Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

4 July 2014

Sub-Committee of Experts on the Transport of Dangerous Goods

Forty-fifth session
Geneva, 23 June – 2 July 2014
Item 11 (a) of the provisional agenda
Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: desensitized explosives

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

Twenty–seventh session
Geneva, 2 – 4 July 2014
Item 3 (a) (i) of the provisional agenda
Classification criteria and related hazard communication: physical hazards

Corrections to working document (ST/SG/AC./C.3/2014/2-ST/SG/AC.10/C.4/2014/2)

Transmitted by the expert from Germany

Introduction

1. This paper reflects discussions by experts from the United States of America, Germany and the World Nitrocellulose Producers Association (WONIPA) and since submitting the working document on desensitized explosives (ST/SG/AC.10/C.3/2014/2-ST/SG/AC.10/C.4/2014/2).

Corrections

2. The Sub-Committee is invited to review and comment on the following corrections to the implementation of a new chapter 2.17 "Desensitized Explosives" proposed in document ST/SG/AC./C.3/2014/2-ST/SG/AC.10/C.4/2014/2.

Corrections to the proposed Chapter 2.17 of the GHS

3. Paragraph 2.17.1 (b) replace as follows: *" It has a mass explosion hazard according to Test Series 6 (a) or 6 (b) or their corrected burning rate according to the burning rate test X is greater than 1200 kg/min; or"*

4. Table 2.17.1 replace note 1 to 5 as follows:

"NOTE 1: "*Desensitized explosives should be prepared so that they remain homogeneous and do not separate during normal storage and handling, particularly if desensitized by wetting. The manufacturer/supplier should give information about the shelf-life and instructions on verifying desensitization on the safety data sheet. In addition, the safety data sheet should include advice on avoiding increased fire, blast or protection hazards when the substance or mixture is not sufficiently desensitized."*

Note 2: *Under certain conditions the content of phlegmatizer (e. g., wetting agent or treatment) may decrease during supply and use, and thus, the hazard potential of the desensitized explosive may increase. This information should be communicated in the safety data sheet.*

NOTE 3: *Desensitized explosives may be treated differently for some regulatory purposes (e.g. transport). Classification of solid desensitized explosives for transport purposes is addressed in Chapter 2.4, section 2.4.2.4 of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations. Classification of liquid desensitized explosives is addressed in Chapter 2.3, section 2.3.1.4 of the Model Regulations.*

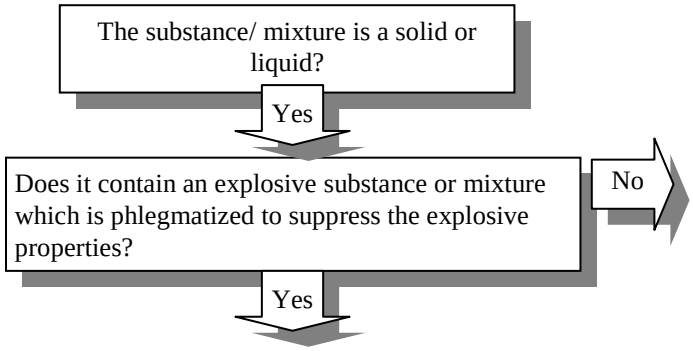
NOTE 4: *Explosive properties of desensitized explosives should be determined by test series 2 of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, and should be communicated in the safety data sheet. For testing of liquid desensitized explosives for transport purposes, refer to section 32, sub-section 32.3.2 of the Manual of Tests and Criteria. Testing of solid desensitized explosives for transport purposes is addressed in section 33, sub-section 33.2.3 of the Manual of Tests and Criteria.*

NOTE 5*: For the purposes of storage, supply and use, desensitized explosives do not fall additionally within the scope of chapters 2.1 (explosives), 2.6 (flammable liquids) and 2.7 (flammable solids).*

NOTE 6*: These classification criteria reference the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, but do not reference the GHS criteria on testing the mixture as a whole (see 1.3.2.3(a)).* “

5. Decision logic 2.17.1 replace the first box and insert a new box as follows:

“



“

6. In Annex 3, Section 2, Table A3.2.2. Replace P212 as follows: „**Avoid heating under confinement or reduction of the phlegmatizer/wetting agent/treatment.”**

