

ARCHIVED REPORT

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Mortars (Europe)

Outlook

- European players continue to lead the international market for mortars of all types
- Development of 120mm mortar systems will continue to drive the market
- We expect production of all mortar types from all European sources to average 15,000 weapons annually

Orientation

Description. High-angle, short-range artillery systems.

Sponsor. European contractors and arsenals develop, produce, and market various mortar designs.

Licensees. Several international contractors produce European mortar designs, with or without license.

Status. Development through serial production.

Total Produced. Through 2023, we estimate European contractors produced at least 778,000 mortars since 1980 inclusive.

Application. Mortars provide highly flexible short-range indirect fire support for the infantry, independent of and complementary to field artillery.

Price Range. In 2024 U.S. dollars, European mortars carry unit prices ranging from \$409 for some of the 51mm mortars such as the M/965 to \$21,860 for a basic towed 120mm mortar.

The Russian Federation has been marketing the 82mm 2B14 for around \$15,000.

Contractors

Prime

Airbus SE	http://www.airbus.com , Mendelweg 30, PO Box 32008, Leiden, Netherlands, Tel: + 31 71 52 456 00, Fax: + 31 71 52 328 07, Prime
BAE Systems plc	http://www.baesystems.com , 6 Carlton Gardens, Stirling Sq, London, United Kingdom, Tel: + 44 1252 373232, Fax: + 44 1252 383991, Prime
Etienne-Lacroix Group	http://www.etienne-lacroix.com , 6 Blvd de Joffrey, CS 30213, Muret, France, Tel: + 33 05 61 56 65 00, Fax: + 33 05 61 51 42 77, Email: caroline.bares@etienne-lacroix.com , Prime
Explosivos Alaveses SA, EXPAL	http://www.expalsystems.com , Avenida del Partenon 16, 5th Planta, Madrid, Spain, Tel: + 34 91 722 01 00, Fax: + 34 91 722 01 01, Email: general@maxam.net , Prime

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Federal State Unitary Enterprise, Rosoboronexport, Rosoboronexport State Corp	http://www.roe.ru , 27/3 Stromynka St, Moscow, Russian Federation, Tel: + 7 495 534 6183, Fax: + 7 495 534 6153, Prime
Nexter Munitions	http://www.nexter-group.fr , Route de Villeneuve, La Chapelle, Saint-Ursin, France, Tel: + 33 02 48 68 71 71, Fax: + 33 02 48 68 70 54, Prime
Patria Oy	http://www.patriagroup.com , Kaivokatu 10 A, Helsinki, Finland, Tel: + 358 20 469 1, Fax: + 358 20 469 2022, Email: info@patria.fi , Prime
RUAG MRO Holding Ltd	http://www.ruag.ch , Allmendstrasse 86, Thun, Switzerland, Tel: + 41 58 467 06 00, Email: info.defence@ruag.com , Prime

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Technical Data

In general, conventional usage divides mortars into three general classes according to the mortar's weight and caliber, as well as the echelon that employs it. In this report, we define the three classes as follows:

<u>Mortar Class</u>	<u>Caliber Range</u>	<u>Echelon(s)</u>
Light	50mm-80mm	Platoon/Company level
Medium	81mm-100mm	Company/Battalion level
Heavy	Greater than 100mm	Battalion/Brigade level

In this report, we use nominal calibers instead of exact calibers to avoid confusion. For example, we will refer to 81mm mortars instead of the more exact 81.4mm caliber. Information regarding several mortars of the Russian Federation and former Warsaw Pact nations remains somewhat sketchy.

