



**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****Fifty-fifth session**

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Item 2 (1) of the provisional agenda

Explosives and related matters: miscellaneous**Clarifications to the regulatory construct of Class 1
compatibility groups, taking into account group S****Transmitted by the Sporting Arms & Ammunition Manufacturers'
Institute (SAAMI)*****Introduction**

1. Compatibility groups generally denote a type of explosive, irrespective of the hazard level indicated by the division. They form the basis of a segregation system within the class of explosives, under the premise that different types of explosives generally should not be transported together, with certain exceptions.¹ Additionally, only 1.4S explosives may ship together with other classes per the underlying segregation system for all dangerous goods².
2. Compatibility group S is the only group that indicates a reduction of hazard based on test criteria, irrespective of the type of explosive. On this basis compatibility group S may be transported with most other explosives and dangerous goods. Like other dangerous goods, compatibility group S may not be transported with compatibility groups A and L, due to the characteristics of those groups that make them incompatible with all other goods.

* In accordance with the programme of work of the Sub-Committee for 2019-2020 approved by the Committee at its ninth session (see ST/SG/AC.10/C.3/108, paragraph 141 and ST/SG/AC.10/46, paragraph 14).

¹ Model Regulations Chapter 7.1, Note at the beginning of 7.1.3.1 and 7.1.3.1.2 (c)

² See Model Regulations Chapter 7.1 paragraphs 7.1.3.2.1 and 7.1.3.2.2; however, some regulations allow all Division 1.4 with other classes.

3. Compatibility group S also appears as a component of classification by analogy. However, this does not represent the practice of competent authorities, and this text should be considered for amendment. The analogy method assigns identical classifications based on tested explosives with similar characteristics, and is not limited to 1.4S explosives.

4. The Sub-Committee has encountered difficulty in different work involving explosives compatibility groups, based on incomplete descriptions of their accepted purposes and uses. Hazard classification is performance-based on testing rather than the identity of the explosive, and the regulatory differences from other explosives are equivalent to being in a different division. In this proposal, we seek to better align the relevant texts of the Model Regulations and the Manual of Tests and Criteria with existing understanding.

The purposes of compatibility groups

5. With the exception of compatibility groups S and N, compatibility groups indicate the type of explosive – for example, group B represents primary explosives used for initiation of other explosives, group C is for propellants and group G is for pyrotechnics. In general, different types of explosives should not be in close proximity to each other, except when incorporated into an explosives article where they are controlled by classification, or in use. The purpose of assigning compatibility groups is to prohibit their proximity to each other in transport and storage incidental to transport.

6. In the context of explosives, the term “compatibility” is a synonym for segregation within Class 1. Compatibility of explosives is used to denote the special system for explosives segregation, which is an additional layer of segregation within the overarching dangerous goods segregation system that inter-relates all classes and divisions. In other words, for dangerous goods other than explosives, generally the assignment to a class or division is all that is necessary to determine segregation, but for explosives there is additional segregation required between explosive types. In some cases segregation goes even further, e.g. down to the UN number within compatibility group L³.

7. Compatibility rules apply regardless of the division. For example, classifications 1.1B or 1.4B may be transported together, and classifications 1.3C and 1.4C may be transported together, but classifications 1.4B and 1.4C (in the same division) may not be transported together.

8. An important exception to the above system is compatibility group S. Group S is not related to the type of explosive, and is determined on the basis of five test criteria which exceed the requirements for Division 1.4. Any explosive compatibility group may be changed into group S if it passes certain safety criteria⁴. Group S only exists for use in conjunction with Division 1.4, defined as “no significant hazard” (relative to high hazard explosives)⁵. The 1.4S classification serves the purpose of a division; the threshold between the 1.4S and 1.4 classifications determined by Test Series 6 is as important as the difference between Division 1.4 and divisions 1.1/1.2/1.3. A 3-tier system of 1.1/1.2/1.3, 1.4 and 1.4S (high, medium and low hazard) is apparent throughout the dangerous goods regulations. The result is that high and medium hazard explosives are subject to segregation of different explosive types, but low hazard configurations of any type of explosive may be excepted from segregation restrictions.

³ Model Regulations Chapter 7.1, paragraph 7.1.3.1.5

⁴ Fireworks provide a comprehensive example, with classifications in 1.1G, 1.2G, 1.3G, 1.4G, and 1.4S.