7. Replace the P212 also in new tables of Annex 3, Section 3

Annex I

Amendments of Chapter 2.17 "Desensitized Explosives"

"Chapter 2.17 Desensitized explosives

2.17.1 Definitions and general considerations

2.17.1.1 *Desensitized explosives* are solid or liquid explosive substances or mixtures which are phlegmatized to suppress their explosive properties in such a manner that they do not mass explode and do not burn too rapidly and therefore may be excluded from the hazard class "Explosives" (Chapter 2.1, see also Note 2 of Chapter 2.1.2.2).[1]

2.17.1.2. The class of desensitized explosives comprises:

(a) Solid desensitized explosives are explosive substances or mixtures which are wetted with water or alcohols or are diluted with other substances, to form a homogeneous solid mixture, to suppress their explosive properties.

NOTE: *This includes desensitization achieved by formation of hydrates of the substances.*

(b) Liquid desensitized explosives are explosive substances or mixtures which are dissolved or suspended in water or other liquid substances, to form a homogeneous liquid mixture to suppress their explosive properties.

2.17.2 Classification criteria

2.17.2.1 Any desensitized explosive shall be considered in this class, unless:

(a) It is manufactured with the view to producing a practical, explosive or pyrotechnic effect; or

(b) It has a mass explosion hazard according to Test Series 6 (a) or 6 (b) or their corrected burning rate according to the burning rate test X is greater than 1200 kg/min~~too high~~; or

(c) Their exothermic decomposition energy is less than 300 J/g.

NOTE 1*: Substances or mixtures which meet the criterion (c) may fall within the scope of other hazard classes.*

NOTE 2*: The exothermic decomposition energy may be estimated using a suitable calorimetric technique (see section 20, sub-section 20.3.3.3 in Part II of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria).*

[1] Unstable explosives as defined in Chapter 2.1 can also be stabilized by desensitization and consequently may be classified as desensitized explosives, provided all criteria of Chapter 2.17 are met. In this case the desensitized explosive ~~should~~shall be tested according to test series 3 (Part I of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria) because information about its sensitiveness to mechanical stimuli is likely to be important for determining conditions for safe handling and use. The results should be communicated in the safety data sheet.

2.17.2.2 Desensitized explosives shall be classified as packaged for supply and use in one of the four categories of this class depending on the corrected burning rate (A_c) using the test "burning rate test (external fire)" described in Part V, sub-section 51.4 of the United Nations Recommendations of the Transport of Dangerous Goods, Manual of Tests and Criteria, according to Table 2.17.1:

Table 2.17.1: Criteria for desensitized explosives

Category	Criteria
1	Desensitized explosives with a corrected burning rate (AC) equal to or greater than 300 kg/min but not more than 1200 kg/min
2	Desensitized explosives with a corrected burning rate (AC) equal to or greater than 140 kg/min but less than 300 kg/min
3	Desensitized explosives with a corrected burning rate (AC) equal to or greater than 60 kg/min but less than 140 kg/min
4	Desensitized explosives with a corrected burning rate (AC) less than 60 kg/min

NOTE 1:

"Desensitized explosives ~~shall~~should be prepared so that they remain homogeneous and do not separate during normal storage and handling, particularly if desensitized by wetting. The manufacturer/supplier should give information about the shelf-life and instructions on verifying desensitization on the safety data sheet. In addition, the safety data sheet should include advice on avoiding increased fire, blast or protection hazards when the substance or mixture is not sufficiently desensitized."

~~*The manufacturer/supplier should give adequate information about the shelf life and an instruction concerning the verification of the desensitization preferentially in the safety data sheet to avoid an increased fire, blast or protjection hazard when not sufficiently desensitized."*~~

~~*Desensitized explosives shall be prepared so that they remain homogeneous and do not separate during storage and handling.*~~

NOTE 2

Under certain conditions the content of phlegmatizer (e. g., wetting agent or treatment) may decrease during supply and use, and thus, the hazard potential of the desensitized explosive may increase. This information should be communicated in the safety data sheet.