<u>Caliber</u>	<u>Designation</u>	<u>Class</u>	<u>Firing Mechanism</u>
<u>Manufacturer – Böhler Special Products (RUAG Land Systems)</u>			
81mm	M8-111	Medium	Fixed firing pin
81mm	M8-522	Medium	Fixed firing pin
81mm	M8-622	Medium	Fixed firing pin
82mm	M8-313	Medium	Fixed firing pin
82mm	M8-413	Medium	Fixed firing pin
82mm	M8-722	Medium	Fixed firing pin
82mm	M8-822	Medium	Fixed firing pin
120mm	M12-1111	Heavy	Fixed firing pin
120mm	M12-2222	Heavy	Fixed firing pin
120mm	M12-2330	Heavy	Fixed firing pin
120mm	M12-3222	Heavy	Fixed firing pin
<u>Manufacturer – Bofors Defence AB (BAE Systems plc)</u>			
120mm	m/41D (1941)	Heavy	Fixed firing pin
<u>Manufacturer – Etienne-Lacroix</u>			
76mm	Samourai	Light	Triggered firing pin
<u>Manufacturer – Explosivos Alaveses SA (EXPAL)</u>			
60mm	Model L	Light	Fixed firing pin
60mm	Model L	Light	Breech trigger
60mm	Model LL M-86	Light	Fixed firing pin
60mm	Commando Mortar	Light	Fixed firing pin
60mm	Model MC-2 Gun-Mortar	Light	Breech/muzzle-loading
81mm	Model LN M-86	Medium	Fixed firing pin
81mm	Model LL M-86	Medium	Fixed firing pin
120mm	Model L	Heavy	Fixed firing pin
120mm	Model L	Heavy	Trigger-operated
120mm	M-86 (M120-13)	Heavy	Fixed firing pin
120mm	M-86 (M120-15)	Heavy	Fixed firing pin

Mortars (Europe)

Caliber	Designation	Class	Firing Mechanism
<u>Manufacturer – Hirtenberger Defence Systems (RUAG Land Systems)</u>			
60mm	C6-110	Light	Fixed firing pin
60mm	C6-210	Light	Triggered firing pin
120mm	M12-3222	Heavy	Fixed firing pin
<u>Manufacturer – Institute of Precise Mechanical Engineering (Rosoboronexport)</u>			
120mm	2A60	Heavy	Breech-loading
120mm	Nona SVK-M	Heavy	Breech-loading
<u>Manufacturer – Motovilikhinskiye Zavody (Rosoboronexport)</u>			
120mm	2S11 Sani	Heavy	Fixed firing pin
<u>Manufacturer – Nizhny Novgorod Engineering Plant (Rosoboronexport)</u>			
82mm	2B14 Podnos	Medium	Fixed firing pin
<u>Manufacturer – Patria Vammass Oy (Patria plc)</u>			
60mm	Commando	Light	Fixed firing pin
60mm	TAM 18	Light	Fixed firing pin
75mm	TAM 18	Light	Fixed firing pin
81mm	Commando	Medium	Fixed firing pin
81mm	Long-Range Normal Mortar	Medium	Fixed firing pin
81mm	M-71	Medium	Fixed firing pin
81mm	M-71	Medium	Split barrel, fixed firing pin
120mm	Standard Mortar	Heavy	Fixed firing pin
120mm	Long-Range Mortar	Heavy	Fixed firing pin
120mm	M-73	Heavy	Fixed firing pin
120mm	Advanced Mortar System	Heavy	Twin turret
160mm	M58	Heavy	Fixed firing pin
<u>Manufacturer – Poudres Reunies de Belgique (Nexter)</u>			
51mm	FLY-K NR8113	Light	Spigot/powerd
60mm	NR493	Light	Fixed firing pin
81mm	NR475 A1	Medium	Fixed firing pin
<u>Manufacturer – BAE Systems plc</u>			
51mm	51mm Mortar	Light	Trigger-operated
81mm	L16 ML	Medium	Fixed firing pin
120mm	BL Mortar	Heavy	Breech-loading
<u>Manufacturer – RUAG Land Systems</u>			
60mm	Model 87	Light	Fixed firing pin
81mm	Model 1972	Medium	Fixed firing pin
120mm	Model 64	Heavy	Fixed firing pin
120mm	Model 74	Heavy	Fixed firing pin
120mm	Model 87	Heavy	Fixed firing pin
120mm	Bighorn	Heavy	Fixed firing pin
120mm	Model 59/83 (twin)	Heavy	Breech-loading
<u>Manufacturer – Russian Federation State Arsenals (Rosoboronexport)</u>			
82mm	M-36 (82-PM 36)	Medium	Fixed firing pin
82mm	M-37 (82-PM 37)	Medium	Fixed firing pin
82mm	M-41 (82-PM 41)	Medium	Fixed firing pin
82mm	New M-37	Medium	Fixed firing pin
82mm	Vasilek AM 2B9	Medium	Automatic firing
107mm	M-38 (107-PM 38)	Heavy	Fixed firing pin
120mm	M-38	Heavy	Fixed firing pin
120mm	M-43 (120-PM 43)	Heavy	Fixed firing pin
160mm	M-43	Heavy	Tripped firing pin
160mm	M-160	Heavy	Tripped firing pin

