, High Pressure, M197: \$0.76
- Blank, M200: \$0.18
- Ball, M855A1, Clipped Mil Pack: \$0.59
- Ball, M855A1, Clipped Bulk Pack: \$0.30
- Tracer, M856A1: \$0.47
- 4 Ball, M855A1/1 Tracer M856A1, Lead Free: \$0.43
- Marking, M1042 (Blue): \$0.78
- Marking, M1042 (Red): \$0.78

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- Marking, M1071, Linked (Blue): \$0.66
- Marking, M1071, Linked (Red): \$0.82

### 7.62x51mm NATO (.308 Winchester)

- Dummy (DDI), M63A1: \$0.73
- Blank, M82: \$0.29
- Bottlenose Blank, M82A1: \$0.36
- Ball, M80, Linked/M13: \$0.47
- Ball, M80A1, Linked: \$1.35
- 4 Ball, M80/1 Tracer, Linked: \$1.13
- 4 Ball, M80A1/1 Tracer, Linked, Lead Free: \$0.99
- 4 Ball, M80/1 Dim Tracer, M276, Linked: \$0.50
- HPT M60: \$1.16
- Long Range, M118: \$0.70
- 4 Armor Piercing, M993/1 Tracer, M62: \$2.45
- Short Range Training, 4 Ball/1 Tracer: \$0.84

### 7.82x67mm (.300 Winchester Magnum)

- Ctg, Mk 248 w/Mods: \$1.35

### 9x19mm Parabellum

- Dummy (DDI), M917A1: \$2.18
- Ball, M882, Combat Pack: \$0.21
- Ball, M882, Commercial Pack: \$0.17
- Marking, M1041 (Blue): \$0.62
- Marking M1041 (Red): \$0.61
- Modular Handgun Ammo: \$0.34

### 12.7x99mm (.50-caliber Browning)

- Dummy (DDI), M2A1: \$6.65
- High Pressure Test, M1: \$3.38
- Blank, M1A1, Linked: \$1.51
- 4 API, M8/1 Tracer, M17, Linked: \$2.23
- 4 SLAP M903/1 SLAPT M96, Linked: \$15.47
- Ball, M33, Linked: \$2.04
- 4 Ball/1 Tracer, Linked: \$3.39
- MP, Mk 211 Mod 0: \$9.41
- API-T, M20, Single Rd: \$2.30
- Short Range Training 4 Ball, M858/1 Tracer, M860, Linked: \$3.39

### 18.29x69.85mm (12-Gauge Shotgun)

- #7-1/2 Chilled Shot: \$0.41
- #9 Shot: \$0.31

**Note:** All DoD-procured shotgun ammunition must be compatible with standard 2.75-inch shotgun chambers.

## Contractors

### Prime

<b>Ammotec Deutschland GmbH</b>	<a href="http://ammotec.com">http://ammotec.com</a> , Kronacher Strasse 63, Furth, Germany, Tel: + 49 911 7930 0, Fax: + 49 911 7930 680, Email: <a href="mailto:info.ammotec@ruag.com">info.ammotec@ruag.com</a> , Prime
<b>BAE Systems, Combat Vehicles (UK)</b>	<a href="http://www.baesystems.com">http://www.baesystems.com</a> , Golf Course Ln, New Filton House, Filton, S Gloucestershire, United Kingdom, Tel: + 44 0117 9888560, Fax: + 44 0117 9888502, Prime
<b>China North Industries Corp (NORINCO)</b>	<a href="http://www.norinco.cn">http://www.norinco.cn</a> , 12A Guang An Men Nan Jie, PO Box 100053, Beijing, China, Tel: + 86 10 6352 9988, Fax: + 86 10 6354 0398, Email: <a href="mailto:norinco@norinco.cn">norinco@norinco.cn</a> , Prime
<b>Companhia Brasileira de Cartuchos, CBC Magtech</b>	<a href="http://www.cbc.com.br">http://www.cbc.com.br</a> , Av. Humberto de Campos 3220, Guapituba, Ribeirao Pires, Brazil, Tel: + 55 11 2139 8378, Fax: + 55 11 2139 8323, Email: <a href="mailto:export@cbc.com.br">export@cbc.com.br</a> , Prime
<b>Denel SOC Ltd</b>	<a href="http://www.denel.co.za">http://www.denel.co.za</a> , Nellmapius Dr, Irene, South Africa, Tel: + 27 12 671 2700, Fax: + 27 12 671 2751, Email: <a href="mailto:marketing@denel.co.za">marketing@denel.co.za</a> , Prime

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<b>FN Herstal SA</b>	<a href="http://www.fnherstal.com">http://www.fnherstal.com</a> , Voie de Liège 33, Herstal, Belgium, Tel: + 32 4 240 81 11, Fax: + 32 4 240 88 99, Email: <a href="mailto:info@fnherstal.com">info@fnherstal.com</a> , Prime
<b>Federal State Unitary Enterprise, Rosoboronexport, Rosoboronexport State Corp</b>	<a href="http://www.roe.ru">http://www.roe.ru</a> , 27/3 Stromynka St, Moscow, Russian Federation, Tel: + 7 495 534 6183, Fax: + 7 495 534 6153, Prime
<b>General Dynamics European Land Systems, Santa Bárbara Sistemas</b>	<a href="http://www.gdels.com">http://www.gdels.com</a> , Via de los Poblados 3, PE Cristalia Edificio 7/8, Madrid, Spain, Tel: + 34 91 585 04 55, Fax: + 34 91 585 02 18, Email: <a href="mailto:info.sbs@gdels.com">info.sbs@gdels.com</a> , Prime
<b>General Dynamics Ordnance and Tactical Systems Canada (formerly SNC Technologies Inc)</b>	<a href="http://www.gd-otscanada.com">http://www.gd-otscanada.com</a> , 5 Montée des Arsenaux, Le Gardeur, Quebec, Canada, Tel: + 1 (450) 581-3080, Fax: + 1 (450) 585-7302, Email: <a href="mailto:info@ca.gd-ots.com">info@ca.gd-ots.com</a> , Prime
<b>Lake City Army Ammunition Plant (Olin Winchester)</b>	PO Box 1000, Independence, MO 64051 United States, Tel: + 1 (816) 796-7101, Fax: + 1 (816) 796-5218, Prime
<b>Nammo AS, Small Caliber Division</b>	<a href="http://www.nammo.com">http://www.nammo.com</a> , Ayrite 8 D, 5th Fl, Vantaa, Finland, Tel: + 358 10 5233 800, Fax: + 358 6 4310 425, Email: <a href="mailto:scd@nammo.com">scd@nammo.com</a> , Prime
<b>Nexter Munitions</b>	<a href="http://www.nexter-group.fr">http://www.nexter-group.fr</a> , Route de Villeneuve, La Chapelle, Saint-Ursin, France, Tel: + 33 02 48 68 71 71, Fax: + 33 02 48 68 70 54, Prime
<b>Ohio Ordnance Works Inc</b>	<a href="http://www.ohioordnanceworks.com">http://www.ohioordnanceworks.com</a> , 310 Park Dr, PO Box 687, Chardon, OH 44024 United States, Tel: + 1 (440) 285-3481, Fax: + 1 (440) 286-8571, Email: <a href="mailto:oow@ohioordnanceworks.com">oow@ohioordnanceworks.com</a> , Prime
<b>Ordnance Factories Organization of India, Ordnance Factory Board - Export Division</b>	<a href="http://www.ofb.gov.in">http://www.ofb.gov.in</a> , 10 A, S K Bose Rd, Kolkata, India, Tel: + 91 33 2248 5077 80, Fax: + 91 33 2248 9744, Email: <a href="mailto:ofbtrade@dataone.in">ofbtrade@dataone.in</a> , Prime
<b>Pakistan Ordnance Factories</b>	Wah Cantt, Pakistan, Tel: + 92 51 9055 21019, Fax: + 92 51 9316253, Email: <a href="mailto:exports@pof.gov.pk">exports@pof.gov.pk</a> , Prime
<b>Rheinmetall Defence</b>	<a href="http://www.rheinmetall-defence.com">http://www.rheinmetall-defence.com</a> , Rheinmetall Platz 1, Düsseldorf, Germany, Tel: + 49 211 473 01, Fax: + 49 211 473 4746, Email: <a href="mailto:info@rheinmetall-defence.com">info@rheinmetall-defence.com</a> , Prime
<b>Sellier &amp; Bellot JSC</b>	<a href="http://www.sellier-bellot.cz">http://www.sellier-bellot.cz</a> , Lidicka 667, Vlasim, Czech Republic, Tel: + 420 317 892 492, Fax: + 420 317 892 489, Email: <a href="mailto:info@sellier-bellot.cz">info@sellier-bellot.cz</a> , Prime
<b>Singapore Technologies Land Systems Ltd (ST Land Systems)</b>	<a href="http://www.stengg.com">http://www.stengg.com</a> , 249 Jalan Boon Lay, Singapore, Singapore, Tel: + 65 6265 1066, Fax: + 65 6261 6932, Email: <a href="mailto:comms.kinetics@stengg.com">comms.kinetics@stengg.com</a> , Prime
<b>Thales Australia, Armaments &amp; Ammunition</b>	<a href="http://www.thalesgroup.com">http://www.thalesgroup.com</a> , 7 Murray Rose Ave, Sydney Olympic Park, New South Wales, Australia, Tel: + 61 2 9562 3333, Email: <a href="mailto:communications@thalesgroup.com">communications@thalesgroup.com</a> , Prime
<b>Zakłady Metalowe Mesko SA</b>	<a href="http://www.mesko.com.pl">http://www.mesko.com.pl</a> , Ul. Legionow 122, Skarzysko-Kamienna, Poland, Tel: + 48 41 253 30 01, Fax: + 48 41 252 02 80, Email: <a href="mailto:marketing@mesko.com.pl">marketing@mesko.com.pl</a> , Prime
<b>Black Hills Ammunition Co</b>	<a href="http://www.black-hills.com">http://www.black-hills.com</a> , PO Box 3090, Rapid City, SD 57709-3090 United States, Tel: + 1 (605) 348-5150, Fax: + 1 (605) 348-9827, Second Prime
<b>Elbit Systems Land (IMI Systems Ltd)</b>	<a href="http://elbitsystems.com/products/land-systems/">http://elbitsystems.com/products/land-systems/</a> , PO Box 1044, Bialik St 64, Ramat HaSharon, Israel, Tel: + 972 3 548 5222, Fax: + 972 3 548 6125, Email: <a href="mailto:imimrktg@imi-israel.com">imimrktg@imi-israel.com</a> , Second Prime
<b>Olin Corp - Winchester Ammunition</b>	<a href="http://www.winchester.com">http://www.winchester.com</a> , 600 Powder Mill Rd, East Alton, IL 62024-1273 United States, Tel: + 1 (618) 258-2000, Email: <a href="mailto:olinwinchesterinfo@olin.com">olinwinchesterinfo@olin.com</a> , Second Prime
<b>Poongsan Defense</b>	<a href="http://www.poongsan.co.kr">http://www.poongsan.co.kr</a> , Poongsan Bldg, 23 Chungjeong-ro, Seoul, Korea, South, Tel: + 82 2 3406 5114, Fax: + 82 2 3406 5400, Email: <a href="mailto:jwkang@poongsan.co.kr">jwkang@poongsan.co.kr</a> , Second Prime

