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STEC PAMPHLET - 19

REGULATION ON PACKAGING OF MILITARY EXPLOSIVES

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Storage & Transport of Explosives Committee
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C O N T E N T S

PREFACE

The packaging for explosives and ammunition plays an important role in deciding their hazard classification. With the growth of packaging industry, a number of materials with different characteristics continue to become available in the market. At present packaging design is finalized by the concerned AHSP in consultation with designer agency.

As per UN recommendations on transport of dangerous goods, packaging for explosives should meet certain minimum prescribed standards. Accordingly regulations on the subject have been finalized taking into considerations various aspects concerning the type, packaging method, performance testing, procedure for certification etc. These regulations provide necessary guidelines for design of packages for military explosives and ammunition.

It is hoped that users will find this revised STEC Pamphlet 2025 simpler, easier to understand and implement, thereby promoting the safe storage and transportation of military explosive. This publication supersedes STEC Pamphlet, 2017 on the subject.

REGULATIONS ON PACKING OF MILITARY EXPLOSIVES

SECTION – I

GENERAL

APPLICABILITY

1. These regulations prescribe detailed packing requirements applicable to transport of military explosives held by various departments/organizations under the Ministry of Defense. Except as otherwise provided in these regulations, no person may offer or accept explosives for transport unless they are properly classified, packaged, marked, labeled, described and certified in a transport document, and otherwise in a condition for transport as required by these regulations.

AIM

2. The aim of this Pamphlet, therefore, is to provide advice on meeting the standards imposed for the packaging of explosives in accordance with the United Nations (UN) recommendations on the Transport of Dangerous Goods (The "Orange Book").

SCOPE

3. These regulations essentially deal with matters of classifying packages, packaging methods, their performance testing, certification, approving authority and marking.

SECTION – II

DEFINITIONS

Definitions

4. This section provides definitions of general terms that are used throughout this regulation. For the purpose of these regulations:

Bags are flexible packaging made of paper, plastics film, textiles, woven material or other suitable materials;

Boxes are packaging with complete rectangular or polygonal faces, made of metal, wood, plywood, reconstituted wood, fiberboard, plastics or other suitable material. Small holes for purpose such as ease of handling or opening, or to meet classification requirements, are permitted as long as they do not compromise the integrity of the packaging during transport;

Closures are devices, which close an opening in a receptacle;

Combination packaging is a combination of packaging for transport purposes, consisting of one or more inner packaging secured in an outer packaging;

Composite packaging are packaging consisting of an outer packaging and an inner receptacle so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter single unit; if is filled, stored, transport and emptied as such;

Crates are outer packaging with incomplete surface;

Drums are flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastics, plywood or other suitable materials. This definition also includes packaging of other shapes e.g. round taper-necked packaging, or pail-shaped packaging. Wooden barrels or Jerri cans are not covered by this definition;

Inner packaging are packaging for which an outer packaging is required for transport;

Inner receptacles are receptacles, which require an outer packaging in order to perform their containment function;

Jerri cans are metal or plastics packaging of rectangular or polygonal cross-section;

Maximumnet is the maximum net mass of contents in a single packaging or maximum combined mass of inner packaging and the contents thereof and is expressed in kg;

Outer packaging is the outer protection of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packaging;

Packages are the complete product of the packing operation, consisting of the packaging and its contents prepared for transport;

Packaging is receptacles and any other components or materials necessary for the receptacle to perform its containment function

Receptacles are containment vessels for receiving and holding substances or articles, including any means of closing;

Reconditioned packaging includes metal drums that are:

(a) cleaned to original materials of construction, with all former contents, internal and external corrosion, and external coatings and labels removed;
(b) restored to original shape and contour, with chimes (if any) straightened and sealed, and all non-integral gaskets replaced; and
(c) Inspected after cleaning but before painting, with rejection of packaging with visible pitting, significant reduction in material thickness, metal fatigue, damaged threads or closures, or other significant defects.

Reused packaging are packaging to be refilled which have been examined and found free of defects affecting the ability to withstand the performance tests; the term includes those which are refilled with the same or similar compatible contents and are transported within distribution chains controlled by the consignor of the product;

Sift proof packaging are packaging impermeable to dry contents including fine solid material produced during transport.

Wooden barrels are packaging made of natural wood, or round cross-section, having convex walls, consisting of staves and heads and fitted with hoops.

NOTES

The followed explanation and examples are meant to assist in clarifying the use of the some of the packaging terms defined in Para 4.

(a) The "inner" of "combination packaging" are always termed "inner packaging" not "inner receptacles". A glass bottle is an example of such an "inner packaging".
(b) The "inners" of "composite packaging" are normally termed "inner receptacles". For example, the "inner" of a 6HA1 composite packaging (plastics material) is such an "inner receptacle" since it is normally not designed to perform a containment function without its "outer packaging" and is not therefore an "inner packaging".

SECTION – III

PACKAGING REQUIREMENTS FOR EXPLOSIVES

General Requirements

5.

a) Class 1 (Explosives) is a restricted class and only those explosive substances and articles that are listed in Table 1 may be accepted for transport. Class 1 is unique in that type of packaging frequently has a decisive effect on the hazard and therefore on the assignment of a particular division. The correct hazard division is determined by use of test procedures provided in the "UN Manual of Tests and Criteria for Classification of Explosive Substances and Articles, Part I". For the purpose of these regulations, the packaging used for goods of class I shall comply with the requirements for the medium danger (Packing Gp II) category.

b) Explosive articles and substances must be packed in packaging of good quality. These must be constructed and closed so as to prevent the package as prepared for transport from any leakage which might be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). No harmful quantity of a dangerous substance may adhere to the outside of packages. These requirements apply both to new and to reused packaging.

c) Parts of packaging which are in direct contact with explosive substances must not be affected by chemical or other action of these substances. Where necessary, they must be provided with a suitable inner coating or treatment. Such parts of packaging must not incorporate constituents liable to react dangerously with the contents so as to form hazardous products, or to weaken them significantly.

d) Each packaging must conform to a design type successfully tested in accordance with the requirements laid in Section V.

e) When filling packaging with liquids, sufficient allege (outage) must be left to ensure that neither leakage nor permanent distortion of the packaging occurs as a result of an expansion of the liquid caused by temperatures likely to occur during transport. Liquid should not completely fill a packaging at a temperature of 55^0C.

f) Inner packaging must be packed in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the outer packaging. Inner packaging that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., must be secured in outer packaging with suitable cushioning material. Any leakage of the contents must not substantially impair the protective properties of the cushioning material or of the outer packaging.

g) Inner packaging containing different substances which may react dangerously with one another must not be placed in the same outer packaging.

h) The closures of packaging containing wetted or diluted substances must be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during transport. Also packaging for water soluble substances should be water resistant.

i) Where pressure may develop in a package by the emission of gas from the contents (as a result of temperature increase or other cause), the packaging may be fitted with a vent, provided that the gas emitted will not cause danger on account of its toxicity, its flammability, the quantity released, etc. The vent must be so designed that, leakages of liquid and the penetration of foreign substances are prevented under normal conditions or transport. Venting of the package is not to be permitted for air transport.

j) New, remanufactured, reused or reconditioned packaging must be capable of passing the tests prescribed in Section V. Before being filled and handed over for transport, every packaging must be inspected to ensure that it is free from corrosion, contamination or other damage. Any packaging which shows signs of reduced strength as compared with the approved design type must no longer be used or must be so reconditioned that it is able to withstand the design type tests.

k) An empty packaging that has contained a dangerous substance must be treated in the same manner as is required by these regulations for a filled packaging until it has been purged of the residue of that dangerous substance.

l) Every packaging intended to contain liquids must successfully undergo a suitable leakproofness test prescribed in section V.

m) Packaging used for solids which may become liquid at temperatures likely to be encountered during transport must also be capable of containing the substance in the liquid state.

n) The packaging must be manufactured and tested under a quality assurance programmed which satisfies the competent authority in order to ensure that each manufactured packaging meets the requirement of these regulations.

6. Additional requirements for the packing of goods of Class 1

a) Nails, staples and other closure devices made of metal having no protective covering must not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosive against contact with the metal.

b) The closure device of packaging containing liquid explosives must ensure a double protection against leakage.

c) Inner packaging, fittings and cushioning materials and the placing of explosive substances or articles in packages must be such that no dangerous movement occurs within packages during transport.

d) In principle, explosives must not be packed together with explosives of a different nature. However, when such mixed packing is allowed, it must be such that an accidental explosion of any part of the contents of the package would not be communicated to the rest of the contents.

e) When the packaging includes a double envelope filled with water which may freeze during transport, a sufficient quantity of an anti-freeze agent must be

added to the water to prevent freezing. Anti-freeze that could create a fire hazard because of its inherent flammability must not be used.

f) Where significant internal pressure is likely to develop in receptacles, such receptacles must be so constructed that detonation is not possible by reason of increase in internal pressure from internal or external causes.

g) Plastics packaging shall not be liable to generate or accumulate sufficient static electricity that a discharge could cause the packaged explosive to ignite or the packaged article to function. The list of explosives requiring anti-static precautions is given at Appendix 'E' to STEC Pamphlet No. 7.

h) If the body of steel drums is double seamed, steps must be taken to prevent the ingress of explosive substances into the recesses of the seams.

i) The closure device of metal drums must include a suitable gasket; if the closure device includes a screw-thread, the ingress of explosive substances into the screw thread must not be possible.

j) The ingress of explosive substances into the recesses of seamed metal packaging must be prevented.

k) Only hoops in hardwood are authorized for wooden barrels intended for the transport of explosive substances.

l) Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charge or are self-propelled, their ignition systems should be protected against stimuli that can be met during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such funpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.

m) Class 1 goods should be packed in accordance with :

   (i) The appropriate packing method shown in column (5) of Table 1
   (ii) Any relevant special provisions shown in column (4) of Table 1, for a specific UN number (substance/article), are detailed in annexure-2.

n) Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packaging (1A2, 1B2, 4A,4B and metal receptacles), the metal packaging should be provided with an inner liner or coating.

o) Notwithstanding the explosive packing methods listed in Table 1, EP 01 may be adopted for any explosive substance or article provided the package has been approved by a national competent authority.

SECTION – IV

CONSTRUCTION OF PACKAGING

General

7. The requirements of this Section do not apply to:
   (a) Packages whose net mass exceeds 400 kg;
   (b) Packaging with a capacity exceeding 450 liters.

Basis

8. In preparing these regulations, account has been taken of a prevailing trend to replace the detailed specifications of packaging by tests designed to ensure that packages containing dangerous goods can withstand normal conditions of transport and to ensure the desirable level of safety. When drafting the regulations sight was not lost of improvements and changes that may occur as a result of progress in science and technology. Consequently, provision is made for the use of packaging which, while not complying exactly with the requirements in this Action, would be nevertheless as satisfactory in every respect as those that do, and would successfully pass the recommended tests when prepared for transport.

Transition period

9. When implementing these regulations, consideration should be given to providing a transitional period of three years of packaging not conforming to the provisions of this Section but which have been found safe for use or are acceptable according to existing regulations.

Design and Construction for Packaging

10. (a) All packaging shall be so designed and constructed that they will:
    (i) Protect the explosive,
    (ii) Prevent the explosives escaping, and
    (iii) Cause no increase in the risk of unintended ignition, when subjected to normal conditions of transport including foreseeable changes in temperature, humidity and pressure;
    (b) The complete package can be handled safely in normal condition of transport
    (c) The packaging will withstand any loading imposed on them by foreseeable stacking to which they will be subjected during transport so that they do not add to the risk presented by the explosives, the packaging' containment function is not harmed, and they are not distorted in a way or to an extent which will reduce their strength or cause instability of a stack;

(d) Any inner packaging and the interior of all outer packaging are free from grit or rust; and

(e) They do not contain or have attached to them any incompatible material, that is to say any material which, if it came into contact with the explosive substance, would be capable of reacting with the explosive substance in a way which would increase the risk of unintended ignition.

Materials used in packaging

11. All packaging shall be of materials which are suitable for the purpose and which are so designed and of sufficient quality as to allow explosives to be carried safely and which are compatible with the explosives to be carried.

12. The code consists of:

a) An Arabic numeral indicating the kind of packaging, e.g. drum, jerrican, etc., followed by:

(i) A capital letter(s) in Latin character indicating the nature of the material, e.g. steel, wood, etc., followed where necessary by :

(ii) An Arabic numeral indicating the category of packaging within the kind to which the packaging belongs.

b) The letter 'W' may follow the packaging code signifying that the packaging, although of the same type indicated by the code is manufactured to a specification to that detailed under "Requirements for Packaging" and is considered equivalent.

13. The following numeral must be used for the kind of packaging listed below:

(i) Drum
(ii) Wooden barrel
(iii) Jerri can
(iv) Box
(v) Bag
(vi) Composite packaging

14. The following capital letters must be used for the types of material listed below:

(i) Steel (all types and surface treatments)
(ii) Aluminum
(iii) Natural wood
(iv) Plywood
(v) Reconstituted wood
(vi) Fiberboard
(vii) Plastics material
(viii) Textile
(ix) Paper, multiwall

15. The following types and codes of packaging are assigned :

Kind	Material	Category	Code
1. Drums	A. Steel	non-removable head	1A1
		removable head	1A2
	B. Aluminum	non-removable head	1B1
		Removable head	1B2
	D. Plywood		1D
	G. Fiber		1G
	H. Plastics	non-removable head	1H1
		removable head	1H2
2. Barrels	C. Wooden	bung type	2C1
		removable head	2C2
3. Jerri cans	A. Steel	non-removable	3A1
		removable head	3A2
4. Boxes	A. Steel		4A
	B. Aluminum		4B
	C. Natural wood	ordinary	4C1
		with sift-proof walls	4C2
	D. Plywood		4D
	F. Reconstituted wood		4F
	G. Fireboard		4G
	H. Plastics	expanded	4H1
		solid	4H2
5. Bags	H. Woven plastics	without inner liner or coating	5H1
		sift-proof	5H2
		water resistant	5H3
	H. Plastics film		
	L. Textile	without inner liner or coating	5L1
		sift-proof	5L2
		water resistant	5L3
	M. Paper	multiwall	5M1
		multiwall, water resistant	5M2
6. Composite	H. Plastics	1 receptacle in steel drum	6HA1
		in steel crate or box	6HA2
		in aluminum drum	6HB1
		in aluminum crate or box	6HB2
		in wooden box	6HC
		in plywood drum	6HD1
		in plywood box	6HD2
		in fiber drum	6HG1
		in fireboard box	6HG2
		in plastics drum	6HH1
		in solid plastics box	6HH2

REQUIREMENTS FOR PACKAGING

16. Steel drums

1A1 non-removable head
1A2 removable head

(i) Body and heads must be constructed of steel sheet of a suitable type and of adequate thickness in relation to the capacity of the drum and to its intended use.

