



HARMONIZED SYSTEM
COMMITTEE

NC0134E1

-
24th Session

O. Fr.

H9-3

Brussels, 27 September 1999.

CLASSIFICATION OF A LAMINATED PRODUCT CALLED "POLYSWITCH"
CONSISTING OF OUTER LAYERS OF NICKEL AND AN INNER LAYER

OF PLASTICS : RESERVATION BY CANADA

(Item VII.22 on Agenda)

Reference documents :

NC0061E1 (HSC/23)
NC0090B2, Annex IJ/28 (HSC/23 – Report)

I. BACKGROUND

1. At its 23rd Session in May 1999, the Committee examined the classification of a laminated product called "PolySwitch" consisting of two outer layers of nickel and an inner layer of plastics. By 17 votes to 3, it finally decided to classify this product in subheading 7506.10 rather than in heading 39.21.
2. Canada wrote to the Secretary General on 26 July 1999 requesting that this decision be re-examined by the HS Committee at its 24th Session, in accordance with Article 8.2 of the HS Convention.
3. On 27 August 1999, the Secretariat received the following Note from Canada setting out the arguments supporting its reservation in respect of the HS Committee's decision on this classification question at its 23rd Session.

II. NOTE BY CANADA

Background documents :

4. "At its 23rd Session, the Harmonized System Committee examined the classification of a laminated product called "PolySwitch" at the request of the Japanese Administration. After an exchange of views, the Committee voted 17 to 3 in favour of classifying "PolySwitch" in

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subheading 7506.10 by application of GIR 3 (b) and taking into account Note 1 (d) to Chapter 75. It is the Canadian Administration's belief the HSC may have classified the product in question without having all the relevant facts and therefore, Canada entered a reservation in order for the HSC to re-examine its classification decision.

Product description :

5. "PolySwitch" is a laminated product in sheet form (12 inches by 16 inches) consisting of an inner layer of a mixture of non-conductive polymers and conductive carbon black with outer layers of nickel foil. After importation, the sheet is cut into various shapes or sizes as required and wires or leads may be attached for use. According to the technical literature, "PolySwitch" is a resettable polymeric positive temperature coefficient (PPTC) device that functions as a low-resistance series element between battery cells and pack circuits with a working voltage not exceeding 60V. It acts as a resettable fuse in response to excessive or overcurrent due to short circuiting or overtemperature due to overcharging.

Background :

6. When examining the classification of "PolySwitch", the HSC considered whether to classify this product as an unfinished article for protecting electric circuits in Chapter 85 by GIR 2 (a) or as a composite good in accordance with GIR 3 (b) in either Chapter 39 or 75. It was agreed that GIR 1 was not applicable as there was no relevant legal provision for these goods.

GIR 2 (a) :

7. There was no support for considering the "PolySwitch" sheet an unfinished article for the purposes of GIR 2 (a). The sheet does not have the essential character of a finished product of Chapter 85 at the time of importation since it will be cut into various shapes or sizes as required by customers to form finished "PolySwitch" products. Further, it was agreed that the product in question does not meet the term "blank" for the purposes of GIR 2 (a) as it does not have the approximate shape or outline of the finished article or part at the time of importation. Rather, the "PolySwitch" sheet was considered a material or semi-manufacture. Thus, GIR 2 (a) was not applicable and classification in Chapter 85 was ruled out.

GIR 3 (b) :

8. The HSC then considered the classification of "PolySwitch" based on essential character in accordance with GIR 3 (b). After a short discussion, the Committee voted to classify the "PolySwitch" sheet in subheading 7506.10 as an article of nickel by GIR 3 (b) and taking into account Note 1 (d) to Chapter 75.
9. The Canadian Administration believes that the Committee may not have had all the relevant facts on the product at issue when the vote was taken. We agree with the logic of the Committee with its application of the GIRs, the exclusion of GIR 2 (a) and the subsequent use of GIR 3 (b) for classifying the product. However, we note that not all the facts needed for determining essential character by GIR 3 (b) were provided in the working document.