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<u>Caliber</u>	<u>Designation</u>	<u>Class</u>	<u>Firing Mechanism</u>
<u>Manufacturer – TDA Armements SAS (Airbus)</u>			
60mm	Type V Commando	Light	Fixed firing pin
60mm	Type A Commando	Light	Lanyard-operated
60mm	Proximity Mortar	Light	Fixed firing pin
60mm	Light Mortar	Light	Fixed firing pin
60mm	MO-60-LP	Light	Fixed firing pin
60mm	Model MCB Gun-Mortar	Light	Breech-loading
60mm	Model LR Gun-Mortar	Light	Breech-loading
81mm	MO-81-61 C	Medium	Fixed firing pin
81mm	MO-81-61 L	Medium	Fixed firing pin
81mm	MCB81 Gun-Mortar	Medium	Breech-loading
81mm	LR Mortar	Medium	Fixed firing pin
81mm	MO-81-LLR	Medium	Fixed firing pin
120mm	MO-120-60	Heavy	Fixed firing pin
120mm	MO-120-L	Heavy	Fixed firing pin
120mm	MO-120-LT	Heavy	Fixed firing pin
120mm	MO-120-M65	Heavy	Fixed firing pin
120mm	MO-120-RT-61	Heavy	Rifled, fixed firing pin

Variants/Upgrades

Variants. Not generally applicable. To have the greatest degree of product differentiation and the largest range of products, mortar contractors usually give modified or upgraded models of their mortars new designations.

Modernization and Retrofit Overview. Other than for totally new designs, the primary enhancements related to mortars are in the field of ammunition.



"Round Out!" British Army 81mm Mortar in Action

Source: U.K. Ministry of Defence

Mortars (Europe)**Program Review**

Note. *Mortars tend to be extremely durable weapons, with many World War II-era designs still in active service worldwide. In an attempt to keep our discussion focused on the current state of the mortar market, we discuss only those mortar systems in active development or currently available on the international market.*

Background. The mortar provides relatively short-range, organic indirect-fire support for infantry units at the rifle-company level.

Rifleman's Artillery

Infantry units at battalion level and below rely on this readily available organic fire support capability, as corps- and division-directed fire missions tend to monopolize brigade- and division-level field gun and howitzer units.

The relatively low weight, high mobility, and range performance of most current-generation mortars make them ideal for frontline infantry indirect-fire support. Mortars are extremely flexible weapons in terms of both range and capability. A variety of fuze and ammunition types enables mortars to fulfill most short-range offensive and defensive fire-support requirements.

Enter the Breech-Loader

The development of breech-loading and muzzle/breech-loading mortar designs precipitated a significant change in this market, in terms of both weapon design and tactical employment. Breech-loading mortar designs allow armies to mount mortars with high rates of fire *inside* armored vehicles, protecting the crew. France and the Russian Federation are among the world leaders in this design area. Furthermore, computerized command and control systems have contributed to the accuracy and coordination of mortar employment in the field. The tried-and-true mortar is now achieving a whole new level of tactical flexibility.

Austria

With its acquisition of Böhler Special Products and Hirtenberger Defence Systems, RUAG Land Systems (Thun, Switzerland) effectively controls the Austrian mortar market. However, for clarity, we shall continue to list Austrian mortars under their original manufacturers.

Böhler Special Products. In 1988, Böhler took over the Vereinigte Edelstahlwerke product line. Vereinigte Edelstahlwerke developed and produced 60mm and 81mm mortars for export. In addition, Böhler continued marketing the earlier 60mm M8/112, M8/424, M6-111, and M6-211 standard mortars, as well as the 60mm

Commando. Böhler further developed the 81mm mortar line as the M8-111, M8-211, and M8-522.

120mm M12 Series

In the early 1980s, the Böhler firm began developing a 120mm mortar for domestic and export sales in conjunction with Hirtenberger. Subsequently, the 120mm M12-1111 entered serial production in 1984 to fulfill an Austrian Army requirement for approximately 90 mortars. The current production standard consists of two improved 120mm mortar designs:

- The M12-3222 (1.9-m barrel)
- The M12-2222 (1.75-m barrel)

The M12-2330 version is compatible with M106 and M125 mortar carrier vehicles and similar vehicles. This mortar features a shorter barrel and special bipod mount.

Hirtenberger Defence Systems. In addition to assuming production of the Böhler mortars in 1995, Hirtenberger developed, and is currently manufacturing, a 60mm mortar, the C6 Commando.

