



HARMONIZED SYSTEM  
COMMITTEE

NC0760E1

-  
32<sup>nd</sup> Session

O. Eng.

Brussels, 17 October 2003.

CLASSIFICATION OF A PRODUCT BY THE NAME OF "YTRIA C"

(Item VI.9 on Agenda)

Reference documents :

NC0724E1 (HSC/31)

NC0730E2, Annex IJ/10 (HSC/31 – Report)

I. BACKGROUND

1. At its 31<sup>st</sup> Session, the Harmonized System Committee examined the classification of a product by the name of "Ytria C".
2. Opening the discussion, the Delegate of Austria explained that his administration considered all information provided about the product to be confidential. He recalled that the product at issue was yttrium oxide to which a very small amount of vanadium oxide had been deliberately added with the aim of altering the physical characteristics of yttrium oxide, such as surface area, particle size, density and melting point. He therefore asked the Committee to modify the description of the product reproduced in paragraph 10 of Doc. NC0724E1 in the rectangular box to also refer to density within the brackets listing the changed physical properties of the final product. He further proposed to delete the phrase "differ from" and to replace it by "essentially differ from" in the text following the brackets of the last sentence of this description.
3. Since the physical properties of the yttrium oxide raw material had been significantly changed by the addition of vanadium pentoxide, in his administration's view, vanadium oxide could not be considered to be a stabiliser. Drawing the Committee's attention to the fact that the specific use of "Ytria C" explained in paragraphs 7 and 8 of Doc. NC0724E1 was made possible by its specific physical characteristics, he stressed that a pure yttrium oxide raw material would not be suitable for the same use. It was the addition of vanadium pentoxide which rendered the product suitable for specific use. Furthermore, he drew the Committee's attention to the limit of the usual impurity level in sintering processes from Ullman's Encyclopaedia of Industrial Chemistry (see paragraph 17 of Doc. NC0724E1), which was set below 1000 ppm. In the product at issue, the concentration of vanadium pentoxide went beyond this limit; he was therefore of the view that vanadium pentoxide could not be

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considered to be an impurity in terms of Note 1 to Chapter 28 and consequently, that "Yttria C" should be classified in heading 38.24.

4. He further explained that "Yttria C" was produced by blending yttrium oxide raw material and vanadium pentoxide in a blender. The mixture was then briquetted or pelletised and the briquettes were sintered at a temperature of between 1600 to 1700 °C in a high temperature furnace. The sintered briquettes were milled in a ball mill and have undergone a sieving process to achieve the required particle size distribution. The final product was then presented as a powder.
5. The EC Delegate agreed with the Secretariat's legal analysis in paragraphs 11 to 14 of the document which showed that heading 28.46 was limited to compounds of rare-earth metals, of yttrium or of scandium or of mixtures of these metals. As mentioned in paragraph 5 of Doc. NC0724E1, vanadium oxide could not be seen as an impurity. This being said, and even though from a technical point of view it might be seen as an impurity, it should be pointed out that according to the General Explanatory Note to Chapter 28, if substances were deliberately left in the product with a view to rendering the product suitable for specific rather than for general use, they were not regarded as impurities permissible in Chapter 28. Based on this understanding with regard to the term "impurities" in Chapter 28, the product at issue should also be excluded from Chapter 28 and classified in heading 38.24. In view of the technical nature of the matter, he agreed that the Committee might wish to obtain the views of the Scientific Sub-Committee before a final decision was taken.
6. The Delegates of Mexico and Russia expressed the view that the product at issue was an intentionally prepared mixture and that vanadium pentoxide had been intentionally added to yttrium oxide to change its physical characteristics in order to render it suitable for specific use. They therefore supported classification in heading 38.24.
7. The US Delegate stated that this matter was highly technical in nature and agreed with others who had suggested that it be sent to the Scientific Sub-Committee for consideration. His administration believed that "Yttria C" was classified in heading 28.46.
8. Recalling that the additional information provided by Austria needed to be studied by experts in national administrations, the EC Delegate proposed that the issue be re-examined by the Committee at its next session in November on the basis of this additional information. At that point, if necessary, the Committee could decide whether the matter should be submitted to the Scientific Sub-Committee for consideration at its next session in January 2004.
9. The Committee agreed with this approach and decided to continue examination of the issue at its next session.