(ii) Body seams must be welded on drums intended to contain more than 40 liters of liquid. Body seams must be mechanically seamed or welded on drums intended to contain solids or 40 liters or less of liquids.

(iii) Chimes must be mechanically seamed or welded. Separate reinforcing rings may be applied.

(iv) The body or a drum of a capacity greater than 60 liters must, in general, have at least two expanded rolling hoops, or, alternatively, at least two separate rolling hoops. If there are separate rolling hoops they must be fitted tightly on the body and so secured that they cannot shift. Rolling hoops must not be spot welded.

(v) Openings for filing, emptying and venting in the bodies or heads of non-removable head (1A1) drums must not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1A2). Closures for openings 9in the bodies and heads of drums must be so designed and applied that they will remain secure and leak proof under normal conditions of transport, closure, flanges may be mechanically seamed or welded in place. Gaskets or other sealing elements must be used with closures, unless the closure is inherently leak-proof.

(vi) Closure devices for removable head drums must be so designed and applied that they will remain secure and drums will remain leak proof under normal conditions of transport. Gaskets or other sealing elements must be used with all removable heads

(vii) If materials use for body, heads, closure and fittings are not in themselves compatible with the contents to be transported, suitable internal protective coatings or treatments must be applied. These coatings or treatments must retain their protective under normal conditions of transport.

(viii) Maximum capacity of drum: 450 liters

(ix) Maximum net mass: 400 kg.

17. Aluminum drums

1B1 non-removable head
1B2 removable head

(i) Body and heads must be constructed of aluminum at least 99% pure or of an aluminum base alloy. Material must be of suitable type and of adequate thickness in relation to the capacity of the drum and to its intended use.

(ii) All seams must be welded. Chime seams, if any, must be reinforced by the application of separate reinforcing rings.

(iii) The body of a drum of a capacity greater than 60 liters must, in general, have at least two expanded rolling hoops or, alternatively, at least two separate rolling hoops. If there are separate rolling hoops they must be fitted tightly on the body and so secured that they cannot shift. Rolling hoops must not be spot welded.

(iv) Openings for filling, emptying and venting in the bodies or heads of non-removable head (1B1) drums must not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1B2). Closure for openings in the bodies and heads of drums must be so designed and applied that they will remain secure and leak proof under normal condition of transport. Closure flanges must be welded in place so that the weld provides a leak proof seam. Gaskets or other sealing elements must be used with closures, unless the closure is inherently leak-proof.

(v) Closure devices for removable head drums shall be so designed and applied that they will remain secure and drums will remain leak proof under normal conditions of transport. Gaskets or other sealing elements must be used with all removable heads.

(vi) Maximum capacity of drum: 450litres

(vii) Maximum net mass: 40 kg.

18. Steel jerri cans

3A1 non-removable head
3A2 removable head

(i) Body and heads must be constructed of steel sheet of a suitable type and of adequate thickness in relation to the capacity of the jerri can and to its intended use.

(ii) Chimes of all jerri cans shall be mechanically seamed or welded. Body seams of jerri cans intended to contain more than 40 liters of liquid shall be welded. Body seams of jerri cans intended to carry 40 liters or less must be mechanically seamed or welded.

(iii) Openings in jerri cans (3A1) must not exceed 7 cm in diameter. Jerri cans with larger openings are considered to be of the removable head type (3A2). Closure must be so designed that they will remain secure and leak proof under normal conditions of transport. Gaskets or other sealing elements must be used with closures, unless the closure is inherently leak-proof.

(iv) If material used for body, heads, closures and fittings are not in themselves compatible with the contents to be transported, suitable internal protective

coatings or treatments must be applied. These coatings or treatments must retain their protective properties under normal conditions of transport.

(v) Maximum capacity of jerricans: 60 liters

(vi) Maximum net mass: 120 kg.

19. Plywood drums

1D

(i) The wood used must be well seasoned, commercially dry and free from any defect likely to lessen the effectiveness of the drum for the purpose intended. If a material other than plywood is used for the manufactures of the heads it must be of a quality equivalent to the plywood.

(ii) At least three-ply plywood must be used for the body and at least five-ply plywood for the lid to specification IS 303 (latest) for MR and BWR grade plywood. The plies must be firmly glued together by a water resistant adhesive with their grains crosswise.

(iii) The body and heads of the drum and their joins must be of a design appropriate to the capacity of the drum and to its intended use.

(iv) In order to prevent sifting of the contents, lids must be lined with Kraft paper or some other equivalent material which must be securely fastened to the lid and extend to the outside along its full circumference.

(v) Maximum capacity of drum: 250 liters

(vi) Maximum net mass: 400kg.

20. Wooden barrels

2C1 bung type

2C2 removable head

(i) The wood used must be of good quality, straight grained, well seasoned and free from knots, bark, rotten wood, sapwood or other defects likely to lessen the effectiveness of the barrel for the purpose intended.

(ii) The body and heads must be of a design appropriate to the capacity of the barrel and to its intended use.

(iii) Staves and heads must be sawn or cleft with the grain so that no annual ring extends over more than half the thickness of stave or head.

(iv) Barrel hoops must be of steel or iron of good quality. The hoops of 2C2 barrels may be of a suitable hardwood.

(v) Wooden barrels 2C1: the diameter of the bunghole must not exceed half the width of the stave in which it is places.

(vi) Wooden barrel 2C2: heads must fit tightly into the crazes.

(vii) Maximum capacity of barrel: 250 liters

(viii) Maximum net mass: 400 kg.

21. Fiber drums

1G

(i) The body of the drum must consist of multiple plies of heavy paper or fiber-board (without corrugations) firmly glued or laminated together and may include one or more protective layers of bitumen, waxed Kraft paper, metal foil, plastics material, etc.

(ii) Heads must be of natural wood, fiber-board, metal, plywood, plastics or other suitable material and may include one or more protective layers of bitumen, waxed Kraft paper, metal foil, plastics material, etc.

(iii) The body and heads of the drums and their joins must be of a design appropriate to the capacity of the drum and to its intended use.

(iv) The assembled packaging must be sufficiently water resistant so as not to delaminated under normal conditions of transport.

(v) Maximum capacity of drum: 450 liters

(vi) Maximum net mass: 400 kg.

22. Plastics drums and jerri cans

1H1 drums, non-removable head

1H2 drums, removable head

3H1 jerri cans, non-removable head

3H2 jerri cans, removable head

(i) The packaging must be manufactured from suitable plastics material and be of adequate strength in relation to its capacity and intended use. No used material other than production residues or regrind from the same manufacturing process may be used. The packaging must be of adequately resistant to ageing and to degradation caused either by the substance contained or ultra-violet radiation. Any permeation of the substance contained must not constitute a danger under normal conditions of transport.

(ii) Unless otherwise approved by the competent authority, the period of use permitted for the transport of dangerous substances is five years from the date of manufacture of the packaging except where a shorter period of use is prescribed because of the nature of the substance to be transported.

(iii) If protection against ultra-violet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the packaging. Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if the carbon black content does not exceed 2% by mass or if the pigment content does not exceed 3% by mass; the content of inhibitors of ultra-violet radiation is not limited.

(iv) Additives serving purposes other than protection against ultra-violet radiation may be included in the composition of the plastics material provided that they do not adversely affect the chemical and physical properties of the material of the packaging. In such circumstances, retesting may be waived.

(v) The wall thickness at every point of the packaging shall be appropriate to its capacity and intended use, taking into account the stresses to which each point is liable to be exposed.

(vi) Openings for filling, emptying and venting in the bodies or heads of non-removable drums (1H1) and jerricans (3H1) must not exceed 7 cm in diameter. Drums and jerricans with larger openings are considered to be of the removable head type (1H2 and 3H2). Closures for openings in the bodies or heads of drums and jerricans must be so designed must be so designed and applied that they will remain secure and leak proof under normal condition of transport. Gaskets or other sealing elements must be used with closures unless the closure is inherently leak proof.

(vii) Closure devices for removable head drums and jerricans must be so designed and applied that they will remain secure and leak proof under normal conditions of transport. Gaskets must be used with all removable heads unless the drum or jerrican design is such that, where the removable head is properly secured, the drum or jerrican is inherently leak proof.

(viii) Maximum capacity of drum and jerricans:
1H1, 1H2: 450 litres
3H1, 3H2: 60 litres.

(ix) Maximum net mass: 1H1, 1H2: 400 kg
3H1, 3H2: 120 kg.

Note: The capacity given above is maximum and lower capacity containers can be utilized in consultation with users and producers.

23. Boxes of natural wood
4C1 ordinary
4C2 with sift-proof walls

(i) The wood used shall be well seasoned, commercially dry and free from defects that would materially lessen the strength of any part of the box. The strength of the material used and the method of construction shall be appropriate to the capacity and intended use of the box. The tops and bottoms may be made of water resistant reconstituted wood such as hardboard, particle board or other suitable type. The wood should be given preservative treatment as per specification IND/ME/883(d). The size and thickness of wooden plank could be decided by AHSP.

(ii) Fastenings must be resistant to vibration experienced under normal conditions of transport. End grain nailing must be avoided whenever practicable. Joins which are likely to be highly stressed must be made using clenched or annular ring nails or equivalent fastenings.

(iii) Box 4C2: each part must consist of one piece or be equivalent thereto. Parts are considered equivalent to one piece when one of the following methods of glued assembly is used: Lindermann joint, Dove Tail Joint tongue and groove joint, ship lap or rabbet joint or butt joint with at least two corrugated metal fasteners at each joint.

(iv) Maximum net mass: 400 kg.

24. Plywood boxes

4D

(i) Plywood used must be at least 3-ply. It must be made from well seasoned rotary cut, sliced or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the box. The strength of the material used and the methods of construction shall be appropriate to the capacity and intended use of the box. All adjacent plies must be glued with water resistant adhesive. Other suitable materials may be used together with plywood in the construction of boxes. Boxes must be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(ii) Maximum net mass: 400 kg.

25. Reconstituted wood boxes

4F

(i) The walls of boxes must be made of water resistant reconstituted wood such as hardboard, particle board or other suitable type. The strength of the material used and the method of construction must be appropriate to the capacity of the boxes and to their intended use.

(ii) Other parts of the boxes may be made of other suitable material.

(iii) Boxes must be securely assembled by means of suitable devices.

(v) Maximum net mass: 400 kg.

26. Fibre-boardboxes

4G

(i) Strong and good quality solid or double-faced corrugated fiber-board (single or multiwall) must be used. Appropriate to the capacity of the box and to its intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m2-see ISO 535:1991. It must have proper bending qualities. Fiber-board shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting of corrugated fiber-board must be firmly glued to the facings.

(ii) The ends of boxes may have a wooden frame or be entirely of wood or other suitable material. Reinforcements of wooden battens or other suitable material may be used.

(iii) Manufacturing joins in the body of boxes must be taped, lapped and glued, or lapped and stitched with metal staples. Lapped joins must have an appropriate overlap.

(iv) Where closing is effected by gluing or taping, a water resistant adhesive shall be used.

(v) Boxes must be designed so as to provide a good fit to the contents.

(vi) Maximum net mass: 400 kg.

(vii) Fiber Board Boxes as per AHSP specification No. CIME/DRG/227C are approved for transportation of TNT.

27. Plastics boxes

4H1 expanded plastics boxes

4H2 solid plastics boxes

(i) The box must be manufactured from suitable plastics material and be of adequate strength in relation to its capacity and intended use. The box shall be adequately resistant to ageing and to degradation caused either by the substance contained or by ultra-violet radiation.

(ii) An expanded plastics box must comprise two parts made of all molded expanded plastics material, a bottom section containing cavities for the inner packaging and a top section covering and interlocking with the bottom section. The top and bottom sections must be designed so that the inner packaging fit snugly. The closure cap for any inner packaging must not be in a contact with the inside of the top section of this box.

(iii) For dispatch, an expanded plastics box must be closed with a self-adhesive tape having sufficient tensile strength to prevent the box from opening. The adhesive tape must be weather resistant and its adhesive compatible with the expanded plastics material of the box. Other closing devices at least equally effective may be used.

(iv) For solid plastics boxes, protection against ultra-violet radiation, if required, must be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives must be compatible with the contents and remain effective throughout the life of the box. Where use is made or carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if the carbon black content does not exceed 2% by mass or if the pigment content does not exceed 3% by mass; the content of inhibitors of ultra-violet radiation is not limited.

(v) Additives serving purposes other than protection against ultra-violet radiation may be included in the composition of the plastics material provided that they do not adversely affect the chemical or physical properties of the box. In such circumstances, retesting may be waived.

(vi) Solid plastics boxes must have closure devices made of a suitable material of adequate strength and so designed as to prevent the box from unintentional opening.

(vii) Maximum net mass 4H1: 60 kg

4H2: 400 kg

28. Steel or aluminium boxes

4A steel

4B aluminium

(i) The strength of the metal and the construction of the box must be appropriate to the capacity of the box and to its intended use.

(ii) Boxes must be lined with fiber-board or felt packing pieces or must have an inner liner or coating of suitable material, as required. If a double seamed metal liner is used, steps must be taken to prevent the ingress of substances, particularly explosives, into the recesses of the seams.

(iii) Closures may be of any suitable type; they shall remain secured under normal conditions of transport.

(iv) Maximum net mass: 400 kg.

29. Textile bags

5L1 without inner liner or coating

5L2 sift-proof

5L3 water resistant

(i) The textile used must be of good quality. The strength of the fabric and the construction of the bag must be appropriate to the capacity of the bag and to its intended use.

(ii) Bags, sift-proof, 5L2: the bag must be made sift-proof, for example by the use of: paper bonded to the inner surface of the bag by a water resistant adhesive such as bitumen: or Plastics film bonded to the inner surface of the bag; or one or more inner liners made of paper or plastics material.

