



**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 Transport of Dangerous Goods****Forty-eighth session**

Geneva, 30 November – 9 December 2015

Item 2 (i) of the provisional agenda

Explosives and related matters: miscellaneous**Analogy approvals based on test results obtained using the
Manual of Tests and Criteria****Transmitted by the Sporting Arms & Ammunition Manufacturers'
Institute (SAAMI)¹****Introduction**

1. SAAMI introduced paper ST/SG/AC.10/C.3/2015/13 on analogy classification at the last session. The Working Group on Explosives noted in their report informal document INF.53 (47th session): “Classification by analogy is commonly used by Competent Authorities to classify explosives without testing based upon comparison with similar products that have been tested according to the Manual of Tests and Criteria (MTC). This practice is not presently acknowledged in the MTC. The Working Group was supportive of the principle and encouraged SAAMI to consider its comments and to return at the 48th session with additional thoughts for consideration.” The plenary discussion was summarized in the report of the secretariat, ST/SG/AC.10/C.3/94, and SAAMI was encouraged to return with a proposal.

Discussion

2. SAAMI proposes an appendix on analogy classification in the United Nations Manual of Tests and Criteria. The presentation of this guidance in an appendix will provide

¹ In accordance with the programme of work of the Sub-Committee for 2015-2016 approved by the Committee at its seventh session (refer to ST/SG/AC.10/C.3/86, para. 86 and ST/SG/AC.10/42, para. 14).

a practical solution for inclusion of this important classification method. The appendix includes the purpose, scope, parameters and an example.

3. The purpose describes the rigorously controlled approach to explosives classification. Self-classification is generally not allowed, and classifications are issued by government in competent authority documents based on small scale and empirical large scale testing. Products, whether they are substances or mixtures, are tested for every variation, whether related to chemical or physical differences of the substance/mixture, packaging and/or article design.

4. The capacity to test every variation does not exist for an infinite number of products. Changes which do not impact the classification should be allowed without retesting, subject to competent authority evaluation and documentation to validate and authorize acceptable variations based on existing test data.

5. Other methods are often used in combination with analogy, so classification by analogy should not be overly prescriptive. The method of reciprocity, for example, does not require exhaustive data as long as key parameters are satisfactorily addressed. Therefore the appendix mentions limited data and that analogy parameters should not be considered absolute or all-inclusive, and applications should not be rejected on clerical grounds alone.

6. The responsibility for preparation of the application rests with the applicant. SAAMI notes that the United Kingdom Health and Safety Executive also addresses this, and provides guidance on analogies and details for how to prepare a competent application: <http://www.hse.gov.uk/explosives/classification/analogy.htm>

7. As with all explosives classifications, final judgement rests with the competent authority as stated in the Manual of Tests and Criteria section 1.1.3 (numbering per the forthcoming 6th Revised edition).

8. Guidance on parameters is separated for substances, articles and packaging. The depth of detail has been reduced by one degree from the last proposal based on feedback from experts.

9. A sentence is proposed for addition to the Manual of Tests and Criteria 6th Revised Edition in section 1.1.3 to reference the proposed appendix.

Proposal

10. Insert a reference in the Manual of Tests and Criteria to a new Appendix XX.

“1.1.3 It should be noted that the Manual of Tests and Criteria is not a concise formulation of testing procedures that will unerringly lead to a proper classification of products. It therefore assumes competence on the part of the testing authority and leaves responsibility for classification with them. The competent authority has discretion to dispense with certain tests, to vary the details of tests, and to require additional tests when this is justified to obtain a reliable and realistic assessment of the hazard of a product. In some cases, a small scale screening procedure may be used to decide whether or not it is necessary to perform larger scale classification tests. Suitable examples of procedures are given in the introductions to some test series and in Appendix 6. Guidance on classification by analogy to existing tested or classified products with limited or no additional testing is given in Appendix XX. Examples which may be listed within various test procedures are for illustrative purposes and are provided for guidance only.”

