



Best Practice Guide on Ammunition Marking, Registration and Record-Keeping

Table of Contents

I. Aim and Scope	5
II. Marking of Ammunition and Ammunition Packaging	5
1. Purpose of Marking Ammunition and Ammunition Packaging	5
2. Types and Methods of Marking Ammunition	6
2.1 Ammunition Marking by Inscriptions	6
2.2 Marking Ammunition with Color Codes	7
2.3 Marking Ammunition with Symbols	7
2.4 Visible and Palpable Markings	7
3. Types and Ways of Marking Ammunition Packaging	8
III. Registration and Record-keeping	8
1. Purpose of Registration and Record-keeping	8
2. Registration and Record-keeping Principles	9
2.1 Registration stages	9
2.2 Registers and Nature of Registered Information	11
IV. Definition of Terms	11
V. References on the Subject „Conventional Ammunition: Marking,Registration and Record-keeping“	14

This Guide was drafted by the government of Germany.

FSC.DEL/73/07/Rev.1/Corr.1

25 October 2007

I. Aim and Scope

This Best Practice Guide applies exclusively to state-owned stockpiles of conventional ammunition for military, paramilitary and security forces and the police of a participating state as mentioned in section II and III of the OSCE Document on Stockpiles of Conventional Ammunition (FSC.DOC/1/03, dated 19 November 2003). All other ammunition as ammunition in private possession and ammunition used for non-conventional weapons, such as NBC weapons or other CBRN devices are excluded.

The information and recommendations provided may be used for the development of a policy, of general operational guidelines and of procedures on all aspects of ammunition marking, registration and record-keeping.

Any investigation conducted on the basis of the markings to be found on conventional ammunition and its packaging as well as on the basis of the relevant records should contribute toward battling the illicit proliferation of ammunition and thus especially the illicit use of small arms and light weapons (SALW).

II. Marking of Ammunition and Ammunition Packaging

1. Purpose of Marking Ammunition and Ammunition Packaging

Conventional ammunition and its packaging have always been labeled with a wide variety of markings for quality control, logistic and mission-tactical reasons as well as for the purpose of preventing accidents. Such markings can serve the following purposes:

To facilitate the exact identification of all ammunition and its designation in any situation, even in darkness or limited visibility.

To provide information on:

- The caliber of the ammunition and the length of the cartridge case.
- The manufacturer of the ammunition.
- The date the ammunition was produced (year and/or month).
- The production lot to which the ammunition belongs. Within the framework of accident prevention, the lot designation can be used to recall a specific production lot which has shown unwanted peculiarities during use or technical ammunition checks and is therefore to be barred from further use. By analogy, the same applies to production lots which are to be disposed of on the grounds of obsolescence. Lot designations are often used in stockpile management because they provide more detailed information on a specific quantity of ammunition than would the mere indication of the corresponding ammunition type and nature. Ammunition consumption, too, is frequently documented on the basis of the lot designation. The lot designation often contains coded information on the manufacturer, the year of production, the month of production, the sequence of production as well as on the ammunition's state of constitutional change.
- The ammunition's specific serial number. Particularly, more complex types of ammunition (such as MANPADS, anti-tank guided missiles, rockets and torpedoes) have - like weapons - a unique serial

number in addition to the lot designation, allowing the identification a particular piece of ammunition.

- Any specific hazards arising from the ammunition and necessitating specific ammunition handling procedures, e.g. due to the fact that the ammunition contains explosives or other hazardous substances (such as phosphorus). The information given serves to classify the ammunition according to hazard division and compatibility group (cf. OSCE Best Practice Guides on *Stockpile Management and Security* and on *Ammunition Transport*).
- The way the ammunition works and thus on the range of tactical objectives for which it can be used (e.g. demolition, armor-piercing or tracer effect).
- The types of weapons for which the ammunition can be used (guns, howitzers, mortars etc.).
- Any specific fuse effect/capability (e.g. of proximity fuses).
- Any type of modification and any specific quality standards that are met in the production process and as to whether the ammunition or any demolition accessory is exchangeable.

The information provided by the markings referred to above can also help to trace the origin of the ammunition within the framework of disciplinary or criminal investigations (e.g. concerning the illicit possession of, use of or trafficking in ammunition). However, this is not the primary reason why they are originally attached to ammunition or its packaging.

Neither this list of reasons for marking ammunition and/or its packaging is exhaustive, nor does it imply that in reality each and every cartridge or package is labeled with all the aforementioned information.

