



Secretariat

Distr.
GENERAL

ST/SG/AC.10/C.4/2004/5
28 April 2004

Original: ENGLISH

**COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the Globally Harmonized System
of Classification and Labelling of Chemicals

Seventh session, 14-16 July 2004
Item 2 (a) of the provisional agenda

**UPDATING OF THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS (GHS)**

Physical hazards

Classification of explosives

Transmitted by the European Chemical Industry Council (CEFIC)

Introduction

Chapter 2.1 of the GHS on the classification of Explosives is based on the text from the United Nations Recommendations on the Transport of Dangerous Goods and the United Nations Manual of Tests and Criteria. Unstable Explosives are precluded from transport, but need to be classified so that they can be regulated in the workplace.

The issue

Figure 2.1 of the GHS is based on Figure 10.1 from the United Nations Manual of Tests and Criteria and rejects Unstable Explosives from the classification procedure. However Unstable Explosives may occur in the workplace and need to be classified so that they can be regulated for the workplace, whilst at the same time maintaining their differentiation from other explosives so that they can be precluded from transport.

Proposal

CEFIC is proposing minor amendments to Chapter 2.1 of the GHS to rectify the problem, and at the same time make some minor editorial amendments to the Chapter to bring it in line with GHS, rather than transport, terminology. The proposal covers amendments to Chapter 2.1 except for Figure 2.1.3, and the guidance in 2.1.4.2.

Deleted text is struck through, and replacement or additional text is in underlined red italic text.

PROPOSAL FOR REVISION OF CHAPTER 2.1

EXPLOSIVES

2.1.1 Definitions and general considerations

2.1.1.1 An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.

A pyrotechnic substance (or mixture) is a substance or mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.

An explosive article is an article containing one or more explosive substances or mixtures.

A pyrotechnic article is an article containing one or more pyrotechnic substances or mixtures.

2.1.1.2 The class of explosives comprises:

- (a) Explosive substances and mixtures;
- (b) Explosive articles, except devices containing explosive substances or mixtures in such quantity or of such a character that their inadvertent or accidental ignition or initiation shall not cause any effect external to the device either by projection, fire, smoke, heat or loud noise; and
- (c) Substances, mixtures and articles not mentioned under (a) and (b) above which are manufactured with the view to producing a practical, explosive or pyrotechnic effect.

2.1.2 Classification criteria

2.1.2.1 Substances, mixtures and articles of this class *which are not classified as an unstable explosive* are assigned to one of the following six divisions depending on the type of hazard they present:

- (a) Division 1.1 Substances, mixtures and articles which have a mass explosion hazard (a mass explosion is one which affects almost the ~~entire load~~ *quantity present* virtually instantaneously);
- (b) Division 1.2 Substances, mixtures and articles which have a projection hazard but not a mass explosion hazard;
- (c) Division 1.3 Substances, mixtures and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:
 - (i) combustion of which gives rise to considerable radiant heat; or
 - (ii) which burn one after another, producing minor blast or projection effects or both;

- (d) Division 1.4 Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package;
- (e) Division 1.5 Very insensitive substances or mixtures which have a mass explosion hazard: substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions;
- (f) Division 1.6 Extremely insensitive articles which do not have a mass explosion hazard: articles which contain only extremely insensitive detonating substances or mixtures and which demonstrate a negligible probability of accidental initiation or propagation.

2.1.2.2 Explosives which are not classified as an unstable explosive are classified in one of the six divisions above based on Test Series 2 to 8 in Part I of the *UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria* according to the following table:

Table 2.1.1: Criteria for explosives

Category	Criteria
Unstable^a explosives or explosives of Division 1.1 to 1.6	For explosives of Divisions 1.1 to 1.6, the following are the core set of tests that need to be performed: Explosibility: according to UN Test series 2 (Section 12 of the <i>UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria</i>). Intentional explosives ^b are not subject to UN Test series 2. Sensitiveness: according to UN Test series 3 (Section 13 of the <i>UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria</i>). Thermal stability: according to UN Test 3(c) (Sub-section 13.6.1 of the <i>UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria</i>). Further tests are necessary to allocate the correct Division.

