



Natural Resources Canada
Ressources naturelles Canada

Authorization Guidelines for Cartridges

Authorization, Sampling, Composition,
General and Detailed Requirements for Type C Explosives

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Canada

Authorization Guidelines for Cartridges

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1. INTRODUCTION

This document is published in accordance with Part 3 of the *Explosives Regulations, 2013* (ER, 2013) published under the *Explosives Act* (R.S., c. E-15, s. 1). It is written in conjunction with the *Explosives Regulatory Division* (ERD) document titled *Authorization and Classification of Explosives* and specifies the documentation and testing needed for the authorization¹ of cartridges.

Small arms cartridges, power device cartridges and primers are classified under Part 3 of the *ER, 2013* as one of the following types:

- Type C.1 - small arms cartridges (designed to be used in small arms of a caliber of no more than 19.1 mm), including shotgun shell cartridges of any gauge;
- Type C.2 - power device cartridges (designed to accomplish mechanical actions);
- Type C.3 - primers.

1.1 Scope

These guidelines apply to small arms cartridges, power device cartridges and primers used in the manufacturing of cartridges. These guidelines specify the requirements for obtaining authorization of cartridges in Canada. They do not apply to military and law enforcement explosives.

These guidelines will be applied to the authorization of all new cartridges and to any currently authorized products that have been significantly modified or changed (s. 37, ER, 2013). Cartridges that are currently authorized will not be required to re-submit documentation or to perform additional testing.

ERD requires documentation to ascertain that the manufacturer has applied sound principles in design and exercised due diligence in evaluating the safety-related properties of the explosive. Due to their standardization through SAAMI (Sporting Arms and Ammunition Manufacturers' Institute), C.I.P. (Permanent International Commission for the Proof of Small Arms) or PATMI (Powder Actuated Tool Manufacturers' Institute), less documentation is needed for small arms cartridges, as described throughout this document.

Since the documentation reveals the details of design, which constitutes the intellectual property of the manufacturer, the submission will be kept confidential in accordance with the *Explosives Act* and Regulations.

¹ Authorization is the process by which an explosive substance or explosive article, as defined in the *Explosives Act* and *Regulations*, is declared authorized by the Chief Inspector, at which time it becomes legal to manufacture, sell, possess or use that explosive or explosive article in Canada or import it into Canada; only after approval is the item added to the list of authorized explosives. As part of this process, the explosive substances or explosive articles are classified in accordance with the *ER, 2013*. Only an explosive substance or explosive article under the care and control of the Department of National Defence is exempt from authorization.

1.2 Approvals - Authorization of the Explosives

Authorization of the explosives may be granted after review of the required documentation and test results. The document *Authorization and Classification of Explosives* describes this process and outlines the documentation, language and format requirements.

1.3 Regulation of Use

ERD does not regulate the use of cartridges. In Canada, the use of small arms cartridges is controlled by law enforcement agencies under the *Criminal Code*. However, as part of the approval and testing process by the Explosives Safety and Security Branch (ESSB), ERD does request information to ensure that the item can be safely used as recommended by the manufacturer, e.g., company product information and technical data.

1.4 Required Documentation

These guidelines, in conjunction with the document *Authorization and Classification of Explosives*, outline the requirements to be met by an applicant for approval of an explosive and, where applicable, its use only with manufacturer-specified system components.

1.5 Continuing Authorization

ERD periodically requests samples or undertakes audits to validate the continuing authorization of the articles on the list of authorized explosives. Samples are requested approximately every five (5) years or continuing authorization audits are conducted to ensure that a quality system has been developed and implemented by Canadian manufacturers and by foreign explosives manufacturers that have products published on the list of authorized explosives. Audits are conducted to measure the effectiveness of the quality control system and identify any weaknesses, risks and areas for improvement. Finally, audits help to determine if the manufacturers are meeting the requirements of the Canadian standards similarly to the testing of samples and whether the quality activities and results comply with their product specifications at the time of authorization. Manufacturers operating a quality system certified to the requirements of ISO-9000 may supply proof of such certification and be subject to less frequent periodic retesting/audit requirement.