Marking of packaging facilitates safe and efficient logistic ammunition handling. Markings for logical record-keep-

ing (e.g. ammunition designation or nature, lot designation or serial number) as well as information on specific hazards arising from the ammunition should be affixed to the ammunition packaging because ammunition is usually packaged under storage conditions or being transported.

All ammunition should be marked appropriately and accurately. Markings on ammunition and its packaging may serve all the reasonable purposes mentioned above. Appropriate markings provide a major contribution to safety, security and the administrative management of the ammunition stockpile. To have the maximum effect and to avoid any confusion, ammunition marking should be done upon manufacture. The following section provides more information about types and methods of marking ammunition.

2. Types and Methods of Marking Ammunition

Because the markings on ammunition are of significance for the user of it, these markings are usually attached in such a way that they are clearly visible but difficult to alter or remove. This is not the case when information is printed or stenciled on ammunition packaging only.

The most common types of ammunition marking are described in the section below.

2.1 Ammunition Marking by Inscriptions

By means of inscriptions (a sequence of letters and/or numbers), information about ammunition should be affixed on the type and nature of the ammunition or on the ammunition model as well as data on the caliber, the length of the cartridge case, the manufacturer, the year/month of production and in particular on the lot designation and/or the serial number.

There are three main ways to convey such information:

2.1.1 Permanent Inscriptions

Depending on the production process, “permanent inscriptions” are usually engraved, cast, stamped or hammered into the outer surface of the ammunition casing – either applying conventional methods of deformation or engraving or using a laser. This type of inscription is considered to be “permanent” because even if a marking appears to have been removed completely it can still be traced by way of forensic methods. As regards small arms ammunition with a cartridge case, permanent markings are usually placed on the bottom of the cartridge case.

2.1.2 Non-permanent Inscriptions

Depending on the production process, “non-permanent inscriptions” are usually painted, drawn or printed directly onto the outer surface of the ammunition casing or packaging. The color of the marking often serves to indicate the type of ammunition, lot number, and intended use or to provide information as to what hazardous substances the ammunition contains.

2.1.3 Use of Labels

Sometimes, filled-in adhesive notes (labels, stickers or metal plates) are attached directly to some types of ammunition or filled-in tags are fastened to it in order to convey the information mentioned above. Caution should be taken with this method of labeling; labels or other material affixed to ammunition that were not part of the manufacturing and testing process might lead to safety and/or performance problems.

2.2 Marking Ammunition with Color Codes

Particularly major-caliber conventional ammunition is

often covered with a coat of paint or dyed (e.g. plastic parts). In most cases, the coat of paint also serves as protective finish and/or as camouflage painting and is thus usually applied to the entire surface of the ammunition casing. The colors used for this purpose indicate, for example, the intended use of the ammunition or provide information as to what hazardous substances the ammunition contains.

Instead of dyeing a large area of the ammunition casing, the ammunition (including small arms ammunition¹) can also be marked with ring-like color markings (rings of paint) in order to indicate, for instance, the presence of tracer ammunition or hazardous additives such as phosphorus.

2.3 Marking Ammunition with Symbols

Symbols with which ammunition is marked usually provide information on the proper handling of the ammunition concerned (e.g. during transport, storage and use) or on its type (e.g. high-explosive, incendiary, armor-piercing ammunition) or on certain international standards on overall measurements, performance and effectiveness of the ammunition. Such Symbols can be “permanent” or “non-permanent” (cf. paragraphs III.2.1.1 and III.2.1.2).

2.4 Visible and Palpable Markings

Markings that are not only visible but also palpable serve, for example, to identify the type/nature of the ammunition or the ammunition model in darkness or limited visibility. This method of labeling is often best integrated into the ammunition manufacturing process; adding grooves, notches or other palpable markings that were not part of the manufacturing and testing process might lead to safety and/or performance problems.

¹ The volume of small caliber ammunition production may make this form of marking cost prohibitive, particularly if performed after manufacture. As a result, this method of labeling is often best integrated into the ammunition manufacturing process.

Some examples of visible and palpable markings:

- a knurl circling the cartridge case or the edge of the cartridge case base;
- longitudinal groves on the jacket of the cartridge case;
- notches on the base of the cartridge case;
- position cams on the jacket of a proximity or time fuse, which indicate the set distance.

3. Types and Ways of Marking Ammunition Packaging

Packaging material for ammunition is usually marked with “permanent” (e.g. stamped or burnt-in) labels

or symbols or with “non-permanent” stickers, tags or symbols (e.g. coats of paint, adhesive notes or tags). As has already been mentioned, in addition to identification information, as listed above in section II.2.1, ammunition packaging is usually provided with information of logistic significance, quality control or for the purpose of preventing accidents during handling, transporting or storing the packed ammunition. In order to facilitate record keeping and the control of the records of the ammunition, the producing company should print the numbers and letters defining the cartridge of ammunition onto each ammunition storage box.