(iii) Bags, water resistant, 5L3: to prevent the entry of moisture the bag must be made waterproof, for example by the use of: separate inner liners of water resistant paper (e.g. waxed Kraft paper, tarred paper or plastics-coated Kraft paper);or plastics film bonded to the inner surface of the bag; or one or more inner liners made of plastics material.

(iv) Maximum net mass: 50 kg.

30. Woven plastics bags

5H1 without inner liner or coating

5H2 sift-proof

5H3 water resistant

(i) Bags must be made from stretched tapes or monofilaments of a suitable plastics material. The strength of the material used and the construction of the bag must be appropriate to the capacity of the bag and to its intended use.

(ii) If the fabric is woven flat, the bags must be made by sewing or some other method ensuring closure of the bottom and one side. If the fabric is tubular, the bag shall be closed by sewing, weaving or some other equally strong method of closure.

(iii) Bags, sift-proof, 5H2: the bag must be made sift-proof, for example by means of: paper or a plastics film bonded to the inner surface of the bag; or one or more separate inner liners made of paper or plastics material.

(iv) Bags, water resistant, 5H3: to prevent the entry of moisture, the bag must be made waterproof, for example by means of: separate inner liners of water resistant paper (e.g. waxed Kraft paper, double-tarred Kraft paper of plastics-coated Kraft paper); or plastics film bonded to the inner or outer surface of the bag; or one or more inner plastics liners.

31. Plastics film bags

5H4

(i) Bags must be made of a suitable plastics material. The strength of the material used and the construction of the bag must be appropriate to the capacity of the bag and to its intended use. Joins enclosures must withstand pressures and impacts liable to occur under normal condition of transport.

(ii) Maximum net mass: 50 kg.

32. Paper bags

5MI multiwall
5M2 multiwall, water resistant

(i) Bags must be made of a suitable Kraft paper or of an equivalent paper with at least three plies. The strength of the paper and the construction of the bags must be appropriate to the capacity of the bag and to its intended use. Joins and closures must be sift-proof.

(ii) Bags 5M2: to prevent the entry of moisture, a bag of four plies or more must be made waterproof by the use of either a water resistant ply as one of the two outermost plies or a water resistant barrier made of a suitable protective material between the two outermost plies; a bag of three plies must be made waterproof by the use of a water resistant ply as the outermost ply. Where there is a danger of the substance contained reacting with moisture of where it is packed damp, a waterproof ply or barrier, such as double-tarred Kraft paper, plastics-coated Kraft paper, plastics film bonded to the inner surface of the bag, or one or more inner plastics liners, must also be placed next to the substance. Joins and closures must be waterproof.

33. Composite packaging (plastics material)

6HA1 plastics receptacle with outer steel drum
6HA2 plastics receptacle with outer steel crate or box
6HB1 plastics receptacle with outer aluminium drum
6HB2 plastics receptacle with outer aluminium crate or box
6HC plastics receptacle with outer wooden box
6HD1 plastics receptacle with outer plywood drum
6HD2 plastics receptacle with outer plywood box
6HG1 plastics receptacle with outer fiber drum
6HG2 plastics receptacle with outer fiber-board box
6HH1 plastics receptacle with outer plastics drum
6HH2 plastics receptacle with outer solid plastics box

(a) Inner receptacle

(i) The provisions of Para 22(i), Para 22(iv) to 22(vii) apply to inner plastics receptacle.

(ii) The inner plastics receptacle must fit snugly inside the outer packaging, which must be free of any projection that might abrade the plastics material.

(iii) Maximum capacity of inner receptacle:
6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 250 litres; 6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2: 60 litres.

(iv) Maximum net mass:
6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 400 kg; 6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2: 75 kg.

(b) Outer packaging

(i) Plastics receptacle with outer steel or aluminium drum 6HA1 or 6HB1; the relevant provisions of Para 16 or 17 as appropriate, apply to the construction of the outer packaging.

(ii) Plastics receptacle with outer steel or aluminium crate or box 6HA2 or 6HB2; the relevant provisions of Para 28 apply to the construction of the outer packaging.

(iii) Plastics receptacle with outer wooden box 6HC; the relevant provisions of Para 23 apply to the construction of the outer packaging.

(iv) Plastics receptacle with outer plywood box 6HD1; the relevant provisions of Para 19 apply to the construction of the outer packaging.

(v) Plastics receptacle with outer plywood box 6HD2; the relevant provisions of Para 24 apply to the construction of the outer packaging.

(vi) Plastics receptacles with outer fiber drum 6HG1; the provisions of Para 21(i) to 21(iv) apply to the construction of the outer packaging.

(vii) Plastics receptacle with outer fiber-board box 6HG2; the relevant provisions of Para 26 apply to the construction of the outer packaging.

(viii) Plastics receptacle with outer plastics drum 6HH1; the provisions of Para 22(i) and Para 22(iii) to 22(vii) apply to the construction of the outer packaging.

(ix) Plastics receptacles with outer solid plastics box (including corrugated plastics material) 6HH2; the provisions of Para 27(i) and Para 27(iv) to 27(vi) apply to the construction of the outer packaging.

SECTION – V

Test Requirements for Packaging

34. Performance and frequency of tests

(i) The design type of each packaging must be tested as provided in this section in accordance with procedures established by the competent authority.

(ii) Tests must be successfully performed on each packaging design type before such packaging is used. A packaging design type is defined by the design, size, material and thickness, manner of construction and packing, but may include various surface treatments. It also includes packaging which differ from the design type only in their lesser design height.

(iii) Tests must be repeated on production samples at intervals established by the competent authority. For such tests on paper or fiber-board packaging, preparation at ambient conditions is considered equivalent to the provisions of Para 35(iii).

(iv) Tests must also be repeated after each modification which alters the design, material or manner of construction of a packaging.

(v) The competent authority may permit the selective testing of packaging that differ only in minor respects from a tested type, e.g. smaller sizes of inner packaging or inner packaging of lower net mass; and packaging such as drums, bags and boxes which are produced with small reductions in external dimension(s).

(vi) Where an outer packaging of a combination packaging has been successfully tested with different types of inner packaging, a variety of such different inner packaging may also be assembled in this outer packaging.

(vii) The competent authority may at any time require proof, by tests in accordance with section, that serially-produced packagingmeet the requirements of the design type tests.

(viii) If an inner treatment or coating is required for safety reasons, it must retain its protective properties even after the tests.

35. Preparation of packaging for testing

(i) Tests must be carried out on packaging prepared as for transport including inner packaging of combination packaging. Inner or single receptacles or packaging shall be filled to not less than 98% of their maximum capacity for liquids or 95% for solids. For combination packaging where the inner packaging is designed to carry liquids and solids, separate testing is required for both liquid and solid contents. The substances or articles to be transported in the packaging may be replaced by other substances or articles except where this would invalidate the results of the tests. For solids, when another substance is used it must have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, so long as they are placed so that the tests results are not affected.

(ii) In the drop tests for liquids, when another substance is used, it must be of similar relative density and viscosity to those of the substance being transported. Water may also be used for the liquid drop test under the conditions in para 36(iv).

(iii) Paper or fibre-board packaging must be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (R.H.). There are three options, one of which must be chosen. The preferred atmosphere is 23+ 2^0C r.h. and 50%, +2% R.H. The two other options are 20+2^0C and 65% +2% R.H. or 27 + 2^0C and 65% + 2% R.H. Average values must fall within these limits. Short-term fluctuations and measurement limitations may cause individual measurements to vary by up to + 5% relative humidity without significant impairment of test reproducibility.

(iv) Bung-type barrels made of natural wood must be left filled with water for at least 24 hours before the tests.

(v) Steps must be taken to ascertain that the plastics material used in the manufacture of plastics drums, plastics jerricans and composite packaging (plastics material) complies with the provisions in Para 22(i). This may be done, for example, by submitting sample receptacles or packaging to a preliminary test extending over a long period, for example six months, during which the samples would remain filled with the substances they are intended to contain and after which the samples must be submitted to the applicable tests listed in Paras 36 to 39. For substances which may cause stress cracking or weakening in plastics drums or jerricans, the sample, filled with the substance or another substance that is known to have at least as severe a stress-cracking influence on the plastics materials in question, must be subjected to a superimposed load equivalent to the total mass of identical packages which might be stacked on it during transport. The minimum height of the stack, including the test sample which must be considered, is 3 metres.

36. Drop test

(i) Number of test samples (per design type and manufacturer) and drop orientation for other than flat drops, the center of gravity shall be vertically over the point of impact. Where more than one orientation is possible for a given drop test, the orientation most likely to result in failure of the packaging must be used.

Packaging	No, of test samples	Drop orientation
Steel drums Alumminium drums Steel jerricans Plywood drums Wooden barrels Fiber drums Plastics drums And jerricans Composite Packaging which are in the shape of a drum.	Six (three for each drop)	First drop (using three samples) the packaging must strike the target diagonally on the chime or if the packaging has no chime, on a circumferential seam or an edge. Second drop (using the other three samples): the packaging must strike the target on the weakest part not tested by the first drop, for example a closure or, for some cylindrical drums, the welded longitudinal seam of the drum body
Boxes of natural wood Plywood boxes Reconstituted wood boxes Fiber-board boxes Plastics boxes Steel or aluminium boxes Composite packaging which are in the shape of box.	Five (one for each drop)	First drop: flat on the bottom Second drop: flat on the top Third drop: flat on the long side Fourth drop: flat on the short side. Fifth drop: on a corner
Bags – single-ply with a side seam	Three (three drops per bag)	First drop: flat on a wide face Second drop: flat on a narrow face Third drop: on an end of the bag
Bags – single-ply without a side seam, or multiply	Three (two drops per bag)	First drop: flat on a wide face Second drop: on an end of the bag.

(ii) Special preparation of test samples for the drop test The temperature of the test sample and its contents must be reduced to -18^0C or lower for the following packaging:

(a) plastics drums

(b) plastics jerricans

(c) plastics boxes other than expanded polystyrene boxes

(d) composite packaging (plastics material)

(e) combination packaging with plastics inner packaging;

(f) textile bags with inner plastics liner

(g) woven plastics bags

(h) plastics film bags

Where test samples are prepared in this way, the conditioning in para 35(iii) may be waived. Test liquids must be kept in the liquid state by the addition of anti-freeze if necessary.

(iii) Target

The target must be a rigid, non-resilient, flat and horizontal surface.

(iv) Drop Height

For solid and liquids, if the test is performed with the solid or liquid to be carried or with another substance having essentially the same physical characteristics the drop height is 1.2m.
For liquids if the test is performed with water:

(a) where the substances to be transported have a relative density not exceeding 1.2: the drop height is 1.2m.

(b) Where the substances to be transported have a relative density exceeding 1.2, the drop height must be calculated on the basis of the relative density (d) of the substance to be carried, rounded up to the first decimal, as follow d x 1.0(m).

(v) Criterion for passing the Test

(a) Each packaging, containing liquid must be leak proof when equilibrium has been reached between the internal and external pressures, except for inner packaging of combination packaging when it is not necessary that the pressures be equalized.
(b) Where a packaging for solids undergoes a drop test and its upper face strikes the target, the test sample passes the test if the entire contents are retained any by inner packaging or inner receptacle (e.g. a plastics bag), even if the closure is no longer sift-proof.
(c) The packaging or outer packaging of a composite or combination packaging must not exhibit any damage liable to affect safety during transport. There must be no leakage of the filling substance from the inner receptacle or inner packaging(s).
(d) Neither the outermost ply of a bag nor an outer packaging must exhibit any damage liable to affect safety during transport.
(e) A slight discharge from the closure(s) upon impact is not considered to be a failure of the packaging provided that no further leakage occurs.
(f) No rupture is permitted in packaging for goods of class 1 which would permit the spillage of loose explosive substances or articles from the outer packaging.

37. **Leak proofness test**

The leak proofness test must be performed on all design type of packaging intended to contain liquids; however, this test is not required for the inner packaging of combination packaging.

(i) Number of test samples: three test samples per design type and manufacturer.
(ii) Special preparation of test samples for the test: either vented closures should be replaced by similar non-vented closures or the vent should be sealed.
(iii) Test method and pressure to be applied: the packaging including their closures must be restrained under water for 5 minutes while an internal air pressure is applied, the method of restraint must not affect the results of the test.

The air pressure (gauge) to be applied must be: Not less than 20kPa (0.2 bar).
Other methods at least equally effective may be used.

(iv) Criterion for passing the test: there shall be no leakage.

38. **Internal pressure (hydraulic) test**

(i) Packaging to be tested: the internal pressure (hydraulic) test must be carried out on all design types of metal, plastics and composite packaging intended to contain liquids. This test is not required for inner packaging of combination packaging.

(ii) Number of test samples: three test samples per design type and manufacture.

(iii) Special preparation of packaging for testing: either vented closures must be replaced by similar non-vented closures or the vent must be sealed.

(iv) Test method and pressure to be applied: metal packaging and composite packaging including their closures must be subjected to the test pressure for 5 minutes. Plastics packaging and composite packaging (plastics material) including their closures must be subjected to the test pressure for 30 minutes. The manner in which the packaging are supported must not invalidate the test. The test pressure must be applied continuously and evenly; it must be kept constant throughout the test period. The hydraulic pressure (gauge) applied, as determined by any one of the following method, must be:

(a) not less than the total gauge pressure measured in the packaging (i.e. the vapour pressure of the filling substance and the partial pressure of the air of other inert gases, minus 100 kPa) at 55^0C, multiplied by a safety factor of 1.5.
(b) not less than 1.75 times the vapour pressure at 50^0C of the substance to be transported, minus 100 kPa but with a minimum test pressure of 100 kPa;
(c) not less than 1.5 times the vapour pressure at 55^0C of the substance to be transported, minus 100 kPa but with a minimum test pressure of 100 kPa.

(v) Criterion for passing the test: no packaging may leak.

39. **Stacking test**

(i) All design types of packaging other than bags are subject to a stacking test.

(ii) Number of test samples: three test samples per design type and manufacture.

(iii) Test method: the test samples must be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport; where the contents

of the test sample are non-dangerous liquids with relative density different from that of the liquid to be transported, the force must be calculated in relation to the latter. The minimum height of the stack including the test sample must be 3 metre. The duration of the test must be 24 hours except that plastics drums, jerricans, and composite packaging 6HH1 and 6HH2 intended for liquids must be subjected to the stacking test for a period of 28 days at a temperature of not less than 40^0C.

