



HARMONIZED SYSTEM
REVIEW SUB-COMMITTEE

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27th Session
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O. Eng.

Brussels, 26 February 2003.

POSSIBLE AMENDMENT OF HEADING 28.23 WITH REGARD TO TITANIUM DIOXIDE

(PROPOSAL BY THE EC)

(Item III.B.14 on Agenda)

Reference documents :

37.456 (RSC/7)
37.650, Annex II (RSC/7 – Report)

I. BACKGROUND

1. On 24 January 2003, the Secretariat received the following new proposal from the EC.
2. “Heading 28.23 refers only to titanium oxides although titanium dioxide is almost the only one of any significance in trade. It is used mostly (about 90 % of world production in the early nineties) for making pigments. For this purpose it must undergo a treatment that consists of adding crystallisation nuclei and very small amounts of oxides. At a later stage of the process it is surface treated.
3. The EC believes it would be advisable to amend the text of heading 28.23 as follows :

“28.23 Titanium oxides, including titanium dioxide, treated by adding very small amounts [3 % by weight] of calcination salts.”

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4. The Explanatory Note to heading 28.23 should also be supplemented by inserting the following sentence :

"This heading also covers titanium dioxide treated by adding 3 % by weight of calcination salts (generally transition element oxides) in order to reduce its catalytic properties on exposure to light. "

II. SECRETARIAT COMMENTS

5. The **EC** in its proposal suggests referring specifically to titanium dioxide in the text of heading 28.23 and at the same time to specify what kind of treatment it could be subjected to when falling in heading 28.23. The amendment of the relevant part of the Explanatory Note is also proposed for this purpose.
6. The Secretariat understands that the proposed amendment is not aimed at any transfer of goods, assuming that the addition of certain quantities of calcination salts would be acceptable within the context of Note 1 to Chapter 28 and thus that titanium dioxide would still remain a separate chemically defined compound.
7. Ullmann's Encyclopaedia of Industrial Chemistry (Sixth Edition, Electronic release) refers to two principal routes for the manufacture of raw pigmentary titanium dioxide : the sulfate and chloride processes. In both, inorganic compounds of transition elements, such as zinc oxide (ZnO), aluminium oxide (Al₂O₃), antimony trioxide (Sb₂O₃) or aluminium chloride (AlCl₃) could be added during the manufacturing process to promote the formation of titanium dioxide crystals and to stabilise its crystal structure.
8. In the sulfate process, when producing specific pigment grades of titanium dioxide, ZnO, Al₂O₃ and/or Sb₂O₃ in quantities of less than 3 % are sometimes added prior to calcination. When producing titanium dioxide of maximum purity, calcination is performed without any further addition.
9. In the chloride process, which does not include the calcination step, AlCl₃ is added in an amount up to 5 mol % during the oxidation reaction, since it promotes formation of rutile (one of the titanium dioxide modifications). The addition of PCl₃ and SiCl₄ suppresses rutile formation, so that anatase pigment is obtained (anatase is another type of the titanium dioxide modifications).
10. Titanium dioxide obtained by one of the two processes above can be marketed directly or after further treatment, e.g., after being coated with oxides or hydroxides of various elements or with silicates or phosphates of titanium, zirconium or aluminium. Different treatments are necessary depending on the future application.
11. The Kirk-Othmer Encyclopaedia of Chemical Technology (Vol. 24, page 247) further explains that because treatments are tailored to the requirement of the final application, the details are specific to the needs of the different market sectors, e.g., paints, plastics, paper. Generally, rutile pigments have between 1 to 15 % of inorganic coating, the higher coating levels being typically used for applications such as mat emulsion paints. Anatase pigments generally have lower coating levels of 1 to 5 %.
12. As stated in the Explanatory Note to heading 28.23 (fourth paragraph on page 299), titanium dioxide when mixed with barium or calcium sulphate or other substances or surface-treated falls in heading 32.06. Hence, titanium oxide with particles coated on the surface would fall, in the Secretariat's view, in heading 32.06.

13. As explained above, the addition of transition elements prior to calcination stabilises the crystal structure of titanium dioxide, which at the end contributes to better weather resistance of the final pigment. The Secretariat therefore shares the EC's view that titanium oxide subjected only to such treatment could not be considered to be surface-treated and would be classifiable in heading 28.23.
14. Furthermore, the Secretariat wishes to recall that the Review Sub-Committee has studied the connection between titanium dioxide of headings 28.23 and 32.06 in the past. At its 7th Session (September 1992), when examining the possible transfer of titanium dioxide from heading 28.23 to Chapter 32, silica, magnesium and iron compounds in very low concentrations were referred to as manufacturing impurities of titanium dioxide. It was also mentioned that surface coatings could be distinguished from manufacturing impurities and that satisfactory test methods, including instrumental methods, were available for this purpose (see paragraphs 7 and 10 of Doc. 37.456). Finally, the Sub-Committee agreed that no transfer of titanium dioxide from heading 28.23 to Chapter 32 was necessary (paragraphs 3 and 4, Annex II to Doc. 37.650, RSC/7 – Report).
15. Taking the existing provisions and the information above into account, the Secretariat agrees with the EC that it may be useful to further clarify how individual types of titanium dioxide (treated to a different extent) currently present on the market are classified. It is, however, an open question whether this should be done at the legal level (in the heading text or in a new Chapter Note) or in the Explanatory Notes or both.
16. The EC is proposing to amend the text of heading 28.23 and its Explanatory Note for this purpose. In this connection, the Secretariat has some doubts with regard to the wording proposed by the EC. The heading text referring to “very small amounts” is vague and might not be interpreted uniformly. As an alternative, a concentration limit for additional substances could be set up, as suggested by the EC in square brackets.
17. The technical literature indicates that the value of 3 % by weight of calcination salts is the upper limit. It may therefore be appropriate to reflect it in the heading text by the expression “not more than 3 % by weight”.
18. Furthermore, it is the Secretariat's understanding, that the reference to calcination salts in the heading text is specifically related to titanium dioxide. Consequently, the comma after “titanium dioxide” should be deleted from the heading text proposed by the EC.
19. Nevertheless, even with these small technical correlation the Secretariat still has concerns about the proposed amendment. We wonder whether the text will, in fact, achieve the stated objective of clarifying the scope of heading 28.23 or may not wind up making it more confusing. The specific inclusion of a certain kind of titanium dioxide may be read by some to limit the heading to only that kind of titanium dioxide. For that reason the Secretariat wonders whether an amendment to the Explanatory Notes or a new legal Note may not be preferable.

III. CONCLUSION

20. In conclusion, the Secretariat would ask the Sub-Committee to express its view on the following points :
- (i) whether the classification of individual types of titanium dioxide treated to a different extend should be further clarified;

NR0388E1

- (ii) if so, whether it should be done at legal level or in an amendment of the Explanatory Notes;
- (iii) if the Sub-Committee prefers an amendment to the Nomenclature, whether the text of heading 28.23 should be amended as proposed by the EC or a new Note to Chapter 28 should be created;
- (iv) if the Sub-Committee considers that an amendment to the Explanatory Notes would also be necessary, whether the text proposed by the EC to be inserted in the Explanatory Note to heading 28.23 would be acceptable.

21. In view of the technical nature of this issue, the Sub-Committee may also wish to obtain the views of the Scientific Sub-Committee on this matter.