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; [rich.pettibone@forecast1.com](mailto:rich.pettibone@forecast1.com)

## Small Arms Ammunition

### Technical Data

#### Small Arms Cartridge Designations

**Note:** *Given the wide availability of small arms ammunition of all types worldwide – and in an effort to avoid redundancy and confusion – we list commonly used military ammunition in this report by caliber, not by specific manufacturer.*

#### Europe

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
4.5x39mm	4.5x39mm Russian, 4.5 SPS, 4.5 Underwater	Russian Federation
4.6x30mm	4.6 PDW	Switzerland United Kingdom
4.73x33mm	Ohne Hülse (Caseless), DM11	Germany
5.45x39mm	5.45mm Russian Rifle, M74	Armenia Bulgaria Czech Republic Germany Poland Romania Russian Federation Serbia Ukraine
5.45x18mm	5.45mm Russian Pistol	Poland Russian Federation
5.5x15mm	.22 Long Rifle	Belgium Bulgaria Czech Republic Finland France Germany Italy Portugal Romania Russian Federation Serbia Spain Sweden Switzerland
5.56x45mm NATO	.223 Remington M193, M855 (SS109)	United Kingdom Belgium Bosnia-Herzegovina Czech Republic Finland France Germany Greece Italy Poland Portugal Russian Federation Serbia Spain Sweden Switzerland Turkey United Kingdom

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<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
5.56x45mm	5.56mm French	France
5.6x35mm	.22 Hornet	Czech Republic
		Finland
		Germany
		Sweden
		Switzerland
5.66x23mm	.224 BOZ	United Kingdom
5.6x29mm	5.6mm Velo Dog	Italy
5.66x39mm	5.66 Underwater, 5.66 MPS	Russian Federation
5.68x26.72mm	.22 Winchester Magnum	Germany
		Switzerland
5.7x28mm	FN P90	Belgium
6x47mm SM	6x47mm Swiss Match	Switzerland
6x52mm	.243 Winchester	Belgium
		Czech Republic
		Finland
		Germany
		Serbia
		Sweden
		Switzerland
6.35x16mm	.25 Automatic Colt Pistol (ACP)	Belgium
		Czech Republic
		Finland
		France
		Germany
		Italy
		Serbia
		Spain
		Sweden
		Switzerland
6x39mm	6mm Norma	Sweden
6.5x50mm	6.5mm Arisaka	Sweden
6.5x52mm	6.5mm Mannlicher-Carcano	Serbia
		Sweden
6.5x54mm	6.5x54mm Mannlicher-Shoenauer, DWM 477, Roth 632	Czech Republic
		Germany
		Serbia
6.5x55mm	6.5mm Swedish Mauser	Finland
		Germany
		Norway
		Serbia
		Sweden
		Switzerland
6.5x55mm	6.5-284 Norma	Sweden
6.5x57mm	6.5x57mm Mauser	Czech Republic
		Germany
		Switzerland
7x57mm	7mm Mauser, 7mm Spanish Mauser, M1893	Belgium
		Croatia
		Finland
		Germany
		Italy
		Portugal
		Serbia
		Spain
		Sweden
		Switzerland

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
7x63mm	7mm Remington Magnum	Belgium Finland Germany Serbia Sweden Switzerland
7x66mm	7x66mm Vom Hofe Super Express	Germany
7.5x22mm	7.5mm Swiss Revolver	Italy Switzerland
7.5x54mm	7.5mm French, 7.5mm MAS	Serbia
7.5x55mm	7.5mm Schmidt-Rubin, M1911	France Germany Italy Sweden Switzerland
7.62x25mm	7.62mm Tokarev	Belarus Bulgaria Czech Republic Finland Poland Romania Russian Federation Serbia Slovak Republic Ukraine
7.62x33mm	7.62mm Spanish Regena, Model 68	Spain
7.62x33mm	.30 Carbine	Belgium Germany Italy Serbia Sweden Switzerland
7.62x36mm	7.62mm Underwater Dart	United Kingdom
7.62x38mm	7.62mm Nagant Revolver	Germany Italy Russian Federation Serbia Switzerland
7.62x39mm	7.62mm Soviet, M1943	Ukraine Armenia Belarus Belgium Bosnia-Herzegovina Bulgaria Croatia Czech Republic Finland Germany Hungary Netherlands Poland Portugal Romania Russian Federation Serbia Slovak Republic Sweden Switzerland
7.62x40mm	7.62mm SP-3	Ukraine
7.62x42mm	7.62 Silent Russian, 7.62 SP-4	Russian Federation Russian Federation

**Small Arms Ammunition**

**Cartridge Caliber**  
 7.62x45mm  
 7.62x51mm NATO

**Common Designation**  
 7.62mm Czech, M1952  
 .308 Winchester

**Producing Country**

Czech Republic  
 Belgium  
 Bosnia-Herzegovina  
 Czech Republic  
 Denmark  
 Finland  
 France  
 Germany  
 Greece  
 Italy  
 Netherlands  
 Norway  
 Poland  
 Portugal  
 Russian Federation  
 Serbia  
 Spain  
 Sweden  
 Switzerland  
 Turkey

7.62x54mm

7.62mm Mosin-Nagant, M1891

United Kingdom  
 Belarus  
 Bosnia-Herzegovina  
 Bulgaria  
 Czech Republic  
 Finland  
 Poland  
 Romania  
 Russian Federation  
 Serbia  
 Sweden  
 Ukraine

