

# AMMUNITION IDENTIFICATION GUIDE FOR UKRAINE

## A Collaborative Project Amidst War

By Lieutenant Perederii,<sup>i</sup> Tony Salvo,<sup>ii</sup> and Drew Prater<sup>iii</sup>

[ National Police of Ukraine,<sup>i</sup> Bomb Techs Without Borders,<sup>ii</sup> and Relyant Global<sup>iii</sup> ]

**D**uring explosive hazard clearance operations, identification of munitions is of the utmost importance. Once the munition is positively identified and its filler and safeties are known, it can be dealt with in a safe and controlled manner. While clearing Fallujah, Mosul, and surrounding areas in Iraq, abandoned explosive ordnance (AXO) and explosive remnants of war (ERW) from twenty-three different countries was encountered, challenging even the most ardent explosive ordnance disposal (EOD) technician. To this end, an ordnance identification document based on the munitions encountered was compiled, the latest version containing more than 340 different munitions.<sup>1</sup> Those working diligently to clear explosive ordnance (EO) in Ukraine, as well as first responders, are facing a similar problem, encountering munitions from twenty-six different countries, some of which are newly identified munitions. An informal group of experienced, international EOD technicians help with identification including former military personnel. Identification is also done through manufacturer websites and publications as well as open source.

Destroyed buildings on the edge of Kharkiv.  
*All images courtesy of the authors.*



## UKRAINE

According to the **Geneva International Centre for Humanitarian Demining (GICHD)**, in the first year of the conflict alone, more than 305,000 explosive munitions were located, recorded, and removed in Ukraine, yet approximately one-third of the country remains affected by EO, endangering millions of Ukrainian citizens as they attempt to go about their daily lives.<sup>2</sup> One US government official stated that the current dud rate among Russian munitions is approximately 40 percent, which only exacerbates this deadly issue.<sup>3</sup>



**FIGURE 1.** ID Guide v.4.0 Ukrainian (left) and English (right).

## AMMUNITION GUIDE

To deal with such a large number of diverse munitions, the US-based nongovernmental organization (NGO) Bomb Techs Without Borders (BTWOB),<sup>4</sup> has co-published the Basic Identification of Ammunition in Ukraine<sup>5</sup> (<https://ukr.bulletpicker.com/id-guides.html>), which is in its fourth version and is available in Ukrainian and English. Initially, the guide was exclusively available in Ukrainian to cater to the target audience—Ukrainian security services, sappers, and EOD personnel. However, an English version of the 3.0 edition was subsequently published on 22 March 2023.

The English version directly mirrors the Ukrainian edition and is mainly intended to assist international partners and international NGOs (INGOs) working with Ukrainians.

Users are able to place entries side-by-side in order to mitigate the language barrier. The guide is free and is published as a .pdf document for maximum compatibility with electronic devices. The target audience is Ukrainian EOD, sappers, deminers, and first responders who, by the very nature of their work, are exposed to these explosive hazards (EH) on a daily basis. The level of detail contained in the guide is deliberately limited to allow for maximum distribution without compromising operational security. The guide is known to be in widespread use with Ukrainian forces, as well as local NGOs and INGOs. The authors are aware of foreign militaries using the guide to identify and track explosive munitions found in Ukraine.



**Φ-1**  
Діаметр: 55 мм  
Загальна висота:  
116.8 мм  
Висота корпусу:  
86 мм  
Країна походження:  
СРСР



**F-1**  
Diameter: 55mm  
Total Height:  
116.8mm  
Body Height:  
86mm  
Country of Origin:  
USSR

**FIGURE 2.** Ukrainian (left) to English (right) comparison.

BTWOB started with a base document of munitions they knew to be found in Ukraine in the summer of 2022, then initially partnered with the National Police of Ukraine EOD. Since then, 8th SOF Regiment EOD and State Emergency Services of Ukraine EOD have joined as major contributing partners. Contact information is provided in the guides, and numerous other agencies, units, and departments contribute in an ad hoc unofficial capacity, as well as individual sappers and EOD operators. The major contributing partners are readily identified on the guide's front cover. These partners provide credible, first-hand information directly from the frontlines with information, pictures, and measurements as time and situations permit.