^a *Unstable explosives are those which are thermally unstable and/or too sensitive for normal handling and use. Special precautions are necessary.*

^b *This comprises substances, mixtures and articles which are manufactured with a view to producing a practical, explosive or pyrotechnic effect.*

NOTE 1: *Explosive substances or mixtures in packaged form and articles may be classified under divisions 1.1 to 1.6 and, for some regulatory purposes, are further subdivided into compatibility groups A to S to distinguish technical requirements (see UN Recommendations on the Transport of Dangerous Goods, Model Regulations, Chapter 2.1).*

NOTE 2: Some explosive substances and mixtures are wetted with water or alcohols or diluted with other substances to suppress their explosives properties. They may be treated differently from explosive substances and mixtures (as desensitized explosives) for some regulatory purposes (e.g. transport).

NOTE 3: For classification tests on solid substances or mixtures, the tests should be performed on the substance or mixture as presented. If for example, for the purposes of supply or transport, the same chemical is to be presented in a physical form different from that which was tested and which is considered likely to materially alter its performance in a classification test, the substance or mixture must also be tested in the new form.

2.1.3 Hazard communication

General and specific considerations concerning labelling requirements are provided in *Hazard Communication: Labelling* (Chapter 1.4). Annex 2 contains summary tables about classification and labelling. Annex 3 contains examples of precautionary statements and pictograms which can be used where allowed by the competent authority.

Table 2.1.2: Label elements for explosives

	<u>Unstable Explosive</u>	Division 1.1	Division 1.2	Division 1.3	Division 1.4	Division 1.5	Division 1.6
Symbol	<u>Exploding bomb</u>	Exploding bomb	Exploding bomb	Exploding bomb	1.4 on orange background ^a	1.5 on orange background ^a	1.6 on orange background ^a
Signal word	<u>Danger</u>	Danger	Danger	Danger	Warning	Warning	No signal word
Hazard statement	<u>Unstable Explosive</u>	Explosive; mass explosion hazard	Explosive; severe projection hazard	Explosive; fire, blast or projection hazard	Fire or projection hazard	May explode in fire	No hazard statement

^a Applies to substances, mixtures and articles subject to some regulatory purposes (e.g. transport).

2.1.4 Decision logic and guidance

The decision logic and guidance, which follow, are not part of the harmonized classification system, but have been provided here as additional guidance. It is strongly recommended that the person responsible for classification studies the criteria before and during use of the decision logic.

2.1.4.1 Decision logic

The classification of substances, mixtures and articles in the class of explosives and further allocation to a division is a very complex, three step procedure. Reference to Part I of the *UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria*, is necessary. The first step is to ascertain whether the substance or mixture has explosive effects (Test Series 1). The second step is the acceptance procedure (Test Series 2 to 4) and the third step is the assignment to a hazard division (Test Series 5 to 7). The assessment whether a candidate for “ammonium nitrate emulsion or suspension or gel, intermediate for blasting explosives (ANE)” is insensitive enough for inclusion in Division 5.1 as an oxidizing liquid (Chapter 2.13) or an oxidizing solid (Chapter 2.14) is answered by test Series 8 tests. The classification procedure is according to the following decision logic (see Figures 2.1.1 to ~~2.1.3~~ 2.1.4).