(iv) **Criterion for passing the test:** no test sample may leak. In composite packaging or combination packaging, there must be no leakage of the filling substance form the inner receptacle or inner packaging. No test sample may show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages. In instances (such as guided load tests of drums and jerricans) where stacking stability is assessed after completion of the test, this may be considered sufficient when two filled packaging of the same type placed on each test sample maintain their position for one hour. Plastics packaging must be cooled to ambient temperature before the assessment.

40. Cooperage test for bung type wooden barrels

(i) Number of samples: one barrel.

(ii) Method of testing: remove all hoops above the bilge of an empty barrel at least two days old.

(iii) Criterion for passing the test: the diameter of the cross-section of the upper part of the barrel must not increase by more than 10%.

41. Test Report

(i) A test report containing at least the following particulars must be drawn up and must be available to the users of the packaging :

(a) Name and address of the test facility;
(b) Name and address of applicant (where appropriate);
(c) A unique test report identification;
(d) Date of the test report;
(e) Manufacturer of the packaging;
(f) Description of the packaging design type (e.g. dimensions, materials, closures, thickness, etc.). including method of manufacture (e.g. blow moulding) and which may include drawing (s) and/or photograph(s);
(g) Maximum capacity;
(h) Characteristics of test contents, e.g. viscosity and relative density for liquids and particle size for solids;

(i) Test descriptions and results;
(j) The test report must be signed with the name and status of the signatory.
(k) The test report must be signed with name and status of signatory.

(ii) The test report must contain statements that the packaging prepared as for transport was tested in accordance with the appropriate provisions of this section and that the use of the other packaging methods or components may render it invalid. A copy of the test report must be available to the competent authority.

SECTION – VI

SAFETY TEST REQUIREMENTS FOR PACKAGES AND UNPACKAGED ARTICLES

42. **Introduction**

(a) These tests are intended to determine the overall stability of the package or unpackaged article in environments which simulate transport accident/incident conditions other than fire to answer the question "Is the article, packaged article or packaged substance too hazardous for transport?"

(b) Typical transport conditions include high temperature and high relative humidity, low temperature, vibration, bumping and dropping. The tests are carried out on the packaged substance, packaged article(s) and, if intended to be transported unpackaged, on the article itself.

(c) Thermal Stability Test. This determines the thermal stability of the packaged substance, packaged article(s) or the unpackaged article.
e.g. Thermal Stability for articles and packages.

(d) Drop Test. This determines the effects of dropping the explosives from heights of a few metres, simulating a fall from a vehicle, or up to 12 metres, simulating a fall from a crane into the hold of a ship.e.g. Twelve Metre Drop Test for Articles and Solid Substances.

(e) The packaged substance, packaged article or unpackaged articles are considered too dangerous to transport if a positive sign of instability is obtained in either Test Type mentioned above.

43. **Thermal stability Test for Articles and Packaged Articles**

(a) Introduction. This test is designed to evaluate the thermal stability of articles and packaged articles when subjected to elevated thermal conditions to determine whether the unit being tested is too hazardous for transport. Several criteria are used to evaluate the results of the test. ***This test does not apply to packaged substances.*** Theminimum size unit acceptable for this test is the smallest packaged unit.

(b) **Apparatus and Materials.** This test requires an oven equipped with ventilation, explosion-proof electrical features and thermostatic control to maintain the temperature at $75 + 0.5^{0}$C. It is desirable that the oven should have dual thermostats or similar protection against excessively high temperatures in the event of a thermostat malfunction. The oven must also be fitted with a temperature recorder to assess any exothermic temperature increase.

(c) **Procedure.** Depending on the unit being tested, a thermocouple is placed either on the outside casing of the unpackaged article, or on the outside casing of an article which is located near the center of its package. The thermocouple is attached to a temperature recorder. The unit to be tested (together with the

thermocouple) is placed in the oven, heated to 75^0C and maintained at that temperature for 48 hours. The unit is then removed from the oven, cooled and inspected. In dealing with an unknown article, proper precautions should be taken in carrying out the test. Temperatures are recorded and the visual examination noted.

(d) **Criteria and Method of Assessing Results** A test result is considered positive (+) if any of the following occurs:

(i) It explodes.
(ii) It ignites.
(iii) It generates coloured fumes or odor.
(iv) It experiences a temperature rise exceeding 3^0C.
(v) The outside casing of the article or the outside packaging is damaged.

(e) An article or packaged article(s) which gives a positive test result is judged to be too hazardous for transport.

44. **Twelve Metre Drop Test for Articles and solid Substances**

(a) Introduction. This test determines whether a test unit (packaged substance or article) can withstand a free-fall impact without producing any significant fire or explosion hazard. It is not intended as a test to evaluate whether the package will withstand the impact.

(b) Apparatus and Materials

(1) Impact Surface

(i) The impact surface is a solid base with a reasonably smooth surface. One example of such a surface is as follow:

Steel plate with a minimum thickness of 75mm and Brinell hardness between 200 and 250, solidly supported by a concrete foundation having a minimum thickness of 600mm.

(ii) The length and width of the surface should be not less than one and one half times the dimension of the unit being tested

(2) Other Apparatus

(i) Photographic or other visual recording devices should be used to verify impact attitude and results.

(ii) Where impact attitude may be considered to be a significant factor, the test agency may use guidance devices to obtain the desired impact attitude. Such devices should not significantly restrain drop velocity, nor impede rebound after impact. In certain cases, some of the explosive articles in a package of articles under test may be replaced with inert articles. These inert articles should be of the same mass and volume as the explosive articles they replace.

(**C) Procedure**

(i) The test unit is dropped from a height of 12 metres as measured from the lowest point of the test unit to the impact surface. A safe waiting period following impact prescribed by the test agency should be observed, even if no visible initiation or ignition occurs at impact. The test unit should then be further examined to determine if any ignition or initiation occurred.

(ii) Data should include package description and observations indicated in the format for United Nation Test Reports. Recorded results should include photographs and recorded visual and audible evidence of initiation or ignition time of occurrence (if any) and indication of severity of the results in terms such as mass detonation or deflagration. Attitude of test unit at impact should be recorded. Rupture of the package may be noted, but does not affect the conclusion.

(iii) Three drop tests are made on the packaged substance or article. However, each test unit is dropped only once.

(d) Criteria and Method of Assessing ResultsA test is considered positive if a significant fire or explosion resulted from impact. Rupture of the package is not considered a positive result.

SECTION – VII

PACKING METHODS FOR EXPLOSIVES

General

45. The assignment of packing methods to explosive substances and articles utilizes the principles based on hazard divisions and compatibility groups to the maximum extent possible, as well as physical characteristics, substance form (e.g. solid wetted, solid dry powder etc.) and particular requirements.

Selection

46.

a) The Packing Method to be used for any particular explosive substance or article is detailed against the Un Serial Number in Table 1 for that particular explosive substance or article.

b) The format of Table 1 is shown below, and a typical example of an entry is given:

TABLE 1

UN Serial Number	Description of Substance or Article	Class-fication Code	Special Provision	packing Method
0106	FUZES, detonating	1.1B		EP 41

(a) It will be seen that under Packing Method, column 5 in this particular case, the method to be used for packing is EP 41.

(b) It follows that the authority deciding to package an explosive substance or article must first ascertain its likely classification when packaged. This process may not in practice be as difficult as it seems as for example, if a Fuze Detonating is to be packaged, it may be classified as:

If without Protective Features

(i) HD 1.1B UN Serial No. 0106, or
(ii) HD 1.2B UN Serial No. 0107, or
(iii) HD 1.4B UN Serial No. 0257, or
(iv) HD 1.4S UN Serial No. 0367

If with Protective Features

(i) HD 1.1D UN Serial No. 0408, or
(ii) HD 1.2D UN Serial No. 0409, or
(iii) HD 1.4D UN Serial No. 0410.

Reference to Table 1 shows that all these UN Serial Numbers are packed to Method EP 41.

Description of Packing Methods

47. Because of the special nature of explosives, the varying degree of hazard they present according to the manner in which they are packed, and the desirability of improving the uniformity of their packing, detailed recommendations are given in annexure 1 on the way in which individual explosive substances and articles, or groups thereof, should be packed.

Special Provisions

48. It is to be noted that a packing code is mentioned against each outer packaging. In annexure 1 the following convention is used:
Packing Methods EP01 to EP09 -- reserved for methods requiring competent authority approval;
Packing Methods EP10 to EP29 -- reserved for explosive substances; and
Packing Methods EP30 onwards -- reserved for explosive articles.

49. Any relevant Special Provision, indicated in column 4 of Table 1 for a specific UN number, to be followed are enumerated in annexure 2.

SECTION – VIII

CONSIGNMENT PROCEDURES

Applicability

50. This section sets forth the general requirements for explosives and ammunition consignments relative to marking, labeling, certification, competent authority approval and training. Except as otherwise provided in those regulations, no person may offer explosive for transport unless these are properly marked, labeled, described and certified as a transport document.

51. The marking indicates that the packaging which bears it corresponds to a successfully tested design type and that lit complies with the provisions of these regulations (Section IV and V)

52. Each packaging intended for use according to those regulations must bear markings which are durable, legible and appear on the top or on a side of packaging of such a size relative to the packaging as to be readily visible. The marking must show:

    (a) The United Nations packaging symbol
    (b) The code number designating the type of packaging.
    (c) Proper shipping name of the explosive item and the corresponding UN number preceded by the letters "UN".

Labeling

53. This requirement relates essentially to danger labels. Labels identifying primary risk must conform to model illustrated in figure-1. Labels must be in the form of a square set at an angle of 45^0 (diamond shaped) with minimum dimensions of 100mm by 100mm. Labels are divided into halves. The upper half of the label is reserved for the pictorial symbol and the lower half for hazard division number and compatibility group letter as appropriate. All labels should be able to withstand open weather exposure without a substantial reduction in effectiveness.

Transport Document

54. The dangerous goods transport document must contain the following information for each explosive substance or article offered for transport by the mode:

    (a) The proper shipping name
    (b) Class, hazard division and compatibility group
    (c) The UN number and
    (d) The total quantity of dangerous goods covered by the description (by volume, mass, or net explosive content as appropriate).

55. The dangerous goods transport documents prepared by the shipper must in addition carry or be accompanied by, a certificate or declaration that the consignment offered can be accepted for transport and that the goods are properly packaged, marked and labeled, and in proper condition for transport in accordance with the applicable regulations. The form for this declaration is:

"I hereby declare that the accompanying package(s) of military explosives are owned by the Ministry of Defense and conform to the testing, marking and labeling requirements of STEC regulations. It is also certified that package(s) are in sound condition suitable to withstand the normal risk of handling and transportation".

Certification and Competent Authority Approval

56. Controller ate of Quality Assurance, CQA(A) and CQA(ME) shall be the main laboratories responsible for performance testing the design of each packaging as per these regulations. Packages for Military Explosives and Ammunition are governed by the drawings/specification which are approved and sealed by CQA(ME) and CQA(A), the AHSPs. The packages should meet the quality requirements of the concerned specifications. CQA(ME) will perform AHSP responsibility for pyrotechnics and Military Explosive and CQA(A) will be responsible for AHSP function for ammunition and propellant charges. The test results of the packaging shall be submitted to Secretary STEC, who is nominated as the Competent Authority for final approval and allotment of UN number and classification code.

57. It is to be noted that packaging used for transport of explosives from one factory to another factory should comply with the standards of these regulations. The responsibility for AHSP function for transit packages will rest with the local inspector and GM of factory concerned.

Similarly the explosives and ammunition development laboratories/establishments shall during the development stage of the ammunition item, transport explosives in packaging recommended in these regulations.

58. ***Training***

Persons engaged in the transport of dangerous goods must receive training in the contents of dangerous goods requirements commensurate with their responsibilities.

59. Individuals such as those who classify dangerous goods; pack dangerous goods; mark and label dangerous goods; prepare transport documents for dangerous goods; offer or accept dangerous goods for transport; carry or handle dangerous goods in transport; mark or placard or load or unload packages of dangerous goods into or from transport vehicles, bulk packaging or freight containers; or are otherwise

directly involved in the transport of dangerous goods as determined by the competent authority must received the following training :

(a) General awareness/familiarization training:

(i) Each person must receive training designed to provide familiarity with the genera provisions of dangerous goods transport requirements.

(ii) Such training shall include a description of the classes of dangerous goods; labeling, marking, placarding and packaging, segregation and compatibility requirements; a description of the purpose and content of the dangerous goods transport document; and a description of available emergency response documents.

(b) Function-specific training: Each person must receive detailed training concerning specific dangerous goods transport requirements which are applicable to he function that person performs.

(c) Safety training: Commeasure with the risk of exposure in the event of a release and the functions performed, each person must receive training on:

(i) Methods and procedures for accident avoidance, such as proper use of packages-handling equipment and appropriate methods of storage of dangerous goods:
(ii) Available emergency response information and how to use it.
(iii) general dangers presented by the various classes of dangerous goods and how to prevent exposure to those hazards, including if appropriate the use of personal protective clothing and equipment; and
(iv) Immediate procedures to be followed in the event of an unintentional release of dangerous goods, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed.