7.62x63mm  
 7.62x63mm

PZAM  
 .30-06 Springfield, .30 Browning, M1906

Russian Federation  
 Belgium  
 Bosnia-Herzegovina  
 Czech Republic  
 Denmark  
 Finland  
 France  
 Germany  
 Greece  
 Hungary  
 Italy  
 Portugal  
 Serbia  
 Spain  
 Sweden  
 Switzerland  
 Turkey

7.62x67mm

.300 Winchester Magnum

United Kingdom  
 Belgium  
 Finland  
 Germany  
 Sweden  
 Switzerland

7.63x25mm

7.63mm Mauser, .30 Mauser Pistol

Italy  
 Portugal

7.65x17mm

7.65mm Browning,  
 .32 Automatic Colt Pistol

Belgium  
 Czech Republic  
 Finland  
 France

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
7.65x19mm	7.65mm Longue, 7.65 MAS	Germany Hungary Italy Serbia Slovak Republic Spain Sweden Switzerland Turkey France Spain Germany Italy Portugal Sweden Finland Belgium Serbia Sweden Belgium Greece Portugal Serbia Sweden United Kingdom
7.65x21mm 7.65x53mm	7.65mm Parabellum, 7.65mm Luger 7.65mm Argentine Mauser	Sweden Finland Belgium Serbia Sweden Belgium Greece Portugal Serbia Sweden United Kingdom
7.7x56mm	.303 Lee-Enfield, .303 British	Sweden Sweden Portugal Portugal Belgium Bosnia-Herzegovina Czech Republic Germany Bosnia-Herzegovina Czech Republic Germany Italy Norway Portugal Serbia Spain Sweden Switzerland Turkey United Kingdom
7.7x58mm 7.82x65mm 7.92x24mm 7.92x24mm 7.92x57mm	7.7mm Arisaka, Type 99 .308 Norma Magnum 7.92mm Subcaliber, M388 7.92mm Portuguese Regana, M973 8mm Mauser	Belgium Bosnia-Herzegovina Czech Republic Germany Bosnia-Herzegovina Czech Republic Germany Italy Norway Portugal Serbia Spain Sweden Switzerland Turkey United Kingdom
8x16mm	.320 Short CF, .320 Short Webley, GR97	Belgium Italy Italy Serbia Italy Switzerland France Italy Hungary Finland Sweden Switzerland Belgium Czech Republic Denmark Finland
8x18mm	8mm Roth-Steyr	Italy Italy Serbia Italy Switzerland France Italy Hungary Finland Sweden Switzerland Belgium Czech Republic Denmark Finland
8x27mm	8mm Gasser, GR304	Italy Switzerland France Italy Hungary Finland Sweden Switzerland Belgium Czech Republic Denmark Finland
8x27mm	8mm French, 8mm Lebel	France Italy Hungary Finland Sweden Switzerland Belgium Czech Republic Denmark Finland
8x56mm 8.6x70mm	8mm Hungarian Mannlicher .338 Lapua Magnum	Hungary Finland Sweden Switzerland Belgium Czech Republic Denmark Finland
9x17mm	9mm Short, .380 Automatic Colt Pistol	Belgium Czech Republic Denmark Finland

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<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
9x18mm	9mm Police, 9mm Ultra	Germany
		Greece
9x18mm	9mm Makarov, 9mm Stechkin, Type 59	Hungary
		Italy
		Netherlands
		Portugal
		Switzerland
		Belgium
		Germany
		Italy
		Switzerland
		Armenia
9x19mm	9mm Glisenti	Belarus
		Bulgaria
9x19mm	9mm Parabellum, 9mm Luger	Romania
		Russian Federation
9x19mm	9mm Parabellum, 9mm Luger	Slovak Republic
		Russian Federation
		Ukraine
		Serbia
		Spain
		Sweden
		Switzerland
		Turkey
		Italy
		Armenia
		Belgium Austria
		Bosnia-Herzegovina
		Bulgaria
		Czech Republic
		Denmark
		Finland
		France
		Germany
		Greece
		Hungary
		Italy
		Netherlands
		Norway
		Poland
		Portugal
		Romania
		Russian Federation
		Serbia
		Slovak Republic
Spain		
Sweden		
Switzerland		
Turkey		
United Kingdom		
9x20mm	9mm Swedish	Serbia
		Spain
		Sweden
		Russian Federation
9x21mm	9mm Gyrza	Czech Republic
		Germany
9x21mm	9mm IMI	Hungary
		Italy
9x22mm	.357 SIG	Slovak Republic
		Switzerland
		Switzerland

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<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
9x23mm	9mm Mannlicher, 9mm Steyr	Italy Switzerland
9x23mm	9mm Action Express	Belgium United Kingdom
9x23mm	9mm Bergmann-Bayard, 9mm Largo	Belgium Portugal Spain
9x23mm	.38 Automatic Colt Pistol	Belgium Italy
9x23mm	.38 Super Auto	Belgium Czech Republic
9x29mm	9mm Winchester Magnum	Italy Belgium
9x29mm	.38 Smith & Wesson Special	Belgium Czech Republic Finland France Germany Italy Poland Russian Federation Serbia Spain Sweden Switzerland Turkey United Kingdom
9x31mm	.380 British, .38/200	France United Kingdom
9x33mm	.357 Smith & Wesson Magnum	Finland France Germany Italy Poland Serbia-Montenegro Sweden Switzerland United Kingdom Russian Federation
9x39mm	9mm SP-5/SP-6	Belgium
9x57mm	9mm Mauser, DWM 491B	Italy Serbia Slovak Republic
10x21mm	.40 Smith & Wesson	Switzerland Belgium France Italy Spain United Kingdom
10x22mm	.41 Action Express	Italy Belgium France Italy Spain United Kingdom
10x25mm	.44 Smith & Wesson Russian	Italy
10x25mm	10mm Bren Ten	Italy Serbia Sweden United Kingdom
11x33mm	.44 Remington Magnum	Finland Italy Sweden
11.43x23mm	.45 Automatic Colt Pistol	Belgium France Germany Greece

## Small Arms Ammunition

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
11.5x19mm	.455 Webley Mk VI	Italy Norway Russian Federation Serbia Spain Switzerland Turkey
12.7x33mm	.50 Action Express	Italy United Kingdom
12.7x77mm	.50 Spotting Rifle	Italy Belgium Greece Spain
12.7x99mm	.50 Browning, .50 BMG	Belgium Bosnia and Herzegovina Denmark France Germany Greece Italy Netherlands Norway Portugal Romania Serbia Spain Sweden Switzerland Turkey
12.7x107mm	12.7mm Soviet	United Kingdom Bosnia and Herzegovina Bulgaria Czech Republic Hungary Poland Romania Russian Federation Serbia Ukraine
14.5x114mm	14.5mm Soviet	Belarus Bulgaria Poland Romania Russian Federation Ukraine
15.2x186mm	15.2 Steyr AMR	Switzerland
15.5x106mm	MILO BRG-15	Belgium

## International

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
5.5x15mm	.22 Long Rifle	Argentina Australia Brazil Canada Mexico People's Republic of China Philippines Republic of Korea Republic of South Africa

**Small Arms Ammunition****Cartridge Caliber**

5.56x45mm NATO

**Common Designation**.223 Remington  
M193, M855 (SS109)**Producing Country**

Argentina  
Australia  
Brazil  
Cambodia  
Canada  
Chile  
Republic of China  
Colombia  
Dominican Republic  
Egypt  
Guatemala  
India  
Indonesia  
Iran  
Israel  
Japan  
Malaysia  
Mexico  
Morocco  
Myanmar  
New Zealand  
Nigeria  
Pakistan  
People's Republic of China  
Peru  
Philippines  
Republic of Korea  
Republic of South Africa  
Saudi Arabia  
Singapore  
Thailand  
United Arab Emirates  
Venezuela  
India  
Israel  
Republic of South Africa  
Brazil  
Republic of South Africa  
Israel  
Philippines  
Republic of Korea  
Brazil  
Israel  
Republic of Korea  
Republic of South Africa  
Brazil  
Colombia  
Mexico  
Republic of Korea  
Republic of South Africa  
Brazil  
Chile  
Colombia  
Republic of Korea  
Republic of South Africa  
Republic of Korea  
Republic of South Africa  
Burkina Faso  
Cambodia  
Cameroon  
Morocco