NOTE 3: *Desensitized explosives may be treated differently for some regulatory purposes (e.g. transport). Classification of solid desensitized explosives for transport purposes is addressed in Chapter 2.4, section 2.4.2.4 of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations. Classification of liquid desensitized explosives is addressed in Chapter 2.3, section 2.3.1.4 of the Model Regulations.*

NOTE 4~~3~~: *Explosive properties of desensitized explosives ~~have~~ should ~~to~~ be determined by test series 2 of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, and should ~~shal~~l be communicated in the safety data sheet. For testing of liquid desensitized explosives for transport purposes, refer to section 32, sub-section 32.3.2 of the Manual of Tests and Criteria. Testing of solid desensitized explosives for transport purposes is addressed in section 33, sub-section 33.2.3 of the Manual of Tests and Criteria.*

NOTE 5: *For the purposes of storage, supply and use, desensitized explosives do not fall additionally within the scope of chapters 2.1 (explosives), 2.6 (flammable liquids) and 2.7 (flammable solids).*

NOTE 6: *These classification criteria reference the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, but do not reference the GHS criteria on testing the mixture as a whole (see 1.3.2.3(a)).*

2.17.3 Hazard communication

General and specific considerations concerning labelling requirements are provided in *Hazard communication: Labelling* (Chapter 1.4). Annex 1 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 2.17.2: Label elements for desensitized explosives

	Category 1	**Category 2**	**Category 3**	**Category 4**
Symbol	Flame	Flame	Flame	Flame
Signal word	Danger	Danger	Warning	Warning
Hazard statement	Desensitized explosive; Fire, blast or projection hazard	Desensitized explosive; Fire or projection hazard	Desensitized explosive; Fire or projection hazard	Desensitized explosive; Fire hazard