2. REQUEST FOR AUTHORIZATION

The requirements that indicate what must be present in the submission and how it will be assessed are described in the document *Authorization and Classification of Explosives*. The submission is a legal declaration to the Government of Canada intended to obtain authorization. It is the first indication of the care a company exercises in achieving a product of acceptable quality. Every submission must be accompanied by the application form F03-01, properly completed. The review process does not start until all information has been submitted.

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2.1 List of Articles

A list of all the articles in the submission by name and identifying part number (when applicable), is required. Note that small arms cartridges are authorized by caliber, e.g. .308 Winchester, .222 Remington, .338 Federal, etc.

2.2 Transport Classification

A letter from a competent authority classifying the cartridges for transport is to be submitted when available, and should be accompanied by supporting information. If a letter of competent authority is not available, the applicant may indicate the expected classification, for example based on a regulatory text.

2.3 Outsourcing

With the exception of small arms cartridges, if some components of the cartridge are purchased from another source, this must be indicated on the drawing and a reference to that source must be given.

2.4 Quality Management System

The requesting company should describe and provide evidence of the quality management system being applied. For small arms cartridges, provide declaration of compliance with a standard such as SAAMI or C.I.P. that their cartridges are subjected to, or PATMI if power device cartridges.

3. SUBMISSION REVIEW AND SAMPLING

This section describes the requirements for the acceptance of a submission and the methodology that will be followed for the selection of samples.

3.1 Products Not Authorized in Canada

Some cartridges and accessories will not be authorized in Canada. The following types of cartridges and accessories will not be authorized for commercial purposes:

- cartridges and projectiles that are prohibited under the *Criminal Code* (R.S., c. C-34, s.1.);
- cartridges that contain tear gas, mace or other gas, or any liquid, spray, powder or other substance that is capable of injuring, immobilizing or otherwise incapacitating any person, when it is to be used for the purpose of injuring, immobilizing or otherwise incapacitating any person by the discharge of the gas or liquid (note that if the proven intended use is against animals, the cartridge may be considered for authorization and will be subject to a product registration from Health Canada);

3.2 Tolerances

Tolerances are to be provided and must conform to those listed in this section.

3.2.1 Chemical (not required for small arms cartridges)

Tolerances for chemicals may be set by the company. All declared ingredients must be present.

3.2.2 Physical

Tolerances on physical characteristics may be set by the company and must not interfere with proper function of the explosive. The tolerances used for small arms cartridges must be in compliance with SAAMI or C.I.P. standards.

3.2.3 Charge Weights (not required for small arms cartridges)

If maximum charge weights are specified in this document, they represent the maximum of the tolerance range. Otherwise, the following applies to charge weights:

- for the propellant: $\pm 20\%$

3.3 Marking and Labeling

The labeling and markings on packages must conform to the *Explosives Regulations, 2013*.

In addition to the requirements described in *Authorization and Classification of Explosives*, the following is expected for ammunition:

- precautions or instructions for the safe handling and use of the ammunition – the instructions must be in both English and French, clear, legible, and with equal prominence given to the two languages;
- small arms cartridges must be stamped with the manufacturer's symbol or name and with the caliber or gauge;
- if applicable, the outer package in which small arms cartridges are to be sold, displayed or distributed must be marked with the words "RELOADED CARTRIDGES" or "SURPLUS CARTRIDGES"

3.4 Packaging

If small arms cartridges are bulletted; packed in packages of 30 kg or less intended for distribution to consumers; and the point of any bullet can come into direct contact with the primer of another cartridge, the proposed packaging method may be subject to additional testing to ensure that an ignition of one cartridge does not communicate to another cartridge. Based on prior test results, .22 caliber rim-fire cartridges in this configuration are exempted from this testing requirement.