Version 4.0 contains more than 500 different munitions and is divided into twenty headings with numerous sub-headings and hyperlinks, enabling the user to navigate quickly through the 914-page document. Basic dimensions and related munitions accompany pictures to assist the user in positive identification of the explosive hazards.

To highlight munitions with additional safety concerns, simple color coding warns users of particular hazards such as incendiary fillers or magnetic fuzing. There are five different color/style lines, which are placed around munition pictures to ensure the user is aware of additional hazards. Additionally, a clock icon is added to those munitions with a time delay hazard.

A solid red line around an image indicates that an item is sensitive to movement. Familiarize yourself with the technical details of the item before conducting any actions!

A dotted red line around the image indicates that the item is sensitive to magnetic field changes, acoustic disturbances, infrared radiation (IR), etc. Do not approach these items!

A solid yellow line around the image indicates that the item is a cluster munition or submunition. Assume that more items like it may be in the areas. Use a clear and proven exit route from the area.

A solid orange line around the image indicates the item contains an incendiary filler (magnesium, white phosphorus, thermite mixture, etc.).

A dotted orange line around the image indicates the presence of toxic materials (poisonous chemicals, depleted uranium, etc.).



Pictures with a clock indicate that the munition has a timer or is designed to self-destruct after a long delay. Consider that these munitions can detonate at any time without warning.

**FIGURE 3.** Color-coded warnings indicate specific hazards, like incendiary fillers or magnetic fuzing. The clock icon denotes munitions with a time delay hazard.

**FIGURE 4.** Table of contents for the ordnance identification document.

### Table of Contents (Page 1)

• Aerial Bombs	Projectiles
• Cluster Bombs	• 12.7–20mm
• Submunitions	• 23mm
Grenades	• 30mm
• Antipersonnel	• 35mm
• Antitank	• 37mm
• Smoke	• 40mm
• Misc	• 43mm
Land Mines	• 57mm
• Antipersonnel	• 73mm
• Antitank	• 76–82mm
• Boobytrap Devices	• 85mm
Sea/River Mines	• 100mm
• Anti-landing Mines	• 105mm
Special Mines	• 115mm
• Limpet Mines	• 120mm
Mortar (Projectiles)	• 122mm
• 60mm • 20mm	• 125mm
• 82mm • 240mm	• 130mm
	• 152mm
	• 155mm
	• 203mm

### Table of Contents (Page 2)

Multiple Launch Rocket System (MLRS)	
• 122mm MLRS 9K51 “Grad”	
• 220mm MLRS 9K57 “Hurricane”	
• 300mm MLRS 9K58 “Smerch”	
Rockets and Launchers	
• 57mm	• 127–150mm
• 80mm	• 266mm
• 82mm	• 220mm
• 122mm	• 300mm
RPG	
• RPG-7 Series	• 80–85.1mm
• Carl Gustav	• 90–95mm
• 40mm	• 105mm
• 60–68mm	• 106–125mm
• 70–75mm	

### Table of Contents (Page 3)

Guided Missiles	Fuzes
• Air-to-Air	• Base Detonating (BD)
• Air-to-Surface	• Bomb
• Surface-to-Air	• Guided Missile
• Antitank	• Drone
• Surface-to-Surface	• Submunition
• Cruise Missiles	• Grenade
• Ballistic Missiles	• Mine
Drones	• Point Detonating (PD) and Point Initiating Base Detonating (PIBD)
• Kamikaze Drones	• Proximity
• Armed Drones	• Time
Modified/Homemade Ammunition	Propellant Pyrotechnics
Mine Clearance Systems	Miscellaneous

The editing and publishing of the identification guide is a massive undertaking, involving the collation of incoming information and meticulous verification of its accuracy. The authors understand the vital importance of ensuring the information is correct and go to great lengths to ensure its accuracy and legitimacy. The primary sources used by the authors to check the accuracy of information are field reports, manufacturer websites, brochures, and publications, as well as military manuals (of varying languages) and texts. Secondary sources of information are intelligence publications, press/media, an informal network of subject matter experts, and open sources (Twitter, Telegram, Facebook, etc.). This information is collated and analyzed for accuracy before being entered into the guide to ensure the highest possible standards.

