STATUS OF AMMUNITION AND COMPONENTS OF AMMUNITION IN THE REACH REGULATION

Version 3

PROFESSIONAL GUIDANCE

Paris, 07 November 2016
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FOREWORD

Since the implementation of REACH on 1st June 2007, the European Commission via the European Chemicals Agency (ECHA) has made available to industry the necessary information and the tools to assist producers, importers and downstream users in fulfilling their duties under the Regulation.

To help producers or importers determine whether their products are "a combination of an article (functioning as a container) and a substance/mixture" or "articles", ECHA has prepared the "Guidance on requirements for substances in articles" (ECHA-11-G-05-EN). This guidance provides flowcharts for "borderline cases" and application examples in order to help determining the correct status of the objects. Nevertheless, these examples can be ambiguous.

Therefore, and to ensure a uniform implementation of REACH in the field of ammunition industries, GICAT REACH Working Group (GICAT being an association for the land armaments industry) edited a professional guide specifically on ammunition status in 2009. An updated version was written in 2013 to take into account the updated ECHA guidance version 2 from April 2011.

After the ECJ ruling in case C-106/14, a further version 3.0 was edited in December 2015 to make quick corrections to all sections with reference to the 0.1 % limit.

Since the end of 2013, the status of certain ammunition types became a European discussion amongst ASD’s (Aerospace and Defence Industries Association of Europe) REACH working group, DG Enterprise (now DG Market) of the European Commission and EDA (European Defence Agency).

To improve the understanding of our arguments with regard to the status of certain ammunition types under the REACH regulation and to reply to a request of the French MOD, GICAT REACH Group worked towards

- Dividing ammunition into more general types including sub-components that may be considered as articles,
- Illustrating the functioning(s) of the ammunition by photographs or diagrams
- Answering in detail all questions of the flowchart of the ECHA guidance on articles with precise explanations for every ammunition type.
- Participating at debates organized in Brussels by EDA to discuss with both members of European MoDs and industrials

The aim of this updated version of our guidance is to compile all the information presented so far in order to, in a near future, be used by other European Industry Defence Associations when discussing with the European Commission and ECHA. The guidance puts forward arguments why most ammunition types are best classified as articles with integral substances/mixtures except for few special cases.
Currently, GICAT REACH Working Group is composed of experts from Etienne LACROIX, NEXTER MUNITIONS, EURENCO, AIRBUS SAFRAN LAUNCHER (ex HERAKLES), TDA, MBDA, DAVEY BICKFORD and JUNGHANS-T2M.

The present guidance has received the agreement of:

- the French association of manufacturers of explosives, pyrotechnics and fireworks, SFEPa, representing 28 companies,

- The Aerospace and Defence Industries Association of Europe, ASD REACH Implementation Working Group, representing 28 member associations in 20 countries,

- BDSV (Bundesverband der Deutschen Sicherheits and Verteidigungsindustrie), the REACH Working Group of the Federation of German Security and Defence Industries, representing over 220 companies (including subsidiaries).

This guidance, if necessary, may be presented as a supporting document during controls to the administration as well as to insurance companies and customers if requested.
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GLOSSARY

OBJECT: may, in principle, refer to any product in the supply chain

ARTICLE: is generally understood to be an object which during production is given a specific shape, surface or design which determines its function to a greater degree than does its chemical composition (definition taken from the REACH regulation).

An article may in turn be made up of an assembly of articles.

AMMUNITION:

"In a weapons system, object charged with explosive substances which produces propellant, explosive, armor-piercing, incendiary, illuminating, smoke producing, audible or other special effects or a combination of these." (Definition from the "Dictionnaire de la Pyrotechnie" Pyrotechnics dictionary edition 6, published by GTPS)

INTENDED RELEASE OF SUBSTANCES BY AN ARTICLE: (§3.1 of ECHA guidance on requirements for substances in articles version 3.0 - December 2015)

“A release of substances from articles is intended if it fulfills an accessory function (to be differentiated from the main function) which is deliberately planned and would not be achieved if the substance were not released. Consequently, substances that are released because of ageing of articles, because of wear and tear or as an unavoidable side-effect of the functioning of the article, are generally not intended releases, as the release as such does not provide a function in itself.”

“If the release of a substance from an object fulfills the main function of the object, the release is not regarded as an “intended release” for the purpose of REACH. In this case the object usually would be considered as a combination of an article (functioning as a container or a carrier material) and a substance/mixture, and not as an article with intended release of a substance/mixture.”

“An intended release of a substance from an article has furthermore to occur under (normal or reasonably foreseeable) conditions of use. This means that the substance release has to occur during the service life of the article. Hence, a substance release during the “production” or “disposal” phase of the article’s life cycle is not an intended release.”

PRODUCER OF AN ARTICLE (Article 3 from REACH regulation): means any natural or legal person who makes or assembles an article within the Community

MANUFACTURER (Article 3 from REACH regulation): means any natural or legal person established within the Community who manufactures a substance within the Community

STB (French title: Specification Technique de Besoin): “Technical Requirement Specifications” defined by the customer to the attention of its supplier. It is a contract between the customer and its supplier.
The REACH regulation: the fundamentals

REACH is a European regulation (EC) n°1907/2006 for the mandatory Registration, Evaluation, Authorisation and Restriction of Chemical substances marketed, manufactured or imported on European Union (EU) territory extended to the European Economic Area. It maintains the pre-existing system of restrictions on certain substance’s use.

The text of the REACH Regulation is the only authentic legal reference.

REACH’s main objectives are to improve the protection of human health and the environment against the risks which chemicals may represent, promote alternative test methods, the free circulation of the substances within the internal market, and reinforce competitiveness and innovation.

This REACH regulation is based on the principle that the economic actors like producers, importers and downstream users have an obligation to ensure that all risks are correctly controlled during manufacture, marketing and use of substances which are hazardous for human health or the environment. These measures are based on the precautionary principle.

Thus, the assessment whether a substance/mixture/article poses a risk to human health or the environment is the responsibility of the producers and importers concerned (and not of the EU Member States¹ as it was under the previous chemical law system) with mandatory sharing of data to minimize the tests necessary. In parallel to this, the European Union may take additional measures (authorization or restriction of use) concerning Substances of Very High Concern (SVHC) when additional action is necessary at European level.

REACH introduced an unprecedented change in the way information is exchanged on the substances throughout the supply chain. Each actor must reinforce the traceability of the substances he uses and ensure that its uses fall within the Exposure Scenarios taken into account by the suppliers.

REACH is a regulation and not a directive. It is therefore not transposed into the national laws of the Members States of the European Union. Instead, these member States may need to amend their regulatory system to integrate the corresponding new measures and requirements.

The ECHA Guidance differentiates objects into 4 different types:

- the object may be a substance or a mixture

- the object may be a combination of an article (acting as container or carrier material) and of a substance or a mixture (cf. last paragraph page 14 of the ECHA Guidance Version 3.0)

¹ Except when the services of the States directly import products from outside the European Community
- the object may be an article with an integral substance/mixture (i.e. the substance or the mixture is an integral part of the article) (cf. page 15 of ECHA Guidance, Version 3.0)

- the object may be an article with an integral substance/mixture whose intended release (without any chemical transformation) fulfills an additional function.

Notice: the concept of a combination of substances and article does not exist in the REACH regulation. It appears only in the ECHA Guidance on articles, which does not constitute a legal advice.

2 - Duties of the REACH regulation

2.1 Concerning "substances and mixtures":

All chemical producers and importers must identify and manage the risks of their substances they produce or market. For substances produced or imported in quantities over 1 ton per year and per company, they must demonstrate this in a registration dossier which must be submitted to the European Chemicals Agency (ECHA).

The ECHA checks that the registration dossier complies with the REACH regulation and must approve the manufacturers’ test proposals and ensure that they are limited to what is necessary and sufficient.

REACH also provides an authorization system to ensure that substances of very high concern are correctly controlled and progressively replaced by appropriate substances or technologies when this is economically and technically viable.

In addition, the EU authorities can propose restrictions on the manufacture, use and marketing of substances causing an unacceptable risk for human health and the environment.

EU Member States are responsible for ensuring that the REACH regulation is respected by inspections which may result in penalties in the event of unjustified non-application.

Registrations and authorizations will result in the obligation for manufacturers to produce and exchange the information required on the hazards (intrinsic or not) of their substances and the risks associated with the uses.

2.2 Concerning "articles"

According to REACH, an "article" means an object which during its manufacture is given a specific shape, surface or design that determines its function(s) to a greater degree than does its chemical composition (article 3.3). In such a case, the contained chemical substances are considered to be integral parts of the article.

The function of the article is associated with a specific use and is determined by what its producer / supplier wants it to be used for and what the end user acquiring it expects
it to do. Defining clearly the function the article is intended to fulfill and designed for is a key step in the determination whether the object is an article under REACH or not.

For substances, that are integral parts of the article, but that are intentionally released to fulfill an additional function, there are registration duties according to article 7: “Any producer or importer of articles submits a registration to the Agency for any substance contained in those articles if both the following conditions are met:

a) The substance is present in those articles in quantities totaling over one ton per producer or importer per year;

b) The substance is intended to be released under normal or reasonably foreseeable conditions of use”.

Thus, only the substances intentionally released without chemical transformation are required to be registered by the producer or importer when the annual quantity produced or imported exceeds 1 ton.

In addition, according to article 2 paragraph 7, point b of the REACH regulation, registration is in general not required in the following cases:

"The following shall be exempted from titles II, V, VI:

(a) Substances included in Annex IV, as sufficient information is known about these substances that they are considered to cause minimum risk because of their intrinsic properties;

(b) Substances covered by Annex V, as registration is deemed inappropriate or unnecessary for these substances and their exemption from these titles does not prejudice the objectives of this Regulation;"

And the annex V outlines the "exemptions from the obligation to register in accordance with article 2(7) (b):

1. Substances which result from a chemical reaction that occurs incidental to exposure of another substance or article to environmental factors such as air, moisture …

3. Substances which result from a chemical reaction occurring upon end use of other substances, mixtures or articles and which are not themselves manufactured, imported or placed on the market.”

Consequently, reaction products are exempted from the registration obligation but not from all requirements of REACH.
2.3 Concerning “combinations of substances/mixtures and articles”

When the object acts mainly as a container for the released or controlled delivery of the contained substances/mixtures, even when these substances are transformed during the use or functioning of the object, the substances are considered by REACH to form a combination with an article acting as a container or carrier material. If such an object is imported into the EU, each of these substances is then subject to the REACH registration obligations, if the quantities exceed one ton/year per substance.

The separation line between an “article” (which contains integral chemical substances) and a "combination of substances and article containing or carrying them" may in some cases be difficult to determine.

These “borderline cases” must receive a special attention: ECHA has published its "Guidance on requirements for substances in articles", version 3, December 2015 to help producers and importers in these cases (cf. chapter 3).

For a producer or importer, determining whether the products are “combinations of substances and articles” (that means substances contained or carried in an article) or “articles” (that means substances which are an integral part of the article) may have significant consequences. The producer or importer must therefore be able to fully demonstrate and justify its status choice in light of the dispositions of the REACH regulation.

This determination process is highly dependent on what is assumed to be the main function of the object, keeping in mind that this function is “what its producer / supplier wants it to be used for and what the end user acquiring it expects it to do” (as stated by ECHA answer to questions of EDA on a document from the 25 November 2015: EDA/TASK FORCE QUESTIONS TO ECHA and RELATED ECHA ASWERS/CLARIFICATIONS ON CLASSIFICATION OF ARTICLES UNDER REACH).

3 - ECHA "Guidance on requirements for substances in articles”

Therefore, to help producers and importers, ECHA has written the "Guidance on requirements for substances in articles". This guidance, now updated, has provided tools for this determination process, particularly flow charts to deal with borderline cases, and examples of application.

However, as noted in the guidance’s warning, the information provided in the guidance, does not constitute legal advice. In contrast to the REACH regulation, the guidance is not binding law.

The updated guidance of April 2011 made significant changes, particularly concerning the flow charts which take priority and which producers should use to decide on their products status (cf. appendix 1 of the guidance called: borderline cases of substances/mixtures in containers or on carrier materials).
However, in the spirit of the REACH regulation, it is the producers of articles who determine the status of their products under REACH. No other authority has the mandate to approve of such classifications. Accordingly, defining the status of an object under REACH is under the producer’s sole responsibility and it is their good faith – backed up by defendable arguments – which will be taken into account in the event of contestation.

A fast-track updated version 3.0 was written in December 2015 to take into account the conclusions of the judgement of the Court of Justice about the 0.1% limit.

A draft of version 4.0 is on consultation.

4 - Ammunition and REACH

4.1 Operation of ammunition

Reminder:

Ammunition consists of component substances, component mixtures and/or component articles.

Under the action of an appropriate stimulus, the ammunition will fulfill a defined function, by combustion, deflagration, detonation, or reaction with the ambient environment of the substances, mixtures or component articles which constitute the ammunition, causing exothermic chemical transformations resulting in the decomposition of the different component substances and mixtures which disappear from the ammunition (generally in a few millisecond) and are replaced by reaction products, mainly H₂, H₂O, NOₓ, COₓ, various oxides, etc. (representative of the component substances, mixtures, articles but which are of a completely different chemical type and therefore also have completely different physical, chemical, toxicological and ecological properties).

The substances generated during the functioning of the ammunition are exempted from registration duties under annex V of the REACH regulation (article 2, §7, point b).