Table 1 – LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0004	AMMONIUM PICRATE dry or wetted with less than 10% water, by mass	1.1D	1	EP 12
0005	CARTRIDGES FOR WEAPONS with bursting charge	1.1F		EP 30
0006	CARTRIDGES FOR WEAPONS with bursting charge	1.1E		EP 30
0007	CARTRIDGES FOR WEAPONS with bursting charge	1.2F		EP 30
0009	AMMUNITION, INCENDIARY with or without buster, expelling charge or propelling charge	1.2G		EP 30
0010	AMMUNITION, ENCENDIARY with or without buster, expelling charge or propelling charge	1.3G		EP 30
0012	CARTRIDGES FOR WEAPONS, INERT PROJECTILES or CARTRIDGES, SMALL ARMS	1.4S		EP 30
0014	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1.4S		EP 30
0015	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1.2G	2	EP 30
0016	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1.3G	2	EP 30
0018	AMMUNITION TEAR-PRODUCING with burster, expelling charge or propelling charge	1.2G		EP 30
0019	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1.3G		EP 30
0020	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1.2K		EP 01
0021	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1.3K		EP 01
0027	BLACK POWDER (GUNPOWDER) granular or as a meal	1.1D		EP 13
0028	BLACK POWDER (GUNPOWDER), COMPRESSED or BLACK POWDER (GUNPOWDER), IN PELLENTS	1.1D		EP 13
0029	DETONATORS, NON-ELECTRIC for blasting	1.1B		EP 31

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0030	DETONATORS, ELECTRIC fro blasting	1.1B		EP 31
0033	BOMBS with bursting charge	1.1F		EP 30
0034	BOMBS with bursting charge	1.1D		EP 30
0035	BOMBS with bursting charge	1.2D		EP 30
0037	BOMBS, PHOTO-FLASH	1.1F		EP 30
0038	BOMBS, PHOTO-FLASH	1.1D		EP 30
0039	BOMBS, PHOTO-FLASH	1.2G		EP 30
0042	BOOSTER, without detonator	1.1D		EP 32
0043	BURSTERS, explosive	1.1D		EP 33
0044	PRIMERS, CAPTYPE	1.4S		EP 33
0048	CHARGES, DEMOLITION	1.1D		EP 30
0049	CARTRIDGES, FLASH	1.1G		EP 35
0050	CARTRIDGES, FLASH	1.3G		EP 35
0054	CARTRIDGES, SIGNAL	1.3G		EP 35
0055	CASES, CARTRIDGE, EMPTY, WITH PRIMER	1.4S		EP 36
0056	CHARGES, DEPTH	1.1D		EP 30
0059	CHARGES, SHAPED, COMMERCIAL without detonator	1.1D	3	EP 37
0060	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D		EP 32
0065	CORD, DETONATING, flexible	1.1D	4	EP 39
0066	CORD, IGNITER	1.4G		EP 40
0070	CUTTERS, CABLE, EXPLOSIVE	1.4S		EP 34
0072	CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX), WETTED with not less than 15% water, by mass	1.1D	5	EP 12
0073	DETONATORS FOR AMMUNITION	1.1B		EP 33
0074	DIAZODINITROPHENOL, WETTED with not than 40% water, or mixture of alcohol and water by mass	1.1A	6 for EP 10(b) 5	EP 10(a) or EP 10(b)

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0075	DIETHYLENEGL YCOL DINITRATE, DESENSITIZED with not less than 25% Non-volatile, water-insoluble phlegmatizer by mass	1.1D	7 8 5	EP15
0076	DINITROPHENOL, dry or wetted with less than 15% water, by mass	1.1D	1	EP 12
0077	DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	1.3C	1	EP 14
0078	DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	1.1D	1	EP 12
0079	HEXANITRODIPHENYLAMINE (DEPICRYLAMINE; HEXYL)	1.1D		EP 12(b) or 12(c)
0081	EXPLOSIVE, BLASTING, TYPE A	1.1D		EP 16
0082	EXPLOSIVE, BLASTING, TYPE B	1.1D	9 for EP 17	EP 16 or EP 17
0083	EXPLOSIVE, BLASTING, TYPE C	1.1D	10	EP 16
0084	EXPLOSIVE, BLASTING, TYPE D	1.1D		EP 16
0092	FLARES, SURFACE	1.3G		EP 35
0093	FLARES, AERIAL	1.3G		EP 35
0094	FLASH POWDER	1.1G	11	EP 13
0099	FRACTURING DEVICES, EXPLOSIVE without detonator, for oil wells	1.1D		EP 34
0101	FUSE, INSTATANEOUS, NON-DETONATING (QUICKMATCH)	1.3G		EP 40
0102	CORD (FUSE), DETONATING, metal clad	1.2D	4	EP 39
0103	FUSE, IGNITER, tubular, metal clad	1.4G		EP 40
0104	CORD (FUSE), DETONATING, MILD EFFECT, metal clad	1.4D	4	EP 39
0105	FUSE, SAFETY	1.4S		EP 40
0106	FUZES, DETONATING	1.1B		EP 41
0107	FUZES, DETONATING	1.2B		EP 41
0110	GRENADES, PRACTICE, hand or rifle	1.4S		EP 41

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0113	GUANYL NITROSAMINOGUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	1.1A	6 for EP10 (a) EP10(b) 5	or10(b)
0114	GUANYL NITROSAMINOGUANYL-TETRAZINE (TETRAZENE), WETTED with not less than 30% water, or mixture of alcohol and water, by mass	1.1A	6 for EP10 (a) EP10(b) 5	or10(b)
0118	HEXOLITE (HEXOTOL), dry or wetted with less than 15% water, by mass	1.1D		EP 12
0121	IGNITERS	1.1G		EP 42
0124	JET PERFORATING GUNS, CHARGED, oil well, without detonator	1.1D		EP 01
0129	LEAD AZIDE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A	6 for EP10(b) 5	EP10(a) or10(b)
0130	LEAD STYPHNATE (LEAD TRINITRORESORCINATE), WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A	6 for EP10(b) 5	EP10(a) or10(b)
0131	LIGHTERS, FUSE	1.4S		EP 42
0132	DEFLAGRATING METAL SALTS OF AROMTIC NITRODERIVATIVES, N.O.S.	1.3C	12 1	EP14(b)
0133	MANNITOL HEXANITRATE (NITROMANNITE),WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1D	5	EP12(a)
0135	MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A	6 for EP10(b) 5	EP10(a) or10(b)
0136	MINES with bursting charge	1.1F		EP 30
0137	MINES with bursting charge	1.1D	EP 30	
0138	MINES with bursting charge	1.2D		EP 30
0143	NITROGLYCERINE, DESENSITIZED with not less than 40% non-volatile water insoluble phlegmatizer, by mass	1.1D	7 8 5	EP 15
0144	NITROGLYCERINE SOLUTION IN ALCOHOL with more than 1% but not more than 10% nitroglycerine	1.1D	13	EP 15

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0146	NITROSTARCH, dry or wetted with less than 20% water ,by mass	1.1D		EP 12
0147	NETRO UREA	1.1D		EP12(b)
0150	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITATE; PETN), WETETED with not less than 20% of water, by mass, or PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), DESENSITIZED with not less than 15% of phlegmatizer, by mass	1.1D	5	EP12(a) or12(b)
0151	PENTOLITE, dry or wetted with less than 15% water, by mass	1.1D		EP12
0153	TRINITROANILINE (PICRAMIDE)	1.1D		EP12(b) or12(c)
0154	TRINITROPHENOL (PICRICACID), dry or wetted with less than 30% water, by mass	1.1D	14 1	EP 12
0155	TRINITROCHLOROBENZENE (PICRYLCHORIDE)	1.1D	14	EP12(b) or12(c)
0158	POTASSIUM SALLTS OF AROMATIC NITO-DERIVATIVES, explosive	1.3C	1	EP14(b)
0159	POWDER CAKE (POWDER PASTE), WETTED with not less then 25% water, by mass	1.3C	5	EP11
0160	POWDER, SMOKELESS	1.1C	15	EP14(b)
0161	POWDER, SMOKELESS	1.3C	15	EP14(b)
0167	PROJECTILES with bursting charge	1.1F		EP 30
0168	PROJECTILES with bursting charge	1.1D		EP 30
0169	PROJECTILES with bursting charge	1.2D		EP 30
0171	AMMUNITION, ILLUMINATING with or Without buster, expelling charge or propelling charge	1.2G		EP 30
0173	RELEASE DEVICES, EXPLOSIVE	1.4S		EP 34
0174	RIVETS, EXPLOSIVE	1.4S		EP 34
0180	ROCKETS with bursting charge	1.1F		EP 30
0181	ROCKETS with bursting charge	1.1E		EP 30
0182	ROCKETS with bursting charge	1.2E		EP 30

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0183	ROCKETS with inert head	1.3C		EP 30
0186	ROCKET MOTORS	1.3C		EP 30
0190	SAMPLES, EXPLOSIVE, other than initiating explosive	-	16	EP 01
0191	SIGNAL DEVICES, HAND	1.4G		EP 35
0192	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G		EP 35
0193	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S		EP 35
0194	SIGNALS, DISTRESS, ship	1.1G		EP 35
0195	SIGNALS, DISTRESS, ship	1.3G		EP 35
0196	SIGNALS, SMOKE	1.1G		EP 35
0197	SIGNALS, SMOKE	1.4G		EP 35
0203	SODIUM SALTS OF AROMATICNIT-RODERIVATIVES; N.O.S., explosive	1.3C	1	EP14(b)
0204	SOUNDING DEVICES, EXPLOSIVE	1.2F		EP 34
0207	TETRANITROANILINE	1.1D		EP12(b) or12(c)
0208	TRINITROPHENYLMETHYL-NITRAMINE (TETRYL)	1.1D		EP12(b) or12(c)
0209	TRINITROTOLUENE (TNT), dry or wetted with less than 30% water, by mass	1.1D	14 17	EP 12
0212	TRACERS FOR AMMUNITION	1.3G		EP 33
0213	TRINITROANISOLE	1.1D		EP12(b) or12(c)
0214	TRINITROBENZENE, dry or wetted with less than 30% water, by mass	1.1D	14	EP 12
0215	TRINITROBENZOIC ACID, dry or wetted with less than 30% water, by mass	1.1D	14	EP 12
0216	TRINITRO-m-CRESOL	1.1D	1	EP12(b) or12(c)
0217	TRINITONAPHTHALENE	1.1D		EP12(b) or12(c)
0218	TRINITROPHENETOLE	1.1D		EP12(b) or12(c)
0219	TRINITRORESORCINOL (STYPHNIC ACID),dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	1.1D	1	EP 12
0220	UREANITRATE, dry or wetted with less than 20% water, by mass	1.1D	18	EP 12

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description or Substance of Article	Classification Code	Special Provisions	Packing Method
0221	WAHEADE, TORPEDO with bursting charge	1.1D		EP 30
0222	AMMUNIUM NITRATE with more than 0.2%combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D		EP12(b) or12(c)
0223	AMMONIUM NITRATE FERTILIZER, which is more liable to explode than ammonium nitrate with 0.2%combustibl4e substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D		EP12(b) or12(c)
0224	BARIUM AZIDE, dry or wetted with less, than 50% water by mass	1.1A	6 for EP10(b)	EP10(a) or10(b)
0225	BOOSTEERS WITH DETONATOR	1.1B		EP 33
0226	CYCLOTETRAMETHYLENETETRANI-TRAMINE (HMX; OCTOGEN), WETTED with not less than 15% water, by mass	1.1D	5	EP12(a)
0234	SODIUM DINITRO-o-CRESOLATE, dry or wetted with less than 15% water, by mass	1.3C	14 1	EP 14
0235	SODIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1.3C	1	EP 14
0236	ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1.3C	1	EP 14
0237	CHARGES,SHAPED, FLEXIBLE,LINEAR	1.4D		EP 38
0238	ROCKETS, LINE-THROWING	1.2G		EP 30
0240	ROCKETS, LINE-THROWING	1.3G		EP 30
0241	EXPLOSIVE, BLASTING, TYPE E	1.1D	19 for EP17	EP 16 or EP17
0242	CHARGES, PROPELLING, FOR CANNON	1.3C		EP 30
0243	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.2H		EP 30
0244	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.3H		EP 30
0245	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.2H		EP 30

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description or Substance of Article	Classification Code	Special Provisions	Packing Method
0246	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.3H		EP30
0247	AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge	1.3J		EP 01
0248	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	1.2L	20	EP 44
0249	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	1.3L	20	EP 44
0250	POCKETE MOTORSWITH HYPER GOLIC LIQUIDS with or without expelling charge or propelling charge	1.3L		EP 01
0254	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1.3G		EP 30
0255	DETONATORS, ELECTRIC for blasting	1.4B		EP 31
0257	FUZES, DETONATING	1.4B		EP 41
0266	OCTOLITE (OCTOL),dry or wetted with less the 15% water, by mass	1.1D		EP 12
0267	DETONATORS, NON-ELECTRIC for blasting	1.4B		EP 31
0268	BOOSTERS WITH DETONATOR	1.2B		EP 33
0271	CHARGES, PROPELLING	1.1C	15	EP 43
0272	CHARGES, PROPELLING	1.3C	15	EP 43
0275	CARTRIDGES, POWER DEVICE	1.3C		EP 34
0276	CARTRIDGES, POWER DEVICE	1.4C		EP 34
0277	CARTRIDGES, OIL WELL	1.3C		EP 34
0278	CARTRIDGES, OIL WELL	1.4C		EP 34
0279	CHARGES, PROPELLING, FOR CANNON	1.1C		EP 30
0280	ROCKET MOTORS	1.1C		EP 30
0281	ROCKET MOTORS	1.2C		EP 30

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description or Substance of Article	Classification Code	Special Provisions	Packing Method
0282	NITROGUANIDINE (PICRITE), dry or wetted with less then 20% water by mass	1.1D		EP 12
0283	BOOSTERS without detonator	1.2D		EP 32
0284	GRENADES, hand or rifle, with bursting charge	1.1D		EP 41
0285	GRENADES, hand or rifle, with bursting charge	1.2D		EP 41
0286	WARHEADS, ROCKET with bursting charge	1.1D		EP 30
0287	WARHEADS, ROCKET with bursting charge	1.2D		EP 30
0288	CHRGES, SHPED, FLEXIBLE, LINEAR	1.1D		EP 38
0289	CORD, DETONATING, flexible	1.4D	4	EP 39
0290	CORD (FUSE), DETONATING, metal clad	1.1D	4	EP 39
0291	BOMBS with bursting charge	1.2F		EP 30
0292	GRENADES, hand or rifle, with bursting charge	1.1F		EP 41
0293	GRENADES, hand or rifle, with bursting charge	1.2F		EP 41
0294	MINES with bursting charge	1.2F		EP 30
0295	ROCKETS with bursting charge	1.2F		EP 30
0296	SOUNDING DEVICES, EXPLOSIVE	1.1F		EP 34
0297	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1.4G		EP 30
0299	BOMBS, PHOTO-FLASH	1.3G		EP 30
0300	AMMUNITION, INCENDIARY with or Without burster, expelling charge or propelling charge	1.4G		EP 30
0301	AMMUNITION, TEAR-RPODUCING With burster, expelling charge or propelling charge	1.4G		EP 30
0303	AMMUNITION, SMOKE with or without burster, expelling or propelling charge	1.4G	2	EP 30
0305	FLASH POWDER	1.3G	11	EP 13
0306	TRACERS FOR AMMUNITION	1.4G		EP 33
0312	CARTRIDGES, SIGNAL	1.4G		EP 35