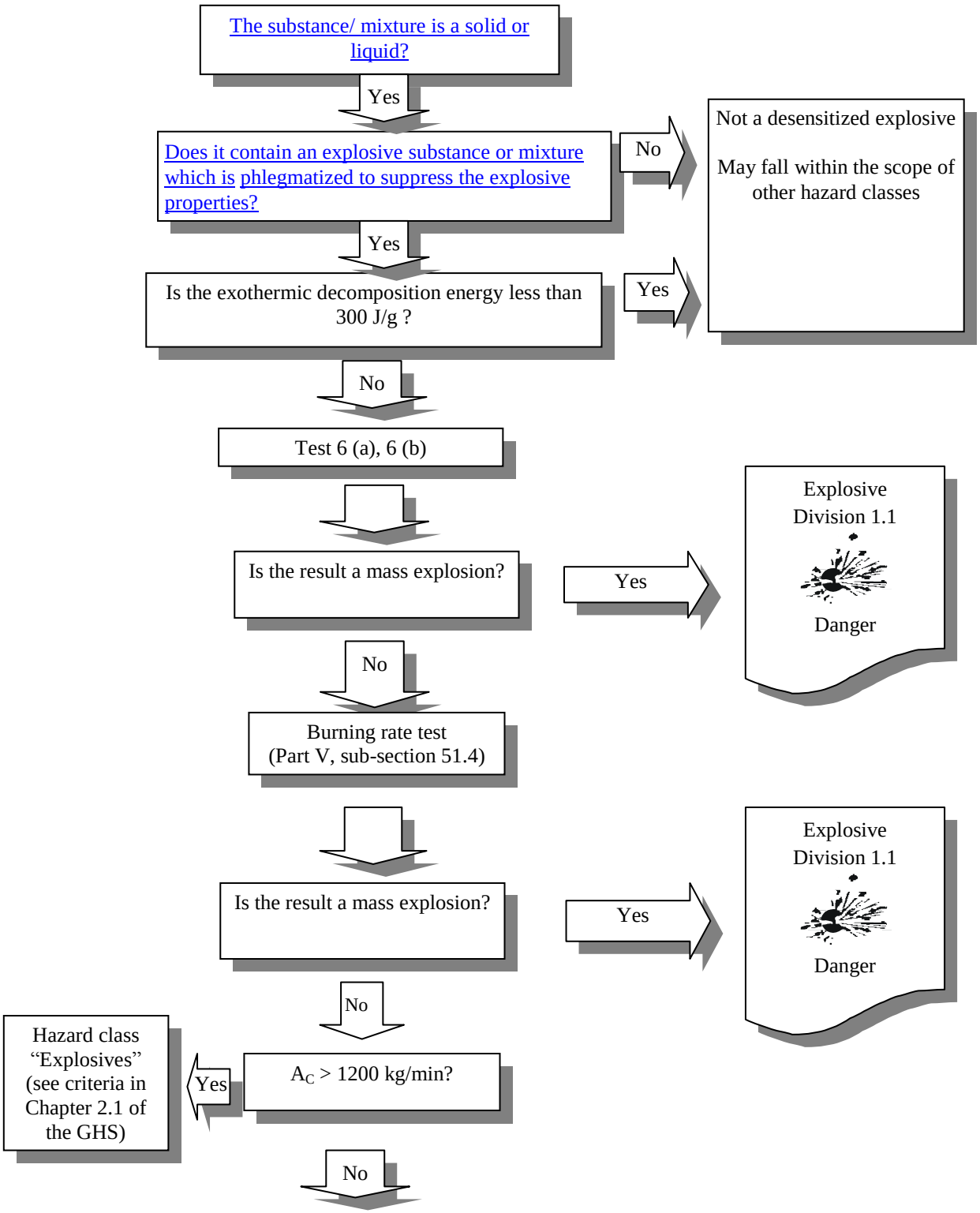
2.17.4 Decision logic and guidance

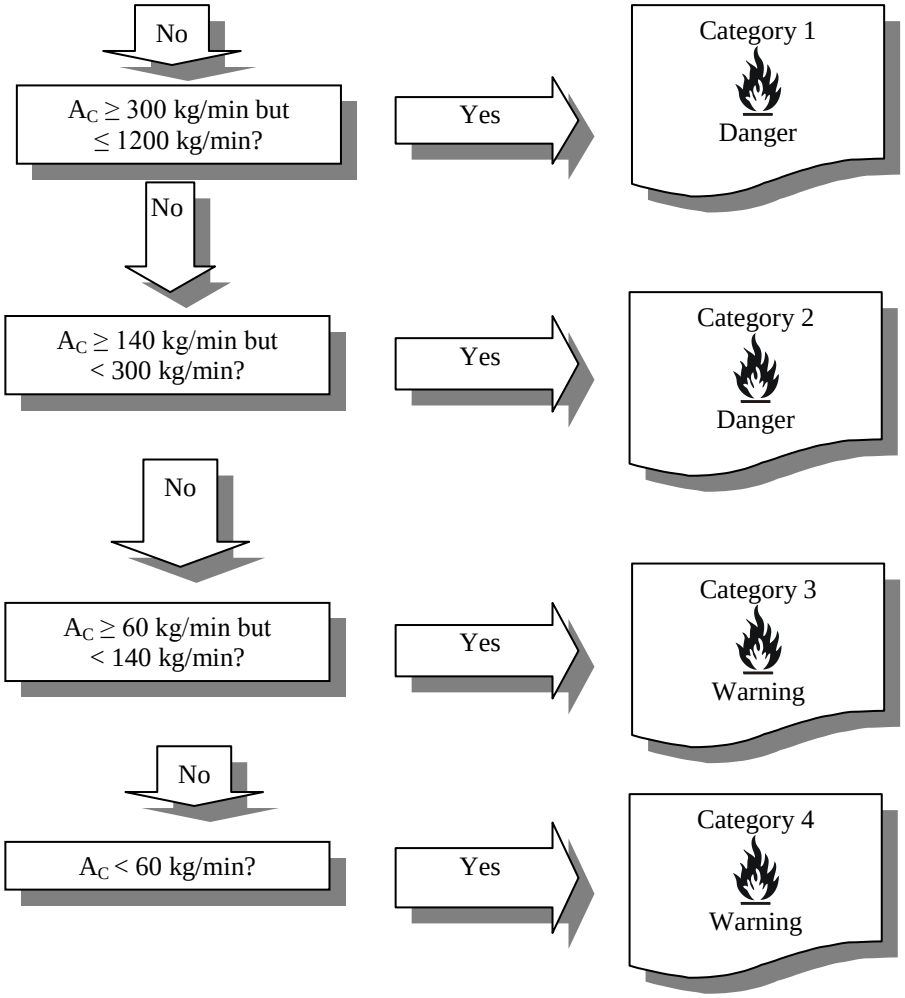
The decision logic and guidance which follow are not part of the harmonized classification system, but have been provided here as additional guidance. It is strongly recommended that the person responsible for classification studies the criteria before and during use of the decision logic.