Only ammunition which intentionally releases chemical substances without transforming them (nota: a change of physical state of a released substance does not alter the nature of the substance (e.g. sublimation of a smoke colorant)), and those which are classified as a container of chemicals are covered by the REACH registration requirements.

These consist in: before the 1st December 2008, pre-register the substances concerned, then, register these substances and take part in the forums (SIEF) intended to exchange the data required relating to the toxicity of the substances in question for all the exposure scenarios reasonably possible.

Therefore, it is mandatory to correctly define the object’s function. An incorrect definition may result in an object being classified as a "substance contained in an article" when it should be classified as an "article containing substances" with a more suitable definition.

For example, defining an artillery shell too generally as an object whose function is to explode may result its classification as a combination of substances/mixture and an article;
whereas if the definition of its function specifies that the explosive is intended to destroy a target with a combination of blast and fragmentation or shaped charge effect, the classification outcome would be quite different (i.e. that it is likely an article with integral substances). All these artillery shell architecture differences would result in distinctions of use in operational service: the different architectures then have different corresponding functions to be fulfilled.

Determining the exact and targeted function of a given type of ammunition must be guided by a concern for technical objectivity, particularly by placing the emphasis on why the ammunition cannot no longer fulfill the same function if it is designed differently. Of course, the aim of classification must in no way be to try to escape the REACH requirements.

Even if their ammunition is undoubtedly declared as "articles with integral substances", this, however, does not limit producers in their duty to ensure that their chemical substance suppliers, manufacturers or importers have carried out the necessary pre-registrations – and the registrations – within the required time limits, since otherwise they would no longer be able to get supplies in the short term.

Finally, whatever the status of the ammunition, it is necessary to check if the chemical substances used are on the list of candidate substances for authorization. If this is the case, the manufacturer must be able to inform his customer of the presence of these substances in the ammunition if the concentration is greater than 0.1 % weight/weight in any given component. A special effort must be made to ensure that these lists of substances are kept updated.

4.2 The REACH obligations in relation with the ammunition classification

The table presented in annex 1 describes the REACH obligations in relation with 4 cases of ammunition status and in relation with 4 statuses of the company concerned.

This table was realized after the meeting on May 2016 organized by EDA. It was requested by EDA to summarize information on the different classification categories and corresponding consequences on requirements/obligations under REACH (potentially including specific examples from ammunition categories).

4.3 Deciding what is the status of an ammunition under REACH

4.3.1 Types of ammunition analyzed:

Ammunition has been classified into different generic types according to the following list:

- Explosive with or without a defined shape
- Propellant with or without a defined shape as powders for weapons
- Explosive ammunition
- Self-propelled ammunition
- Fixed or projected illuminating ammunition and pyrotechnics (and signaling pyrotechnics)
- Smoke ammunition
- Emitting decoys
- Passive decoys
- Practice ammunition
- Armor-piercing ammunition
- Pyrotechnic cords
- Pyrotechnic (or energy) components and devices
- Physiological-effect ammunition
- Special-effect ammunition
- Gas generators

This list does not claim to be exhaustive, or that there are no overlaps between certain types of generics listed. However, it covers most known ammunition types and particularly those produced in or imported into France.

4.3.2 Tools to analyze ammunition:
The diagnostic of the status of the ammunition in relation to REACH must be carried out professionally, using all expertise available and intellectual integrity. It is broken down chronologically as shown in the flow diagram on the next page to answer the question "is the ammunition an article or not?" (Figure 2 from page 13 of ECHA guidance on articles version 3.0)
The first question the company must answer is the following:

*Step 1: Identify the function of the object.*

*Step 2: Are the shape, surface and design of the ammunition more relevant for the function than its chemical composition?*

If yes, the object is an article.

If no, the object is a substance or a mixture.
This flowchart shows the importance to clearly define the function(s) of the ammunition in its normal conditions of use. "Function" means what is expected of the ammunition by its customer or user – its "final effect" or "terminal effect" (why it was designed) and for what purposes. The analysis of the elements providing the ammunition's performances may be a key element for answering the question.

If it is not possible to unambiguously conclude whether the answer is yes or no, proceed with step 3.

**Step 3: Does the object contain a substance or a mixture which can be physically separated from the object (e.g. by pouring it or by extracting it)?**

If yes, proceed with the questions in step 4, otherwise proceed with step 6:

**Step 4:**

"Question 4a: If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable, in principle (though perhaps without convenience or sophistication), of carrying out the function defined in step 1?  
Question 4b: Does the object act mainly (i.e. according to the function defined under step 1) as a container or carrier for the release or controlled delivery of the substance/mixture or its reaction products?  
Question 4c: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?  
If you can answer these questions predominantly with yes (i.e. 2 of 3) rather than no, then the object should be regarded as a combination of an article(functioning as a container or a carrier material) and a substance/mixture."

If not, check the questions in step 5.

**Step 5:**

"Question 5a: If the substance/mixture were to be removed or separated from the object, would it be unable to fulfill its intended purpose?  
Question 5b: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?  
Question 5c: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?"

If you can answer these questions predominantly with "yes", then the function of the object is likely to be determined rather by the physical properties of shape, surface and design, than by the chemical composition. The object is then regarded as an article with an integral substance/mixture (i.e. the substance/mixture forms an integral part of the article).
If you can answer "no" to most of these questions (i.e. 2 out of 3), the object is then regarded as a combination of an **article** (acting as a container or carrier material) and a substance/mixture.

**Step 6:**

"**Question 6a:** does the object have a function other than being further processed? If the object predominantly has other functions (i.e. end-use functions), then this may be an indication that it is an article according to the definition of REACH.

**Question 6b:** does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition)? If the object is mainly put on the market or acquired because of its shape/surface/design, this is an indication that the object is an article.

**Question 6c:** when further processed, does the object undergo only “light processing”, i.e. no gross changes in shape? “Light processing”, such as drilling, surface grinding or coating, may improve or modify an object’s shape, surface or design for carrying out a function and is thus frequently applied to objects which are already articles. Thus, if only “light processing” is applied, this is an indication that the object is an article. Processes leading to gross changes in shape, meaning changes of depth, width and height of an object, are not regarded as “light processing”. These can for example be primary shaping processes (such as casting or sintering) or forming processes (such as extrusion, forging or rolling). If the object preserves at least one of its characteristic dimensions (depth, width and/or height) when further processed, the process can be regarded as “light processing”.

**Question 6d:** when further processed, does the chemical composition of the object remain the same? A change of the chemical composition in the next processing steps may indicate the object is a mixture. However, some treatments of an object which is an article may result in a change in its overall chemical composition, but not in its status of being an article. Examples are printing onto the surface, painting, applying coatings, dyeing, etc.

Not all questions may apply to all objects and the weight of evidence of the answers to the questions may vary from case to case. However, in concluding whether or not the object is an article, the answer to various of the relevant indicative questions should be considered and not only the answer to one of them. Predominantly answering "yes" to the questions indicates that the object is an article. Predominantly answering "no" to the questions indicates that the object is a substance or mixture.

**Specific case (for ammunition considered to be articles containing one or more integral substances/mixtures): ask yourself the following question: are substances released intentionally?** (See definition of "intended release of substances by an article" in the glossary p.5)

If **yes**, the substance released must be pre-registered, then registered (if the annual quantity consumed exceeds 1 ton per year per substance and if it has not already been registered by a third party for the same use).

If no, there is no obligation for the manufacturer or importer of the article to register the substances it contains.
4.3.3 Examples of arguments to lead the analysis with the flowchart:
These examples of arguments have to be chosen and adapted in function of the specifications of the ammunition.

4.3.3.1 Step 1: Identify the function of the object.

The function of an object can be roughly determined by analyzing what its producer/supplier wants it to be used for and what the end user acquiring it expects to do.

The functions of ammunition expected by the operational staff of the armed forces are clearly transcribed in the Customer's STB. To lead this analysis, it will be useful for the producer to refer to the STB.

The functions required by the customer are transcribed in the following way: destroy a target, propel an object, illuminate a battlefield, camouflage a target, signal a position, allow training … In contrast, the wording “explode”, “generate gas”, generate light”, or “generate smoke” or “release a substance” would be unusual in a customer’s use description and should therefore not be used for determining the ammunition’s function since they only describe the means to achieve the function expected by the user but not the function in itself. Accordingly, these terms are too restrictive, do not match all the specified requirements of the function of an ammunition and may produce misleading results in REACH analysis.

For a given type of ammunition, several functions are required, and are often equally important.

Generally, it's possible to identify generic requirements for all ammunition like:

- Interface with a system (weapon barrel, launcher, etc.).
- Function at a defined distance in relation to a specific target,
- Develop effectiveness within a specified delay, for a specified duration and with a specified volume
- Function effectively in a defined spectral range for the ammunition concerned
- Incorporate RAMS (Reliability, Availability, Maintainability and Safety)
- Incorporate safety conditions acceptable to the user (the function must be effective only when the conditions are met and prohibited in all other conditions, which implies an architecture organized around a device intended to obtain the desired effect),
- Withstand the stresses met during all its life phases.

Some examples below, shall be used to illustrate this point:

- For smoke ammunition: to camouflage a target by preventing the propagation of electromagnetic radiation in a certain space area and allowing troops and materiel
(equipment, vehicles, etc.), to move in daylight or at night without the enemy is able to perform accurate locating.

- For incendiary ammunition: to destroy targets or combustible materials, to cause the combustion of materials, to weaken the mechanical characteristics of metal objects.

- For a signaling device: to generate a visual effect to follow the trajectory of a projectile in the day and at night, to transmit a coded message (colored smoke producer), to delimit a particular area

- For a training grenade: to simulate every effects of a real grenade (handle, implementation, ignition system, sound effect, etc.)

4.3.3.2 Step 2: Are the shape, surface and design of the ammunition more relevant for the function than its chemical composition?

If we can unambiguously conclude that the shape, surface or design of the object is more relevant for the function than its chemical composition, the object is an article.

For example, in the case of an ammunition for vehicle protection, if you substitute a smoke pyrotechnic composition by another one, you could still obtain the function of camouflage of the vehicle with more or less efficiency. In contrast, if you change the external shape of the ammunition, you couldn't interface it with the system specified. Therefore, the shape/form/design is in this case more important than the chemical composition of the ammunition (which leads to it being classified as “article”).

Other arguments to answer yes at this step could be:

- The external shape of the ammunition is one of the most important points to interface with a system (weapon barrel, launcher,…),

- The surface of the ammunition must have the highest quality, it is also an important point to avoid problems in the gun chamber and to reach the required range,

- The ammunition is designed, for safety and efficiency requirements, to prevent the unintentional operation, to arm at the required time in order to enable the pyrotechnic train to operate and to function as asked for in the requirements described in step 1,

- In order to guarantee the required functions and effects, a specific architecture of the ammunition cartridge is needed to provide special confinement leading to optimized reaction (combustion, detonation, reaction with the ambient environment,…):

  - The nature and the thickness of the body, the diameters of the vents
  - The specific form of the pyrotechnic object
  - The compression rate of the mixture, the density and the homogeneity, the specific form given to the mixture (cylinder of a specific geometry, often equipped
with a central duct, making it possible to ensure the specified reaction speed law
and the mechanical acceleration resistance characteristics).

For all these reasons, in most cases of ammunition types, the answer is “yes”, i.e. the
shape, the surface and design of the ammunition is more relevant for the function than its
chemical composition.

Accordingly, continuing the discussion with the other steps described below is not
necessary for most ammunition types but only for the borderline cases of such ammunition
types where a deeper assessment is needed.

4.3.3.3 Step 3: Does the object contain a substance or a mixture which can be
physically separated from the object (e.g. by pouring or wringing out)?

In most ammunition types, the answer to this question is “NO” for 2 main reasons:

The pyrotechnic substance or composition is often formed directly in the object by melt cast
or compression in a metal, ceramic, plastic or cardboard body.
Separate them is not physically possible without damaging the pyrotechnic substance or
composition with limited technical means like “pouring or wringing out “ as suggested in
ECHA Guidance.

Dismantling ammunition to separate the substance/mixture which it is not designed to do,
generates a pyrotechnic risk which could lead to a pyrotechnic incidental reaction
(especially when the substance or mixture is an primary explosive). To limit as much as
possible the risk of a pyrotechnic incidental reaction, highly sophisticated technical tools in
a specialised industrial environment workshop are necessary and of course, it will generate
an human and/or environmental exposure to the pyrotechnic substance/composition.

In normal conditions, for safety reasons, it is forbidden to separate pyrotechnic composition
from the ammunition.

Accordingly, the answer to this question is usually “NO” since the pyrotechnic substance or
composition cannot be physically separated from the object in most ammunition types, and
we have to proceed directly with step 6 (and skip steps 4 and 5).

The answer is “YES” for few cases of ammunition which are designed to be dismantled (see
examples in the table in annex 2).

Accordingly, the answer to this question is usually “NO” since the pyrotechnic substance or
composition cannot be physically separated from the object in most ammunition types, and
we have to proceed directly with step 6 (and skip steps 4 and 5).
4.3.3.4 Step 4:

If it is possible to physically separate the substance/mixture from the object (which usually is not possible in most ammunition types), we have to apply the STEP 4 a, b, c. The purpose of the questions of this STEP 4 is to determine if the object contains a substance/mixture for which the rest of the object is a container or carrier material.

The following on this step is only for the border line cases where it is impossible to answer yes to the step 2 which should be analyzed case by case.