5.56x45mm

SS107

5.6x35mm  
5.68x26.72mm  
5.7x43mm.22 Hornet  
.22 Winchester Magnum  
.222 Remington

6x52mm

.243 Winchester

6.35x16mm

.25 Automatic Colt Pistol (ACP)

7x57mm

7mm Mauser, 7mm Spanish Mauser,  
M1893

7x63mm

7mm Remington Magnum

7.5x54mm

7.5mm French, 7.5mm MAS

**Small Arms Ammunition**

**Cartridge Caliber**

**Common Designation**

**Producing Country**

7.62x25mm

7.62mm Tokarev

7.62x33mm  
7.62x33mm

7.62mm Regana, Modelo 68  
.30 Carbine

7.62x39mm

7.62mm Soviet, M1943

7.62x51mm NATO

.308 Winchester

Vietnam  
Dominican Republic  
Iran  
Republic of South Africa  
Thailand  
Cuba  
Democratic People's Republic of Korea  
People's Republic of China  
Argentina  
Bolivia  
Brazil  
Burkina Faso  
Colombia  
Cuba  
Dominican Republic  
Ecuador  
Guatemala  
Iran  
Israel  
Japan  
Mexico  
Morocco  
Philippines  
Republic of Korea  
Republic of South Africa  
Thailand  
Venezuela  
Vietnam  
Brazil  
Cambodia  
Cameroon  
Cuba  
Democratic People's Republic of Korea  
Egypt  
India  
Indonesia  
Iran  
Israel  
Morocco  
Pakistan  
People's Republic of China  
Peru  
Republic of Korea  
Republic of South Africa  
Singapore  
Sudan  
Syria  
Vietnam  
Zimbabwe  
Argentina  
Australia  
Bolivia  
Brazil  
Cameroon  
Canada  
Chile  
Colombia  
Cuba  
Dominican Republic

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
		Ecuador
		Egypt
		India
		Indonesia
		Iran
		Israel
		Japan
		Malaysia
		Morocco
		Myanmar
		Nepal
		New Zealand
		Nigeria
		Pakistan
		Paraguay
		Peru
		Philippines
		Republic of China
		Republic of Korea
		Republic of South Africa
		Saudi Arabia
		Singapore
		Sudan
		Thailand
		United Arab Emirates (Abu Dhabi)
		Uruguay
		Venezuela
		Zimbabwe
7.62x54mm	7.62mm Mosin-Nagant	Cuba
		Egypt
		Iran
		People's Republic of China
		Syria
		Vietnam
7.62x63mm	.30-06 Springfield, .30 Browning M1906	Argentina
		Brazil
		Canada
		Colombia
		Cuba
		Dominican Republic
		Indonesia
		Iran
		Israel
		Mexico
		Pakistan
		Philippines
		Republic of Korea
		Republic of South Africa
		Venezuela
7.62x67mm	.300 Winchester Magnum	Canada
		Republic of Korea
		Republic of South Africa
7.65x17mm	7.65mm Browning, .32 Automatic Colt Pistol	Brazil
		Chile
		Dominican Republic
		Iran
		Mexico
		Republic of Korea
		Republic of South Africa
		Thailand

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
7.65x19mm	7.65mm Longue, 7.65 MAS	Burkina Faso Morocco
7.65x53mm	7.65mm Argentine Mauser 7.65 Turkish Mauser	Argentina Brazil Chile Colombia Peru
7.7x56mm	.303 Lee-Enfield, .303 British	Canada Egypt India Israel Myanmar Pakistan Republic of South Africa Zimbabwe
7.92x57mm	8mm Mauser	Argentina Republic of South Africa
8x50mm	8mm French, 8mm MAS	Burkina Faso Cameroon Sudan
9x17mm	9mm Short, .380 Automatic Colt Pistol	Argentina Brazil Chile Egypt Israel Mexico Pakistan Republic of Korea Republic of South Africa Zimbabwe
9x18mm	9mm Makarov, Type 59	Cuba Democratic People's Republic of Korea Egypt Iran Pakistan People's Republic of China Syria Vietnam
9x19mm	9mm Parabellum, 9mm Luger	Argentina Australia Bolivia Brazil Cambodia Cameroon Canada Chile Colombia Cuba Dominican Republic Ecuador Egypt Guatemala India Indonesia Iran Israel Malaysia Mexico Morocco Myanmar

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
		Nepal
		New Zealand
		Nigeria
		Pakistan
		Paraguay
		People's Republic of China
		Peru
		Republic of Korea
		Republic of South Africa
		Saudi Arabia
		Singapore
		Thailand
		United Arab Emirates (Abu Dhabi)
		Uruguay
		Venezuela
		Vietnam
		Zimbabwe
9x21mm	9mm IMI	Indonesia
9x23mm	.38 Automatic Colt Pistol	Israel
		Brazil
		Chile
		Colombia
		Mexico
		Venezuela
9x23mm	.38 Super Auto	Brazil
		Chile
		Colombia
		Mexico
		Republic of Korea
		Republic of South Africa
9x29mm	.38 Smith & Wesson Special	Argentina
		Brazil
		Chile
		Dominican Republic
		Indonesia
		Iran
		Israel
		Japan
		Malaysia
		Mexico
		Philippines
		Republic of Korea
		Republic of South Africa
		Thailand
9x31mm	.380 British, .38/200	India
		Republic of South Africa
9x33mm	.357 Smith & Wesson Magnum	Brazil
		Israel
		Mexico
		Republic of Korea
		Republic of South Africa
		Thailand
10x21mm	.40 Smith & Wesson	Israel
		Republic of Korea
10x22mm	.41 Action Express	Israel
10x25mm	10mm Bren Ten	Brazil
		Republic of Korea
10x33mm	.41 Remington Magnum	Republic of Korea
11x29mm	.44 Smith & Wesson Special	Republic of Korea

**Small Arms Ammunition**

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
11x33mm	.44 Remington Magnum	Brazil Israel Republic of Korea Republic of South Africa
11.43x23mm	.45 Automatic Colt Pistol	Argentina Bolivia Brazil Canada Colombia Cuba Dominican Republic Iran Israel Japan Mexico Paraguay Philippines Republic of China Republic of Korea Republic of South Africa Singapore Thailand Venezuela
11.5x23mm	.45 Auto Rim	Brazil
11.5x33mm	.45 Colt, .45 Long Colt	Republic of Korea Mexico
11.5x19mm	.455 Webley Mk VI	India Republic of South Africa
12.7x33mm	.50 Action Express	Israel
12.7x77mm	.50 Spotting Rifle	Brazil India Pakistan Republic of Korea Republic of South Africa
12.7x99mm	.50 Browning	Argentina Australia Brazil Canada Chile Colombia Dominican Republic Egypt India Indonesia Iran Israel Japan Malaysia Mexico Morocco Nepal New Zealand Pakistan People's Republic of China Philippines Republic of China Republic of Korea Republic of South Africa Saudi Arabia Singapore

## Small Arms Ammunition

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Producing Country</u>
12.7x107mm	12.7mm Soviet, 12.7 DShK, Type 54	Thailand United Arab Emirates Cuba Egypt Iran Israel Pakistan People's Republic of China Syria Vietnam
14.5x114mm	14.5mm Soviet, 14.5 KPV, Type 56	Cuba Egypt Iran Pakistan People's Republic of China Syria

## United States

The U.S. Department of Defense currently procures small arms ammunition in a variety of calibers. The most common calibers are as follows:

<u>Cartridge Caliber</u>	<u>Common Designation</u>	<u>Weapon/Application</u>
5.5x15mm	.22 Long Rifle	Marksmanship training weapons
5.56x45mm NATO	.223 Remington M193, M855 (SS109)	M16/M4 series; Mk 16 Mod 0 SCAR-L M249 Squad Automatic Weapon (SAW)
6.8x43mm SPC		Barrett M468 battle carbine
7.62x51mm NATO	.308 Winchester M80, M118	M14, M24 SWS, M40A3, M110 and USMC DMR Mk 17 Mod 0 SCAR-H; M60- and M240-series machine guns
7.62x67mm	.300 Winchester Magnum Mk 248 w/Mods	M24E1 SWS
9x17mm	.380 Automatic Colt Pistol	M134 Minigun; EX-34 Chain Gun
9x19mm Parabellum	9mm M882	General/Flag Officer personal sidearms M9, M11 and M17 sidearm M4 and MP5 submachine guns
11.43x23mm	.45 Automatic Colt Pistol	M1911 series, Model 15, and MEU (SOC) sidearms
12.7x99mm	.50-caliber Browning	Barrett Model 82A1, M90A1, M107, M-87R rifles; M2-series heavy machine gun; GAU-19/A Gatling gun
18.29x69.85mm	12-gauge shotgun (2.75-in chamber)	Benelli M104 and Mossberg Model 500/590 series; Lightweight Shotgun System (LSS)

## Small Arms Ammunition

### Program Review

#### Europe

**Background.** Since the emergence of the "arquebus" matchlock rifle on the continent in the 15th century, Europe has remained the center of small arms development.