## II. SECRETARIAT COMMENTS

10. On the basis of additional information provided by Austria during the last Committee meeting, the Secretariat has modified the description of the product at issue as follows :

Yttrium oxide powder treated by pressing (briquetting or pelletising), sintering, milling and sieving to achieve the required particle size. Prior to this treatment, a very small amount of vanadium pentoxide has been added as a sintering aid. Physical properties of the treated product (surface area, particle size, density and melting point) essentially differ from that of untreated yttrium oxide, thus enabling its use in a particular industry.

11. As mentioned at the last session, headings 28.46 and 38.24 merit consideration for the classification of the product at issue. The principal question is whether the very small amount of vanadium pentoxide present in the product could be regarded as an impurity permissible by Note 1 to Chapter 28.
12. On the basis of information available, it appears that the presence of vanadium pentoxide in the product "Yttria C" has no specific function in its final use (i.e., the preparation of ceramic moulds). Thus, it could be assumed that the addition of vanadium oxide plays a role in the manufacturing process, in particular, in the treatment of yttrium oxide raw material by sintering.
13. In the Secretariat's opinion, in order to determine more precisely the role of vanadium pentoxide in the manufacturing process of "Yttria C", it would be useful to know what the physical characteristics of yttrium oxide sintered without the addition of vanadium pentoxide are. In other words, it may be helpful to compare the physical characteristics of yttrium oxide sintered with the addition of vanadium pentoxide with the physical characteristics of yttrium oxide sintered without addition of vanadium pentoxide. That comparison could give a better idea as to whether vanadium pentoxide acts as an accelerator of the sintering process (performing a role similar to a catalyst) or whether it directly modifies the physical parameters of yttrium oxide during the sintering.
14. Sintering of yttrium oxide in the manufacture of the "Yttria C" product occurs at a temperature of between 1,600 to 1,700 °C. As mentioned in paragraphs 16 to 18 of Doc. NC0724E1, sintering in general has an influence on particle size and particle surface area. These changes can be manipulated by using sintering additives, which are intentionally added to the sintering systems in quantities of 0.1 to 10 wt%.
15. It, therefore, appears that additives/sintering aids accelerate, enhance and support the physical changes of yttrium oxide during sintering. Ullmann's Encyclopaedia distinguishes between the usual level of impurities of the sintering systems (below 1,000 ppm) and the amount of sintering additives (from 0.1 to 10 % wt) (see paragraphs 16 and 17 of Doc. NC0724E1).
16. Based on the foregoing, the Secretariat agrees with the statement of the Austrian Delegate in paragraph 3 above that vanadium pentoxide should not be considered to be an impurity of the sintering system since it performs the function of a sintering aid. Vanadium pentoxide as such remains in the material after sintering; consequently, it is present in the final "Yttria C" product. Therefore, one could conclude that vanadium oxide was not deliberately left in the product to perform any specific function in the use of the final product; it was deliberately added during the manufacturing process to help impart certain physical characteristics to the final product. These specific physical characteristics enable that the final product be utilised in a particular industry.
17. In accordance with the General Explanatory Note to Chapter 28 (Part (A), second paragraph, on page 261), the term "impurities" applies exclusively to substances whose presence in the single chemical compound results solely and directly from the manufacturing process (including purification). The substances may result from any of the factors involved in the process.
18. The same General Explanatory Note (third paragraph) further stipulates that when such substances are deliberately left in the product with a view to rendering the product particularly suitable for specific use rather than for general use, they are not regarded as permissible impurities (emphasis added).

19. Since vanadium pentoxide was deliberately added to yttrium oxide as a sintering aid having no particular role in the use of the final product, the question as to whether a sintering aid could be considered to be an impurity resulting from the manufacturing process, permitted by Note 1 (a) to Chapter 28 merits examination by the Committee. Based on the Explanatory Note provisions above, the Secretariat feels that the key issue to consider is whether the change in physical characteristics of yttrium oxide was caused by the deliberate addition of vanadium pentoxide (sintering aid) rendering the final product suitable for specific use or whether it results from the sintering process itself (e.g., from heat treatment) which was moderated by using vanadium pentoxide as an enhancer and accelerator.
20. Due to the highly technical nature of the issue the Committee may wish to send the matter to the Scientific Sub-Committee for examination, addressing to it the issues raised in paragraphs 13 and 19, as well as the comments above, before taking a final decision on the classification of the product at issue.

### III. CONCLUSION

21. The Committee is invited to rule on classification of "Yttria C", taking the Secretariat's comments above into account.
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