**Question 4a:** If the substance/mixture were to be removed or separated from the object and used independently from it, would the substance/mixture still be capable, in principle (though perhaps without convenience or sophistication), of carrying out the function defined in step 1?

This question should be analyzed case by case.

In a large majority of ammunition, the answer to this question is NO, because, once the substance/mixture is removed, it is often unable to perform the functions expected of the ammunition (required in the STB and defined in step 1).

To illustrate this, imagine a smoke mixture that was removed from the ammunition (if such was possible in safety conditions) and laid on the ground, and operated outside the ammunition. In this case, the pyrotechnic compositions would not produce the correct fragmentation effect on the shell body, and thus fail to meet one of its main functions for camouflage. In a battle situation, the user would be a dead man before he had started....

**Question 4b:** Does the object act mainly (i.e. according to the function defined under step 1) as a container or carrier for the release or controlled delivery of the substance/mixture or its reaction products?

This question should be analyzed case by case.

Usually, the answer to this question is NO, because, the ammunition is constituted of:
- shell body to interface with the barrel, to withstand the stresses generated by the impulse of the shot and the impact on the ground, to protect the payload from all the stresses encountered, to give the required fragmentation (petals)
- fin to ensure projectile stability
- driving belt to insert the projectile in the tube, to prevent gas leakage between projectile and barrel, to ensure projectile spinning for stability
- bursting charge perfectly defined to enable the required bursting of the body leading to an optimal functioning
- impact fuse to have a chronometric function to prevent the unintentional operation and to arm at the required time
- pyrotechnic composition perfectly defined to give the required function leading to the required effect

By naming the above listed ammunition parts, we want to highlight the fact that ammunition clearly is not mainly a container for the release or controlled delivery of the substance/mixture or of its reaction products, because there are many other integral parts of an ammunition that are necessary for its being able to perform its main function but which are not at all linked to “releasing” or “delivering” substances or reaction products.

Thus, all the previous named items and the number of design criteria required for the ammunition (including smoke ammunition) to function correctly, lead to the answer NO.
Accordingly, ammunition usually does not act mainly as a container or carrier for release or controlled delivery of the substance/mixture or of its reaction products.

Furthermore, this question asks about “release or controlled delivery of the substance mixture or of its reaction products”. Usually, the functioning of an ammunition leads to fragmentation of the body or a part of the body and to an instantaneous reaction (in a few milliseconds) of its integral substances/mixtures in order to form other reaction products. These will condense and recombine in solid, liquid and gaseous particles with, for many cases, a precise shape (in order to remain in suspension in the ambient environment), a defined size, a precise emission ray (between 0.4 and 0.8 µm will be effective in the visible spectrum, between 3 and 12 µm in the infrared spectrum), a narrowly defined concentration (in order to generate different optical properties), and/or a specific nature (in order to absorb or diffuse according to the effect sought) to comply with the required function and effect. Thus, in quite a number of cases, there is no release of “substances/mixtures or reaction products” from ammunition, but many ammunition types release articles instead. Per definition, the answer to the question in such cases is NO.

In summary, for most ammunition types, the release of a substance/mixture/of reaction products (if such happens) is only one part of the main function of the ammunition types in questions but certainly not the main part. If ammunition was designed as a simple container releasing substances/mixtures/reaction products, it would in most cases not be fit to fulfill the functional required asked for by the customers and described previously in step 1.

*Question 4c: Is the substance/mixture consumed (i.e. used up e.g. due to a chemical or physical modification) or eliminated (i.e. released from the object) during the use phase of the object, thereby rendering the object useless and leading to the end of its service life?*

This question should be analyzed case by case. Usually, the answer to this question is YES, because the integral substances of ammunition are consumed or eliminated during the use phase, since the operation of the ammunition leads to the chemical reaction of the relevant substances (with the destruction of the architecture in the same time). One exception to this general rule might be practice grenades that can be reloaded with the substance several times.

**4.3.3.5 Step 5:**

Step 5 is a reversion of the questions used in step 4 to verify the outcome one has achieved in step 4. Thus, one only needs to apply this step if the answers to STEP 4 received a majority of NO.

*Question 5a: If the substance/mixture were to be removed or separated from the object, would the object be unable to fulfill its intended purpose?*

The answer to this question is YES, because no ammunition type will correctly function without its integral pyrotechnic substances or mixtures.

*Question 5b: Is the main purpose of the object other than to deliver the substance/mixture or its reaction products?*

This question should be analyzed case by case. However, in most cases, it is correct to answer YES, because the ammunition type in question is usually designed to ensure the functions defined on step 1 which go well...
beyond simply “delivering the substance/mixture or its reaction products” like a simple container.

**Question 5c: Is the object normally discarded with the substance/mixture at the end of its service life, i.e. at disposal?”**

Usually, the answer to this question is **YES**. Indeed, if the ammunition is used correctly, there is no “disposal” of the ammunition because when it is fired or dropped after firing (in a battle area, in the sea or after an ejection from a plane …), the object emptied of its integral substances/mixtures is either destroyed or nor be recovered.

According to an answer of ECHA to EDA, disposal of unused ammunition cartridges is not to be seen as “normal service life” of ammunition. In consequence, this option (where the substances may indeed still be present in the cartridge) is not to be taken into account here.

At the end of Steps 4 and 5, the status of a product either as an article with an integral substance (be it subject to intended release or not) or as a combination of a substance/mixture and an article acting as a carrier material or container is finished.

**4.3.3.6 Step 6:**

Step 6 is used to determine whether an object is either an article with an integral substance (be it subject to intended release or not) or a substance/mixture or semi-finished good. Thus, this step applies for example to different stages of aluminum processing, of textile and non-woven processing, polymer processing or paper processing (see examples in ECHA guidance). In contrast, Step 6 has nothing to do with the classification of an object as “container”.

Step 6 can only be applied if the answer to STEP 3 is NO, i.e. the object cannot be physically separated from the substance or mixture that it contains.

**Question 6a: does the object have a function other than being further processed? If the object predominantly has other functions (i.e. end-use functions), then this may be an indication that it is an article according to the definition of REACH.**

This question should be analyzed case by case. Usually, the answer to this question is **YES** since pyrotechnic components, e.g. delay elements, are “finished” products that can be directly assembled into the finished ammunition and they do not need re-working or continued production (as would be the case for, e.g., aluminum rolling ingots).

**Question 6b: does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition)? If the object is mainly put on the market or acquired because of its shape/surface/design, this is an indication that the object is an article.**

This question should be analyzed case by case. Usually, the answer to this question is **YES**, especially when the ammunition is adapted to a specific armed system.
**Question 6c: When further processed, does the object undergo only “light processing”, i.e. no gross changes in shape?**

Usually, the answer to this question is **YES** since pyrotechnic components are not further processed at all and certainly not subject to gross changes in shape when assembled to ammunition.

**Question 6d: When further processed, does the chemical composition of the object remain the same?**

Usually, the answer to this question is **YES** since pyrotechnic components are not further processed at all and therefore not subject to change of its chemical composition.

Unfortunately, and as it is noticed in the ECHA guidance on articles, “not all questions of step 6 may apply to all objects" and they are not really adapted to being apply to an ammunition, but are mostly adapted for objects which shall be processed...

However, **if the answers are predominately YES, this indicates that the object is an article.**

### 4.3.4 Analysis of ammunition:

The table on the following pages indicates how the status of the previous different generic types of ammunition are determined for components, subsytems and systems, using the method described in paragraph 4 of this guidance. It is organized in columns giving for each type of ammunition or sub parts respectively:

- the number of the line,
- the generic type name of the ammunition or of the sub parts,
- a few examples illustrating the types of ammunition or sub parts, without claiming to be exhaustive,
- step 1: description of the main function of the object,
- step 2: the answer to the question: "Are the ammunition's shape, surface and design more relevant for the function than the chemical composition?", i.e.: "YES", "NO" or "BORDERLINE CASE", with – where applicable – a short explanatory comment,
- step 3: the answer to the question regarding whether the substance or mixture can be separated from the object,
- step 4: the answers to questions 4a, 4b, 4c,
- step 5: the answers to questions 5a, 5b, 5c
- step 6: the answers to questions 6a, 6b, 6c, 6d,
- the resulting classification of the object after the analysis: either as a substance, as a mixture, as a "combination of an article and of a substance/mixture" or as "articles containing integral substances/mixtures with or without intended release" and,
- the presence or not of release of substances with information specifying whether it is a main function or an accessory function (in this last case, it will be an "intended release").

In this table, for full clarity and transparency, for all the types of ammunition and components analyzed, all the steps of the flowchart are developed, even if we can usually unambiguously conclude already at step 2 that the shape, surface or design of the object is more relevant for the function than its chemical composition assuming that the object is an article.

This table can thus be seen as an overlapping of the analysis in order to verify if the results are the same if determined by both the "short" and "long" way: indeed, the results are the same.

Furthermore, as indicated in the flowchart of ECHA, steps 4 and 5 can only be answered if the answer at step 3 is YES, and step 6 can only be answered if the answer at step 3 is NO, we decide to answer all questions in the table (Yet, to respect the logic of the flowchart, the answers that are usually not applicable are highlighted in grey).
**Bibliography**


REACH "Interpretation guidelines - Version 3 – May 2014" published by ASD

Documents published by the DGA (French Armaments Directorate) in the context of the seminar of 09 October 2008 "Impact de REACH sur le cycle de vie des systèmes d'armes" (Impact of REACH on the life cycles of weapons systems) and in particular the report by working group 5 on ammunition

"Guidance on requirements for substances in articles" Version 3.0 - published by ECHA


REACH Interpretation Guidelines – Annex I – Global Aerospace and Defense Industry Opinion on what constitutes a substance, preparation and an article
Document available on the ASD (AeroSpace and Defense Industry Association of Europe) website:
http://www.asd-europe.org/Content/Default.asp
<table>
<thead>
<tr>
<th>Substance or mixture manufacturer within EU or substance or mixture importer</th>
<th>Producer of the final product (company which purchases substance or mixture to formulate pyrotechnic composition on its own industrial site, from an EU supplier, also a downstream user of substances/mixtures under REACH)</th>
<th>Importer of the final product from non-EU territory into the European Union (= importer under REACH)</th>
<th>User of the final product (= might be a downstream user under REACH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinguish if the substance/mixture manufacturer produces the substance only for its needs or whether the substance is put on the market...</td>
<td>Registration (art. 6): Must submit registration for any substances produced &gt;1t/a.</td>
<td>Registration (art. 6): No obligation</td>
<td>Registration (art. 6): No obligation</td>
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<tr>
<td>Authorisation (art. 56 and Annex XIV): Must apply an application for authorisation for each use of a substance included in Annex-XIV. SVHC (art. 33): not applicable SDS (art. 32): Must provide a Safety Data Sheet for all substances or mixtures produced only if they are put on the market. Notification (art. 7.2): not applicable CLP notification: Must classify and label all substances produced according to standard CLP rules. CLP notification: Must notify to ECHA the classification of all substances manufactured in quantity &gt;1t/a or classified as dangerous within 1 month after placing them on the market, unless the information was already provided in a registration dossier.</td>
<td>Registration (art. 6): No registration duties apply (since registration must be done by the EU manufacturers of the substance). Only if the use of the substance is not covered in suppliers’ registration, must get into contact with supplier or write Downstream User Chemical Safety Report for that substance in accordance with art. 37 REACH. Authorisation (art. 56 and Annex XIV): Only if the use is not already covered by an authorisation up in the supply chain SVHC (art. 33): Must inform its customers about the presence of any SVHCs if contained &gt;0.1% in any component of the product (including pyrotechnic composition). SDS (art. 31): Need to provide a Safety Data Sheet in accordance with Art. 31 REACH but with a adapted format to article as ammunition Notification (art. 7.2): must notify any SVHCs present in more than 1t/a and &gt; 0.1% in the product CLP label: Must classify and label ammunition according to specific CLP rules for explosives as outlined in Table 2.1.2 Annex I CLP (“exploding bomb”). CLP notification: No obligation, since notification duty applies to manufacturers of the substances.</td>
<td>Registration (art. 6): Authorization (art.56 and 66.1 and Annex XIV): No obligation. SVHC (art.33): Must inform its customers about the presence of any SVHCs if contained &gt;0.1% in any component of the product (including pyrotechnic composition). SDS (art. 31): Need to provide a Safety Data Sheet in accordance with Art. 31 REACH but with a adapted format to article as ammunition Notification (art. 7.2): must notify any SVHCs present in more than 1t/a and &gt; 0.1% in the product CLP label: Must classify and label ammunition according to specific CLP rules for explosives as outlined in Table 2.1.2 Annex I CLP (“exploding bomb”). CLP notification: No obligation</td>
<td>Registration (art. 6): No obligation Authorisation (art.56 and Annex XIV): No obligation SVHC (art.33): No obligation SDS (art. 37.1 and 2): If its use isn’t identified in the SDS or not recommended, the downstream user must inform its supplier. If its supplier doesn’t want to take care of its use, the downstream user must write its own CSR (in specific conditions: art. 37.4). Notification (art. 66): must notify the use of a substance subjected to authorisation, in conformity with the article 56 §2 (the use of the downstream user must be covered by an authorisation) 3 months after the first delivery. CLP label: No obligation CLP notification: No obligation</td>
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<tr>
<td>Article with intended release of a substance</td>
<td>Release of a substance must be covered by an authorisation</td>
<td>Registration (art. 6): Must submit registration for all substances produced &gt;1t/a.</td>
<td>Authorisation (art. 56 and Annex XIV): Must apply an application for authorisation for each use of a substance included in Annex-XIV.</td>
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<tr>
<td>a signalling smoke ammunition by sublimation of a dye</td>
<td>Registration: Must submit registration for the (one) substance that is intended to be released from the ammunition if present in the ammunition (in total) &gt;1t/a; unless substance has already been registered for that use. (Art. 7 (1) REACH). After 31 May 2018: probably no obligations, since EU supplier will likely already have registered the substance for that use. Annex XIV: Only if their use is not already covered by an authorisation up in the supply chain, must apply for authorisation for use of all Annex-XIV substances used during own production. Art.33: Must inform customers about SVHCs if present &gt;0.1% in any component of the product (including in smoke composition). SDS: No need to provide a Safety Data Sheet in accordance with Art. 31 REACH for the ammunition (ammunition-specific information format only). Art. 7 (2): Only if substance has not already been registered for that use, must notify all SVHC present &gt;1t/a in the ammunition and &gt;0.1% in the specific component produced by the company. CLP label: Must classify and label ammunition according to the specific CLP rules for explosives as outlined in Table 2.1.2 Annex I CLP (“exploding bomb”). CLP notification: No obligations, since notification duty applies to manufacturers of the substances.</td>
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</table>