III. Registration and Record-keeping

1. Purpose of Registration and Record-keeping

According to the OSCE Document on Stockpiles of Conventional Ammunition, there is general agreement that stockpiles of ammunition, including ammunition identified as surplus and/or ammunition awaiting disposal, destruction should be registered and recorded as accurately as possible.²

In the context of this Best Practice Guide, the term “registration” refers to the collection of data needed to facilitate the identification of any piece of ammunition, its legal status and the location of its storage, at a given stage of its life.

The term “record-keeping” involves the maintenance of the data collected during the registration process in order to facilitate the identification of any piece of ammunition, its legal status and the location of its storage, at a given stage of its life.

To this end, registration and record-keeping should span the entire life cycle of ammunition, from its production to its consumption or disposal/destruction. Thorough registration and sustained record-keeping provides:

- accurate information on the exact types and nature or models of the ammunition that is in stock,
- quantities of the different types of ammunition,
- their condition,
- the site where the ammunition is being stored.

The capability to provide accurate information is a basic prerequisite for supplying the respective end users with serviceable ammunition in accordance with their requirements, for preventing accidents involving ammunition as well as for replenishing stockpiles or developing acquisition plans. In addition, the above-mentioned capability facilitates identification at an early stage of any loss resulting from theft or embezzlement and supports subsequent investigations. Registration and Record-

2 Cf. OSCE Document on Stockpiles of Conventional Ammunition, Section II, paragraph 16.

Keeping are the keys to controlling legal stocks of ammunition and preventing them from becoming illicit.

2. Registration and Record-keeping Principles

This section is to describe a number of essential principles governing the registration and record-keeping of ammunition.

2.1 Registration stages

Registration and Record-keeping of ammunition should be conducted at least at the following stages:

- at manufacture,
- at testing,
- at time of shipment & receipt,
- at storage and possession,
- in case of loss or theft,
- at consumption/use or disposal/destruction,
- at any transport and handling.

2.1.1 Registration and Record-keeping during the Production Process

It is a common practice that during the production process the manufacturer divides ammunition, ammunition components and explosives into production batches, called “lots”.

The manufacturer assigns each lot a unique designation which identifies and can be used to register unambiguously the ammunition of a particular production batch from that manufacturer.

Common quantities of ammunition contained in one lot designation during the production process are, for instance, approximately 500,000 cartridges in the area of small arms ammunition, up to 5,000 cartridges with

regard to tank ammunition and up to 500 items in the category of MANPADS³.

The manufacturer records the quantities of ammunition produced with production status reports, using the respective lot designation. This registration by the manufacturer marks the beginning of the documentation of the ammunition's life cycle.

For each lot produced, manufacturers should be required to create an ammunition data card (ADC), which serves as the “birth certificate” of the ammunition. The ADC contains the quantity of ammunition that has actually been produced along with further technical and component details and test results as well. The ADC or a copy thereof, usually accompanies the partial quantities of an ammunition lot.

2.1.2 Registration and Record-Keeping at Testing

In any case, especially if a State participates in a proof-testing or standardization regime for ammunition, a record of testing for each individual lot designation of ammunition should be kept by the agency conducting the testing and by the client.

2.1.3 Registration and Record-Keeping at Possession

One person should be responsible for the transfer of one ammunition stockpile to another. The ammunition to be transferred should be compared with the pertinent data in the stock status reports accompanying the shipment of ammunition (e.g. delivery list, master record card). This comparison should be carried out in the form of a visual inspection both by the person handing over the ammunition and by the person receiving it. Each of the two persons should be furnished with some document about the result of the comparison, which then provides

3 SAMPLING PROCEDURES according to ISO 2859.

the basis for subsequent book-keeping operations (addition to or removal from a stockpile). All relevant data on additions or retirements of ammunition in a depot which has been confirmed by documentary evidence is to be forwarded to the central record office of the organization in charge of the particular depots.

Any major organization (such as the police and the armed forces) that possesses ammunition should keep a central documentary stock record of the ammunition it has purchased or taken possession of. This record should be kept by reliable and well-trained personnel pursuant to the Generally Accepted Accounting Principles (e.g. by way of additions, removal and stocktaking). Dedicated logistic support offices should be established to document and manage the stockpiles and transfers of ammunition for a specific supply area, provide effective support in storage space planning and management, and conduct ammunition surveillance operations. The offices can also provide lot-specific ammunition control and other ammunition management processes and also furnish information for logistic control purposes.