⁵ See the tables in Model Regulations Chapter 2.1, paragraphs 2.1.2.1.1 and 2.1.2.1.2

9. In addition to waiving segregation requirements, hazard classification 1.4S has been utilized to create many differences in the regulations for low hazard explosives. Some examples of the use of group S for purposes other than segregation are:

- (a) Only goods classified as 1.4S may be transported as cargo on passenger aircraft. (Other Division 1.4 goods may only be transported by cargo aircraft, and Divisions 1.1, 1.2 and 1.3 generally may not be transported by air.)
- (b) Goods classified as 1.4S do not require a hazard label or placard in the Model Regulations or maritime regulations.⁶

Non-relevance of compatibility group S to analogy classifications

10. Paragraph 10.1.2 of the Manual of Tests and Criteria, states that compatibility group S is eligible for classification by analogy without testing based on test results for a comparable explosive article. A similar statement appears in the Model Regulations Chapter 2.1, para. 2.1.3.4.3. However, based on previous informal discussion amongst the Working Group on Explosives, there is consensus that competent authorities assign analogy classifications without regard to whether an explosive is in compatibility group S, or whether the explosive is an article or a substance. Analogies are based on similar explosive configurations within any classification, using parameters like the type, packaging and amount.

11. An example of when it should be appropriate to waive testing was discussed during the review of informal document INF.21 (fifty-second session) by the Working Group on Explosives. That informal document described an article potentially qualifying for Division 1.6N assignment. The question raised during the fifty-second session was “Why can’t compatibility group N tests be similarly waived?”. At the time, the working group agreed that analogies can be made within any compatibility group.

Corresponding changes to the Model Regulations and the Manual of Tests and Criteria

12. We propose to clarify that Test Series 6 is used for 1.4S determinations in paragraph 2.1.3.4.2 of the Model Regulations. No change is necessary in the Manual of Tests and Criteria, as this is covered in paragraph 10.4.2.3.

13. In paragraph 2.1.2.1 of the Model Regulations, we propose to clarify that the assignments of compatibility groups N and S are based on testing, as currently the text only refers to kinds of explosives. We also propose to clarify that test results consistent with a lower level of hazard are the basis for the differences allowed for transport of 1.4S with other explosives. There are no corresponding changes necessary in the Manual of Tests and Criteria, as the first point is already addressed in paragraph 10.1.2, and unlike the Model Regulations, the Manual of Tests and Criteria does not address the segregation logic for explosives.

14. We propose to eliminate the special references to compatibility group S in the context of classification by analogy, and that analogies include substances in addition to explosive

⁶ Model Regulations Chapter 5.2, paragraph 5.2.2.2.1.4; IMDG Code, Chapter 5.2, paragraph 5.2.1.1.

articles. This requires changes to paragraph 2.1.3.4.3 of the Model Regulations and to paragraph 10.1.2 of the Manual of Tests and Criteria.

Proposals

(New text is underlined. Deleted text is ~~crossed-out~~)

15. Modify paragraph 2.1.3.4.2 of the Model Regulations as follows:

“Test series 5, 6 and 7 are used for the determination of the hazard division. Test series 5 is used to determine whether a substance can be assigned to Division 1.5. Test series 6 is used for the assignment of substances and articles to Divisions 1.1, 1.2, 1.3, ~~and 1.4,~~ and 1.4 Compatibility Group S...”

16. Modify paragraph 2.1.2.1 of the Model Regulations as follows:

“2.1.2.1 Goods of Class 1 are assigned to one of six divisions, depending on the type of hazard they present (see 2.1.1.4) and to one of thirteen compatibility groups which identify the kinds of explosive substances and articles that are deemed to be compatible. Compatibility groups N and S indicate compliance with test criteria. Compatibility Group S denotes a reduction in hazard irrespective of the kind of explosive, and compatibility with other goods. The tables in 2.1.2.1.1 and 2.1.2.1.2 show the scheme of classification into compatibility groups, the possible hazard divisions associated with each group and the consequential classification codes.”.

17. Modify paragraph 2.1.3.4.3 of the Model Regulations as follows:

“2.1.3.4.3 ~~In the case of Compatibility Group S +~~ The tests may be waived by the competent authority if classification by analogy is possible using test results for a comparable substance or article.”.

18. Modify the last sentence of the paragraph 10.1.2 of the Manual of Tests and Criteria as follows:

“~~In the case of compatibility groups.~~ The tests may be waived, (where appropriate by the competent authority) if classification by analogy is based on test results for a comparable substance or article.”.