For the purposes of our discussion, we define small arms as the basic cartridge-firing individual and crew-served weapons of the infantry, as follows:

- Sidearms (pistols), firing pistol-caliber ammunition
- Submachine guns (machine pistols), firing pistol-caliber ammunition
- Battle carbines, firing intermediate-caliber ammunition
- Battle rifles, firing full-caliber rifle ammunition

In addition, infantry small arms encompass crew-served machine guns, as follows:

- Light machine guns, firing either intermediate-caliber or full-caliber ammunition
- Medium (general-purpose) machine guns, firing full-caliber ammunition
- Heavy machine guns, firing heavy (12.7mm and above) ammunition

#### *Wide Availability, Huge Demand*

The proliferation of European small arms since World War II has led to a wide availability of ammunition for these weapons worldwide. While an increasing number of nations are adopting NATO-standard arms and ammunition, the worldwide diversity of doctrinal, financial, and political circumstances leads to a continuing demand for a wide variety of ammunition well beyond NATO-standard types.

Small arms ammunition, while cheap in terms of unit price, represents a major expense for most nations due to the large quantities required. At present, at least 30 European nations are involved to some extent in the European small arms ammunition market. In this report, we briefly review only the most active players in the European small arms ammunition market so as to present a cross-section of the entire market.

#### Belgium

*FN Herstal SA.* Since its founding in 1891, the world-famous Fabrique Nationale firm has been the most prolific European developer, producer, and exporter of small arms and ammunition.

In addition to producing the latest-pattern NATO-standard small arms ammunition, FN Herstal is also the leading producer of several supposedly obsolete ammunition types. These older ammunition types remain particularly popular with private shooting enthusiasts in the United States and Europe, as well as with the forces of developing nations. Despite the influx of new players, we expect that FN Herstal will remain a potent force in the international market for the foreseeable future.

#### *An Industry Leader*

FN Herstal remains at the forefront of ammunition development. Major developments have included:

- 5.56x45mm NATO (.223 Remington) SS109 round, which replaced the M193 as NATO's standard 5.56 round
- 7.62x51mm NATO (.308 Winchester) SS123 round, an advanced-design round with reportedly greater steel penetration characteristics than standard 7.62mm ammunition
- 12.7x99mm (.50-caliber) FN169 round, which reportedly gives performance comparable to that of standard 20mm projectiles

#### *Cutting-Edge Technology*

In 1988, FN Herstal announced the development of a new 5.7mm small arms system, the P90. The contractor claims this 5.7x28mm round has three times the stopping power of a conventional 9x19mm Parabellum round. NATO approved this ammunition for use. FN Herstal has thus far sold the P90 to Saudi Arabia and at least one Asian nation, as well as to a number of major police and other internal security organizations. In October 1999, FN Herstal announced that it had granted a license to Winchester-Olin for production of the new 5.7mm round in the United States.

#### Czech Republic

*Sellier & Bellot JSC.* In continuous operation since 1825, Sellier & Bellot remains one of the most significant European players in the small arms ammunition market. Offering an extensive line of military-pattern and sporting ammunition types, the firm depends primarily on export sales of pistol, rifle, and shotgun ammunition for its continuing success.

#### *188-Year Legacy*

In 1825, Louis Sellier, a French merchant, secured a charter from Austrian Emperor Franz I to manufacture

## Small Arms Ammunition

percussion caps for military small arms in Prague. Shortly afterward, Sellier invited fellow Frenchman Jean Maria Nicolaus Bellot to join the company. In 1870, the firm entered the modern small arms ammunition market, initially with the production of Flobert rimfire and Lefauchaux pin-primer cartridges. By the turn of the century, Sellier & Bellot operated small arms ammunition production facilities in Prague, Schönebeck (Germany), and Riga (Latvia).

In 1945, the Czech government nationalized Sellier & Bellot as a state monopoly for the manufacture of both military and commercial small arms ammunition. In 1992, the firm became a joint stock company. The manufacturer exports nearly 70 percent of its production through its subsidiary, Sellier & Bellot Trade JSC.

### *Lucrative U.S. Market*

Sellier & Bellot currently exports small arms ammunition to over 70 countries. In particular, Sellier & Bellot ammunition is well known to American sportsmen. In the United States, Sellier & Bellot ranks as one of the top foreign suppliers of commercial small arms ammunition.

### France

**Nexter Munitions.** France produces large quantities of NATO-standard small arms ammunition for domestic military and internal security use, as well as for sale to French client states in Africa and elsewhere in the world. Within the French defense industry, Nexter (formerly Giat Industries) remains the primary supplier of small arms ammunition.

### *Production for Africa & the Middle East*

French contractors now produce the majority of 7.5x54mm MAS pattern ammunition for export. Burkina Faso, Burundi, Cameroon, Central African Republic, Djibouti, Gabon, Gambia, Ivory Coast, Mali, Mauritania, Niger, Rwanda, and Senegal have all procured French 7.5mm and 5.56mm ammunition. Several undisclosed Middle Eastern states are also regular consumers of French small arms ammunition.

French firms also have long been in the forefront of ammunition development. Both Nexter (which, as Giat Industries, absorbed Luchaire and Matra Manhurin Defense) and Societe Francaise de Munitions have developed armor-piercing rounds. In addition, Societe Francaise de Munitions has developed high-velocity THV ammunition for sidearms and submachine guns. French forces also use 7.62mm PPI armor-piercing ammunition with ground-mounted and vehicle-mounted machine guns.

## *Corporate Evolution*

In October 2006, Giat Industries approved a reorganization and an associated name change to Nexter. Under the restructuring, the group maintains four core operations:

- Nexter Systems
- Nexter Munitions
- Nexter Electronics
- Nexter Mechanics

The move reportedly better prepared the firm for consolidation with another corporate entity.

In 2015, Krauss-Maffei Wegmann and Nexter signed an agreement on a merger plan.

As part of the process, the two companies contributed their shares to a newly incorporated joint holding company based in the Netherlands. They each received 50 percent of the shares of this company, which became the sole shareholder in KMW and Nexter. Completion of the merger of KMW and Nexter was formally announced in January 2016.

The newly merged firm is the third-largest land defense contractor in the world, behind General Dynamics and BAE Systems. Ownership is split between the French government's Giat Industries holding company and KMW parent the Wegmann Group (controlled by Germany's Bode family). At time of merger, the single entity employed around 6,000 people and had an order book of approximately EUR9 billion (\$9.9 billion), with turnover of around EUR2 billion.

### *Competing for Domestic Procurement*

Reflecting the dramatic changes in the international market, France expanded its sources of procurement for small arms ammunition beyond domestic contractors. In 2001, Israel Military Industries (IMI) Ltd secured a three-year contract to supply a minimum of 40 million 5.56x45mm NATO (.223 Remington) M855 cartridges. At the same time, the team of Thomson-DASA Armements and (then) RO Defence won a contract worth \$7.4 million to supply at least 20 million M855 cartridges.

### Federal Republic of Germany

**Rheinmetall Defence.** This German player continues to rank among the world leaders in all aspects of ammunition development and production.

## Small Arms Ammunition

### *Acquiring the Eurometaal Line*

With its acquisition of Eurometaal Holding NV (Zaandam, the Netherlands), Rheinmetall inherited this Dutch player's extensive line of small arms ammunition. Eurometaal had been primarily involved in producing NATO-standard small arms ammunition for the Dutch armed forces. Eurometaal also made some export sales to Latin America and southern Africa. Efforts to increase export sales appear to be paying off, with at least one sale to an undisclosed Southeast Asian nation. Also, in early 2001, a Latin American nation (possibly Chile) procured 11.4 million rounds of Dutch small arms ammunition.