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description or Substance of Article	Classification Code	Special Provisions	Packing Method
0313	SIGNALS, SMOKE	1.2G		EP 35
0314	IGNITERS	1.2G		EP 42
0315	IGNITERS	1.3G		EP 42
0316	FUZES, IGNITING	1.3G		EP 41
0317	FUZES, IGNITING	1.4G		EP 41
0318	GRENADES, PRACTICE, hand or rifle	1.3G		EP 41
0319	PRIMERS, TUBULAR	1.3G		EP 33
0320	PRIMERS, TUBULAR	1.4G		EP 33
0321	CARTRIDGES FOR WEAPONS with bursting charge	1.2E		EP 30
0322	ROCKET MOTORS WITH HYPER GOLICLIQUIDS with or without expelling charge	1.2L		EP 01
0323	CARTRIDGES, POWER DEVICE	1.4S		EP 34
0324	PROJECTILES with bursting charge	1.2F		EP 30
0325	IGNITERS	1.4G		EP 42
0326	CARTRIDGES FOR WEARONS, BLANK	1.1C		EP 30
0327	CARTRIDGES FOR WEARONS, BLANK or CARTRIDGES SMALL ARMS, BALNK	1.3C		EP 30
0328	CARTRIDGES FOR WEAPONS, INERT PROJECTILE	1.2C		EP 30
0329	TORPEDOES with bursting charge	1.1E		EP 30
0330	TORPEDOES with bursting charge	1.1F		EP 30
0331	EXPLOSIVE, BLASTING, TYPE B	1.5D	21	EP16or EP 17
0332	EXPLOSIVE, BLASTING, TYPE E	1.5D	21	EP16or EP 17
0333	FIREWORKS	1.1G		EP 35
0334	FIREWORKS	1.2G		EP 35
0335	FIREWORKS	1.3G		EP 35
0336	FIREWORKS	1.4G		EP 35
0337	FIREWORKS	1.4S		EP 35

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description or Substance of Article	Classification Code	Special Provisions	Packing Method
0338	CARTRIDGESD FOR WEARONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1.4C		EP 30
0339	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4C		EP 30
0340	NITROCELLULOSE, dry or wetted with less then 25% water (or alcohol), by mass	1.1D	EP12(a)	or12(b)
0341	NITROCELLULOSE, unmodified or plasticized with less than 18% plasticizing substance by mass	1.1D	EP12(b)	
0342	NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	1.3C	22	EP14(a)
0343	NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance,by mass	1.3C	22	EP 11
0344	PROJECTILES with bursting charge	1.4D		EP 30
0345	PROJECTILES, inert with tracer	1.4S		EP 30
0346	PROJECTILES with burster or expelling charge	1.2D		EP 30
0347	PROJECTILES with burster or expelling charge	1.4D		EP 30
0348	CARTRIDGES FOR WEAPONS with bursting charge	1.4F		EP 30
0349	ARTICLES, EXPLOSIVE, N.O.S.	1.4S	23	EP 01
0350	ARTICLES, EXPLOSIVE, N.O.S.	1.4B	23	EP 01
0351	ARTICLES, EXPLOSIVE, N.O.S.	1.4C	23	EP 01
0352	ARTICLES, EXPLOSIVE, N.O.S.	1.4D	23	EP 01
0353	ARTICLES, EXPLOSIVE, N.O.S.	1.4G	23	EP 01
0354	ARTICLES, EXPLOSIVE, N.O.S.	1.1L	23	EP 01
0355	ARTICLES, EXPLOSIVE, N.O.S.	1.2L	23	EP 01
0356	ARTICLES, EXPLOSIVE, N.O.S.	1.3L	23	EP 01
0357	SUBSTANCES, EXPLOSIVE, N.O.S	1.1L	23	EP 01
0358	SUBSTANCES, EXPLOSIVE, N.O.S	1.2L	23	EP 01

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance or Article	Classification Code	Special Provisions	Packing Method
0359	SUBSTANCES, EXPLOSIVE, N.O.S	1.3L	23	EP 01
0360	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.1B		EP 31
0361	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.4B		EP 31
0362	AMMUNITION, PRACTICE	1.4G		EP 30
0363	AMMUNITION, PROOF	1.4G		EP 30
0364	DETONATORS FOR AMMUNITION	1.2B		EP 33
0365	DETONATORS FOR AMMUNITION	1.4B		EP 33
0366	DETONATORS FOR AMMUNITION	1.4S		EP 33
0367	FUZES, DETONATING	1.4S		EP 41
0368	FUZES, IGNITING	1.4S		EP 41
0369	WARHEADS, ROCKET with bursting charge	1.1F		EP 30
0370	WARHEADS, ROCKET with burster or expelling charge	1.4D		EP 30
0371	WARHEADS, ROCKET with burster or expelling charge	1.4F		EP 30
0372	GRENADES, PRACTICE, hand or rifle	1.2G		EP 41
0373	SIGNAL DEVICES, HAND	1.4S		EP 35
0374	SOUNDING DEVICES, EXPLOSIVE	1.1D		EP 34
0375	SOUNDING DEVICES, EXPLOSIVE	1.2D		EP 34
0376	PRIMERS, TUBULAR	1.4S		EP 33
0377	PRIMERS, CAPTYPE	1.1B		EP 33
0378	PRIMERS, CAPTYPE	1.4B		EP 33
0379	CASE, CARTRIDGE, EMPTY, WITH RPIMER	1.4C		EP 36
0380	ARTICLES, PYROPHORIC	1.2L		EP 01
0381	CARTRIDGES, POWER DEVICE	1.2C		EP 34
0382	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.2B	23	EP01
0383	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4B	23	EP 01

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0384	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4S	23	EP 01
0385	5-NITROBENZOTRIAZOL	1.1D		EP12(b) or12(c)
0386	TRINITROBENZENESULPHONIC ACID	1.1D	1	EP12(b) or12(c)
0387	TRINITROFLUORENONE	1.1D		EP12(b) or12(c)
0388	TRINITROTOLUENE (TNT) AND TRINITROBENZENE MIXTURE or TRINITROTOLUENE (TNT) AND HEXANITROSTILBENE MIXTURE	1.1D		EP12(b) or12(c)
0389	TRINITROTOLUENE (TNT) MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D		EP12(b) or12(c)
0390	TRITONAL	1.1D		EP12(b) or12(c)
0391	CYCLOTRIMETHYLENETRINITRA-MINE (CYCLONITE;HEXOGEN; RDX) AND CYCLOTETRMETHYLENE-TETRANITRAMINE (HMX; OCTOGEN) MIXTURES,WETTED with not less than 15% water, by mass or CYCLOTRIMETHY-LENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX) AND CYCLOTETRAMETHYLENE-TETRANITRAMINE, (HMX; OCTOGEN) MIXTURES DESENSITIZED with not less than 10% phlegamtizer, by mass	1.1D	5	EP12(a) EP12(b)
0392	HAXANITROSTILBENE	1.1D		EP12(b) or12(c)
0393	HEXOTONAL	1.1D		EP12(b)
0394	TRINITRORESORCINOL (STYPHNIC ACID)WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1D	1	EP12(a)
0395	ROCKET MOTORS, LIQUID FUELLED	1.2J		EP 01
0396	ROCKET MOTORS, LIQUID FUELLED	1.3J		EP 01

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0397	ROCKETS, LIQUID FUELLED with bursting charge	1.1J		EP 01
0398	ROCKETS, LIQUID FUELLED with bursting charge	1.2J		EP 01
0399	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1.1J		EP 01
0400	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1.2J		EP 01
0401	DIPICRYL SULPHIDE, dry or wetted with less than 10% water, by mass	1.1D	14	EP 12
0402	AMMONIUM PERCHLORATE	1.1D	24	EP12(b) or12(c)
0403	FLARES, AERIAL	1.4G		EP 35
0404	FLARES, AERIAL	1.4S		EP 35
0405	CARTRIDGES, SIGNAL	1.4S		EP 35
0406	DINITROSOBENZENE	1.3C		EP 14
0407	TETRAZOL-1-ACETIC ACID	1.4C		EP 14
0408	FUZES, DETONATING with protective features	1.1D		EP 41
0409	FUZES, DETONATING with protective features	1.2D		EP 41
0410	FUZES, DETONATING with protective features	1.4D		EP 41
0411	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN) with not less than 7% wax, by mass	1.1D	25	EP12(b) or 12 (c)
0412	CARTRIDGES FOR WEAPONS with bursting charge	1.4E		EP 30
0413	CARTRIDGES FOR WEAPONS, BLANK	1.2C		EP 30
0414	CHARGES, PROPELLLING, FOR CANNON	1.2C		EP 30
0415	CHARGES, PROPELLING	1.2C		EP 43
0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.3C		EP 30
0418	FLARES, SURFACE	1.1G		EP 35

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance or Article	Classification Code	Special Provisions	Packing Method
0419	FLARES,SURFACE	1.2G		EP 35
0420	FLARES, AERIAL	1.1G		EP 35
0421	FLARES, AERIAL	1.2G		EP 35
0424	PROJECTILES, inert with tracer	1.3G		EP 30
0425	PROJECTILES, inert with tracer	1.4G		EP 30
0426	PROJECTILES with burster or expelling charge	1.2F		EP 30

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance or Article	Classification Code	Special Provisions	Packing Method
0411	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN)with not less than 7% wax, by mass	1.1D	25	EP12(b) or 12 (c)
0412	CARTRIDGES FOR WEAPONS with bursting charge	1.4E		EP 30
0413	CARTRIDGES FOR WEAPONS, BLANK	1.2C		EP 30
0414	CHARGES, PROPELLLING, FOR CANNON	1.2C		EP 30
0415	CHARGES, PROPELLING	1.2C		EP 43
0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.3C		EP 30
0418	FLARES, SURFACE	1.1G		EP 35
0419	FLARES,SURFACE	1.2G		EP 35
0420	FLARES, AERIAL	1.1G		EP 35
0421	FLARES, AERIAL	1.2G		EP 35
0424	PROJECTILES, inert with tracer	1.3G		EP 30
0425	PROJECTILES, inert with tracer	1.4G		EP 30
0426	PROJECTILES with burster or expelling charge	1.2F		EP 30
0427	PROJECTILES with burster or expelling charge	1.4F		EP 30
0428	ARTICLES, PYROTECHNIC for technical purposes	1.1G		EP 35
0429	ARTICLES, PYROTECHNIC for technical purposes	1.2G		EP 35
0430	ARTICLES, PYROTECHNIC for technical purposes	1.3G		EP 35
0431	ARTICLES, PYROTECHNIC for technical purposes	1.4G		EP 35
0432	ARTICLES, PYROTECHNIC for technical purposes	1.4S		EP 35
0433	POWDER CAKE (POWDER PASTE), WETTED with not less than 17% alcohol, by mass	1.1C	5	EP 11
0434	PROJECTILES with burster or expelling charge	1.2G		EP 30
0435	PROJECTILES with burster or expelling charge	1.4G		EP 30

0437	ROCKETS with expelling charge	1.3C		EP 30
0438	ROCKETS with expelling charge	1.4C		EP 30
0439	CHARGES, SHAPED, COMMERCIAL without detonator	1.2D	3	EP 37
0440	CHARGES, SHAPED, COMMERCIAL without detonator	1.4D	3	EP 37
0441	CHARGES, SHAPED, COMMERCIAL without detonator	1.4S	3	EP 37
0442	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.1D		EP 37
0443	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.2D		EP 37
0444	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4D		EP 37
0445	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4S		EP 37
0446	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.4C		EP 36
0447	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.3C		EP 36
0448	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C	EP14(b)	
0449	TORPEDOES, LIQUID FUELLED with or without bursting charge	1.1J		EP 01
0450	TORPEDOES, LIQUID FUELLED with inert head	1.3J		EP 01
0451	TORPEDOES with bursting charge	1.1D		EP 30
0452	GRENADES, PRACTICE, hand or rifle	1.4G		EP 41
0453	ROCKETS, LINE-THROWING	1.4G		EP 30
0454	IGNIITERS	1.4S		EP 42
0455	DETONATORS, NON-ELECTRIC for blasting	1.4S		EP 31
0456	DETONATORS, ELECTRIC for blasting	1.4S		EP 31
0457	CHARGES, BURSTING, PLASTICS BONDED	1.1D		EP 30
0458	CHARGES, BURSTING, PLASTICS	1.2D		EP 30
0459	CHARGES, BURSTING, PLASTICS BONDED	1.4D		EP 30
0460	CHARGES, BURSTING, PLASTICS BONDED	1.4S		EP 30
0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.1B	23	EP 01
0462	ARTICLES, EXPLOSIVE, N.O.S.	1.1C	23	EP 01

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance of Article	Classification Code	Special Provisions	Packing Method
0463	ARTICLES, EXPLOSIVE, N.O.S.	1.1D	23	EP 01
0464	ARTICLES, EXPLOSIVE, N.O.S.	1.1E	23	EP 01
0465	ARTICLES, EXPLOSIVE, N.O.S.	1.1F	23	EP 01
0466	ARTICLES, EXPLOSIVE, N.O.S.	1.2C	23	EP 01
0467	ARTICLES, EXPLOSIVE, N.O.S.	1.2D	23	EP 01
0468	ARTICLES, EXPLOSIVE, N.O.S.	1.2E	23	EP 01
0469	ARTICLES, EXPLOSIVE, N.O.S.	1.2F	23	EP 01
0470	ARTICLES, EXPLOSIVE, N.O.S.	1.3C	23	EP 01
0471	ARTICLES, EXPLOSIVE, N.O.S.	1.4E	23	EP 01
0472	ARTICLES, EXPLOSIVE, N.O.S.	1.4F	23	EP 01
0473	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1A	23	EP 01
0474	SUBSTANCES, EXPLOSIVE, N.O.S	1.1C	23	EP 01
0475	SUBSTANCES, EXPLOSIVE, N.O.S	1.1D	23	EP 01
0476	SUBSTANCES, EXPLOSIVE, N.O.S	1.1G	23	EP 01
0477	SUBSTANCES, EXPLOSIVE, N.O.S	1.3C	23	EP 01
0478	SUBSTANCES, EXPLOSIVE, N.O.S	1.3G	23	EP 01
0479	SUBSTANCES, EXPLOSIVE, N.O.S	1.4C	23	EP 01
0480	SUBSTANCES, EXPLOSIVE, N.O.S	1.4D	23	EP 01
0481	SUBSTANCES, EXPLOSIVE, N.O.S	1.4S	23	EP 01
0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVI), N.O.S.	1.5D	23	EP 01
0483	CYCLOTRIMETHYLENETRINT-(RAMINE CYCLONITE; HEXOGEN; RDX), DESENSITIZED	1.1D		EP12(b) or12(c)
0484	CYCLOTETRAMETHYLENETETRANI TRAMINE (OCTOGEN, HMX), DESENSITIZED	1.1D		EP12(b) or12(c)
0485	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4G	23	EP 01
0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI)	1.6N		EP 01
0487	SIGNALS, SMOKE	1.3G		EP 35
0488	AMMUNITION, PRACTICE	1.3G		EP 30
0489	DINITROGLYCOLURIL (DINGU)	1.1D		EP12(b) or12(c)
0490	NITROTRIAZOLONE (NTO)	1.1D		EP12(b) or 12(c)
0491	CHARGES, PROPELLING	1.4C	15	EP 43

LIST OF SUBSTANCES OR ARTICLES BY UN SERIAL NUMBER

UN Serial Number	Description of Substance or Article	Classification Code	Special Provisions	Packing Method
0492	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G		EP 35
0493	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G		EP 35
0494	JET PERFORATING GUNS, CHARGED, oil well, without detonator	1.4D		EP 01
0495	PROPELLANT, LIQUID	1.3C	267 8	EP 15
0496	OCTONAL	1.1D	EP12(b) or12(c)	
0497	PROPELLANT, LIQUID	1.1C	267 8	EP 15
0498	PROPELLANT,SOLID	1.1C		EP 14
0499	PROPELLANT, SOLID	1.3C		EP 14

Annexure 1

PACKING METHODS FOR EXPLOSIVES

Notes:

(1) Whenever Boxes, natural wood, ordinary (4C1) are listed in this annexure, a Box, natural wood, sift-proof walls (4C2) may be used instead.