3.5 Sampling of the Submission

Not all articles need to be tested. Submissions are sampled and the acceptance of the submission depends on the behavior of the sample. New articles similar to existing articles from established and known companies are typically authorized by analogy to existing products.

When individual types of articles are submitted for authorization, each such article will be evaluated on its merits. When more than one cartridge is submitted, one in five cartridges is selected for testing. For example, for a submission with 14 cartridges, ($14/5=2.8$), 3 samples would be selected (round to the nearest number). For a submission with 11 cartridges, ($11/5=2.2$), 2 samples would be selected (round to the nearest number). Inspectors may decide on more samples where they believe this is necessary to evaluate a submission.

4. TESTING AND AUTHORIZATION

The document *Authorization and Classification of Explosives* describes the general authorization process. This includes the selection of samples by ERD, the preparation of a test plan by the Canadian Explosives Research Laboratory (CANMET-CERL), and the issuance of a Chief Inspector of Explosives (CIE) report by CANMET-CERL to ERD that includes recommendations for the authorization and classification of the products. This section describes in greater detail the basis on which cartridges will be authorized.

Specific construction and performance requirements are described in Appendix A. The section on general requirements identifies some characteristics with the letter “C” meaning critical. More stringent acceptance criteria are used for “C” characteristics.

4.1 Packaging for Samples

When samples are sent to CANMET-CERL for product testing, they are to be shipped in their intended packaging with the appropriate labeling and instructions. Improper packaging will result in rejection of the submission. Packaging other than for small arms cartridges and components transported as Limited Quantities must comply with the specification set out in the *National Standard of Canada CAN/CGSB 43.151-97, Packaging of Explosives (Class 1) for Transportation*.

4.2 Chemical Analysis

Chemicals must meet the declaration within the tolerances set by the company.

4.3 Acceptance Criteria

4.3.1 For Each Small Arms Cartridge

Ten (10) rounds are functioned for each type of cartridge tested at CANMET-CERL. Average peak pressure on 10 rounds must be less than or equal to the SAAMI Maximum

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Probable Sample Mean (MPSM).

Three (3) units minimum are dismantled and measured and, in cases where the propellant has not previously been authorized, they are subject to thermal stability tests.

Overall, 10/10 must meet the critical requirements (marked “C”) and at least 8/10 must meet all the non-critical requirements. Failure to meet these requirements constitutes rejection of the ammunition. For a submission with multiple ammunitions of a specific type, all articles that were selected for testing must pass testing with success.

4.3.2 Authorization of Cartridges and Submission

For a submission where an applicant has elected to have one or more articles authorized on an individual basis, the authorization of each article will be as described above in section 4.3.1.

For a submission that includes one or more types of cartridges, the authorization of types of cartridges will be based on the following:

- each type of cartridge will be treated individually, i.e., if one or additional types from a submission pass testing at CANMET-CERL, and an additional type from the same submission fails testing, only the failed type will not be authorized; and
- for a type of cartridge to be authorized, all articles that were selected for testing from that type must pass testing as per the requirements of section 4.3.1 above.

4.4 Transport Classification

Cartridges may be classified for transport as per Table 1 below.

Table 1 – Transport Classification

Shipping Name	UN Number	Classification
Cartridges, small arms	0012	1.4S
Cartridges for weapons, inert projectile	0012	1.4S
Cartridges, small arms blank	0014	1.4S
Cartridges for weapons, blank	0014	1.4S
Cartridges for tools, blank	0014	1.4S
Cases, cartridge, empty, with primer	0379	1.4C
Cases, cartridge, empty, with primer	0055	1.4S
Cartridges, power devices	0323	1.4S
Cartridges, power devices	0276	1.4C
Cartridges, power devices	0275	1.3C
Cartridges, power devices	0381	1.2C
Primers, cap type	0044	1.4S