**Table 2.1.2 Annex I CLP (“exploding bomb”).**

- Production or use of a substance involving a) a mixture (chemical composition equally or more relevant to function than shape / surface / design of the product) or b) more than 1t/a of a single material or a) mixture (chemical composition equally or more relevant to function than shape / surface / design of the product) must be covered by an authorisation 3 months after the first delivery. 

| Mixture (chemical composition equally or more relevant to function than shape / surface / design of the product) | Black powders | Registration (art. 6): Must submit registration for all substances produced >1t/a. | Authorisation (art. 56 and Annex XIV): Must apply an application for authorisation for each use of a substance included in Annex-XIV. | SVHC (art.33): not applicable | SDS (art.31): Must provide a Material Safety Data Sheet for all substances or mixtures produced | Notification (art. 7.2): not applicable | CLP label: Must classify and label all substances produced according to standard CLP rules. CLP notification: Must notify to ECHA the classification of all substances manufactured in quantity >1t/a or classified as dangerous within 1 month after placing them on the market, unless the information was already provided in a registration dossier. |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |

- An initial draft of this table was provided by a member of ASD.
## ANNEX 2

Ammunition status under REACH

<table>
<thead>
<tr>
<th>No.</th>
<th>GENERIC TYPE</th>
<th>NON EXHAUSTIVE EXAMPLES</th>
<th>STEP 1: MAIN FUNCTION OF THE OBJECT</th>
<th>STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 5</th>
<th>STEP 3: CAN 5 OR M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6</th>
<th>STEP 4: 4a 4b 4c</th>
<th>STEP 5: 5a 5b 5c</th>
<th>CLASSIFICATION OF THE OBJECT: SUBSTANCE, SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE?</th>
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<tbody>
<tr>
<td></td>
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<td>STEP 5: YES GO TO STEP 4 NO GO TO STEP 6</td>
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<td>Apply if YES at the step 3</td>
<td>Apply only if more NO at the step 4</td>
<td>Apply if NO at the step 3</td>
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<tr>
<td>1</td>
<td>Propellant without a defined shape</td>
<td>Propellant charges without specific shape, bulk black powder,..</td>
<td>Generating gas</td>
<td>NO Only the chemical nature of the substances present in the propellant charge is responsible for the generation of gas that does not follow a specific combustion law.</td>
<td>Not applicable - Object is a substance or mixture</td>
<td>Not applicable - Object is a substance or mixture</td>
<td>Not applicable - Object is a substance or mixture</td>
<td>Not applicable - Object is a substance or mixture</td>
<td>SUBSTANCE OR MIXTURE</td>
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<td>2</td>
<td>Propellant with a defined shape</td>
<td>Propellant charges for weapons, for gas generators, Agglomerate propellant charges, Thrusters, Solid propellant engines, etc. Propellant powder: B19T (cylindrical with 19 holes)</td>
<td>Designed: -to be integrated in a specific ammunition to deliver defined ballistic performances (depending of the type of projectile, max. volume of the gun chamber,..) in order to propel a projectile by generating gas according to a specific combustion law in order to achieve an appropriate distribution of pressure (for example along the gun tube so that it can support it without breaking.) -to ensure safety and reliability specifications.</td>
<td>YES The design and the shape govern the specific combustion law (speed, duration, gas volume) and are much more important than the nature of the mixture which can't alone reach any specific combustion law. The picture on left shows a specific shape of a propellant powder with 19 holes. They determine the WEB (the thickness to burn to obtain a specific rate of combustion).</td>
<td>NO The powder or charge is the object.</td>
<td>Not applicable - Step 6 Powder or charge has an end-use function and cannot be separated.</td>
<td>Not applicable - Step 6</td>
<td>6a: YES The object retains its integrity and is integrated in a system for generating gas by combustion of a defined law. 6b: YES The customer focuses on the shape, the design of the propellant in order to integrate it in its system and ensure performance. 6c: YES (light processing) or not determined 6d: YES or not determined</td>
<td>NO RELEASE</td>
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</table>

**Components**

- Black powder
- A solid propellant engine with a central duct

**Ammunition status under REACH**

1. **Propellant without a defined shape**
   - Propellant charges without specific shape, bulk black powder...
   - **Generating gas**
   - **Step 2:** Are shape, surface or design more relevant for the function than the chemical composition? If it is not possible to unambiguously conclude, go to step 5.
   - **Step 3:** Can 5 or M be separated from the object? Yes go to step 4, no go to step 6.
   - **Step 4:**
     - 4a
     - 4b
     - 4c
   - **Step 5:**
     - 5a
     - 5b
     - 5c
   - **Classification of the object:** Substance, substance, mixture, article, or combination of an article and a substance or mixture.
   - **Intentional release of a substance within the article:** No release.

2. **Propellant with a defined shape**
   - Propellant charges for weapons, for gas generators, Agglomerate propellant charges, Thrusters, Solid propellant engines, etc.
   - **Propellant powder: B19T (cylindrical with 19 holes)**
   - **Designed:**
     - To be integrated in a specific ammunition to deliver defined ballistic performances (depending of the type of projectile, max. volume of the gun chamber,..) in order to propel a projectile by generating gas according to a specific combustion law in order to achieve an appropriate distribution of pressure (for example along the gun tube so that it can support it without breaking.)
     - To ensure safety and reliability specifications.
   - **Step 2:** Are shape, surface or design more relevant for the function than the chemical composition? If it is not possible to unambiguously conclude, go to step 5.
   - **Step 3:** Can 5 or M be separated from the object? Yes go to step 4, no go to step 6.
   - **Step 4:**
     - 4a
     - 4b
     - 4c
   - **Step 5:**
     - 5a
     - 5b
     - 5c
   - **Classification of the object:** Substance, substance, mixture, article, or combination of an article and a substance or mixture.
   - **Intentional release of a substance within the article:** No release.
<table>
<thead>
<tr>
<th>No.</th>
<th>GENERIC TYPE</th>
<th>NON EXHAUSTIVE EXAMPLES</th>
<th>STEP 1: MAIN FUNCTION OF THE OBJECT</th>
<th>STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3</th>
<th>STEP 3: CAN S OR M BE SEPARATED FROM THE OBJECT?</th>
<th>STEP 4: ONLY AVAILABLE FOR THE CHARGE</th>
<th>STEP 5: ONLY AVAILABLE FOR THE CHARGE</th>
<th>STEP 6</th>
<th>CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE?</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Explosive without a defined shape</td>
<td>Explosive mixture without its ignition system... ex: explosive for an offensive grenade Plastic explosives: used for demolition, etc...</td>
<td>Generate a shock wave without action against a specific target NO Only the chemical nature of substance(s) is responsible for generating the shock wave. Not applicable – Object is a substance or mixture</td>
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<td>3</td>
<td>High (secondary) explosive charge without its initiation system (engineering charge)</td>
<td>Anti-tank mines, reactive bricks, Support shells, Explosive shells, Hollow shells, shape charge, Mortar ammunition, Missile or torpedos or rocket warheads, Pre-fragmented ammunition, HE cartridge of different calibers, fixed HE gun ammunition linked or not, mortar warhead without initiation system etc...</td>
<td>Designed: 1. for the destruction of a defined target by the action of fragments, solid and inert materials at a specified distance and velocity. 2. to fit a specified class of weapon system – to ensure safety and reliability specifications 1: YES The design and the shape of the charge are responsible for the projection of solid and inert materials (fragments, core of a core generating charge, projectiles, shaped charge jet, plugs...) and to control their movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target; while various explosives substances / mixtures could be used to obtain similar effects. 1: NO in most cases In most cases, the explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. A high secondary explosive charge that has not functioned will be destroyed preferentially by burning or blasting, except for few cases scheduled for dismantling.</td>
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<tr>
<td>4a</td>
<td>High (secondary) explosive charge with defined shape</td>
<td>Anti-tank mines, reactive bricks, Support shells, Explosive shells, Hollow shells, shape charge, Mortar ammunition, Missile or torpedos or rocket warheads, Pre-fragmented ammunition, HE cartridge of different calibers, fixed HE gun ammunition linked or not, mortar warhead without initiation system etc...</td>
<td>Designed: 1. for the destruction or damage of a defined target by the projection of fragments, solid and inert materials at a specified distance and velocity. 2. to fit a specified class of weapon system – to ensure safety and reliability specifications 1: YES The design and the shape of the charge are responsible for the projection of solid and inert materials (fragments, core of a core generating charge, projectiles, shaped charge jet, plugs...) and to control their movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target; while various explosives substances / mixtures could be used to obtain similar effects. 1: NO in most cases In most cases, the explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. A high secondary explosive charge that has not functioned will be destroyed preferentially by burning or blasting, except for few cases scheduled for dismantling.</td>
<td>4a : NO The explosive charge is not a defined shape. 4b : NO The explosive charge is not a defined shape. 4c : NO The explosive charge is not a defined shape.</td>
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<tr>
<td>4b</td>
<td>Pellet material</td>
<td>2 - to fit into a component forming part of a sub-system to produce an energetic effect.</td>
<td>2 NO / 3 YES</td>
<td>The energetic material with a defined shape (for example, pellet) is the object.</td>
<td>specific class of weapon system. Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation...). These reactions are chemical reactions and the reaction products are not in the scope of REACH (cf annex V). The pyrotechnic train allows the initiation of pyrotechnic charge (remotely) to obtain the desired final effects while ensuring the safety. 4c : YES The nominal operating of a high explosive charge leads to the initiation and reaction of the integral substances with the destruction of the architecture at the same time. All the substances/mixtures are consumed.</td>
<td>3 YES</td>
<td>6d : YES</td>
<td>Or not applicable</td>
<td>4 YES</td>
<td></td>
</tr>
<tr>
<td>4b</td>
<td>Charge for: Missile or torpedo or rocket warheads, Submarine mines, Reinforced blast ammunition, explosive shells, etc.</td>
<td>Designed : - to exclusively generate a shock wave or a blast effect (shock over pressure) for the destruction of a defined target - to fit into a specific class of weapon system or to maintain specific dimensions - to ensure safety and reliability specifications.</td>
<td>2 YES</td>
<td>The design and the shape of the charge must be responsible for the generation of a specific shock wave in order to reach and destroy the defined target (while various explosives substances / mixtures could be used to obtain similar effects).</td>
<td>NO</td>
<td>The explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. An explosive charge that has not functioned will be, destroyed preferentially by burning or blasting, except for few cases scheduled for dismantling. 4a : NO The explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. An explosive charge that has not functioned will be, destroyed preferentially by burning or blasting, except for few cases scheduled for dismantling. 4a : NO</td>
<td>3 YES</td>
<td>6d : YES</td>
<td>Or not applicable</td>
<td>4 YES</td>
</tr>
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</tr>
<tr>
<td>5a</td>
<td>Pyrotechnic (or energetic) components and devices</td>
<td>Initiators, igniters, fuses, detonators, primers, relay devices, primer tubes, igniter plugs, safety and arming systems, primer fuses, relay, boosters, etc.</td>
<td>Designed:</td>
<td>NO In most cases. The design and the architecture are more important to govern the appropriate effect during a specific duration, to generate a shock wave to lead to a chain reaction of pyrotechnical substances.</td>
<td>YES GO TO STEP 4</td>
<td>NO GO TO STEP 6</td>
<td>4a : NO</td>
<td>5a : YES</td>
<td>6a : YES</td>
<td>Without its pyrotechnic substance/mixture, a pyrotechnic component cannot fulfill its requested functions.</td>
</tr>
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<td></td>
<td></td>
<td>Gas generators used for (inflatable devices, air bags, flotation devices...) Generation of breathable oxygen, tank pressurization, power ejection system for payload, base bleed devices</td>
<td>- to transform an external action (mechanical, heat, electrical, optical, electromagnetic, etc.) into a pyrotechnic action which produces or transmits an effect (push, pull, perforate, break, delay, light, pressure generation, gas generation, etc....).</td>
<td>In most cases, the explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. Especially on components or devices such as detonators, the pyrotechnic charge (which is often a primary explosive) that has not functioned will be destroyed, preferentially by burning or blasting (chemical separation only). Only some exceptional cases will be scheduled for dismantling.</td>
<td>2 NO / 2 YES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The component maintains its integrity. It's a finished product with unexpected further processed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designed:</td>
<td>YES</td>
<td>NO In most cases. The design and the architecture are more important to govern the appropriate effect during a specific duration, to generate a shock wave to lead to a chain reaction of pyrotechnical substances.</td>
<td>YES GO TO STEP 4</td>
<td>NO GO TO STEP 6</td>
<td>4a : NO</td>
<td>5a : YES</td>
<td>6a : YES</td>
<td>Without its pyrotechnic substance/mixture, a pyrotechnic component cannot fulfill its requested functions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designed:</td>
<td>YES</td>
<td>NO In most cases. The design and the architecture are more important to govern the appropriate effect during a specific duration, to generate a shock wave to lead to a chain reaction of pyrotechnical substances.</td>
<td>YES GO TO STEP 4</td>
<td>NO GO TO STEP 6</td>
<td>4a : NO</td>
<td>5a : YES</td>
<td>6a : YES</td>
<td>Without its pyrotechnic substance/mixture, a pyrotechnic component cannot fulfill its requested functions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designed:</td>
<td>YES</td>
<td>NO In most cases. The design and the architecture are more important to govern the appropriate effect during a specific duration, to generate a shock wave to lead to a chain reaction of pyrotechnical substances.</td>
<td>YES GO TO STEP 4</td>
<td>NO GO TO STEP 6</td>
<td>4a : NO</td>
<td>5a : YES</td>
<td>6a : YES</td>
<td>Without its pyrotechnic substance/mixture, a pyrotechnic component cannot fulfill its requested functions.</td>
</tr>
</tbody>
</table>