Prior to its acquisition by Rheinmetall, Eurometaal had also developed a new armor-piercing 12.7x99mm (.50-caliber) round for the Browning M2HB heavy machine gun. Designated the APi 2000, the round is ballistically similar to the standard line of .50-caliber ammunition, but its special metal alloy core and brass jacket offer a higher degree of armor perforation.

#### Norway

*Nammo Raufoss AS.* Norway produces a relatively small amount of small arms ammunition, almost entirely for Norwegian military requirements. Historically, Norway has not been a major exporter of small arms and ammunition.

However, due to their exceptional performance, certain types of Norwegian 12.7x99mm (.50-caliber) ammunition for the M2HB machine gun have gained an appreciable export following. Nammo Raufoss 12.7x99mm (.50-caliber) rounds include:

- NM140 Armor Piercing High Explosive Incendiary (AP-HE-I), featuring a patented bullet design that offers exceptional armor perforation performance and "behind armor" effects
- NM160, which is an NM140 round with a tracer element
- NM140A1, the NM140 modified to suit a U.S. Navy requirement
- NM173, ballistically similar to the standard M2 ball round but offering superior perforation performance
- NM185, an NM173 round with an inert filling

Nammo Raufoss has sold these rounds in large numbers to Scandinavian nations and the Federal Republic of Germany, and to the United States and other countries outside Europe.

In 1998, the world-famous Raufoss small arms manufacturing firm became a component of the new

Nordic Ammunition organization; the firm now operates as Nammo Raufoss.

#### Poland

*Zaklady Metalowe Mesko SA.* Long a member of the Warsaw Pact, Poland continues its serial production of Russian-pattern ammunition. However, following its integration into NATO, Poland began adopting NATO-standard chamberings for its small arms.

### *Expanding Market Presence*

While there has been a moderate level of export to several Middle East nations (including Syria), most of Poland's recent production of small arms ammunition has been for domestic consumption.

While several Polish ammunition production facilities remain state-owned, the Zaklady Metalowe Mesko firm has begun to make itself known on the international market with at least two significant sales to the Middle East. In addition to producing the 9x18mm Makarov pistol/submachine gun cartridge in standard form, this firm also produces the Russian-developed improved version of this round.

#### Russian Federation

*FSUE Rosoboronexport.* The Soviet Union was long one of the largest producers (and users) of small arms ammunition in the world. Even after a period of consolidation, the Russian Federation still maintains a prodigious small arms manufacturing capacity.

### *Courting the Export Market*

Given the realities of their economy, the Russians continue to place an increased emphasis on export sales as a means of generating capital. Under the auspices of the Rosoboronexport organization, Russian contractors are securing an increasing number of export sales, due in no small part to the bargain-basement prices of Russian products on the international market.

The Novosibirsk Low-Voltage Equipment Plant and the Vostok firm (Moscow) produce several types of small arms ammunition.

### *Duplex Ammunition Introduced*

In 1998, the Novosibirsk firm unveiled a 12.7x107mm duplex cartridge, available in two versions:

- 1SL Armor Piercing round
- 1SLT Armor Piercing Incendiary Tracer round

In these designs, the tip of the second bullet rests in a recess in the base of the first bullet; three dimples on the cartridge case hold the lower portion of the second bullet in place. The contractor has yet to report any sales

## Small Arms Ammunition

of this round outside the Commonwealth of Independent States.

Another semi-privatized player is the joint stock company Kirovsky Zavod Mayak. This firm, located in Kirov, specializes in the production of belted (linked) ammunition for machine guns. Available chamberings include 7.62x39mm, 7.62x54mm, 12.7x107mm, and 14.5x114mm.

### Spain

**General Dynamics Santa Barbara Sistemas.** In addition to producing many modern small arms under license, Spanish ammunition contractors produce NATO-standard cartridges and several older-pattern cartridges.

### *Under the GD Umbrella*

Exports of Spanish ammunition have increased with the rationalization of the Santa Barbara facilities. In 2002, General Dynamics acquired Santa Barbara; the firm now operates as General Dynamics Santa Barbara Sistemas. Historically, export customers for Spanish small arms ammunition have included Brazil, Djibouti, the Dominican Republic, Egypt, Malawi, Morocco, Tanzania, and Zaire.

### Switzerland

**RUAG Ammotec.** The Swiss small arms ammunition industry, headed by the unified RUAG group, has traditionally focused on domestic requirements. However, the growing popularity of Swiss small arms has expanded the export portion of the Swiss market. The Swiss acknowledge exporting their small arms ammunition to Argentina, Austria, Chile, Denmark, Ecuador, France, Germany, the Netherlands, Portugal, and Singapore. Open-source reporting suggests that the list of export customers may be more extensive.

### *Swiss-P Line*

In 1999, Schweizerische Munitionsunternehmung (now a component of RUAG) announced that it was offering a new family of ballistically matched 7.62x51mm NATO (.308 Winchester) and 7.82x66mm (.300 Winchester Magnum) ammunition. This "Swiss-P" line is available in four types:

- Standard match-sniper
- Styx Action (limited penetration)
- Armor-piercing
- Subsonic

The marketing of the Swiss-P ammunition line continues under the RUAG Ammotec name (see below).

## *RUAG Ammotec Emerges*

In July 2002, RUAG announced that it was merging its small arms business with that of Dynamit Nobel (Germany). The firm (of which RUAG owns 80 percent) operates as RUAG Ammotec and initially projected annual sales of over \$195 million.

With its acquisition of Hirtenberger Defence Systems (Hirtenberg, Austria), RUAG Ammotec also controls the firm that has effectively monopolized the Austrian domestic and export markets, now that Südsteirische Metallindustrie is no longer trading. Available evidence indicates that military and security forces in the Middle East – including those in Iran, Iraq (pre-Operation Iraqi Freedom), and Jordan – have dealt with Hirtenberger and Südsteirische Metallindustrie.

United Kingdom. The British small arms ammunition industry produces the full range of NATO-standard ammunition for domestic procurement and for export to over a dozen countries.

**BAE Systems Land & Armaments.** Once the world-famous RO Defence firm, this contractor has been a component of BAE Systems since mid-2000. Its Munitions & Ordnance division remains the major domestic supplier of small arms ammunition to the British Army. In 1997, the Italian Army procured 16.75 million 5.56x45mm NATO (.223 Remington) ball cartridges and 3.5 million 5.56x45mm NATO tracer cartridges from (then) RO Defence.

### *Oldies but Goodies*

BAE Systems also continues to produce "obsolete" ammunition patterns for export to nations still equipped with old-style British small arms. These customers include the former British colonies of Bangladesh, Botswana, and Tonga.

In 1999, the U.K. Ministry of Defence issued a requirement for up to 500 million rounds of small arms ammunition, mainly in the 5.56x45mm NATO (.223 Remington) pattern. In a reflection of the changing times following the end of the Cold War, a number of international firms tendered to the requirement. Also indicative of the changing times is the fact that the U.K. has procured small ammunition from countries such as Israel and Pakistan.

### *Brits Active in Civilian Market*

In addition to BAE Systems, several smaller firms also produce small arms ammunition, with a significant portion of their orders from the civilian market. These firms include:

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- The Cobra Gun Company
- Manroy Engineering, producing 12.7x99mm (.50-caliber) ammunition
- Conjay Firearms and Ammunition Ltd, producing 9x19mm Parabellum cartridges
- Eley Ltd, producing 5.5x15mm (.22 Long Rifle) cartridges for training purposes

The U.K. is also the home to the .224 BOZ small arms cartridges. Developed by the Civil Defence Supply Agency to provide police and internal security units with a cartridge capable of defeating light vehicle and body armor, the BOZ cartridge features almost twice the velocity and effective range of the 9x19mm Parabellum round. Sales have thus far been limited to the United Kingdom; a number of other nations have expressed interest.

### International

**Background.** While Europe has remained the center of small arms development since the 15th century, the rest of the world has never been far behind. Indeed, the rest of the world still tends to follow Europe's lead in the field of small arms development. Witness the growing worldwide adoption of NATO-standard small arms ammunition.