Feedback from the field has been positive and the identification guide is known to be used by the different agencies which provide input, as well as local commercial companies, local NGOs, and INGOs. The identification guide has quickly become the “go-to guide” for personnel clearing unexploded ordnance (UXO), those needing to identify the discovered items for accurate reporting to the proper authorities, and for training teams. Continually updated with new additions, corrections, and images added to existing content, the guides maintain their relevance and utility. Updates are announced on [BTWOB.org](https://www.btwob.org) and Facebook.

Even animals are not safe from the ravages of war, as evidenced by the EO contamination and destruction at the Feldman Ecopark on the east side of Kharkiv. These images show the Ecopark enclosure with rocket penetration.

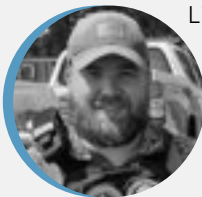


## CONCLUSION

This guide is possible due to the many people who have shared and contributed information about EO found in Ukraine, and we are pleased it is helping to protect the men and women clearing their homes, cities, and fields, as well as helping to keep Ukrainian citizens safe from the indiscriminate hazards of EO. ©

*See endnotes next page.*

### **LIEUTENANT PEREDERII** National Police of Ukraine



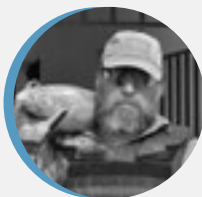
Lieutenant Perederii currently serves in the National Police of Ukraine (NPU) and has been the primary NPU representative for the ammunition ID guide's development since the first edition. He has been in law enforcement for over eight years and an explosive ordnance disposal (EOD) officer for four years. He graduated from the EOD school in Merefa, Ukraine, in 2020, and has also attended numerous training courses overseas throughout his career.

### **TONY SALVO** Bomb Techs Without Borders, Ukraine Branch Director, Senior Technical Advisor



Tony Salvo is a former US Army enlisted EOD technician (eight years) with extensive combat experience in the Iraq and Afghanistan conflicts. Previously, he has worked in the humanitarian sector in Iraq and Syria clearing explosive hazards left from the ISIS conflict. Currently he serves as the Branch Director and Senior Technical Advisor for Bomb Techs Without Borders in Ukraine.

### **DREW A. PRATER** Relyant Global International C-IED SME



Drew A. Prater is a former US Army EOD Technician (nineteen years) who has worked internationally for the past eighteen years conducting humanitarian and commercial clearance and training operations throughout Afghanistan, Burkina Faso, Cambodia, Iraq, Jordan, Mali, Nigeria, Pakistan, Thailand, Ukraine, and Vietnam. He has also authored and co-authored numerous articles for professional journals and publications. He is currently the International C-IED SME for Relyant Global and a volunteer with Bomb Techs Without Borders.

## **Ammunition Identification Guide for Ukraine: A Collaborative Project Amidst War by Perederii, Salvo, and Prater**

1. Created by Drew Prater and Tony Salvo for Optima Group
2. GICHD, "Ukraine Faces Massive Explosive Contamination One Year into Conflict," ReliefWeb, 22 February 2023, <https://tinyurl.com/4pp8uxuj>.
3. Clark, Joseph, "DOD Announces \$800M Security Assistance Package for Ukraine," U.S. Department of Defense, 7 July 2023, <https://tinyurl.com/4fxjtbkk>.
4. Bomb Techs Without Borders, [www.BTWOB.org](http://www.BTWOB.org).
5. "Basic Identification of Ammunition in Ukraine," BulletPicker, <https://ukr.bulletpicker.com/id-guides.html>.