Page 31
| No. | GENERIC TYPE | NON EXHAUSTIVE EXAMPLES | STEP 1: MAIN FUNCTION OF THE OBJECT | STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3 | STEP 3: CAN S OR M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6 | STEP 4: 4a: NO 4b: NO 4c: NO Apply if YES at the step 3 | STEP 5: 5a: NO 5b: NO 5c: NO Apply only if more NO at the step 4 | STEP 6: 6a: NO 6b: NO 6c: NO 6d: NO Apply if NO at the step 3 | CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE | INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE? |
|-----|--------------|------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5b  | Explosive belts and nuts, various actuators (push rods, valves, retractors, releasers, etc.), cutters, separators, retractors, releasers, etc.) | Designed: to transform a pyrotechnical action into a mechanical force (heat, shock wave, etc.), to fit specific dimensions- to ensure safety and reliability specifications. | YES  | NO In most cases, the explosive material is tightly pressed into the casing, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. Especially on components or devices such as actuators, the pyrotechnic charge (which is often a secondary explosive) that has not functioned will be destroyed, preferably by burning or blasting (chemical separation only). Only some exceptional cases will be scheduled for dismantling. | 4a : NO The substance/mixture (with no organizational design) used without the component would be unable to achieve the function defined in step 1. The device must be ignited by a pyrotechnic train and must ensure safety and reliability functions. 4b : NO A component is designed to fit into a specific volume in a system or sub-system or to fit into specific dimensions to achieve the effects described in step 3. Its nominal operating is line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation,...). The pyrotechnic train allows the initiation of the component (remotely) to obtain the desired final effects while ensuring the safety. 4c : YES The functioning of the device leads to the reaction of the integral substances with the destruction of the architecture at the same time | 5a : YES Without pyrotechnic substance/mixture, a pyrotechnic device cannot fulfill its identified functions. 5b : YES A device is designed to ensure the function defined on step 1. 5c : YES In normal conditions of functioning, there is no “disposal” of the component or device because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not be recovered. 6a : YES The device maintains its integrity. It’s a finished product with unexpected further processed. 6b : YES The customer specified the architecture (dimensions,...) of the product for its integration in his weapon system and to ensure the defined performances. 6c : YES Not applicable or small transformation only. 6d : YES Or not applicable | 4 YES
| No. | GENERIC TYPE               | NON EXHAUSTIVE EXAMPLES                                      | STEP 1: MAIN FUNCTION OF THE OBJECT                                                                 | STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3 | STEP 3: CAN S OR M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6 | STEP 4: 4a NO Apply if NO at the step 3 4b NO Apply if YES at the step 3 4c NO Only if more NO at the step 3 | STEP 5: 5a NO Apply if NO at the step 5 5b NO Apply if YES at the step 5 5c NO Apply if YES at the step 5 5d NO Apply if YES at the step 5 5e NO Apply if YES at the step 5 | STEP 6: 6a NO Apply if NO at the step 6 6b NO Apply if YES at the step 6 6c NO Apply if YES at the step 6 6d NO Apply if YES at the step 6 6e NO Apply if YES at the step 6 | CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE | INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE? ARTICLE NO RELEASE |
|-----|---------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6   | Pyrotechnic and explosive cords | Explosive cords, time delay cords, transmission cords, detonation cords, etc. | Designed: to transmit a detonation, to cut by formed load effect, to generate a time delay and/or transmit an order. To fit specific dimensions of the desired operating time of the desired delay, the desired cut length and thickness of a specific material… To ensure safety and reliability specifications. | NO In most cases, the explosive cord contains an envelope with a specific shape and thickness designed to produce the desired effect (cutting, delay, transmission). The design of the envelope ensures the confinement, the density, the speed and avoids mechanical stress. Accordingly, the design of the cord is more relevant for the function than the chemical composition. Only some exceptional cases will be scheduled for dismantling. | 4a NO The cord contains an envelope with a specific shape and thickness designed to produce the desired effect (cutting, delay, transmission). The design of the envelope ensures the confinement, the density, the speed and avoids mechanical stress. (chemical separation only). Only some exceptional cases will be scheduled for dismantling. | 5a YES Without pyrotechnic charge, the cord couldn’t function. | 6a NO The cord maintains its integrity. It’s a finished product with unexpected further processed. | 6b NO The customer specified the architecture of the product (dimensions, caliber…) to ensure the defined performances. | 6c YES Not applicable or small transformation only | 6d NO Or not applicable |

**Subsystems**

<p>| No. | GENERIC TYPE               | NON EXHAUSTIVE EXAMPLES                                      | STEP 1: MAIN FUNCTION OF THE OBJECT                                                                 | STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3 | STEP 3: CAN S OR M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6 | STEP 4: 4a NO Apply if NO at the step 3 4b NO Apply if YES at the step 3 4c NO Only if more NO at the step 3 | STEP 5: 5a NO Apply if NO at the step 5 5b NO Apply if YES at the step 5 5c NO Apply if YES at the step 5 5d NO Apply if YES at the step 5 5e NO Apply if YES at the step 5 | STEP 6: 6a NO Apply if NO at the step 6 6b NO Apply if YES at the step 6 6c NO Apply if YES at the step 6 6d NO Apply if YES at the step 6 6e NO Apply if YES at the step 6 | CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE | INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE? ARTICLE NO RELEASE |
|-----|---------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7   | Propellant charge         | Tail charge assembly (TCA) for mortar ammunition              | Designed: to be ignited in the chamber of a gun to produce a specific pressure / time event to project an object from a gun at high velocity or produce noise and smoke simulating the firing of a gun. To fit into the specific shape of a specific type of weapon system. To ensure safety and reliability specifications. | YES The design, shape and architecture are essential to provide, through a launch system, a specific pressure to propel ammunition to a specific initial speed. | 4a NO The propellant charge is tightly pressed into the casing or tightly enclosed into the system, thus making it impossible to be separated by simple means like pouring or wringing out. | 5a YES Without pyrotechnic charge, the propellant charge can’t function. | 6a NO The propellant charge maintains its integrity. It’s a finished product with unexpected further processed. | 6b NO The customer specified the architecture of the product (dimensions, caliber…) to ensure the defined performances. | 6c NO Not applicable or small transformation only | 6d NO Or not applicable | 6e NO Or not applicable |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>GENERIC TYPE</th>
<th>NON EXHAUSTIVE EXAMPLES</th>
<th>STEP 1: MAIN FUNCTION OF THE OBJECT</th>
<th>STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3</th>
<th>STEP 3: CAN S or M BE SEPARATED FROM THE OBJECT?</th>
<th>STEP 4:</th>
<th>STEP 5:</th>
<th>STEP 6:</th>
<th>CLASSIFICATION OF THE OBJECT, SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE?</th>
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</table>
| 8   | Self-propelled engine | ![Self-propelled engine](image1) | Designed:  
- to propel an ammunition at a specific distance, in an autonomous way.  
- to be ignited in the chamber of a gun to produce a specific pressure / time event to project an object from a gun at high velocity or produce noise and smoke representative of firing a gun  
- to fit into specific dimensions of an ammunition loader  
- to ensure safety and reliability specifications.  
Yes: The design, shape and architecture are essential to self-propelling ammunition with a specific thrust force during a given time  
No: In most cases, the propellant charge is tightly pressed into the casing or tightly enclosed into the system, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. A propellant charge that has not functioned will be destroyed, preferentially by burning or blasting (chemical separation only). Only some exceptional cases will be scheduled for dismantling.  
4a: NO  
4b: YES  
4c: YES  
4d: NO  
5a: YES  
5b: YES  
5c: YES  
5d: NO  
6a: YES  
6b: YES  
6c: YES  
6d: NO  
6e: NO  
6f: NO  
6g: NO  |  |  |  |  |  |  |  |  |  |  |  |
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<th>No.</th>
<th>GENERIC TYPE</th>
<th>NON EXHAUSTIVE EXAMPLES</th>
<th>STEP 1: MAIN FUNCTION OF THE OBJECT</th>
<th>STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3</th>
<th>STEP 3: CAN S OR M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6</th>
<th>STEP 4: 4a 4b 4c Apply if YES at the step 3</th>
<th>STEP 5: 5a 5b 5c Apply only if more NO at the step 4</th>
<th>STEP 6 6a 6b 6c 6d Apply if NO at the step 3</th>
<th>CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE OBJECT?</th>
</tr>
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<tbody>
<tr>
<td>9</td>
<td>Warhead with initiation system</td>
<td>Warhead</td>
<td>Designed: - to disintegrate a defined target with the generation of metal fragments and/or damage surrounding areas with a blast wave. - to fit into specific dimensions - to ensure safety and reliability specifications.</td>
<td>the design, YES the shape of the warhead are reasonable at the given time for the projection of solid and inert materials (metal fragments, core of a core generating charge, projectiles, shaped charge jet, plates...) and control their movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target (while various explosives substances / mixtures could be used to obtain similar effects).</td>
<td>NO In most cases, the explosive charge is tightly pressed into the casing or tightly encased into the system, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them. The explosive charge (which is often a secondary explosive) that has not functioned will be destroyed, preferentially by burning or blasting (chemical separation only). Only some exceptional cases will be scheduled for dismantling.</td>
<td>4a : NO The substance/mixture (with no organizational design) used without the object would be unable to achieve the function defined in step 1. The war head must be ignited by a pyrotechnic train. It is generally designed to be propelled while ensuring safety and reliability functions. 4b : NO The war head is designed to fit into a specific class of weapon system. Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation...). The pyrotechnic train allows the initiation of the war head (remotely) to obtain the desired final effects while ensuring the safety. 4c : YES The functioning of the war head leads to the reaction of the integral substances with the destruction of the architecture at the same time.</td>
<td>5a : YES Without pyrotechnic substance/mixture, the war head cannot fulfill its identified functions. 5b : YES The war head is designed to ensure the function defined in step 1. 5c : YES In normal conditions of functioning, there is no “disposal” of the war head because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not be recovered.</td>
<td>6a : YES The component maintains its integrity. It's a finished product with unexpected further processed. 6b : YES The customer specified the architecture (dimensions...) of the product for its integration in his weapon system and to ensure the defined performances. 6c : YES Not applicable or small transformation only 6d : YES Or not applicable</td>
<td>3 YES</td>
<td>ARTICLE NO RELEASE</td>
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<td>10</td>
<td>Systems</td>
<td></td>
<td>EXPERIMENTAL</td>
<td>YES</td>
<td>NO GO TO STEP 4</td>
<td>NO</td>
<td>Try</td>
<td>Apply only if more NO at the step 4</td>
<td>YES / NO</td>
<td>NO RELEASE</td>
</tr>
<tr>
<td></td>
<td>Ammunition and kinetic energy ammunition</td>
<td></td>
<td>MODEL ^ 24 / 120 High explosive anti tank</td>
<td>Designed:</td>
<td>NO (The design and the shape of the armor-piercing / kinetic energy ammunition are responsible for the projection of the ammunition and control the movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target while various explosive substances / mixtures could be used to obtain similar effects).</td>
<td>4a : NO</td>
<td>5a : YES</td>
<td>6a : YES</td>
<td>Without pyrotechnic substance/mixture, the ammunition cannot fulfill its identified functions.</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Model ^ 24</td>
<td>In most cases.</td>
<td>NO (In normal conditions of functioning, there is no &quot;disposal&quot; of the ammunition because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not be recovered).</td>
<td>4b : NO</td>
<td>5b : YES</td>
<td>6b : YES</td>
<td>The ammunition is designed to ensure the function defined on step 1.</td>
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<td></td>
<td>Model ^ 24 / Armor piercing ammunition</td>
<td>Insert projectile which may contain a tracer, but without any high explosive content; relying on its kinetic energy to defeat a target.</td>
<td>NO (Only some exceptional cases will be scheduled for dismantling. Only some exceptional cases will be scheduled for dismantling.).</td>
<td>4c : YES</td>
<td>5c : YES</td>
<td>6c : YES</td>
<td>In no circumstances, the design is not forbidden to separate them.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Model ^ 24 / Armor piercing ammunition</td>
<td>Designed:</td>
<td>NO (The design and the shape of the armor-piercing / kinetic energy ammunition are responsible for the projection of the ammunition and control the movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target while various explosive substances / mixtures could be used to obtain similar effects).</td>
<td>4d : NO</td>
<td>5d : YES</td>
<td>6d : YES</td>
<td>The operation of a armor-piercing or kinetic energy ammunition leads to the reaction of the integral substances with the destruction of the architecture at the same time.</td>
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</tbody>
</table>
**High Explosive (HE) ammunition and munitions**

- Anti-tank mines, Reactive bricks, Support shells, Explosive shells, Hollow shells, shape charge, Defensive grenades, Mortar HE ammunition, Missile or torpedo or rocket, Pre-fragmented ammunition, etc.
- HE cartridges, of different calibers, fixed HE gun ammunition linked or not.
- HE Artillery and cannon projectiles; torpedo, missile and rocket warheads; Aircraft bombs; Hand or launched by rifle or dispenser) Grenades; Explosive Reactive Armor; Anti-tank Mine; Anti-torpedo, missile and rocket warheads; Pre-fragmented Ammunition. Ammunition comprising a HE filled projectile complete with a fixed or semi-fixed propelling charge, linked or not. Shaped charge / Hollow charge warheads and projectiles. Explosively formed penetrator warhead.