For the purposes of our discussion, we define small arms as the basic cartridge-firing individual and crew-served weapons of the infantry, as follows:

- Sidearms (pistols), firing pistol-caliber ammunition
- Submachine guns (machine pistols), firing pistol-caliber ammunition
- Battle carbines, firing intermediate-caliber ammunition
- Battle rifles, firing full-caliber rifle ammunition

In addition, infantry small arms encompass crew-served machine guns, as follows:

- Light machine guns, firing either intermediate-caliber or full-caliber ammunition
- Medium (general-purpose) machine guns, firing full-caliber ammunition
- Heavy machine guns, firing heavy (12.7mm and above) ammunition

The number of non-U.S. and non-European players producing small arms ammunition continues to grow as nations seek to become self-sufficient for political and strategic reasons.

### *Leveraging Capabilities*

Many non-U.S. and non-European players can take advantage of economies of labor and increasingly sophisticated industrial bases to produce highly competitive ammunition products. Importation of American or European munitions leads to licensed (and unlicensed) production, which, in turn, serves to establish the technical capability (manufacturing infrastructure and skilled personnel) for indigenous development and production.

At least 80 non-U.S. and non-European contractors and government organizations are currently involved in the international small arms ammunition market. In this report, we briefly review only the most active non-U.S. and non-European players so as to present a cross-section of the entire market.

### AFRICA

#### Republic of South Africa

*Denel (Pty) Ltd.* In 1992, the state-owned ARMSCOR organization reorganized, transferring its manufacturing companies to Denel Ltd. This company continues to supply all of South Africa's small arms ammunition requirements.

Under the auspices of Denel, Pretoria Metal Pressings produces 5.56x45mm NATO (.223 Remington), 7.62x51mm NATO (.308 Winchester), 7.7x56mm (.303 British), 9x19mm Parabellum, and 12.7x99mm (.50-caliber) cartridges; other types are available per demand. In addition, New Generation Ammunition Ltd provides a variety of handgun cartridges for military, police, internal security, and private use.

### *Seeking Export Opportunities*

Since the lifting of U.N. sanctions in 1994, South Africa has found its military products to be much easier to export. Since 1994, Denel has secured several regional and international sales, including a 2002 sale of 7.62x51mm NATO (.308 Winchester) ammunition to an unspecified "South Asian" nation.

### ASIA

#### India

*Ordnance Factories Organization of India.* As a component of India's Ministry of Defence, this organization operates a large British-designed ammunition industry, based on the old Ordnance Factories organization of pre-independence India. Domestic ammunition production fills the large Indian requirements, and accommodates export sales as well. India has exported small arms ammunition to Bangladesh, Myanmar, and Sri Lanka. There are also unconfirmed reports of sales to Africa.

## Small Arms Ammunition

### *Production for INSAS*

With the long-delayed advent of the Indian Small Arms System, production of the associated 5.56x45mm SS107 round was expected to rise dramatically. The Indian Ordnance Board initially delayed the importation of the required production machinery for the SS107 cartridge. The SS107 is not a NATO-standard cartridge, as its case is slightly longer than the M193 or SS109. In 1997, Israel Military Industries (IMI) secured a contract worth \$13.88 million to supply 50 million SS109 cartridges (for which the INSAS weapon is also compatible), with an option for an additional 50 million rounds.

India still plans to manufacture the SS107 round. With the receipt of the necessary production machinery, production of the SS107 is ramping up; production should remain at a fairly high level throughout the forecast period.

### Pakistan

*Pakistan Ordnance Factories.* As a component of the Pakistan Ministry of Defense, the state-owned Pakistan Ordnance Factories employed around 45,000 people as of 2000, making it the largest single industrial organization in Pakistan. The organization satisfies all of Pakistan's small arms ammunition requirements; Pakistan also offers small arms ammunition on the international market. The manufacturing facility at Wah Cantt produces both NATO-standard and Russian-pattern ammunition.

### *Expanding Customer Base*

Since 1979, the Persian Gulf region has been a receptive market for Pakistan's ammunition in all calibers. Pakistan has also reportedly secured sales to Southeast Asia (Thailand), sub-Saharan Africa, Saudi Arabia, South America, and even the United Kingdom. Since late 1999, Pakistani production of small arms ammunition has proceeded at significantly increased rates. Pakistan Ordnance Factories has also exported ammunition manufacturing technology to Malaysia and Saudi Arabia.

### People's Republic of China

*China North Industries Corporation (NORINCO).* This organization acts as the umbrella agency and international marketing conduit for all Chinese state-owned military production facilities. Ammunition production specifically involves eight facilities (identified simply as Plants 11, 31, 41, 61, 71, 81, 321, and 661; these numbers appear on the cartridge case head-stamp).

### *Massive Capability*

Unconfirmed reports suggest that small arms ammunition production since 1997 has exceeded

600 million per year; production reportedly surged to more than 1 billion rounds per year after 1999 to meet two large export orders. In addition to meeting the huge domestic People's Liberation Army (PLA) requirement, NORINCO has widely exported small arms ammunition. NORINCO ammunition has surfaced in the Balkans; Iran and several East African nations have also been customers.

### Republic of Korea

*Poongsan Defense.* Since the 1950s, the Republic of Korea has been a major arms producer for the Pacific Rim.

### *PMC Still a Major Player*

The ROK has also filled a number of U.S. contracts. Indeed, Poongsan ammunition – still available under the PMC (Poongsan Metal Corporation) brand name despite reports of the brand's demise – is quite common in the United States for both military and civilian use. Other export customers for Korean small arms ammunition include Australia, Bangladesh, Indonesia, Turkey, and other Asian nations.

As a result of the ROK Army's wholesale adoption of the indigenous 5.56mm K1A and K2 battle carbines, Korean industry has become heavily involved in the production of 5.56x45mm NATO (.223 Remington) ammunition for ROK Army procurement.

### Republic of Singapore

*Singapore Technologies Kinetics Ltd.* Known as Chartered Industries of Singapore until 2000, this firm has managed to make extensive use of the international market. This multifaceted organization offers a wide range of small arms ammunition in both NATO-standard and Russian patterns.

### *Growing Market Share*

In addition to providing small arms ammunition for Singapore's modern and well-structured armed forces, ST-K also exports small arms ammunition worldwide. Customers include New Zealand, Thailand, and the United Arab Emirates. Unconfirmed reports also indicate export sales to Cambodia, Myanmar, and two African nations.

## AUSTRALIA/NEW ZEALAND

### Australia

*Thales Australia.* The Australian Department of Defence coordinates the functions of several major facilities as well as smaller units in the production of all types of ammunition. In August 1999, the formerly government-owned ADI Ltd (Australian Defence Industries) became a component of the Transfield and Thomson-CSF (now Thales) joint venture team. The

## Small Arms Ammunition

contractor operates a number of these formerly government-owned facilities.

In October 2006, the Thales Group (Neuilly-sur-Seine, France) acquired ADI Ltd. The Australian contractor now operates as Thales Australia.

### *Heavy Aussie Demand*

Thales Australia produces a full line of NATO-standard small arms ammunition types for domestic use and export. Since the Australian Army's adoption of the 5.56mm Steyr AUG battle carbine (as the F88), production of 5.56x45mm NATO (.223 Remington) ammunition has been especially heavy. In 1998, ADI secured a contract worth \$6.16 million from the Australian Department of Defence for 5.56x45mm NATO ammunition in both standard and linked form.

Small arms ammunition production primarily occurs at the Footscray Ammunition Factory, located in Victoria. In addition, Olin Australia produces 5.5x15mm (.22 Long Rifle) training rounds. There has been a moderate level of regional export of this ammunition.

### MIDDLE EAST

#### Israel

*Israel Military Industries Ltd (IMI)*. This firm serves as the prime Israel Defense Forces (IDF) contractor for small arms ammunition; IMI also offers its products for export.

### *Middle Eastern Powerhouse*

Although IMI has never disclosed its export customers, research indicates that IMI has secured sales to Latin America (possibly Mexico) and sub-Saharan Africa. In 1997, India ordered an initial 50 million 5.56x45mm NATO (.223 Remington) SS109 rounds; in 1999, the U.K. ordered more than 9 million 9x19mm Parabellum rounds for delivery in 2000 and 2001. Israel's domestic consumption of small arms ammunition is consistent with the maintenance of high force readiness levels and operational requirements.

In Israel, production of 5.56x45mm NATO (.223 Remington) ammunition did not come fully on line until about 1978. Prior to that time, Israel purchased large quantities of small arms ammunition from the United States through both government and commercial channels.