60mm C6 Commando

The C6 is available in two variants:

- The C6-110 (with a fixed firing pin)
- The C6-210 (with a triggered firing pin)

The C6 exhibits very high construction standards. Hirtenberger sold the C6 to at least six unidentified export nations, in addition to the Austrian Army.

Belgium

Poudres Reunies de Belgique. Before falling into receivership in July 1990, the Poudres Reunies de Belgique concern (with its Forges de Zeebrugge subsidiary) was heavily involved in the development and manufacture of mortars. Giat Industries (now operating as Nexter) subsequently acquired rights to the product line; the Poudres Reunies de Belgique line of mortars is still available on the open market.

51mm FLY-K

The 51mm FLY-K mortar and the 60mm standard light mortar each targeted different markets. The FLY-K is essentially a spigot mortar that employs a unique propulsion system. This system produces only a minimal level of noise on firing, very little gas or smoke, and no flash signature. The mortar is thus very difficult to detect and extremely suitable for airborne and special operations forces. Several types of

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ammunition are available for the unique FLY-K weapon, including:

- Practice
- High Explosive
- Smoke/Incendiary
- Illumination

Titanite in France, through the Cathyor Engineering licensee of Switzerland, now runs the FLY-K program. The more recent Jerboa mortar, a product of the People's Republic of China, is essentially a copy of the FLY-K.

60mm NR493

The Poudres Reunies de Belgique 60mm NR493 mortar is a more conventional light mortar configuration. With its NR431 ammunition, the 60mm NR493 is very effective at the company level.

81mm NR475

The 81mm NR475 A1 is a robust, air-portable, battalion-level medium mortar. The 81mm NR475 A1 and the 60mm NR493 began to replace the 81mm M29 and the 60mm M19, respectively, in Belgian service; the Belgian armed forces did not procure the FLY-K. Poudres Reunies de Belgique marketed all three mortars on the international market, with emphasis on Belgium's former African colonies.

Finland

Patria Vammas Oy. Part of the state-owned Patria plc organization, this firm resulted from the 1991 merger of Patria and Oy Tampella. It is now one of the most productive and prolific members of the Finnish defense industry. Vammas is a major producer of mortar systems and related equipment. The Finnish Army employs the 81mm 81Krh71 and the 120mm 120Krh72 mortars.

Patria Family of Mortars

On the international market, Patria Vammas actively promotes the entire family of mortars, including:

- The 60mm basic and Commando
- Two 81mm mortars
- Three 120mm mortars

Although the 160mm M58 mortar has not been in production for over three decades, it is still apparently available for new orders. An earlier design, the Model 62 120mm mortar, soldiers on in license production as Soltam's K5 and K6 in Israel and as the U.S. Army's M120 and M121.

The more effective 120mm mortar designs include the standard mortar and long-range mortar. Vammas has

integrated the long-range 120mm mortar with the Patria NA-112 GT light tracked vehicle. The Finnish Army evaluated and then ordered this weapon; deliveries are ongoing.

AMOS Rising

The most recent major development from Patria Vammas is the Advanced Mortar System (AMOS). This is a 120mm smoothbore mortar system integrated with a Swedish Hägglunds vehicle and turret. The vehicle is essentially a Stridsfordon 90 tracked armored vehicle derivative. The mortar system mounts in a two-man turret. To avoid excess stress on the turret, the mortar features a hydropneumatic recoil system. In the currently planned configuration, a basic ammunition load would consist of 40 conventional and six guided mortar rounds.

The program targets the Scandinavian region as a common vehicle-mounted 120mm mortar system. In 1999, Finland ordered a test installation on an XA-203 wheeled vehicle; in 2001, Sweden ordered a test installation on a Stridsfordon 90 vehicle.

France

Etienne-Lacroix. At the 2000 Satory weapons fair, this firm unveiled its 76mm Samourai as a "shoulder-fired mortar." This rather unique weapon certainly does not fit the general concept of a mortar. Indeed, the Samourai is not really a man-portable anti-armor weapon either. For lack of a better definition, we will rely on the contractor's marketing and consider it a mortar in this report.

Optimized for Urban Warfare

The Samourai has a maximum range of 600 meters (656.2 yd), optimizing its advertised urban warfare and close-combat application. Only 60 centimeters (23.6 in) of free space is necessary to fire the weapon. The Samourai fires four types of 76mm ammunition:

- Demolition
- Smoke
- Smoke Gel
- Flash/Bang

The French Army is currently evaluating the Samourai; the Société d'Etudes, Realisation et d'Applications Techniques organization will handle serial production once orders materialize.