**Engineering explosive charges.**

**Mortar HE ammunition**

- **Hollow charge**
- **Reactive brick**
- **Defensive grenade**

**Non-exhaustive Examples**

**11.**  
**Generic Type:** High Explosive (HE) ammunition and munitions

**Main Function of the Object:**

- To control the movement of a solid and inert material for the destruction of a defined target, fragments, projectiles, “shape charge”, “plaque”...

**Shape, Surface or Design More Relevant for the Function Than the Chemical Composition?**

**Yes:**

- The design and the shape of the high explosive ammunition are responsible for the projection of the solid and inert materials (fragments, core of a core generating charge, projectiles, shaped charge jet, plata...), and control their movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target (while various explosives substances / mixtures could be used to obtain similar effects).

**No:**

- The explosive charge is tightly pressed into the casing or tightly enclosed into the system, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is not forbidden to separate them.

**Can or Must be Separated From the Object?**

**Yes:**

- The explosive charge (which is often a secondary explosive) that has not functioned will be destroyed, preferentially by burning or blasting (chemical separation only).

**No:**

- Only some exceptional cases will be scheduled for dismantling.

**Are or Must Be Designed to Separate From the Object?**

**Yes:**

- The substance/mixture (with no organizational design) used without the object would be unable to achieve the function defined in step 1.

**No:**

- The high explosive ammunition must be ignited by a pyrotechnic train. It is generally designed to be propelled, while ensuring safety and reliability functions.

**Design:**

- The high explosive ammunition is designed to fit into a specific class of weapon system. Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train: combustion, deflagration, detonation,...

- The pyrotechnic train allows the initiation of high explosive ammunition (remotely) to obtain the desired final effects while ensuring the safety

**Reliability:**

- With a delay igniter plug of 4 to 6 s and an ejection spoon

**Safet:**

- The safety radius was designed to remain in the open without any danger beyond a radius of 22 m. This grenade is made:
  - With an oval plastic body loaded explosive and on the periphery, a pre-fragmented metal sleeve and balls to the upper and lower portions
  - With a delay igniter plug of 4 to 6 s and an ejection spoon

**Functions When the Object is Separated From the Substance or Mixture?**

**Yes:**

- Without pyrotechnic substance/mixture, the high explosive ammunition could not fulfill its identified functions

**No**

- The customer specified the architecture (dimensions, caliber...) of the product for its integration in his weapon system and to ensure the defined performance.

**Classification of the Object: Substance, Mixture, Article, or Combination of an Article and a Substance or Mixture**

<table>
<thead>
<tr>
<th>No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5a</td>
<td>YES</td>
</tr>
<tr>
<td>5b</td>
<td>YES</td>
</tr>
<tr>
<td>5c</td>
<td>YES</td>
</tr>
<tr>
<td>5d</td>
<td>YES</td>
</tr>
<tr>
<td>5e</td>
<td>YES</td>
</tr>
<tr>
<td>5f</td>
<td>YES</td>
</tr>
</tbody>
</table>

**Intentional Release of a Substance Within the Article?**

- 3 YES
- 6a: YES
- 6b: YES
- 6c: YES
- 6d: YES

**Remark:**

- Not applicable or small transformation
### Step 1: Main Function of the Object

**GENERIC TYPE**: Ammunition

**NON EXHAUSTIVE EXAMPLES**:
- Illuminating or projected explosive charges, etc.
- Reinforced Tracking flares, Ground Offensive grenades, Missile or illuminating flares, etc.

**DESIGNED TO**:
- Generate a shock wave under the effect of a stimulus electric, mechanical, shock, heat...
- Triggered by an initiation system: destruction of a defined target, by a shock wave or a blast effect (blast over-pressure) or projection of fragments.
- For destruction or damage to a target by blast effect (blast over-pressure) triggered by an integral initiation system.
- To fit into a specific dimensions.
- To ensure safety and reliability specifications.

**Designed**:
- To generate a shock wave under the effect of a stimulus electric, mechanical, shock, heat...
- Triggered by an initiation system: destruction of a defined target, by a shock wave or a blast effect (blast over-pressure) or projection of fragments.
- For destruction or damage to a target by blast effect (blast over-pressure) triggered by an integral initiation system.
- To fit into a specific dimensions.
- To ensure safety and reliability specifications.

**Step 2: Are Shape, Surface or Design More Relevant for the Function Than the Chemical Composion? If it is not possible to unambiguously conclude go to Step 3**

**YES**
- In most cases, the explosive charge is tightly pressed into the casing or tightly enclosed into the system, thus making it impossible to be separated by simple means like pouring or wringing out.
- In addition, for safety reasons, it is not forbidden to separate them.
- The explosive charge (which is often a secondary explosive) that has not been functioned will be destroyed, preferably by burning or blasting (chemical separation only).
- Only some exceptional cases will be considered for dismantling.

**NO**
- The design and the shape of the high explosive ammunition are responsible for the projection of solid and inert materials (fragments, core of a core generating charge, projectiles, shaped charge jet, plate...) and to control their movement thanks to their specific properties such as their shape, mass, and kinetic energy in order to reach and destroy the defined target (while various explosives substances / mixtures could be used to obtain similar effects).

**Step 3: Can 4a or 4b be Separated From the Object?**

**YES**
- GO TO STEP 4

**NO**
- GO TO STEP 6

**Step 4: Apply If Yes at the Step 3**

**4a**
- The substance/mixture (with no organizational design) used without the object would be unable to achieve the function defined in step 1.
- The explosive ammunition must be ignited by a pyrotechnic train. It is generally designed to be propelled while ensuring safety and reliability functions.
- The high explosive ammunition is designed to fit into a specific class of weapon system.
- Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation).
- The pyrotechnic train allows the initiation of high explosive ammunition (remotely) to obtain the desired final effects while ensuring the safety

**4b**
- NO
- The functioning of a high explosive ammunition leads to the reaction of the integral substances with the destruction of the architecture at the same time

**4c**
- YES
- In most cases, the explosive charge is tightly pressed into the casing or tightly enclosed into the system, thus making it impossible to be separated by simple means like pouring or wringing out.
- In addition, for safety reasons, it is not forbidden to separate them.
- The explosive charge (which is often a secondary explosive) that has not been functioned will be destroyed, preferably by burning or blasting (chemical separation only).

**Step 5: Apply only if more NO at the step 4**

**5a**
- YES
- Without pyrotechnic substance/mixture, the high explosive ammunition couldnt fulfill its identified functions.

**5b**
- YES
- The high explosive ammunition must be ignited by a pyrotechnic train. It is generally designed to be propelled while ensuring safety and reliability functions.
- The high explosive ammunition is designed to fit into a specific class of weapon system.
- Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation).
- The pyrotechnic train allows the initiation of high explosive ammunition (remotely) to obtain the desired final effects while ensuring the safety

**5c**
- YES
- In normal conditions of functioning, there is no “disposal” of the ammunition because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not be recovered.

**5d**
- YES
- The high explosive ammunition maintains its integrity.
- It’s a finished product with unexpected further processed.

**5e**
- YES
- The customer specified the architecture (dimensions, caliber...) of the product for its integration in his weapon system and to ensure the defined performances.

**5f**
- YES
- Not applicable or small transformation only

**5g**
- YES
- Or not applicable

**5h**
- YES
- The object is generally designed to project the effects... (see functions defined in step 1)

**6a**
- YES
- The high explosive ammunition maintains its integrity.
- It’s a finished product with unexpected further processed.

**6b**
- YES
- The customer specified the architecture (dimensions, caliber...) of the product for its integration in his weapon system and to ensure the defined performances.

**6c**
- YES
- Not applicable or small transformation only

**6d**
- YES
- Or not applicable

**6e**
- YES
- The object is generally designed to project the effects... (see functions defined in step 1)
| No. | GENERIC TYPE | NON EXHAUSTIVE EXAMPLES | STEP 1: MAIN FUNCTION OF THE OBJECT | STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION? IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3 | STEP 3: CAN S or M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6 | STEP 4: 4a | 4b | 4c | Apply IF YES at the step 3 | STEP 5: 5a | 5b | 5c | Apply only if more NO at the step 4 | STEP 6 6a | 6b | 6c | 6d | Apply if NO at the step 3 | CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE | INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE? |
|-----|--------------|-------------------------|-------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------|-----|-----|-------------------------------|----------------|-----|-----|-----|----------------|----------------------------------|------------------|
|     |              |                         | Stabilizing the trajectory (for certain types of ammunition) | An illuminating ammunition that hasn't functioned will be preferentially destroyed by burning or blasting, except for few cases scheduled for dismantling. It isn't a physical separation from the object but a chemical separation. | Illuminating shell as distress signal comprises a pen shaped ejecting device, secured, plastic holder, 4 self-propelled red flares and 2 chaff loaded and radar visible flares. All these combined effects (ejection, propulsion, IR emitted signal and EM emitting signal) could be deployed without a pyrotechnic chain. Another example: a signal cartridge needs to be fired from a 40 mm handgun and comprises case and percussion primer, a propelling charge, a trajectory delay and a star to obtain a colored light. This type of ammunition is generally designed to be projected while ensuring the functions of safety and reliability. | 4b | NO | This type of ammunition is generally designed to be projected and be adapted to a launcher while ensuring the functions of safety and reliability. Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation,...). 4c | YES | It is a single operation during which the substances / mixtures are consumed. The become inert object becomes a waste. | 2 NO/ 3 YES | 5a | 5b | 5c | Apply only if more NO at the step 4 | 6a | 6b | 6c | 6d | Apply if NO at the step 3 | 6c: YES or small transformation only | 6d: YES or not applicable | 4 YES |

- Distress signals: To ensure safety and reliability specifications.
- Naval illuminating shell: Stabilizing the trajectory.
- Signal cartridge 40 mm: An illuminating ammunition.

**Intentional Release of a Substance Within the Article?**
- 6c: YES
- 6d: YES
- 4 YES
### NON EXHAUSTIVE EXAMPLES

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>12 b</td>
<td>Day and night location markers, etc.</td>
<td>b. Designed: to generate a visual (light or smoke) effect for a specific duration, visible at a specific distance to follow a trajectory of a projectile in the day and in the night, to transmit a coded message (colored smoke), to mark a position by day or by night…. By combustion reaction or reaction with the ambient environment (water, etc.), NO</td>
<td>This marker is dropped automatically from an airplane and needs to fit into the launcher. Its specific design with a scared ballast allows an ignition at the contact of the sea and to stay on the surface of the sea. The marker is designed to sink after 60 min of functioning to avoid that it becomes an obstacle on the surface. A marker that hasn’t functioned will be preferentially destroyed by burning or blasting. It isn’t a physical separation from the object but a chemical separation.</td>
<td>NO</td>
<td>This pyrotechnic composition is shaped in the body of the object (metal, ceramic, plastic or cardboard body) by compression or by melt cast, or tightly enclosed into the body, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is forbidden to separate them. A marker that hasn’t functioned will be preferentially destroyed by burning or blasting.</td>
<td>4a / NO</td>
<td>Pyrotechnic mixtures used without the object (structure, form, caliber, system of ignition,…) would be unable to generate a visual effect. The ammunition should be initiated by a pyrotechnic chain as a firing pin when there’s an impact initiation (marine marker type 6152 LXT) or by an electric igniter powered by a battery (marine marker LXT type 6060).</td>
<td>5a: YES</td>
<td>Without substance or mixture, the object would be unable to realize the identified functions.</td>
</tr>
<tr>
<td>13</td>
<td>Smoke screening ammunition</td>
<td>a. Designed: to obscure a defined target at a specific distance or to camouflage a part of the theatre of operations by producing an opaque screen in a specific wave band, for a determined duration, to fit into a specific class of weapon system (not for all devices) to ensure safety and reliability specifications</td>
<td></td>
<td></td>
<td>4b: NO</td>
<td>This type of ammunition is designed to be adapted to a weapon or a launcher system (shape, size,…). Its nominal operating is in line with one or several pyrotechnic reactions of the pyrotechnic train (combustion, deflagration, detonation…).</td>
<td>4c: YES</td>
<td>It is a single operation during which the integral substances / mixtures are consumed. The become inert object becomes a waste.</td>
<td>5b: YES</td>
</tr>
</tbody>
</table>