A regular comparison of the content of the stockpiles between a storage facility and the Central Record Office has proven beneficial. To this end, all storage facilities (depots) should draw up lists of the existing lots of individual types of ammunition (so-called “lot lists”) and forward them to the central record office. Owing to the fact that many storage facilities house various types of ammunition (e.g. projectiles, missiles, bombs), it is advisable to report the stockpiles of each individual type of ammunition at adequate regular intervals at predetermined dates to the Central Record Office. Procedures of physical inventory are specified in the OSCE Best Practice Guide on *Stockpile Management and Security*.

A procedure like this ensures that each ammunition lot is thoroughly documented during the whole live-cycle, from its production through its useful life to its final consumption or destruction.

Regular internal stock-taking as described in the Best Practice Guide on *Stockpile Management and Security* can also be properly conducted on this basis.

More details on registration and record-keeping during the storage or transport of ammunition are provided by the OSCE Best Practice Guides on *Stockpile Management and Security* and on *Ammunition Transport* developed in the framework of the OSCE Document on Stockpile of Conventional Ammunition.

2.1.4 Registration and Record-Keeping in case of Loss or Theft

In case of lost or stolen ammunition a record should be kept by the affected storage facility and the central Record Office to facilitate prompt notification of national competent authorities.

2.1.5 Registration and Record-Keeping at consumption/use or disposal/destruction

All facilities or organizations (i.e. military or police unit, battalion, brigade) consuming or disposing of ammunition should be accountable for all ammunition contained within their inventories or authority. To this end, the facility/organization should keep a stock status report containing all existing ammunition items and listing all ammunition lots and the exact location where they are being stored.

Any consumption, transfer or disposal of ammunition within the framework of training activities (practice firing) or during missions should be documented in consumption records (i.e. ammunition and scoring logs).

Such records serve as documentary evidence and should be preserved for a period of at least three full calendar years after the final entry has been made.

A record should be maintained of the ammunition already disposed or destroyed at the direction of competent national authorities by those carrying out the disposal or destruction.

2.2 Registers and Nature of Registered Information

There are, of course, a wide variety of registration and record-keeping procedures. All registration and record-keeping procedures should be effective and easy to implement.

All registers used for record-keeping should be appropriately authenticated. The authorities of any state should assure the maintenance of active ammunition inventory records until the ammunition is exhausted or disposed. The archived ammunition records should be maintained at a central location for no less than 20 years and ideally indefinitely. Any entities other than governmental bodies that are authorized to maintain certain records, should ensure that all active records of the above-mentioned information are maintained to the same standards as governmental organizations for as

long as they perform this activity. On completion of this function, those entities shall transmit the registers in their possession to the competent governmental authority or to the dealer taking over this activity.

To successfully serve the purposes as described at paragraph III.1, the information to be recorded above should, at a minimum, include:

- the description of the producer,
- the stock number,
- a precise description of the ammunition, notably its type and model, caliber, type of explosives and pyrotechnics,
- the condition of the ammunition or condition code,
- the LOT-description,
- ownership account,
- the serial number (if any),
- hazard division / sub-division.

As appropriate, a record should be kept of the origin and destination of the ammunition and, eventually, of the export or import licenses including end-user-certifications.

All the above information should be made available to competent national authorities if requested by national law.

IV. Definition of Terms

Accountable Agency

Subunit, unit, agency or facility which is obliged to document its equipment, stocks or stockpiles.

Ammunition

In the context of this Best Practice Guide to the OSCE Document on Stockpiles of Conventional Ammunition

the technical term “ammunition” covers all substances and items that have or may have explosive properties like

- a) **Explosive substances and pyrotechnic mixtures,**
- b) **Items containing explosives,**
- c) **Agents and items** not listed under a) nor b) that were produced to bring about a practical effect by means of an explosion or a pyrotechnic effect,

d) Agents and substances that produce smoke.

This definition includes conventional ammunition, explosive material and detonating devices of land-, air- and sea-based weapons systems. The following broad categories serve as an indicator:

- a) Ammunition for small arms and light weapons (SALW),
- b) Ammunition for major weapon and equipment systems, including missiles,
- c) Rockets,
- d) Landmines and other types of mines,
- e) Other conventional ammunition, explosive material and detonating devices,
- f) Flares, signals, grenades, pyrotechnic simulators, and smoke producing munitions,
- g) Training and target practice material for the above, provided that they contain explosive or pyrotechnic fillers.