2.17.4.1 Decision logic

To classify desensitized explosives, data for the explosive potential and the corrected burning rate has to be determined as described in Part V *of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria*. Classification is according to decision logic 2.17.1.

Decision logic 2.17.1 for desensitized explosives





2.17.4.2 Guidance

2.17.4.2.1 The classification procedure for desensitized explosives does not apply if:

(a) The substances or mixtures contain no explosives according to the GHS criteria in Chapter 2.1; or

(b) The exothermic decomposition energy is less than 300 J/g.

2.17.4.2.2 The exothermic decomposition energy ~~should~~shall be determined using the explosive already desensitized (i.e.: the homogenous solid or liquids mixture formed by the explosive and the substance(s) used to suppress its explosive properties). The exothermic decomposition energy may be estimated using a suitable calorimetric technique (see Section 20, sub-section 20.3.3.3 in Part II of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria).”

Annex III

Consequential amendments

A. GHS

1. In the TABLE OF CONTENTS, under Part 2. Insert: “Chapter 2.17, Desensitized explosives:

2. In chapter 1.2 add the following definition for desensitized explosives:

“***Desensitized explosives*** mean solid or liquid explosive substances or mixtures which are phlegmatized to suppress their explosive properties in such a manner that they do not mass explode and do not burn too rapidly and therefore may be excluded from the hazard class “Explosives” (see Chapter 2.1; see also Note 2 to paragraph 2.1.2.2).”

3. Amend Note 2 to paragraph 2.1.2.2 to read as follows:

*“**NOTE 2:*** Some explosives substances and mixtures are wetted with water or alcohols, diluted with other substances or dissolved or suspended in water or other liquid substances to suppress or reduce their explosive properties. They may be a candidate for classification as desensitized explosives (see chapter 2.17) or may be treated differently from explosive substances and mixtures (as desensitized explosives) for some regulatory purposes (e.g. transport) see 1.3.2.4.5.2.”

4. In Annex I, insert a new Table A1.17 for the new hazard class ”Desensitized explosives” as follows:

“A1.17 Desensitized explosives (see Chapter 2.17 for classification criteria)

Classification		**Labelling**				
Hazard class	**Hazard category**	**Pictogram**		**Signal word**	**Hazard statement**	**Hazard statement Codes**
		GHS	**UN Model Regulations**			
Desensitized explosives	**1**		*Not applicable*	**Danger**	Desensitized explosive; Fire, blast or projection hazard	H206
	2		*Not applicable*		Desensitized explosive; Fire or projection hazard	H207
	3		*Not applicable*	**Warning**	Desensitized explosive; Fire or projection hazard	H207
	4		*Not applicable*		Desensitized explosive; Fire hazard	H208

NOTE: *Classification and labelling of desensitized explosives are addressed in transport regulations in a different way. In transport, solid desensitized explosives are classified in Division 4.1 (flammable solids) and shall bear a Division 4.1 label. (See: Chapter 2.4, section 2.4.2.4 of the United Nations Recommendations on the*

Transport of Dangerous Goods, Model Regulations). Liquid desensitized explosives are classified in Class 3 (flammable liquids) for transport purposes and shall bear a Class 3 label (see, Chapter 2.3, section 2.3.1.4 of the Model Regulations).”

5. In Annex 3, Section 1, Table A3.1.1, insert the following physical hazard statements:

Code **(1)**	**Physical hazard statements** **(2)**	**Hazard class (GHS chapter)** **(3)**	**Hazard category** **(4)**
H206	Desensitized explosive; Fire, blast or projection hazard	Desensitized explosives (chapter 2.17)	1
H207	Desensitized explosive; Fire or projection hazard	Desensitized explosives (chapter 2.17)	2, 3
H208	Desensitized explosive; Fire hazard	Desensitized explosives (chapter 2.17)	4

6. In Annex 3, Section 2, Table A3.2.2:

P212

Insert the following new precautionary statement

Code **(1)**	**Prevention precautionary statements** **(2)**	**Hazard class** **(3)**	**Hazard category** **(4)**	**Conditions for use** **(5)**
P212	**Avoid heating under confinement or reduction of the phlegmatizer/wetting agent/treatment ~~due to the risk of explosion.~~**	Desensitized explosives (chapter 2.17)	1, 2, 3, 4	

P230

Amend the condition for use to read as follows:

“- For substances and mixtures which are wetted, diluted, dissolved or suspended with a phlegmatizer in order to reduce their explosive properties

Manufacturer/supplier or the competent authority to specify appropriate material”.