### STEP 1: MAIN FUNCTION OF THE OBJECT

#### 13a Smoke shell, smoke grenade
- **To obscure a defined target at a specific distance or to camouflage a part of the theatre of operations by producing an opaque screen in a specific wave band, for a determined duration,**
- **to fit into a specific class of weapon system (not for all devices)**
- **to ensure safety and reliability specifications**
## Step 1: Main Function of the Object

**Non Exhaustive Examples:**

- **GOAL:** Generate carbon

**Generic Type:**
- **STEP 2:** Are Shape, Surface or Design More Relevant for the Function Than the Chemical Compositional If it is not possible to unambiguously conclude go to step 3

**STEP 3:** Can or Must Be Separated From the Object?
- **NO**

**STEP 4:** Go to Step 6

**CLASSIFICATION OF THE OBJECT:**

- **ARTICLE**
- **NO RELEASE**

### Example 1: Combustion Reaction

- **NO**

- **4a:** NO

- **4c:** YES

**Classification:**

- **ARTICLE**

### Example 2: Dispersion of Carbon Black

- **YES**

- **5b:** YES

**Classification:**

- **ARTICLE**

### Example 3: Combustion Reaction and Dispersion of Specific Powder

- **YES and NO**

- **4a:** NO

**Classification:**

- **ARTICLE**

### Example 4: GALIX 17 (Smoke Ammunition + Dispersion of Carbon Black)

- **Waste**

- **4c:** YES

**Classification:**

- **ARTICLE**

---

**Page 41**
### GALIX 13 (smoke ammunition + dispersion of metallic powder)

**STEP 1: MAIN FUNCTION OF THE OBJECT**

- **OBJECT:** GALIX 13
- **NATURE:** Pyrotechnic design
- **FUNCTION:** To cause an optical effect in the visible spectrum, between 0.4 and 0.8 mm, in order to absorb or diffuse light rays as possible by retro diffusion according to the identified effect.

**STEP 2: CAN S OR M BE SEPARATED FROM THE OBJECT?**

- YES

**STEP 3: IF YES GO TO STEP 4, IF NO GO TO STEP 6**

**STEP 4: APPLY YES AT THE STEP 3**

- **DESCRIPTION:** The pyrotechnic train allows the initiation of smoke or dispersed substance/mixture (combustion, deflagration,...)
- **APPLICATION:** Yes

**STEP 5: APPLY ONLY IF MORE NO AT THE STEP 3**

- **DESCRIPTION:** The operation of an ammunition leads to the reaction and dispersion of the integral substances/mixtures.
- **APPLICATION:** Yes

**STEP 6: APPLY IF NO AT THE STEP 3**

- **DESCRIPTION:** The pyrotechnic function is maintained.
- **APPLICATION:** Yes

### 3.3a (II): by a substance reacting with the ambient environment

**YES**

- The design and the architecture are important to govern the dispersal, the appropriate effect during a specific duration, the control movement.

**NO**

- The pyrotechnic composition is shaped in the body of the object (metal, ceramic, plastic or cardboard body) by compression or by melt cast, thus making it impossible to be separated by simple means like pouring or wringing out.

**4a:** NO

- Pyrotechnic substances or mixtures used without the object (structure, form, caliber, system of ignition,...) would be unable to produce the effects defined in step 1.

For example, terephthalic acid generates a white smoke in contact with air but the ammunition is designed to be projected to ensure the safety and efficiency. For this reason, the ammunition needs to be inflated to work.

**4b:** NO

- After ignition, the body of the object has an influence on the combustion law and acts on the effects.

### 5a: YES

- Without pyrotechnic substance/mixture, the munition cannot fulfill its identified functions.

**5b:** YES

- The ammunition is designed to ensure the function defined in step 1.

**5c:** YES

- In normal conditions of functioning, there is no "disposal" of the ammunition because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not recovered.

**6a:** YES

- The munition maintains its integrity.

**6b:** YES

- The customer specified the architecture (dimensions,...) of the object for its integration in his weapon system and to ensure the defined performances.

**6c:** NO

- Not applicable or small transformation only

**6d:** YES

- Not applicable or small transformation only

**ARTICLE**

**NO RELEASE**

- The substance used reacts immediately with the ambient conditions and is fully transformed.

The reaction products are exempted from registration according to REACH annex V.
<table>
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<tr>
<th>No.</th>
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<th>STEP 3: CAN OR MUST BE SEPARATED FROM THE OBJECT?</th>
<th>STEP 4:</th>
<th>STEP 5:</th>
<th>STEP 6:</th>
<th>CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>13b</td>
<td>Colored smoke or white smoke, Smoke signals, ...</td>
<td>6. Designed: To mark a position or provide information for a range of signaling purposes as navigation, locating, marking wind direction, distress, ... with a colored or white smoke in a specific wave band, for a determined duration.</td>
<td><strong>YES</strong> To optimize the generation of the opaque screen during a specific duration, the design and architecture of the material and mechanical systems are essential (in order to pierce/melt holes or create openings in specific places of the special material and of a given size, to generate smoke at a given rate, to keep combustion going and confined, according to a given combustion law, without stopping of going into flames, ...) Plus additional functions for marine products such as hydrostatic initiation, delay after ammunition ejection in order to light up only when reaching the sea surface or a given depth. The following table describes how the colored smoke signal functions:</td>
<td><strong>NO</strong> In most cases, the pyrotechnic composition is shaped in the body of the object (metal, ceramic, plastic or cardboard body) by compression or by most cast, or tightly enclosed into the body, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is forbidden to separate them. Smoke ammunition, that hasn’t functioned, will be preferentially destroyed by burning or blazing, except for some cases scheduled for dismantling. It isn’t a physical separation from the object but a chemical separation.</td>
<td>4a: <strong>NO</strong> Pyrotechnic substances or mixtures used without the object (structure, form, caliber, system of ignition, ...) would be unable to produce the effects defined in step 1. For example to activate all types of hand and rifle launched grenades, there’s a grenade fuse, which allows to project them and to use them in safety. For submarine signals, the initiation system is hydrostatic. The object is design to withstand a pressure of a depth of 500 m. 4b: <strong>NO</strong> After ignition, the body of the object has an influence on the combustion law and acts on the effects.</td>
<td>5a: <strong>YES</strong> Without substance or mixture, the object would be unable to realize the identified functions. 5b: <strong>YES</strong> The object is designed to project the effects (see function defined in step 1). 5c: <strong>YES</strong> In normal conditions of functioning, there is no “disposal” of the ammunition because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not be recovered.</td>
<td>6a: <strong>YES</strong> The ammunition maintains its integrity. It’s a finished product with unexpected further processed. 6b: <strong>YES</strong> The customer specified the architecture (dimensions, caliber, ...) of the product for its integration in his weapon system and to ensure the defined performances. 6c: <strong>YES</strong> Not applicable or small transformation only 6d: <strong>YES</strong> Or not applicable</td>
<td><strong>4 YES</strong></td>
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</tr>
<tr>
<td>13</td>
<td>ATTACK WARNING SIGNAL 12b (i) by sublimation of an organic dye</td>
<td><strong>YES</strong></td>
<td><strong>NO</strong></td>
<td>Generally, the substance or mixture of substances is used without the object (structure, form, caliber, system of ignition,...) would be unable to produce the effects defined in step 1.</td>
<td><strong>NO</strong></td>
<td><strong>4a</strong></td>
<td><strong>NO</strong></td>
<td>Pyrotechnic substances or mixtures used without the object (structure, form, caliber, system of ignition,...) would be unable to produce the effects defined in step 1.</td>
<td><strong>4b</strong></td>
</tr>
</tbody>
</table>

### Example 13

**Smoke signals**

- **Spokes signals**
  - **Smoke pot of practice munitions**
  - **Colored smoke grenade**
  - **Attack warning signal**

**12b (ii) by sublimation of an organic dye**

- **YES**
  - To optimize the generation of the opaque screen during a specific duration, the design and architecture of the material and mechanical systems are essential (in order to pierce/melt holes or create openings in specific places of the special material and of a given size, to generate smoke at a given rate, to keep combustion going and confined, according to a given combustion law, without stopping of going into flames,...)

- **NO**
  - Generally, the substance or mixture of substances is shaped in the body of the object (metal, ceramic, plastic or cardboard body), or tightly enclosed into the body, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is forbidden to separate them.

**Smoke ammunition**

- **Smoke ammunition, that hasn't functioned, will be preferentially destroyed by burning or blazing, except for few cases scheduled for dismantling.**
- **It isn't a physical separation from the object but a chemical separation.**

**Pyrotechnic substances or mixtures used without the object (structure, form, caliber, system of ignition,...) would be unable to produce the effects defined in step 1.**

- **4b**
  - NO
  - After ignition, the body of the object has an influence on the combustion law and acts on the effects.
  - **4c**
    - YES
    - It is a single operation during which the substances/mixtures are consumed. The become inert object becomes waste.

- **2 NO**
  - 1 YES

**Without substance or mixture, the object would be unable to realize the identified functions.**

- **5b**
  - YES
  - The object is designed to project the effects (see function defined in step 1).

**In normal conditions of functioning, there is no "disposal" of the ammunition because it is fixed or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not recovered.**

- **3 YES**

**The smoke signal maintains its integrity. It's a finished product with unexpected further processed.**

- **6a**
  - YES
  - The smoke signal will maintains its integrity. It's a finished product with unexpected further processed.

**The customer specified the architecture (dimensions, caliber,...) of the product, in some cases, for its integration in the weapon system and to ensure the defined performances.**

- **6c**
  - YES
  - Not applicable or small transformation only

**Or not applicable**

- **6d**
  - YES
  - Or not applicable
<table>
<thead>
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<th>STEP 3: CAN IT BE OR MUST IT BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6</th>
<th>STEP 4: APPLY IF YES AT THE STEP 3</th>
<th>STEP 5: APPLY ONLY IF MORE NO AT THE STEP 4</th>
<th>CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE</th>
<th>ARTICLES</th>
<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Emissive decoys</td>
<td>Wide band obscuring grenades, smoke, Practice bomb marker</td>
<td>YES</td>
<td>NO</td>
<td>Generally, the substance or mixture of substances is shaped in the body of the object (metal, ceramic, plastic or cardboard body) by compression or by melt cast, thus making it impossible to be separated by simple means like pouring or wringing out. It isn’t a physical separation from the object but a chemical separation.</td>
<td>4a: NO</td>
<td>Pyrotechnic substances or mixtures used without the object (structure, form, caliber, system of ignition,…); would be unable to produce the effects defined in step 1. For example, terephthalic acid generates a white smoke in contact with air but the ammunition is designed to be projected to ensure the safety and the efficiency. For this reason, the ammunition needs to be initiated to work.</td>
<td>5a: NO</td>
<td>Without substance or mixture, the object would be unable to achieve the identified functions.</td>
<td>5b: NO</td>
</tr>
<tr>
<td>14</td>
<td>Emissive decoys</td>
<td>Conventional decoys, Spectral decoys, IR tracking flares, Countermeasure rockets, etc.</td>
<td>Designed: to provide protection of aircraft from missiles by delivering a signal of a specific power according to a given time law and frequency bands to confuse missile guidance electronics to fit into a specific class of launcher (OTAN calibers or other…) to ensure safety and reliability specifications</td>
<td>YES</td>
<td>NO</td>
<td>The structure in which the payload is confined is required to firstly launch the cartridge from a launcher (round or square size) and especially to contain the initiation chain and hot gases required for ignition of the IIR payload that delivers the signal decay. The ignition occurs at a specific distance from the platform to be protected for security. The cartridge is ejected at a speed more than 25 m/ s. The structure of the decay must resist to mechanical aggressions as vibrations, shock, thrust and also be water resistant.</td>
<td>4a: NO</td>
<td>The substance or mixture of substances is shaped in the body of the object (metal, ceramic, plastic or cardboard body) by compression or by melt cast, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is forbidden to separate them. Spectral flare that hasn’t functioning will be preferentially destroyed by burning or blasting, except for cases scheduled for dismantling. It is not a physical separation from the object</td>
<td>5a: NO</td>
<td>Without the pyrostructure mixture, the object would be unable to achieve the identified functions.</td>
</tr>
<tr>
<td>No.</td>
<td>GENERIC TYPE</td>
<td>NON EXHAUSTIVE EXAMPLES</td>
<td>STEP 1: MAIN FUNCTION OF THE OBJECT</td>
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<td>STEP 3: CAN S or M BE SEPARATED FROM THE OBJECT? YES GO TO STEP 4 NO GO TO STEP 6</td>
<td>STEP 4: 4a 4b 4c Apply if YES at the step 3 5a 5b 5c Apply only if more NO at the step 4</td>
<td>STEP 5: 5a 5b 5c 5d Apply if NO at the step 3</td>
<td>STEP 6 6a 6b 6c 6d</td>
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<td>A flare cartridge with 4 payloads ejected individually by the system.</td>
<td>A flare cartridge with 4 payloads ejected individually by the system.</td>
<td>Thus, the shape/design/surface is more relevant than the chemical composition.</td>
<td>Are considered: the become inert object becomes waste 2 NO / 3 YES</td>
<td>Not be recovered. 3 YES</td>
<td>4a: NO 4b: NO 4c: YES 4d: YES</td>
<td>Or not applicable 4e: NO</td>
<td>6c: YES Not applicable or small transformation only</td>
<td>6d: YES Or not applicable</td>
</tr>
</tbody>
</table>