In addition to IMI, Kalia Israel Cartridge Company manufactures 5.56x45mm NATO (.223 Remington) ammunition in both the M193 and SS109 patterns. And the state-owned ammunition factory in Tel Aviv

manufactures several patterns of small arms ammunition.

IMI has established dealer-direct joint marketing programs in the U.S., the U.K., and Ireland for both government procurement and commercial sales.

### NORTH AMERICA

#### Canada

*SNC Technologies Inc.* Canada's small arms ammunition industry produces NATO-standard ammunition and several "obsolete" cartridge types for Canadian armed forces procurement and for export.

The Canadian armed forces' adoption of the 5.56mm C7 (M16A2) battle carbine generated a significant demand for 5.56x45mm NATO (.223 Remington) ammunition. SNC Technologies (SNC Tech) and its Valcartier Industries subsidiary (acquired in 1991) are the primary Canadian sources of NATO-standard small arms ammunition in Canada. The high quality of SNC/Valcartier ammunition resulted in an impressive level of exports, with the most recent reported sale being in mid-1999 to France.

### *Under the GD Umbrella*

In February 2006, General Dynamics (Falls Church, Virginia) announced its acquisition of SNC Technologies. The Canadian contractor now operates as a component of the General Dynamics Ordnance and Tactical Systems division.

### SOUTH AMERICA

#### Brazil

*Companhia Brasileira de Cartuchos (CBC Magtech)*. Three main domestic ammunition manufacturers – Fabrica Nacional de Cartuchos e Municoes (Sao Paulo), CBC Magtech (Ribeirao Pires), and Fabrica Realengo (Rio de Janeiro) – meet the bulk of Brazil's small arms ammunition requirements, with sufficient spare capacity to permit extensive overseas marketing of small arms ammunition.

### *Popular Export Line*

The figures released by the Brazilian government in the early 1990s indicated notable successes in the export of small arms ammunition. The U.S. non-military (commercial) market has been a major recipient of both civil and military types of Brazilian small arms ammunition. Like South Korea's PMC, Brazil's CBC Magtech is a brand name quite familiar to sport shooters in the United States. CBC Magtech alone claims to produce more than 100 million rounds of small arms ammunition annually for export.

## Small Arms Ammunition

No fewer than 21 nations procure Brazilian-produced ammunition for military use. Brazilian manufacturers also export to Asia; CBC Magtech sold ammunition to Singapore through the 1970s. Brazil has also reportedly sold small arms ammunition to unspecified nations in the Middle East (possibly Iran and pre-Operation Iraqi Freedom Iraq) and Central Africa.

### United States

While Europe has remained the center of small arms development since the introduction of the "arquebus" matchlock rifle on the continent in the 15th century, the United States has clearly emerged as the driving force in the modern small arms market.

#### *Setting the NATO Standards*

Through its leadership of NATO, the U.S. has established the .223 Remington (5.56x45mm NATO), .308 Winchester (7.62x51mm NATO), and .50-caliber Browning (12.7x99mm) rounds as virtually the world standards for small arms ammunition.

Furthermore, despite almost universal adoption of the 9x19mm Parabellum cartridge for sidearms and submachine guns by governments worldwide, the tried-and-true .45 Automatic Colt Pistol (ACP) round has lost none of its dominance as the definitive man-stopping defensive round.

For the purposes of our discussion, we define small arms as the basic cartridge-firing individual and crew-served weapons of the infantry, as follows:

- Sidearms (pistols), firing pistol-caliber ammunition
- Submachine guns, firing pistol-caliber ammunition
- Shotguns, firing 12-gauge (2.75-in) shells
- Battle carbines, firing intermediate-caliber ammunition
- Battle rifles, firing full-caliber rifle ammunition

In addition, infantry small arms encompass crew-served machine guns, as follows:

- Light machine guns, firing either intermediate-caliber or full-caliber ammunition, depending upon the weapon's design
- Medium (general-purpose) machine guns, firing full-caliber ammunition
- Heavy machine guns, firing .50-caliber (12.7x99mm) ammunition

#### *U.S. Production Infrastructure*

The U.S. Army's ammunition production base includes 20 government-owned ammunition plants (many of

which are inactive) located throughout the country. Appendix VI ("U.S. Army Operations Support Command") of this service provides a complete listing of U.S. ammunition plants. The U.S. Army usually awards five-year contracts to various firms in the private sector for operating and maintaining these ammunition plants.

**Description.** Northrop Grumman (formerly Orbital ATK) currently manages the Lake City Army Ammunition Plant, the last active vestige of the once-massive U.S. Army small arms ammunition plant system.

Primary military small arms ammunition types produced at LCAAP include:

- 5.56x45mm NATO (.223 Remington)
- 7.62x51mm NATO (.308 Winchester)
- 9x19mm Parabellum
- 45 ACP (11.43x23mm)
- .50-caliber Browning (12.7x99mm)

On April 12, 2005, the contractor announced that its Lake City Army Ammunition Plant had achieved a significant production milestone by delivering 1.2 billion rounds of small arms ammunition to the U.S. Army through March 31. Since winning the contract to produce small-caliber ammunition in April 2000, Lake City has steadily increased annual production capacity from 350 million rounds to 1.4 billion rounds.

#### *GDOTS as Second-Source Prime*

On August 23, 2005, the U.S. Army Field Support Command awarded General Dynamics Ordnance and Tactical Systems a \$171,177,551 firm-fixed-price contract to act as the small-caliber-ammunition second-source prime contractor. With this contract, the U.S. Department of Defense officially established GDOTS as the secondary source for 5.56x45mm NATO (.223 Remington), 7.62x51mm NATO (.308 Winchester), and .50-caliber Browning (12.7x99mm) small arms ammunition through August 23, 2010.

The U.S. Army has since awarded GDOTS a number of follow-on contracts, extending the contractor's second-source status.

#### *Plenty of Opportunities*

Prior to the GDOTS contract, Olin Corporation (East Alton, Illinois), through its Winchester Ammunition division, had increasingly been acting as a secondary vendor for small arms ammunition. Despite GDOTS

## Small Arms Ammunition

securing the status as secondary-source contractor, the Forecast International Weapons Group expects that the U.S. DoD will continue to procure small arms

ammunition from sources beyond its prime contractors, including from Olin/Winchester.



Soldier of the 101st Airborne Division (Air Assault) in Iraq

Source: U.S. Army

## Funding

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The various contractors, some of which are state-owned organizations, fund the development of small arms ammunition.

## Timetable

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### Europe

We expect one or more completely new cartridge types to enter service during the next 10 years.

### International

The prospects for technological innovation among non-U.S. and non-European players are somewhat less than for their U.S. and European counterparts, as the majority of non-U.S. and non-European players are primarily concerned with domestic self-sufficiency.

## Small Arms Ammunition

### United States

Ongoing operational requirements will effectively push advanced small arms ammunition programs to the back burner during the coming decade.

## Worldwide Distribution/Inventories

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Small arms ammunition produced by various contractors and state-owned organizations is available worldwide.

## Forecast Rationale

### Europe

The combined output of European manufacturers, which we expect will average about 8 billion rounds per year, easily outpaces the combined production of the rest of the non-U.S. international small arms ammunition market.

The vast majority of European small arms ammunition production is of NATO-standard and Russian-pattern cartridges. A significant level of production also addresses the continued worldwide demand for older-pattern cartridges.

### International

The combined output of all non-U.S. and non-European manufacturers, which we expect will average nearly 7 billion rounds per year, still trails European small arms ammunition production by a margin of about 1 billion rounds annually. Yet there are now well over twice as many non-U.S. and non-European players involved in the international small arms ammunition market as there are U.S. and European players.

With the general adoption of NATO-standard small arms ammunition worldwide, these emerging international players are now in direct competition with the established U.S. and European players for export sales.

### United States

In addition to supporting wartime expenditures, the ongoing small arms ammunition production surge in the United States replaces war reserves and training stocks of ammunition, which had both dwindled to dangerously low levels by the late 1990s.

By FY06, U.S. small arms ammunition producers (primarily the Lake City Army Ammunition Plant) had finally achieved the stated U.S. Department of Defense annual procurement objective of 1.5 billion rounds. However, based on our analysis of the annual DoD budget request documentation, the Forecast International Weapons Group believes that U.S. procurement of small arms ammunition will maintain a relatively stable rate of about 1 billion rounds annually.

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