7. In Annex 3, Section 2, table A.3.2.2, apply the following precautionary statements to desensitized explosives as follows:

P210

Insert a new row for the hazard class “Desensitized explosives (chapter 2.17)” applicable to hazard categories “1, 2, 3, 4”

P230

Insert a new row for the hazard class “Desensitized explosives (chapter 2.17)” applicable to hazard categories “1, 2, 3, 4” with the condition for use: “…Manufacturer/supplier or the competent authority to specify appropriate material”

P233

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3, 4"

P280

Insert a new row for the hazard class "Desensitized explosives (Chapter 2.17)" applicable to hazard categories "1, 2, 3, 4" with the condition for use: "Manufacturer/supplier or the competent authority to specify he appropriate type of equipment"

8. In Annex 3, Section 2, table A.3.2.3, apply the following precautionary statements to desensitized explosives as follows:

P370

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3"

P371

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard category "4"

P375

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1,2,3"

P380

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3, 4"

P370 + P380 + P375

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3"

P371 + P380 + P375

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard category "4"

9. In Annex 3, Section 2, table A.3.2.4 apply the following precautionary statement to desensitized explosives as follows:

P401

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3, 4" with the condition for use: "…Manufacturer/supplier or the competent authority to specify local/regional/national/international regulations as applicable."

10. In Annex 3, Section 2, table A.3.2.5 apply the following precautionary statement to desensitized explosives as follows:

P501

Insert a new row for the hazard class "Desensitized explosives (chapter 2.17)" applicable to hazard categories "1, 2, 3, 4" with the condition for use: "… in accordance with local/regional/national/international regulations (to be specified). Manufacturer/supplier or the competent authority to specify whether disposal requirements apply to content, container or both."

11. In Annex 3, Section 3 inserts the following new tables:

DESENSITIZED EXPLOSIVES
(Chapter 2.17)

Symbol Flame


Hazard category	**Signal word**	**Hazard statement**	
1	Danger	H206	Desensitized explosive; Fire, blast or projection hazard
2	Danger	H207	Desensitized explosive; Fire or projection hazard
3	Warning	H207	Desensitized explosive; Fire or projection hazard

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.** P212 **Avoid heating under confinement or reduction of the phlegmatizer/wetting agent/treatment ~~due to the risk of explosion.~~** P230 **Keep wetted with…** ...Manufacturer/supplier or the competent authority to specify appropriate material. P233 **Keep container tightly closed** P280 **Wear protective gloves/protective clothing/eye protection/face protection**	P370+P380+P375 **In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion**	P401 **Store in accordance with…** …Manufacturer/supplier or the competent authority to specify local/regional/ national/international regulations as applicable.	P501 **Dispose of contents/containers to…** …in accordance with local/regional/national /international regulations (to be specified). Manufacturer/supplier or the competent authority to specify whether disposal requirements apply to contents, container or both.

DESENSITIZED EXPLOSIVES
(Chapter 2.17)

Symbol
Flame

Hazard category	**Signal word**	**Hazard statement**	
4	Warning	H208	Desensitized explosive; Fire hazard

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.** P212 **Avoid heating under confinement or reduction of the phlegmatizer/wetting agent/treatment ~~due to the risk of explosion.~~** P230 **Keep wetted with…** ...Manufacturer/supplier or the competent authority to specify appropriate material. P233 **Keep container tightly closed** P280 **Wear protective gloves/protective clothing/eye protection/face protection**	P371+P380+P375 **In case of major fire and large quantities: Evacuate area~~.~~ Fight fire remotely due to the risk of explosion**	P401 **Store in accordance with…** …Manufacturer/supplier or the competent authority to specify local/regional/ national/international regulations as applicable.	P501 **Dispose of contents/containers to…** …in accordance with local/regional/national /international regulations (to be specified). Manufacturer/supplier or the competent authority to specify whether disposal requirements apply to contents, container or both.