(2) Leak proof packaging should correspond to a design type that has passed leak proofness test at the Packing Group II level.

(3) The term receptacle used in the Inner and Intermediate packing columns of this table includes boxes, bottles, cans, drums, jars and tubes, including any means of closure.

(4) Reels are device made of plastics, wood, fibre-board, metal or other suitable material comprising a central spindle with or without side walls at each end of the spindle. Articles and substances can be wound onto the spindle and may be retained by side walls.

(5) Trays are sheets of metal, plastics, wood, fibre-board or other suitable material which are placed in the inner, intermediate or outer packaging and achieve a close-fit in such packaging. The surface of the tray may be shaped so that packaging or articles can be inserted, held secure and separated from each other.

(6) Some UN number cover substances which may be transported dry or wetted. Where appropriate, the heading of the packing method indicates whether it is suitable for the dry, powder or wetted substance.

LIST OF PACKING METHODS FOR EXPLOSVIE

METHOD EP 01

Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements

Division, Compatibility group and UN number:

1.1A: 0473
1.1B: 0461
1.1C: 0462, 0474
1.1D: 0124, 0463, 0475
1.1E: 0464
1.1F: 0465
1.1G: 0476
1.1J: 0397, 0399, 0449
1.1L: 0354, 0357
1.2B: 0382
1.2C: 0466
1.2D: 0467
1.2E: 0468
1.2F: 0469
1.2J: 0395, 0398, 0400
1.2K: 0020
1.2L: 0322, 0355, 0358, 0380
1.3C: 0470, 0477
1.3G: 0478
1.3J: 0247, 0396, 0450
1.3K: 0021
1.3L: 0250, 0356, 0359
1.4B: 0350, 0383
1.4C: 0351, 0479
1.4D: 0352, 0480, 0494
1.4E: 0471
1.4F: 0472
1.4G: 0353, 0485
1.4S: 0349, 0384, 0481
1.5D: 0482
1.6N: 0486
Other: 0190

Special provisions:

16 for 0190

23 for 0349, 0350, 0351, 0352, 0353, 0354, 0355, 0356, 0357, 0358, 0359, 0382, 0383, 0384, 0461, 0462, 0463, 0464, 0465, 0466, 0467, 0468, 0469, 0470, 0471, 0472, 0473, 0474, 0475, 0476, 0477, 0478, 0479, 0480, 0481, 0482 and 0485

Note: “Packaging approved by the competent authority is to be used only”

METHOD EP 10(a)

Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags plastics textile, plastic coated or lined rubber textile, rubberized textile	Bags plastics textile, plastic coated or lined rubber textile, rubberized Receptacles plastics metal	Drums steel, removable head(1A2) plastics, removable head(1H2)

Division. Compatibility group and UN number:
1.1A: 0074, 0113, 0114, 0129, 0130, 0135, 0224
Special provisions:
5 for 0074, 0113, 0114, 0129, 0130, 0135
Note:
1: The intermediate packaging should be filled with water saturated material such as an anti-freeze solution or wetted cushioning.
2: Outer packaging should be filled with water saturated material such as an anti-freeze solution or wetted cushioning. Outer packaging should be constructed and sealed to prevent evaporation of the wetting solution except when 0224 is being carried dry.

METHOD EP 10(b)

Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacles metal wood rubber, conductive plastics, conductive Bags rubber, conductive plastics, conductive	Dividing partitions metal wood plastics fibre-board	Boxes natural wood, sift proof wall(4C2) plywood (4D) reconstituted wood (4F)

Division, Compatibility group and UN number:1.1A: 0074, 1133, 0114, 0129, 0130, 0135, 0224
Special provisions: 6 for 0074, 0113, 0114, 0129, 0130, 0135, 0224

METHOD EP 11		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags Paper, waterproofed Plastics Textile, rubberized Sheets Plastics Textile, rubberized	Not necessary fibre board (1G) Steel (4A) aluminium(4B) Natural wood, ordinary Plywood (4D) Reconstituted wood (4F) fibre board(4G) Plastics, expanded (4H1) Plastics, solid (4H2)	Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood plastics, removable head (1H2) Boxes (4C1)

Division, Compatibility group and UN number:

1.1C: 0433

1.3C: 0159, 0343

Special provisions:

see Para 5(h), Section III

22 for 0343

5 for 0159, 0433

Note:

Inner packaging are not required for 0159 when metal (1A2or 1B2) or plastics (1H2) drums are used as outer packaings.

METHOD EP 12(a) (solid wetted 1.1D)		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper, multiwall, water resistant plastics textile textile, rubberized woven plastics Receptacles metal plastics	Bags plastics textile, plastic coated or lined Receptacles metal plastics	Boxes steel(4A) aluminium(4B) natural wood, ordinary (4C1) plywood(4D) reconstituted wood(4F) fibre board(4G) plastics, expanded (4H1) plastics, solid (4H2) Drums Steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) Plastics, removable Head (1H2)

Division, Compatibility group and UN number:

1.1D: 0004, 0072, 0076, 0078, 0118, 0133, 0146, 0150, 0151, 0154, 0209, 0214, 0215, 0219, 0220, 0226, 0266, 0282, 0340, 0391, 0394, 0401

Special provisions:

14 for 0154, 0209, 0214, 0215, 0401
18 for 0220
1 for 0004, 0076, 0078, 0154, 0219, 0394
17 for 0209
5 for 0072, 0133, 0150, 0226, 0391

Note:

1: Intermediate packaging are not required if leak proof drums are used as the outer packaging.
2: Intermediate packaging are not required for 0072 and 0226.

METHOD EP 12(b) (solid dry, other than powder 1.1D)		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper, Kraft paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	Bags (for 0150 only) plastics textile, plastic coated or lined	Bags woven plastics, sift-proof (5H2/3) plastics, film (5H4) textile, sift-proof(5L2) textile, water resistant (5L3) paper, multiwall, water resistant (5M2) Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood(4D) reconstituted wood (4F) fibre-board (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.1D: 0004, 0076, 0078, 0079, 0118, 0146, 0147, 0150, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0266, 0282, 0340, 0341, 0385, 0386, 0387, 0388, 0389, 0390, 0391, 0392, 0393, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496

Special provisions:

14 for 0154,.0155,.0209,.0214,.0215,.0401
18 for 0220
25 for 0411

24 for 0402
1 for 0004, 0076, 0078, 0154, 0216, 0219, 0386
17 for 0209
5 for 0150, 0391

Note:

Inner packaging are not required for 0222 and 0223 when the outer packaging is a bag.

METHOD EP 12(c) (for solid dry powder 1.1D		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper, multiwall water resistant plastics woven plastics Receptacles fibreboard metal plastics wood	Bags paper, multiwall, water resistant with inner lining plastics Receptacles metal plastics	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium removable head(1B2) fibre (1G)

Division, Compatibility group and UN number:

1.1D: 0004, 0076, 0078, 0079, 0118, 0146, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0226, 0282, 0385, 0386, 0387, 0388, 0389, 0390, 0392, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496

Special provisions:

14 for 0154,.0155,.0209,.0214,.0215,.0401
18 for 0220
25 for 0411
24 for 0402
1 for 0004, 0076, 0078, 0154, 0216, 0219, 0386
17 for 0209

Note:

1: Intermediate packaging are not required if drums are used as the outer packaging.

2: These packages should be sift-proof.

METHOD EP 13		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper, plastics textile, rubberized Receptacles Fibre-board metal plastics wood Sheets paper, kraft paper, waxed	Not necessary	Boxes steel (4A) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)

Division, Compatibility group and UN number:

1.1D: 0027, 0028
1.1G: 0094
1.3G: 0305

Special provisions:

Para 6(o), Section III for 0027 when in inner packaging are not used 11 for 0094, 0305

Note:

1: Inner packaging are not necessary for 0027 when drums are used as the outer packaging.
2: Packaging should be sift-proof
3: Sheets may only be used for 0028.

METHOD EP 14(a) (solid wetted)		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
` Bags plasticsplastics textile woven plastics Receptacle metal plastics	Bags plastics textile, plastic coated or lined Receptacle metal plastics	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums Steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.3C: 0077, 0234, 0235, 0236, 0342

Special provisions:

14 for 0234

22 for 0342

1 for 0077, 0234, 0235, 0236

Note:

1: Inner packaging are not required for 0342 when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packaging.

2: Intermediate packaging are not required if leakproof removable head drums are used as the outer packaging.

METHOD EP 14(b) (solid dry)		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags Paper Kraft plastics textile, sift-proof woven plastics, Sif-proof Receptacles Fibre-board metal paper plastics woven plastics sift-proof	Not necessary	Boxes natural wood, ordinary plywood (4D) reconstituted wood (4F) fibre-board (4G) Drums steel, removable head(1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Divisions, Compatibility group and UN number:

1.1C: 0160, 0498
1.3C: 0077, 0132, 0161, 0234, 0235, 0236, 0406, 0499
1.4C: 0407, 0448

Special provisions:

Para 6(O), Section III for 0160 and 0161, when metal drums (1A2 or 1B2) are used as the outer packaging.

12 for 0132

1 for 0132, 0077, 0234, 0235, 0236

15 fir 0160 and 0161, when metal drums (1A2 or 1B2) are used as the outer packaging.

Note:

Inner packaging's are not required for 0160 and 0161 if drums are used as the outer packaging.

METHOD EP 15		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacle metal plastics	Bags plastics in metal receptacles Drums metal	Box wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) Plywood (1D) fibre (1G)

Division, Compatibility group and UN number:

1.1C: 0497
1.1D: 0075, 0143, 0144
1.3C: 0495

Special provisions:

26 for 0495 and 0497
7 for 0075, 0143, 0495 and 0497 when boxes are used as the outer packaging.
8 for 0075, 0143, 0495 and 0497 when drums are used as the outer packaging.
13 for 0143
5 for 0075 and 0143

Note: 1: metal receptacles as inner packaging may only be used for 0144
2: bags are to be used as intermediate packaging for 0075, 0143, 0495 and 0497 when boxes are used as outer packaging.
3: drums are to be used as intermediate packaging for 0075, 0143, 0497 and 0497 when drums are used as outer packaging.
4: intermediate packaging are not necessary for 0144.
5: fibre-board boxes (4G) may only be used for 0144.
6: aluminium drums, removable head (1B2) are not allowed for 0144.

METHOD EP 16		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper, wetted and oil resistant plastics textile, plastic coated or lined woven plastics, sift-proof Receptacle Fibre-board, water resistant metal plastics wood, sift-proof Sheets paper, water resistant paper, waxed plastics	Note necessary	Bags woven plastics (5H1/ 2/3) paper, multiwall, water resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3) Boxes steel(4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2) Jerri cans steel, removable head (3A2) plastics, removable head (3H2)

Division, Compatibility group and UN number:

1.1D: 0081, 0082, 0083, 0084, 0241

1.5D: 0331, 0332

Special provisions:

10 for 0083

21 for 0331 and 0332

Note:

1: Inner packaging is notnecessary for 0082, 0241, 0331 and 0332 if leak proof removable head drums are used as the outer packaging.

2: Inner packaging is not required for 0082, 0084, 0241, 0331 and 0332 when the explosive is contained in a material impervious to liquid.

3: Inner packaging is not required for 0081 when contained in rigid plastic which is impervious to nitric esters.

4: Inner packaging is not required for 0331 when Bags (5H2), (5H3) or are used as outer packaging.

5: Bags (5H2) and (5H3) should be used only for 0082, 0241, 0331 and 0332

6: Bags should not be used as outer packaging for 0081

METHOD EP 17

Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Not necessary	Not necessary	IBCs metal (11A), (11B), (11N) (21A), (21B), (21N) (31A), (31B), (31N) flexible (13H2), (13H3) (13H4), (13L2), (13L3) (13L4), (13M2) Rigid Plastics (11H1), (11H2), (21H1), (21H2), (31H1), (31H2) composite (11HZ1) (11HZ2), (21HZ1), (21HZ2) (31HZ1), (31HZ2)

Division, Compatibility group and UN number:

1.1D: 0082, 0241

1.5D: 0331, 0332

Special Provisions:

9 for 0082

19 for 0241

21 for 0331, 0332

Note:

1: IBCs should only be used for free flowing substances.

2: metal IBCs should not be used for 0082 and 0241

3: flexible IBCs should be used for solids only.