Figure 2.1.1: Overall scheme of the procedure for classifying a substance, mixture or article in the class of explosives (Class 1 for transport)

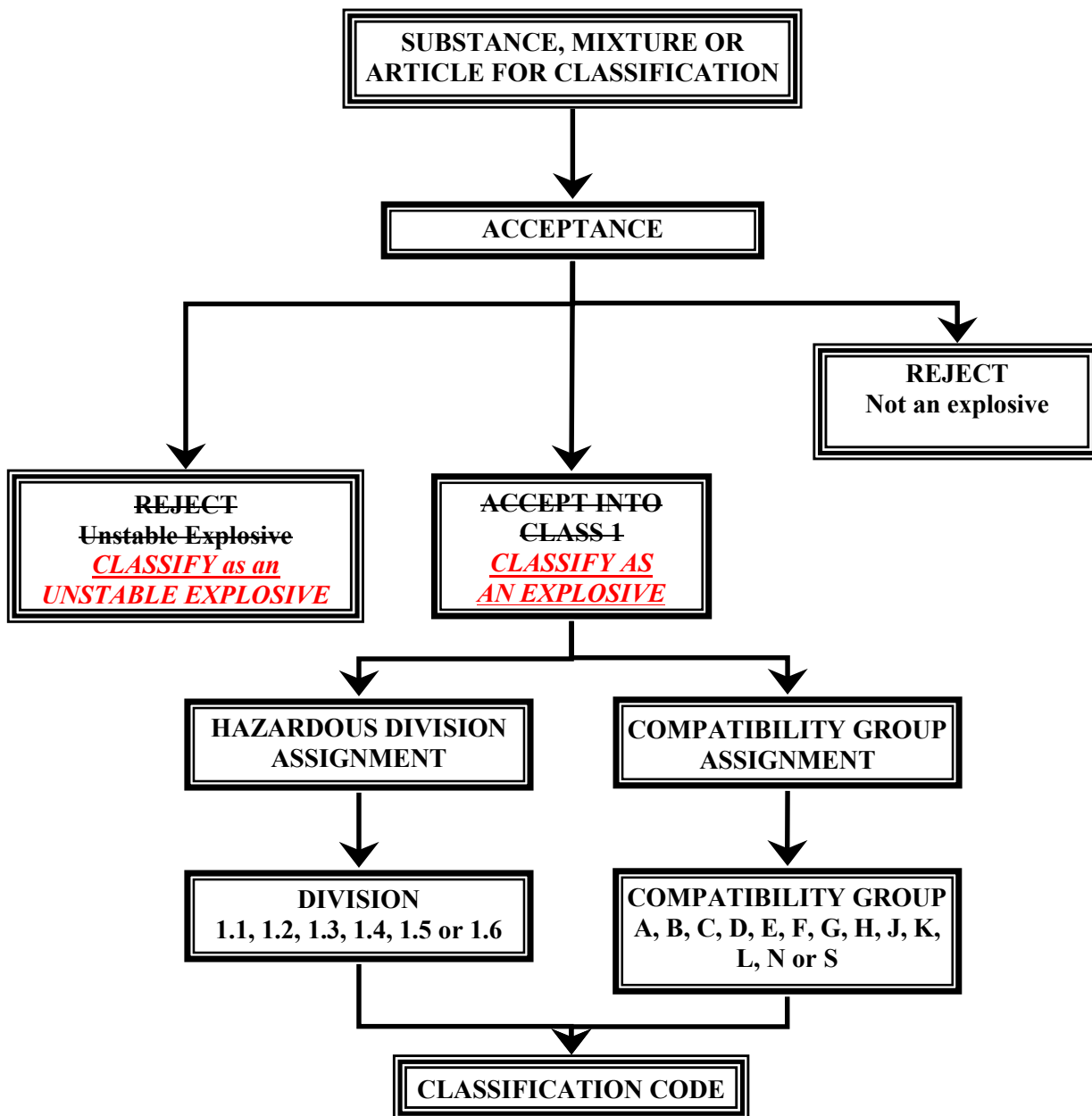
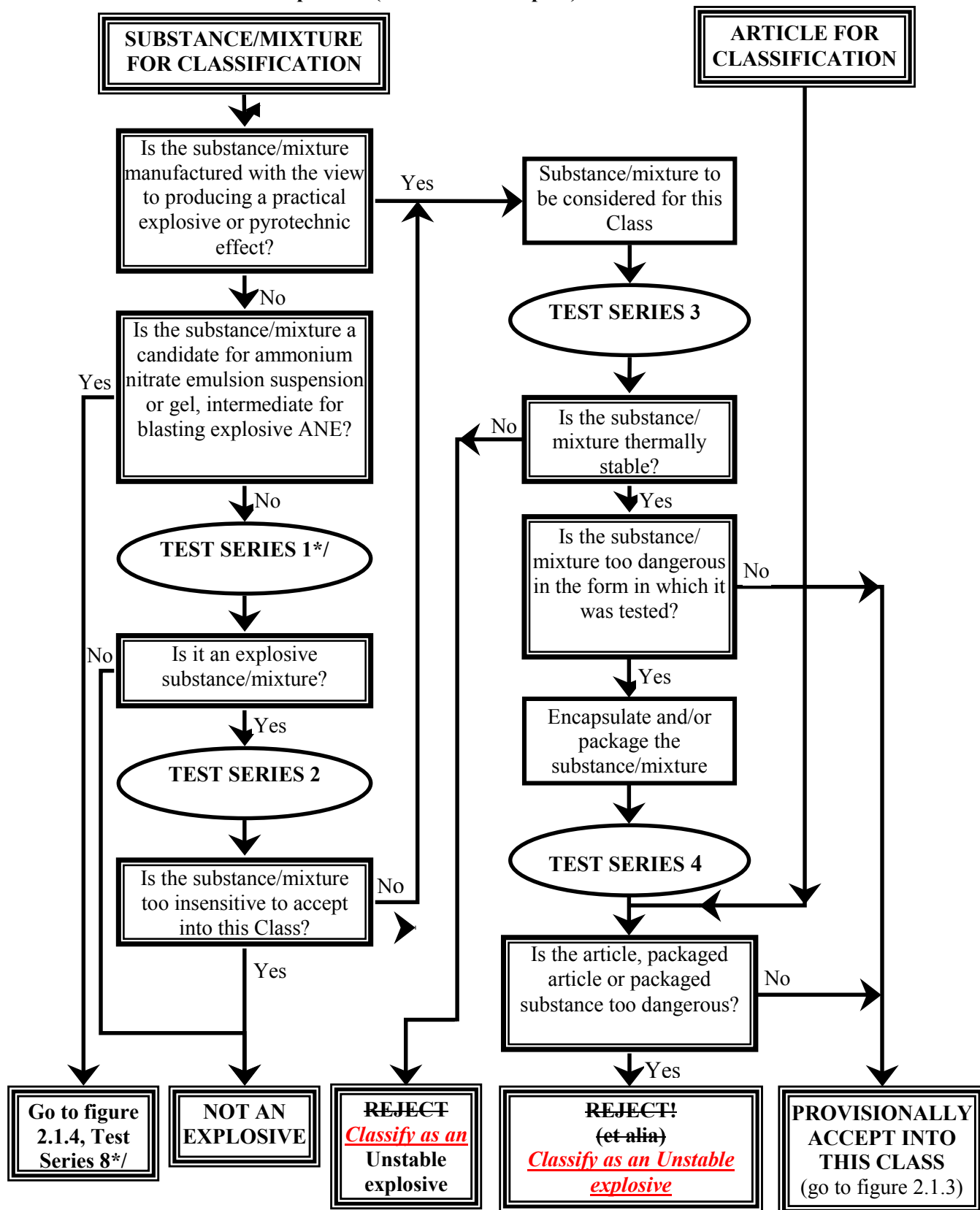


Figure 2.1.2: Procedure for provisional acceptance of a substance, mixture or article in the class of explosives (Class 1 for transport)



**/ For classification purposes, start with test series 2.*

Figure 2.1.4: Procedure for provisional acceptance of a substance, mixture or article in oxidizing liquids or solids as ANE