TDA Armements (Thomson-Brandt). Thomson-DASA Armements, now a component of Airbus, is the most current descendent of the world-famous Brandt mortar brand name. For clarity, we continue to use the Thomson-Brandt brand name in this report.

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Still the Driving Force

Thomson-DASA/Brandt continues to produce and market the largest variety of mortars in the world. Covering the full spectrum from 60mm to 120mm, the product line includes several interesting developments from the basic mortar design.

Brandt 60mm Mortars

Thomson-Brandt has sold the 60mm Commando mortar to the armed forces of more than 20 nations, including Bolivia, Burundi, Cameroon, Central African Republic, Chad, Djibouti, France, Gabon, Ireland, Lebanon, Niger, and Senegal. The 60mm Light Mortar has also scored sales in these market areas, although not to the same extent as the Commando.

The MO-60-LP long-range 60mm mortar augments the shorter-range Commando (in two versions) and the highly successful MO-60-L light mortar. Brandt is also producing a 60mm proximity mortar, with its rather unique bipod, for close-combat and ambush applications. The Swiss produce this mortar under license; the Swiss Army has procured this mortar for its regular and reserve units.

MCB Gun-Mortar

The MCB gun-mortar is a specialized, armored vehicle-mounted, breech-loading mortar with a 12- to 20-round-per-minute rate of fire. Thomson-Brandt offers this mortar system in 60mm and 81mm variants. Long-range versions, featuring longer barrels, are also available. Thomson-Brandt has sold this system, mounted on various French armored vehicles and even small patrol boats, to a number of export customers.

Brandt 81mm Mortars

Thomson-Brandt's 81mm mortar line includes lightweight (MO-81-LC, MO-81-LL, and MO-81-LLR) and long-range (MO-81-LP) variants. Brandt began production of the heavier, longer-barreled MO-81-61-L and lighter, short-barreled MO-81-61-C in 1961; the French Army adopted the shorter-range C variant that same year. The Brandt MO-81-LP long-range 81mm mortar is still in serial production for unidentified customers.

Italy and Argentina produce the Brandt 81mm mortar under license (in Italy as the Oto M62); several Latin American nations (including El Salvador, Paraguay, and Venezuela) have procured Thomson-Brandt 81mm mortars in both lightweight and standard versions.

Brandt 120mm Mortars

Thomson-Brandt has long been a world leader in the field of 120mm mortars with its line of smoothbore and rifled weapons.

In 1995, France selected the 120 2R2M for its new vehicle-mounted 120mm mortar requirement. The U.S. Marine Corps also ordered the 2R2M, as the basis for its Dragonfire concept demonstrator.

With the growing international interest in vehicle-mounted mortar systems, we expect the Thomson-Brandt line of 120mm mortars to achieve significant commercial success.

Russian Federation

The prodigious Russian production of mortars during World War II continues to impact the international market. The Russians were among the pioneers in large-caliber mortar development.

Tortuous Transformation

With the breakup of the large State Arsenal system in the 1990s, the Russian Federation began its tortuous transformation from the centrally controlled infrastructure of the former Soviet Union to a collection of separate, often state-owned design authorities and manufacturing facilities. Despite this chaos, the Russian arms industry remains a leading supplier of world-class military ordnance for the international market.

FSUE Rosoboronexport. This organization acts as the primary conduit between the Russian defense industry and the international market. All individual Russian contractors thus effectively operate under the auspices of Rosoboronexport.

The following World War II-era mortars are all still in active service in the Russian Federation, even though they are no longer produced:

- 82mm M-36, M-37, and M-41
- 107mm M-38
- 120mm M-38 and M-43
- 160mm M-43 and M-160

Licensed production of the 82mm M-37 continues in Bulgaria, Egypt, and the People's Republic of China.

The only Russian mortars in recent production are:

- The "new" 82mm M-37
- The 82mm 2B14 Podnos
- The 82mm AM 2B9 Vasilek
- The 120mm 2S11 Sani

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The 82mm 2B14 Podnos is in serial production at Nizhny Novgorod Engineering Plant; also, Bulgaria produces the Podnos on an as-needed basis.