11. Insert a new appendix in the Manual of Tests and Criteria to read as follows:

Appendix XX

Classification by analogy of explosives

1. Purpose

1.1 Unlike the majority of chemicals which are self-classified by industry, explosives often require written approval from one or more competent authorities due to national or regional explosives laws. Similarly, self-reactives and organic peroxides may be included in these laws or other legislation, and this appendix may also apply to their classification. Products thus controlled are classified on the basis of small scale and empirical large scale testing according to the procedures of this Manual of Tests and Criteria. Specific combinations of chemical and physical specifications, packaging and article designs are evaluated. This results in a level of data and control above that normally applied to other dangerous goods. Products thus controlled vary greatly in hazard, e.g. explosives range from Division 1.1 to Division 1.4 Compatibility Group S, and may present less danger than products which are self-classified; accordingly the use of judgment is required for competent authorities to simultaneously ensure safety and facilitate commerce.

1.2 The capacity to test every variation does not exist for an infinite number of products. Changes which are deemed insignificant to the classification are allowable without additional testing, but are still subject to competent authority evaluation and documentation. Therefore, while many products are tested, others are approvable by alternative means, including but not limited to analogy, expertise, reciprocity, determination of negligible change or regulation defaults.

1.3 “Analogy” is the approval of products with limited or no additional testing by comparison to existing tested or classified products. The purpose of this appendix is to provide guidance in performing approvals by analogy. Analogies vary from simple to complex, based on the differences that may exist between the reference and candidate products. These differences can vary in significance, which may or may not be acceptable for purposes of comparison.

2. Scope

2.1 An analogy approval of a candidate is based on comparison to one or more reference products that provide a basis for classification with limited or no additional testing. A reference substance or article is one that has been classified according to this Manual of Tests and Criteria.

2.2 The applicant must first determine which parameters are critical, and for these, whether the candidate(s) fall within the scope of the reference(s). The information supporting an application should allow a comparison of the reference and candidate items, for example, by use of a table and technical explanation as appropriate.

2.3 The analogy method may be used alone or in conjunction with other non-testing means mentioned in paragraph 1.2 above, and limitations of the analogy method do not preclude the use of other methods alone or in combination with analogies. The expertise and discretion of the competent authority are paramount, and take precedence (see UNMTC section 1.1.3 of this Manual).

3. Parameters

The following parameters of technical data may be relevant to classification by analogy and are presented for consideration; however, they should not be considered absolute or all-inclusive. Parameters are divided into substances, articles and packaging.

3.1 Substance parameters

- Ingredient percentages
- Chemical variations or Substitutions
- Surface area
- Particle size distribution
- Density

3.2 Article parameters

- Substance(s) in the article (described above)
- Maximum Net Explosive Weight (N.E.W.) per article
- Article design
- Protection(s) from ignition/initiation
- Dimensions
- Materials of construction

3.3 Packaging parameters

- Maximum Net Explosive Weight (N.E.W.) per inner packaging if applicable
- Maximum Net Explosive Weight (N.E.W.) per outer packaging?
- Dimensions and volume
- Head space within packaging (substances)
- Material of construction - confinement (pressure rise) / containment (shrapnel/debris)
- Design
- Geometry
- Maximum number of articles per package (articles)
- Type of inner packaging
- Type of intermediate packaging (if required/present)
- Spacing/dimensions (articles)
- Protection from ignition/initiation
- Limitation of reaction severity

4. Article example

The table below compares properties to determine whether parameters are analogous in a simple analogy.

<i>Technical data</i>	<i>Candidate article</i>	<i>Reference article</i>
	XXX	YYY
Original classification	TBD	UN0277, 1.3C
Basis of classification	Analogy	UN Series 3 tests UN Series 6 tests
Description	See drawing xxx supplied	See drawing yyy supplied
Material of construction	Steel	Steel
Fabrication	Welded	Welded
NEW per article	10 g	15 g
Explosive	HNS-II	HNS-II
Packing method – Inner	Receptacle, fibreboard, 6 units per inner box	Receptacle, fibreboard, 6 units per inner box
Packing method – Intermediate	None	None
Packing method – Outer	Box, fibreboard (4G), 8 inner packagings per inner box	Box, fibreboard (4G), 8 inner packagings per inner box
Packing instruction	PI 134	PI 134
NEW per box	480 g	720 g