APPENDIX A – GENERAL REQUIREMENTS

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CHARACTERISTICS	REQUIREMENTS
<p><u>1.</u> <u>Shipping Package</u></p> <p><u>1.1</u> <u>Labeling (C)</u>¹</p> <ul style="list-style-type: none"> • Product name and/or part number of the cartridge (as it appears on the list of authorized explosives) • Dangerous goods hazard label (UN number and proper shipping name (either English or French)) <u>or</u> Limited Quantity mark, as appropriate • Name and address of the holder of authorization • For reloaded cartridges, the outer package in which they are to be sold, displayed or distributed shall be conspicuously marked with the name and address of the person or firm who reloaded them and with the words “RELOADED CARTRIDGES” • For surplus small arms cartridges, the outer package in which they are to be sold, displayed or distributed shall be conspicuously marked with the words “SURPLUS CARTRIDGES” <p><u>1.2</u> <u>Condition of Packaging</u></p> <ul style="list-style-type: none"> • Loose composition (C). 	<p>Must meet <i>Transportation of Dangerous Goods Act</i>, its Regulations, and/or its referred standards.</p> <p>Not allowed.</p>

¹ (C): Critical requirement.

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CHARACTERISTICS	REQUIREMENTS
<p><u>2.0. Labeling of Cartridges and Consumer Packaging</u></p> <p><u>2.1 Labeling of Consumer Packaging</u></p> <ul style="list-style-type: none"> • Product name and/or part number as per the list of authorized explosives. • Identity of the product in terms of its common or generic name or in terms of its function, for example, “cartridges” (as per the CPLA). • Name and address of the holder of authorization. • The date of manufacture and the shift (if applicable) during which it was manufactured, or lot number. • Instructions in English and French for the safe handling, storage, use and disposal of the cartridge. Must include the words “Danger” or “Warning”, and “Keep Out of Reach of Children.” “Danger” ou “Avertissement” et “Gardez hors de la portée des enfants.”. For ammunition containing lead, the instructions must address the potential exposure to lead or other substances and the need for adequate ventilation and hygiene. • <u>For shotgun shells</u>: Shot gauge, shell length, shot number or type of projectile must be displayed on the consumer package. • <u>For rifle and pistol cartridges</u>: Caliber, bullet type and weight (gr or g) must be displayed on the consumer package. • For reloaded cartridges, the outer package in which they are to be sold, displayed or distributed shall be conspicuously marked with the name and address of the person or firm who reloaded them and with the words “RELOADED CARTRIDGES” • For surplus small arms cartridges, the outer package in which they are to be sold, displayed or distributed shall be conspicuously marked with the word “SURPLUS CARTRIDGES” <p><u>2.2 Labeling and Markings on Cartridges</u></p> <ul style="list-style-type: none"> • Stamping on cartridge case must include manufacturer’s symbol or name, and the caliber (rifle or pistol) or gauge (shotgun). 	<p>Consumer packaging must meet the <i>Consumer Packaging and Labelling Act (CPLA)</i>.</p>

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CHARACTERISTICS	REQUIREMENTS
<p><u>3.</u> <u>Physical Requirements</u></p> <p><u>3.1</u> <u>Construction of Ammunition</u></p> <ul style="list-style-type: none"> • Dimensions must meet SAAMI / C.I.P. or PATMI. • Must chamber properly. • For shotshell ammunition open and closed length will be checked and must meet SAAMI or C.I.P. • Primers must not protrude and shall not be recessed more than 0.2 mm. Primers for shotshell ammunition must not protrude and shall be recessed no more than 0.4 mm. <p><u>3.2</u> <u>Mass</u></p> <ul style="list-style-type: none"> • The propellant mass must be as declared (<i>not required for small arms cartridges</i>). 	<p>Tolerance $\pm 20\%$ unless declared otherwise.</p>
<p><u>4.</u> <u>Performance</u></p> <p><u>4.1</u> <u>Function</u></p> <ul style="list-style-type: none"> • Average peak pressure on 10 rounds must be less than or equal to SAAMI MPSM (C). 	<p>Not allowed to exceed the pressure.</p>