82mm AM 2B9 Vasilek

The unique 82mm AM 2B9 Vasilek automatic mortar saw extensive service during Soviet operations in Afghanistan in the 1980s. Both towed and vehicle-mounted versions of the AM 2B9 Vasilek are currently available. Low-rate production continues at the state-owned Bolshevik Zavod in Saint Petersburg. The Hungarians also produce the Vasilek, as the Type DE 82. The People's Republic of China produces an almost exact copy as the Type W99.

Russian 120mm Mortars

The 120mm 2S11 Sani is a standard towed mortar featuring a recoil buffer system. The Motovilikhinskiye Zavody organization produces the 2S11 for Russian Federation forces; Bulgaria and Hungary produce the 2S11 under license.

One of the newer designs, the 120mm 2A60, is a product of the Institute of Precise Mechanical Engineering. The 2A60 is the vehicle-mounted, breech-loading mortar component of the 2S9 and 2S23 armored vehicles; the Nona SVK-M is a towed version of the 2A60 rifled, breech-loading mortar. The tracked 2S9 and wheeled 2S23 platforms are currently in service with the member states of the former Soviet Union, as well as with the People's Republic of China (2S23) and possibly Vietnam (2S9).

Spain

Explosivos Alaveses SA (EXPAL). Since the 1930s, the former Esperanza y Cia has been heavily involved in the mortar field. It has also acted as a subcontractor to Thomson-DASA Armements (Thomson-Brandt), among others. Under the ECIA name, the firm produced all the mortars currently in Spanish service; it has exported its mortars to four European, 11 Latin American, and 13 African nations, with further exports of the weapons to 14 Asian armed forces. After falling into receivership in 1993, the company resumed production in mid-1995 under the name Explosivos Alaveses SA.

The EXPAL Line

Now operating as EXPAL, Explosivos Alaveses produces a full line of mortars, including:

- Two 60mm light company mortars and a 60mm Commando mortar
- Four 81mm medium mortars
- Two 120mm heavy mortars

Like Brandt, this firm has produced a gun-mortar for use in armored personnel carriers and light watercraft.

Sweden

Bofors Defence AB. In mid-2005, BAE Systems plc acquired United Defense LP and, with it, Bofors Defence. The world-famous Bofors firm produced the 120mm m/41D (1941) towed mortar. Although long out of serial production, this fixed-firing-pin mortar remains available for further orders on an as-needed basis. The 81mm m/29 medium mortar is another long-serving (over 70 years) Bofors product that is still available on the international market.

120mm Multiple Mortar System

Bofors continues developing a vehicle-mounted, multibarrel 120mm mortar system, the Multiple Mortar System. The wheeled-vehicle configuration, called MORGAN, mounts a four-barrel weapon on a VME 825B 6x6 articulated truck chassis. The tracked-vehicle version mounts a two-barrel version on an MT-LB tracked vehicle.

Switzerland

RUAG Land Systems. Formerly Schweizerische Unternehmung für Waffensysteme (and before that, Eidgenössische Waffenfabrik Bern), this organization has produced the rather conventional 81mm Model 1972 and the 120mm Model 1974 mortars for domestic procurement. More recently, RUAG added the 60mm Model 1987 (a license-produced Brandt proximity mortar) and the 120mm Model 1987 (an improved Model 1974) to its mortar line.

120mm Bighorn Mortar

In 1998, RUAG introduced its 120mm Bighorn mortar amid a great deal of international interest. This smoothbore muzzle-loaded system features a completely self-contained mount with a semi-automatic loading system. The turntable-mount system includes the powerplant and all hydraulically operated controls, making the Bighorn independent of its wheeled or tracked armored vehicle platform. Fire control includes a ring-laser-gyroscope-based navigation and positioning system.

RUAG is marketing the Bighorn as the answer to the Swiss armed forces' requirement for a self-propelled mortar mounted on the Piranha 8x8 wheeled armored vehicle chassis.

United Kingdom

BAE Systems plc. Formerly Royal Ordnance, RO Defence is now a component of BAE Systems plc. The 81mm L16 mortar is still in serial production; the 51mm light mortar remains available for production orders.

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81mm L16

The contractor has produced well over 5,000 L16 mortars; the L16 remains in service in at least 42 nations throughout Europe, Africa, and Asia. The U.S. Army and Marine Corps procured some 1,800 RO-made L16 mortars in the A2 configuration (designated M252 or Medium Extended Range Mortar) before securing production rights.