Due to the Scope of the OSCE Document on Stockpiles of Conventional Ammunition, all statements with regard to ammunition in this Best Practice Guide apply exclusively to stateowned stockpiles of conventional ammunition for military, paramilitary and security forces and the police of a participating state as stated in section II and III of the OSCE Document on Stockpiles of Conventional Ammunition. All other ammunition as ammunition in private possession and ammunition used for non-conventional weapons, such as Improvised Explosive Devices (IED), NBC weapons or other CBRN devices are excluded.

Ammunition Accident

Unexpected event involving ammunition in which an unwelcome ammunition-specific effect leads to personal injury or damage to property.

Ammunition Data Card (ADC)

Record created at time of ammunition manufacture. Contains list of components used to manufacture the ammo as well as technical, process & quantity details.

Ammunition Packaging Material

Ammunition packaging material is packaging for ammunition and forms an ammunition package together with the ammunition. It is made of packaging material designed to enclose ammunition or keep it together in order to make it transportable and storable.

Ammunition Surveillance

Identification or evaluation of the actual state of the ammunition and its packaging.

Ammunition surveillance includes:

- a) checking the ammunition for operational safety and serviceability,
- b) checking the ammunition for changes, i.e. corrosion, deterioration of explosives or pyrotechnics,
- c) subjecting ammunition to a visual inspection, disassembly of ammunition for component testing,
- d) performing tests on ammunition (example: continuity test, pull test, tests on components, chemical tests (ageing), functional tests).

Explosive substances are solid or liquid substances or mixtures, which can, by chemical reaction, generate gases of such a high temperature, pressure and speed that they can cause destruction in their vicinity.

Explosives means blasting agents, propellants, initiating agents, igniting agents, pyrotechnic mixtures. **High explosives** means detonating agents or compositions.

Lot (Lot Designation)

A lot is the quantity of ammunition or explosive material which is produced by a manufacturer on the basis of the same production data, the same production process and under comparable operating conditions in uninterrupted sequence.

Lot Surveillance Card

A lot surveillance card/file serves to monitor stocks in order to determine the date of the last examination. It also contains information on the state of the ammunition.

Nature of Ammunition

Ammunition with the same intended use and the same effect. Examples: high-explosive ammunition, HEAT ammunition, high-explosive plastic ammunition, fragmentation ammunition, illuminating ammunition, armor-piercing ammunition.

Provisioning

Provisioning of ammunition is the stockpiling of ammunition for the purpose of smoothly and immediately meeting any current, planned or short-term demand for ammunition in places which have been earmarked for this.

Property Accounting

Stock management procedure for the purpose of determining authorized levels and requirements, keeping stock records, managing defense materiel, registering records and entering them into the books as well as drawing up reports.

Record-keeping

In this context, the term “Record-keeping” involves maintenance of data in order to facilitate the identification of any piece of ammunition, its legal status and the location of its storage, at a given stage of its life-cycle.

Registration

In this context, the term “registration” involves collection of data in order to facilitate the identification of any piece of ammunition, its legal status and the location of its storage, at a given stage of its life.

Propellants mean agents made of solid or liquid deflagrating explosives that are used for propulsion.

Pyrotechnic mixtures are substances or mixtures designed to generate an effect in the form of heat, light, sound, gas or smoke or a combination of these effects as a result of nondetonative, self-sustaining, exothermic chemical reactions.

Serviceable Ammunition

Ammunition which meets the minimum technical requirements in terms of serviceability, performance and operational safety and has been cleared for use.

Stock Record

Documentary list of the material which has been taken possession of (including the pertinent records). The list is kept in accordance with the Generally Accepted Accounting Principles.

Stock Status Report

List of existing supply items for materiel planning, stock management etc. Shows the status of on hand assets by stock number, lot number, condition and storage location.

Type of Ammunition

Ammunition having the same basic designation and nominal size and belonging to the same weapon/equipment system.

Examples of ammunition types:

- a) 7.62 x 51 cartridge,
- b) 20 mm x 139 cartridge,
- c) complete ammunition unit (projectile, projectile fuse, propelling charge, primer) for a 155-mm howitzer.

V. References on the Subject „Conventional Ammunition: Marking, Registration and Record-keeping“

1. UN Resolution 60/74, Problems arising from the accumulation of conventional ammunition stockpiles in surplus, 11 January 2006.
2. OSCE Document on Stockpiles of Conventional Ammunition, FSC.DOC/1/03, dated 19 November 2003.
3. STANAG 2953 The Identification Of Ammunition (AOP-2 (B)).