METHOD EP 30		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.1C: 0279, 0280, 0326
1.1D: 0034, 0038, 0048, 0056, 0137, 168, 0221, 0286, 0451, 0457
1.1E: 0006, 0181, 0329
1.1F: 0005, 0033, 0037, 0136, 0167, 0180, 0330, 0369
1.2C: 0281, 0328, 0413, 0414, 0436
1.2D: 0035, 0138, 0169, 0287, 0346, 0458
1.2E: 0182, 0321
1.2F: 0007, 0291, 0294, 0295, 0324, 0426
1.2G: 0009, 0015, 0018, 0039, 0717, 0238, 0434
1.2H: 0243, 0245
1.3L: 0183, 0186, 0242, 0327, 0417, 0417
1.3G: 0010, 0016, 0019, 0240, 0254, 0299, 0424, 0488
1.3H: 0244, 0246
1.4C: 0338, 0339, 0438
1.4D: 0344, 0347, 0370, 0459
1.4E: 0412
1.4F: 0348, 0371, 0427

1.4G: 0297, 0300, 0301, 0303, 0362, 0363, 0425, 0435, 0453
1.4S: 0012, 0014, 0345, 0460

Special provisions:

Para 6(m), Sec III applies to all umbers except for 0005, 0007, 0012, 0014, 0033, 0037, 0136, 0167, 0180, 0238, 0240, 0242, 0279, 0291, 0294, 0295, 0324, 0326, 0327, 0330, 0338, 0339, 0348, 0369, 0371, 0143, 0414, 0417, 0426, 0427, 0453, 0458, 0459, 0460

Para 6(o), Sec III for 0457, 0458, 0459, 0460

2 for 0015, 0016 and 0303

METHOD EP 31

Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper plastics Receptacle Fibre board metal plastics wood Reels	Not necessary	Boxes steel(4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre board (4G) Drums steel removable Head (1A2) aluminium removable Head (1B2) fibre (1G) plastics removable head (1H2)

Division, Compatibility group and UN number:

1.1B: 0029, 0030, 0360
1.4B: 0255, 0267, 0361
1.4S: 0455, 0456, 0500

Special provisions:

Note:

1: Bags should not be used as inner packaging for 0029, 0267 and 0455

2: Reels should only be used as inner packaging for 0030, 0255, 0360, 0361, 0456 and 0500

METHOD EP 32(a)		
Articles consisting of closed metal, plastics or fibre-board casings that contain a detonating explosive or consisting of plastics-bonded detonating explosives		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre board (4G) plastics, solid (4H2)

Division, Compatibility group and Un number:
1.1D: 0042, 0060
1.2D: 0283
Special provision:

METHOD EP 32(b)		
Articles without casings		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacles Fibre-board metal plastics Sheets paper plastics	Not necessary	Boxes steel(4A) aluminium (4B) wood, natural ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre board (4G) plastics, solid (4H2)

Division, Compatibility group and UN number:

1.1D: 0042, 0060

1.2D: 0283

Special provisions:

Para 6(o), Sec III for 0042, 0060 and 0283

METHOD EP 33		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacles Fibre board metal plastics wood Trays, fitted with dividing partitions fibre board plastics wood	Receptacles fibre board metal plastics wood	Boxes steel (4A) aluminium (4B) wood, natural ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre board (4G) plastics, solid (4H2)

Division, Compatibility group and UN number:

1.1B: 0073, 0225, 0377

1.1D: 0243

1.2B: 0268, 0364

1.3G: 0212, 0319

1.4B: 0365, 0378

1.4G: 0306, 0320

1.4S: 0044, 0366, 0376

Special provisions:

Note:

1: Trays should only be used as inner packaging for 0044, 0073, 0319, 0320, 0364, 0365, 0366, 0376, 0377 and 0378

2: Receptacles are only required as intermediate packaging when the inner packaging are trays

METHOD EP 34		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags water resistant Receptacles Fibre-board metal plastics wood Sheets Fibre=board, corrugated Tubes fibre board	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A4) aluminium, removable head (1B2)

Division, Compatibility group and UN number:

1.1D: 0099, 0374
1.1F: 0296
1.2C: 0381
1.2D: 0375
1.2F: 0204
1.3C: 0275, 0277
1.4C: 0276, 0278
1.4S: 0070, 0173, 0174, 0323

METHOD EP 35		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head aluminium, removable head (1B2) fibre (1G) plastics plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.1G: 0049, 0192, 0194, 0196, 0333, 0418, 0420, 0428
1.2G: 0313, 0334, 0419, 0421, 0429
1.3G: 0050, 0054, 0092, 0093, 0195, 0335, 0430, 0487, 0492
1.4G: 0191, 0197, 0312, 0336, 0403, 0431, 0493
1.4S: 0193, 0337, 0373, 0404, 0405, 0432

METHOD EP 36		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags plastics textile Boxes fibre-board plastics wood Dividing partitions in the outer packaging	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, expanded ($4H_2$) plastics, solid (4H2) Drums steel, removable head ($1A_2$) aluminium, removable head (1B2) fibre (1G) plastics plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.3C: 0447
1.4C: 0379, 0446
1.4S: 0055

METHOD EP 37		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags plastics Boxes fibre-board Tubes fibre-board metal plastics Dividing partitions in the outer packaging	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G)

Division, Compatibility group and UN number:

1.1D: 0059, 0442
1.2D: 0439, 0443
1.4D: 0440, 0444
1.4S: 0441, 0445

Special provisions:

3 for 0059, 0439, 0440 and 0441

METHOD EP 38		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2)

Division, Compatibility group and UN number:

1.1D: 0288

1.4D: 0237

Special provisions:

Para 6(o), Sec III for 0237 and 0288

Note:

If the ends of the articles are sealed, inner packaging are not necessary

METHOD EP 39		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags plastics Receptacle fibre-board metal plastic wood Reel Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.1D: 0065, 0290
1.2D: 0102
1.4D: 0104, 0289

Special provisions:

4 for 0065, 0102, 0104, 0289 and 0290

Note:

Inner packaging is not required for 0065 and 0289 when they are in coils.

METHOD EP 40		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags Plastics Reel Sheets Paper, Kraft Plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) Reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums Steel, removable head (1A2) aluminium, removable Head (1B2) fibre (1G)

Division, Compatibility group and UN number:

1.3G: 0101
1.4G: 0066, 0103
1.4S: 0105

Special provisions:

Para 6(o) Sec III for 0105

Note:

1 if the ends of 0105 are sealed, no inner packaging is required
2 for 0101, the packaging should be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps.
3 steel and aluminium (boxes and drums) may not be used for 0101

METHOD EP 41		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacles fibre-board metal plastics wood Trays, fitted with dividing partitions plastics wood Dividing partitions in the outer packaging	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and UN number:

1.1B: 0106
1.1D: 0284, 0408
1.1F: 0292
1.2B: 0107
1.2D: 0285, 0409
1.2F: 0293
1.2G: 0372
1.3G: 0316, 0318
1.4B: 0257
1.4D: 0410
1.4G: 0317, 0452
1.4S: 0110, 0367, 0368

METHOD EP 42		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags paper plastics Receptacle fibre-board metal plastics wood Sheets paper Trays, fitted with dividing partitions plastic	Not necessary steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1Q) plastics, removable head (1H2)	Boxes

Division, Compatibility group and UN number:

1.1G: 0121
1.2G: 0314
1.3G: 0315
1.4G: 0325
1.4S: 0131, 0454

METHOD EP 43		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Bags Paper, kraft plastics textile textile, rubberized Receptacles fibre-board metal plastics Trays, fitted with partitions plastics wood	Not necessary steel, removable head ($1A_2$) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibre-board (4G) plastics, solid (4H2) Drums dividing

Division, Compatibility group and UN number:

1.1C: 0271
1.2C: 0415
1.3C: 0272
1.4C: 0491

Special provision:

15 for 0271, 0272, 0415 and 0491 when metal packaging are used

Note:

Instead of the above inner and outer packaging, composite packaging (6HH2) (plastic receptacle with outer solid box) may be used.

METHOD EP 44		
Inner packaging and arrangements	Intermediate packaging and arrangements	Outer packaging and arrangements
Receptacles Fibre-board metal plastics Dividing partitions in the outer packaging	Not necessary	Boxes steel (4A) aluminium (4A) wood, natural, ordinary (4C1) with metal liner plywood (4D) with metal liner reconstituted wood (4F) with metal liner plastic, expanded (4H1)

Division, Compatibility group and UN number:

1.2L: 0248

1.3L: 0249

Special provisions:

20 for 0248 and 0249

Annexure - 2

SPECIAL PROVISIONS FOR PACKING OF EXPLOSIVES

1. Packaging should be lead free, (0004, 0076, 0077, 0078, 0132, 0154, 0158, 0203, 0216, 0219, 0234, 0235, 0236, 0238, 0394).
2. Articles containing smoke-producing substance(s) corrosive according to the criteria for class 8 should be labeled with "CORROSIVE" subsidiary risk label.
3. When the shaped charges are packed singly, the conical cavity should face downwards and the package marked "THIS SIDE UP". When the shaped charged are packed in pairs, the conical cavities should face inwards to minimize the jetting effect in the event of accidental initiation (UN 0059, 0439, 0440, 0441).
4. The ends of the detonating cord should be sealed, for example, by a plug firmly fixed so that the explosive cannot escape. The ends of CORD DETONATING flexible should be tied fast (UN 0065, 0102, 0104, 0289, 0290).
5. substance, when containing less alcohol, water or phlegmatizer This than specified, should not be transported unless specifically authorized by the competent authority (UN 0072, 0074, 0075, 0113, 0114, 0129, 0130, 0133, 0135, 0143, 0150, 0159, 0226, 0391, 0433).
6. The following conditions should be satisfied:
   (a) No inner packaging should contain more than 50% of explosive substance (quantity corresponding to dry substance).
   (b) No compartment between dividing partitions should contain more than one inner packaging, firmly fitted.
   (c) The outer packaging should be partitioned into up to 25 compartments (0074, 0133, 0114, 0129, 0130, 0135, 0244)]
7. Inner packaging should have taped screw cap closures and be not more than 5 litres capacity each. Inner packaging should be surrounded with non-combustible absorbent cushioning materials. The amount of absorbent cushioning material should be sufficient to absorb the liquid contents. Metal receptacles should be cushioned from each other. Net mass of propellant is limited to 30kg for each package when outer packaging are boxes (0075, 0143, 0495, 0497).
8. When intermediate packaging are drums, they should be surrounded with non-combustible cushioning material in a quantity sufficient to absorb the liquid contents. A composite packaging consisting of a plastic receptacle in a metal drum may be used instead of the inner and intermediated packaging. The net volume of propellant in each package should not exceed 120 litres (0075, 0143, 0495, 0497)
9. This packing method may only be used for explosives of 0082 which are mixtures of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives should not contain nitroglycerin, similar liquid organic nitrates, or chlorates (0082).
10. Any explosives, Blasting, type C containing chlorates should be segregated from explosives containing ammonium nitrate or other ammonium salts (0083).
11. No more than 50 g of substance should be packed in an inner packaging (0094, 0305).
12. Arrangement for the carriage of [UN 0132] should conform to the following:

"National or International regulations may list, either as single or as suitable collective entries, substances or articles which do not appear in these regulations. A "generic" or "not otherwise specified" (N.O.S.) entry may be used to permit the transport of substances or articles which do not appear specifically by name in the list of dangerous goods. Such an article or substance may be transported only after its dangerous properties have been determined. The substance or article then be classified according to the class definitions and test criteria and the name which most appropriately describes the substance. The classification should be made by the appropriate competent authority. Once the class of the substance or article has been so established, all conditions for dispatch and transport, as provided in these regulations, should be met. Any substance or article having or suspected of having explosive characteristics should first be considered for inclusion in class 1. Some collective entries may be of the "generic" or "not otherwise specified" type provided that the regulations contain provisions ensuring safety, both by excluding extremely dangerous goods from normal transport and by covering all subsidiary risks inherent in some goods.

13. Absorbent cushioning material should be inserted (0144).
14. For small quantities of not more than 500 g, with not less than 10% water, by mass, may also be classified in Division 4.1, subject to special provisions with respect to packaging.
15. Metal packaging should be so constructed that the risk of explosion, by reason of increase in internal pressure form internal or external causes is prevented (0160, 0161, 0271, 0272, 0415, 0491].
16. Samples of new or exiting explosive substances or articles may be transported as directed by the competent authorities for purposes including: testing, classification research and development, quality control, or as a commercial sample. Explosives samples which are not wetted or desensitized should be limited to 10kg in small packages as specified by the competent authorities. Explosives samples which are wetted or desensitized should be limited to 25kg.
17. Bags shift-proof (5H2) recommended for flake or prilled TNT in the dry state and a maximum net mass of 30kg (0209).
18. For quantities of not more than 11.5 kg, this substance, with not less than 10% water, by mass, may also be classified in Div 4.1, subject to special provisions with respect to packaging.
19. This packing method may only be used for explosives of 0241 which consists of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include hydrocarbons or aluminium powder, but should not include nitro-derivatives such as trinitrotoluene (0241)
20. Packaging should be protected against the ingress of water. When CONTRIVANCES, WATER ACTIVATED are transported unpackaged, they should be provided with at least two independent protective features which prevent the ingress of water (0284, 0249).
21. The word "AGENT" may be used instead of "EXPLOSIVE" when approved by the competent authority (0331, 0332).

22. Nitrocellulose with not less than 25% alcohol by mass, or not less than 18% plasticizing substance by mass and not more than 12.6% nitrogen by dry mass, packed in receptacles so constructed that explosion by reason of increased internal pressure is not possible may be appropriately classified in Division 4.1
23. This designation should be used only when no other appropriate designation exists in the list, and only with the approval of the competent authority of the country of origin.
24. The classification of these substances is expected to vary especially with the particle size and packaging but the borderlines have not been experimentally determined, appropriate classification should be verified following the classification procedure.
25. The phlegmatised substance must be significantly less sensitive then dry PETN.
26. Unless it can be demonstrated by testing that the sensitivity of the substance in its frozen state is no greater than in its liquid state, the substance should remain liquid during normal transport conditions. It should not freeze above – 15^0C.

Specimen primary risk label

CLASS I
Explosive substances or articles

Figure-I

Symbol (exploding bomb): black; background: orange; Figure 'I' in bottom corner

Background: orange; Figures: black; Numerals must be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm x 100 mm); Figure 'I' in bottom corner

** Place for division
* Place for compatibility group