In 1993, Howa Machine of Japan secured licensed-production rights for the L16A1 to fill a Japan Ground Self-Defense Force (JGSDF) requirement. Prior to its acquisition by BAE Systems, RO had exported the L16A2 to Austria, Bahrain, Belize, Brazil, Canada, Guyana, India, Kenya, Malawi, Malaysia, the Netherlands, New Zealand, Nigeria, Norway, Oman, Portugal, Qatar, the United Arab Emirates, the United States, and Yemen.

BAE Systems continues to improve the L16 design. The L16 can mount on an expanding variety of vehicles, including the tracked Bv206. The contractor has also introduced a new line of ammunition, enhancing L16 range performance toward a goal of 7,500 meters (8,202 yd). This represents a 34 percent improvement over the L16's current maximum range of 5,600 meters (6,124 yd).

51mm RARDE

The 51mm RARDE mortar will replace the obsolescent 2-inch mortar at the infantry platoon level in British Army service. Like the 2-inch mortar, the 51mm mortar requires one man for operation, and it fires the same variety of ammunition (smoke, illumination, and high explosive). The BAE Systems 51mm mortar has generated considerable interest worldwide, especially with the 20 nations currently employing the old 2-inch mortar.

120mm Mortars

The contractor has developed a 120mm breech-loading heavy mortar for integration on the RO 2003 armored mortar carrier, as well as on the ubiquitous M113. The mortar mounts in a protective turret, which permits rapid deployment and operation in hostile-fire environments. The British Army has yet to procure any of these systems, although it has been considering such a mobile 120mm mortar system for some time. The firm has also developed the 120mm Armored Mortar System, based on earlier RO 2003 work, specifically addressing a Saudi requirement for a 120mm mortar compatible with the Piranha/Light Armored Vehicle chassis (73 procured).

Analysis. Compared with other segments of the European and international small arms markets, the European market for mortars is hardly dynamic.

This situation is primarily due to two factors. First, the end of the Cold War has had an impact on the entire European small arms market to varying degrees. More important for our discussion, however, is the enduring nature of basic mortar designs. Mortars are among the simplest, most rugged weapons available to the infantry. Since the Second World War, developments in the mortar field have been essentially limited to improvements in ammunition and fuzes, as well as efforts to make mortars lighter and more easily transportable.

Undoubtedly, the most dynamic portion of this market segment involves the development of mobile 120mm breech-loading heavy mortars. Starting with the Russian 120mm 2S9 tracked mortar platform in the mid-1980s, the mobile 120mm breech-loader has become increasingly popular with armies worldwide. Virtually every major European player in the mortar market is involved in its own 120mm mobile mortar program.

Funding

The various contractors, some of which are government-owned enterprises or state-owned arsenals, fund the development of mortars.

Timetable

Patria Vammas and TDA Armements (Thomson-Brandt) will both likely introduce significant new lightweight 120mm mortar designs during the next 10 years. We expect a subsequent procurement surge as new 120mm designs increasingly replace existing medium and heavy mortars worldwide.

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Worldwide Distribution/Inventories

Export Potential. European designs remain the international standard for mortars of all types. They are the mortars of choice on the international market, as well as for licensed (and unlicensed) production worldwide. We do not expect this dominance to subside any time soon.

Countries. European mortars are widely available throughout the world. Due to the extensive number of non-primary sales and resales, we cannot determine the precise inventory by country.

Forecast Rationale

The European market for mortars remains generally static. As the Swedish 120mm m/29 and any number of Russian designs clearly demonstrate, the simple, robust mortar often outlasts several generations of owners and users. The wide availability of serviceable old mortars continues to hinder significant investment in new production.

Rise of 120mm Breech-Loaders

However, the European market for mortars is hardly dead. The introduction of mobile 120mm breech-loading heavy mortars clearly represents the most dynamic development in this market. Starting with the Russian 120mm 2S9 tracked mortar platform in the mid-1980s, the mobile 120mm breech-loader has become increasingly popular with armies worldwide.

Virtually every major European player in the mortar market is involved in its own 120mm mobile mortar program. In fact, the heavy mortar market segment will continue to drive production and procurement throughout the next decade.

European Market Leadership

Despite the growing number of non-European manufacturers, established European players will remain the leaders in the international market for mortars. Many of the mortars available on the international market remain license-produced European designs or outright knockoffs of European standards. We expect a steady base level of procurement, averaging 15,000 weapons per year.

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