DIFFERENT TYPES and DESIGNS of CONVENTIONAL DECOYS FOR AIRCRAFT AND HELICOPTERS
<table>
<thead>
<tr>
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<tbody>
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<td>15</td>
<td>Passive decoys</td>
<td>Electromagnetic effect cartridges, Countermeasure rockets, Chaff decoy systems, dispensing systems</td>
<td>Designed: To protect a target (generally a ship) against a missile, by deploying an object or group of objects liable to generate a specific electromagnetic or radar signature, intended to confuse, dilute, seduce or distract missile guidance electronics to fit a specific class of launcher (OTAN calibers or other) to ensure safety and reliability specifications</td>
<td>YES GO TO STEP 4</td>
<td>NO GO TO STEP 6</td>
<td>Apply if YES at the step 3</td>
<td>Apply only if more NO at the step 4</td>
<td>Apply if NO at the step 3</td>
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4a: NO  
The pyrotechnic booster or the chaff payload used without the object (structure, form, caliber, system of ignition, ...) would be unable to produce the effects defined in step 1.  
4b: NO  
The object is designed to fit into a weapon system; it must be initiated by a pyrotechnic chain. It is designed for transmitting a signal while performing the functions of security and reliability.  
4c: YES  
It is a single operation during which the substances / mixtures are consumed. The become inert object becomes waste.  
2 NO / 3 YES

5a: YES  
Without substance or mixture, the object would be unable to realize the identified functions.  
5b: YES  
The object is designed to project the effects... (see function defined in step 1).  
5c: YES  
In normal conditions of functioning, there is no “disposal” of the ammunition because when it is fired or dropped after firing, the object empties its integral substances/mixtures is either destroyed and/or not be recovered.  
3 YES

6a: YES  
The decoy maintains its Integrity.  
6b: YES  
The customer specified the architecture (dimensions, caliber, ...) of the product for its integration in his launcher and to ensure the defined performances.  
6c: YES  
Not applicable or small transformation only  
6d: YES  
Or not applicable  
4 YES

a. NO  
NO RELEASE of substance but of an article: chaff is an aluminum fiber glass, cuts in defined dipole lengths to respond to different radar wavelengths.
| No. | GENERIC TYPE | NON EXHAUSTIVE EXAMPLES | STEP 1: MAIN FUNCTION OF THE OBJECT | STEP 2: ARE SHAPE, SURFACE OR DESIGN MORE RELEVANT FOR THE FUNCTION THAN THE CHEMICAL COMPOSITION?  
**IF IT IS NOT POSSIBLE TO UNAMBIGUOUSLY CONCLUDE GO TO STEP 3** | STEP 3: CAN S or M BE SEPARATED FROM THE OBJECT?  
**YES GO TO STEP 4**  
**NO GO TO STEP 6** | STEP 4: Apply if YES at the step 3  
**4a:** YES  
**4b:** NO  
**4c:** YES | STEP 5: Apply only if more NO at the step 4  
**5a:** YES  
**5b:** NO  
**5c:** YES | STEP 6:  
**6a:** YES  
**6b:** No  
**6c:** NO | CLASSIFICATION OF THE OBJECT: SUBSTANCE, MIXTURE, ARTICLE, OR COMBINATION OF AN ARTICLE AND A SUBSTANCE OR MIXTURE | INTENTIONAL RELEASE OF A SUBSTANCE  
**WITHIN THE ARTICLE?** |
|-----|-------------|-------------------|-----------------------------------|---------------------------------|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 10  | Anti-riot / Physiological Effect ammunition | Aerosols or grenades containing CS tear gas or pepper irritant or any other substance having these effects | Designed:  
- to produce a non-lethal physiological effect by dispersal of a substance,  
- by smoke, powder dispersal, water borne spray by various means including grenade, ...  
- In the case of grenade the effect must be generated during a specific duration and cover a specific area.  
- to fit into a specific class of weapon and launcher (for grenade)  
- to ensure safety and reliability specifications | BORDERLINE CASE in the case of the aerosol.  
YES  
In the case of the grenade, the shape is designed to fit to be thrown by hand, by a rifle and/or by a specific launcher.  
The structure is a watertight and air tight with a specific shutter to assure the safety of the user.  
The structure is designed to open in 2 parts to allow the release of the teargas pellets before the impact with the ground, avoiding contact with the shooter. | NO  
4a: YES  
In the case of an aerosol, even if the substance is separated from the spray can, the physiological effect would take place (but with a less efficiency).  
NO  
In the case of the grenade, the teargas pellets separated from the object cannot carry out the function defined in step 1. | YES  
5a: YES  
In both cases (aerosol dispenser and grenade), without substance or mixture, the object would be unable to fulfill the identified functions.  
5b: NO  
In the case of an aerosol dispenser, the main function of the object is to deliver the substance.  
YES  
In the case of a grenade, because the object is designed to project the effect (see function defined in step 1).  
5c: NO  
In normal conditions of functioning, there is no “disposal” of the grenade because when it is fired or dropped after firing, the object emptied of its integral substance/mixture is either destroyed and/or not be recovered. | 6a: YES  
The aerosol or grenade maintains its integrity.  
There are finished products with unexpected further processed.  
6b: YES  
The customer specified the architecture (dimensions, caliber,...) of the product for its integration in his launcher or rifle and to ensure the defined performances.  
6c: YES  
Not applicable or small transformation only.  
6d: YES  
Or not applicable  
4: YES | For the case of teargas aerosol:  
combination of an article and a substance or mixture | For the case of a teargas grenade:  
An article | In the case of teargas aerosol, the release of the substance fulfills the main function.  
In the ECHA’s guidance on articles, if the release fulfills the main function of the object, the object **USUALLY** would be considered as a combination of an article and substance/mixture.  
In the case of the teargas grenade, the conclusion of the steps 4 and 5 are unambiguously and conclude that it is an article. The release of the substance is an intended release in the meaning of Art 7 of REACH.  
Accordingly, we consider that the teargas must be registered. |
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<th>STEP 6: 6a  6b  6c  6d  6e  6f  6g Apply if NO at the step 3</th>
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<th>INTENTIONAL RELEASE OF A SUBSTANCE WITHIN THE ARTICLE?</th>
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<td>17</td>
<td>Special effect ammunition</td>
<td>Irritation ammunition</td>
<td>17a: Acoustic ammunition, Flash bang grenades, etc. Stun grenades, simulating ammunition</td>
<td>A flash bang grenade</td>
<td>Designed:</td>
<td>In the case of the grenade, the shape is designed to fit to be thrown by hand, by a rifle and by a specific launcher. The structure is watertight and air tight with a specific shutter to allow the release of the tear gas pellets before the impact with the ground, avoiding contact with the shooter.</td>
<td>YES</td>
<td>The pyrotechnic mixture of substances is tightly enclosed into the body of the object, thus making it impossible to be separated by simple means like pouring or wringing out. In addition, for safety reasons, it is forbidden to separate them.</td>
<td>This type of ammunition, that hasn't functioned, will be, preferably destroyed by burning or blasting, except for few exceptional cases scheduled for dismantling.</td>
<td>It isn't a physical separation from the object but a chemical separation.</td>
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<td>17d</td>
<td>Anti-sonar location markers, underwater countermeasures</td>
<td></td>
<td>IT IT TO PROTECT A SUBMARINE AGAINST THE ATTACK OF A THREAT (LIKE A MISSILE) IN ORDER TO SIMULATE AN UNDERWATER ACOUSTIC SIGNATURE WITH THE RELEASE OF BUBBLES GENERATED BY THE EXPLOSION OR COMBUSTION OF A MATERIAL THAT PRODUCES GAS.</td>
<td>TO OPTIMIZE THE GENERATION OF BUBBLES DURING A SPECIFIC DURATION, THE DESIGN AND ARCHITECTURE OF THE MATERIAL AND MECHANICAL SYSTEM ARE ESSENTIAL TO ALLOW A HYDROSTATIC INITIATION, DELAY AFTER AMMUNITION EJECTION IN ORDER TO LIGHT UP ONLY WHEN REACHING THE SEA SURFACE OR A GIVEN DEPTH. THE AMMUNITION IS EQUIPPED WITH A FLOAT TO AVOID IT TO SINK.</td>
<td>YES</td>
<td>NO TO STEP 4</td>
<td>NO TO STEP 6</td>
<td>APPLY IF YES AT THE STEP 3</td>
<td>APPLY IF NO AT THE STEP 3</td>
<td>YES</td>
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<td>18</td>
<td>Practice (or training) ammunition</td>
<td>Practice bombs and shells, Training tracking flares, Dummy hollow shell ammunition, practice rocket, inert practice mines, Practice mortar ammunition</td>
<td>DESIGNED: - FOR TRAINING OR EXPERIMENTAL PURPOSES (AS TO CHECK WEAPON FUNCTION), INERT FILLED PROJECTILES WITH OR WITHOUT PYROTECHNIC EFFECTS (AS SMOKE OR LIGHT OR SOUND) REPRESENTING 'LIVE' AMMUNITION WHICH CAN BE FIRED FROM A GUN OR DROPPED FROM AIRCRAFT TO SIMULATE A REAL AMMUNITION OF APPROPRIATE GEOMETRY, AT A SPECIFIC SPEED AND DISTANCE. - TO FIT INTO STANDARD FULL-Caliber AMMUNITION TYPES TO ENSURE SAFETY AND RELIABILITY SPECIFICATIONS.</td>
<td>YES</td>
<td>GENERAL, THE SUBSTANCE OR MIXTURE OF SUBSTANCES IS SHAPED IN THE BODY OF THE AMMUNITION (METAL, CERAMIC, PLASTIC OR CARDBOARD BODY) BY COMPRESSION OR BY MELT CAST, THUS MAKING IT IMPOSSIBLE TO BE SEPARATED BY SIMPLE MEANS LIKE POURING OR WRINGING OUT.</td>
<td>NO</td>
<td>4a : NO</td>
<td>4b : NO</td>
<td>4c : NO</td>
<td>5a : YES</td>
</tr>
<tr>
<td>18</td>
<td>Practice (or training) ammunition</td>
<td>Mortar training system</td>
<td>The design, the shape and the mass are essential for having a realistic training. The most important requirement is that the object is the exact replica of the real ammunition; substances contained have a secondary role. In this way, the mechanical and ballistic characteristics have to be similar to those of tactical ammunition. Moreover, an initiation system or fuse is responsible at a given time to release an impact munition without projection of solids and inert materials and component substance.</td>
<td>It's a single operation during which the substances / mixtures are consumed. The inert object becomes waste. It isn't a physical separation from the object but a chemical separation. To the 2 cases, no human or environmental exposure.</td>
<td>2 NO / 2 YES</td>
<td>3 YES</td>
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<td>18</td>
<td>Practice (or training) ammunition</td>
<td>Practice grenades containing tax, mines or other ammunition...</td>
<td>The design and the shape are essential to release with an ignition system a substance without causing injury and YES</td>
<td></td>
<td>4a : NO</td>
<td></td>
<td></td>
<td>5a : YES</td>
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| Artículo |

* 18 a.
  - Practice bombs and shells, Training tracking flares, Dummy hollow shell ammunition, practice rocket, inert practice mines, Practice mortar ammunition

* 18 b.
  - Practice grenades containing tax, mines or other ammunition.
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<th>STEP 4: 4a 4b 4c Apply if YES at the step 3 4d NO 4e NO 4f NO 4g NO 4h NO</th>
<th>STEP 5: 5a 5b 5c Apply only if more NO at the step 4 5d NO 5e NO 5f NO 5g NO 5h NO</th>
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<td>19</td>
<td>Marine marker</td>
<td>A green marker</td>
<td>Designed: To mark a position in the sea after being launched from an aircraft or helicopter at a given altitude and speed.</td>
<td>The marker needs to be adapted to the launcher. There is an ejected fin assembly cramped on the body to provide the good ballistic properties during the fall and guarantees the dispersion of the dye at the good position. The shape, the design of the object are important to mark a position precisely, but the most important is the substance contained.</td>
<td>Yes: It is possible to separate the body of the marker from the ignition plug. 4b: NO The substance alone couldn’t fulfill the function if it is dispersed alone from an aircraft. The dye will be dispersed into small droplets before reaching the sea surface. 4c: YES The object acts mainly as a container for release the delivery of the substance. However it has to break at the impact with the sea surface to release the dye. 4d: YES It is a single operation during which the substance is consumed. The inert object becomes waste.</td>
<td>2 NO / 1 YES</td>
<td>5b: YES The object is generally designed to simulate the effects... (see function defined in step 3) 5c: YES In normal conditions of functioning, there is no “dispersion” of the grenade because when it is fired or dropped after firing, the object emptied of its integral substances/mixtures is either destroyed and/or not recovered. Except in few cases, when the body of the grenade can be reloaded with a substance and screw another ignition plug.</td>
<td>2 YES</td>
<td>6b: YES The customer specified the architecture (dimensions, caliber,...) to ensure the defined performances. 6c: YES Not applicable or small transformation only 6d: YES Or not applicable</td>
<td>4 YES</td>
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2 YES/5 NO

Not applicable or small transformation only

6d: YES

Or not applicable

4 YES