Canadian comments :

10. General Interpretative Rule 3 (b) governs classification of composite goods according to the constituent material that gives the product its essential character. In determining the essential character, different aspects of the product such as its composition and the function of the individual components must be considered.
11. Physically, the "Polyswitch" product is a rectangular composite sheet of two nickel foil layers "sandwiching" a polymer/carbon black layer. The outer nickel foil layers are 0.025 mm thick and the inner layer of polymer/carbon black is 0.3 mm thick.
12. In paragraph 2 to Doc. NC0061E1, the Secretariat felt this product was a laminated nickel semi-manufacture of Chapter 75 and that the plastics layer could be considered a "coating" for the purposes of Note 1 (d) to Chapter 75. As support, the Secretariat mentioned a previous HSC decision on laminated steel and laminated aluminum where the plastic layer was between the layers of metal. The laminated sheets were classified as coated metal sheets (see Annex F/13 to Doc. 41.600 – HSC/20 – Report). However, it should be noted that it was the metal sheets which characterized these composite products and the inner plastics layer was just considered a coating for classification purposes.
13. With respect to "PolySwitch", the inner plastic layer cannot be considered a simple "coating" for the purposes of Note 1 (d) to Chapter 75. This layer is a deliberate mixture of non-conductive polymers and conductive carbon black (plastics) and it is the component that does the actual switching of the electricity and protects the batteries and electrical circuits against overcurrent and/or overtemperature conditions. As the temperature or current increases, the electrical conductivity of the polymer/carbon black (plastics) layer decreases because the polymer component melts (becomes amorphous) and expands causing the conductive carbon black particles to separate, resulting in a non-linear increase in the resistance of the product. The "PolySwitch" product will then automatically reset after the excessive current is dissipated or the temperature returns to normal as the polymer component cools and contracts.
14. Upon closer inspection, it is both the conductive nature of the carbon black and the insulating nature of the polymer which creates the switching function of the plastics layer within this product. However, when examining the carbon black and polymer components for the purposes of GIR 3 (b), although the conductivity of the "switch" is dependent upon the carbon black particles, it is the non-conductive role of the polymer which provides the critical function of the product. That is, it is the polymer, by expanding and contracting in relation to temperature, which creates the resettable switch aspect of "PolySwitch".
15. According to the manufacturing process outlined in paragraph 1 (d) of Doc. NC0061E1; the polymer/carbon black mixture is extruded in sheet form and then nickel foil is laminated by heat sealing on to the mixture. The nickel foil layers provide heat resistance, durability and a conductive base for the attachment of wires. While these metal layers are important to the overall function of the switch, they are, in our opinion, ancillary to the switching function of the plastics core.
16. With respect to the Secretariat's comments in paragraph 5 of Doc. NC0061E1, we believe that the descriptions under the heading "Combinations of plastics and materials other than textiles" on page 598 of the Explanatory Notes are not all encompassing and limiting. Further, this Explanatory Note starts with the phrase, "This Chapter also covers the following

products,..." and then cites examples (a) through (d). Our Administration is of the opinion that these Explanatory Notes are not an exhaustive list. If any composite product is determined to have the essential character of plastics by way of GIR 3 (b) and is covered by heading 39.21, then we do not see how it can be excluded from that heading by this Explanatory Note.

17. In conclusion, the Canadian Administration believes "PolySwitch" is a plastic sheet laminated with nickel foil. This is supported by the description of the manufacturing process. It is not a "coated" or laminated nickel foil for the purposes of Note 1 (d) to Chapter 75, nor is it excluded from heading 39.21 by the Explanatory Notes. Further, our Administration believes that the essential character of "PolySwitch" should also be determined by function when the roles of the components are clear. Since it is the plastic component that provides the switching properties, the main function of this product, we support classification in Chapter 39, specifically subheading 3921.90 as a plastic sheet combined with other materials, in accordance with GIR 3 (b).
18. As an additional comment, the name "PolySwitch" is undoubtedly a coined contraction for "polymer switch" given by the manufacturer to emphasize the component of importance, the polymer component."

III. SECRETARIAT COMMENTS

19. When this question was examined at the Committee's 23rd Session, several delegates expressed very differing views regarding the classification of "PolySwitch". The majority of delegates favoured classification of the "PolySwitch" sheet in subheading 7506.10 as a sheet of nickel laminated with plastics for use, after further working, in the manufacture of resettable fuses. This position was based on the following legal provisions and arguments :
- (1) GIR 3 (a) and Note 1 (d) to Chapter 75.
 - (2) The product at issue is laminated. The inner layer of plastics is completely embedded in the two outer layers of nickel. That inner layer can only be seen if the article is totally destroyed. Furthermore, all parties agree that this product cannot be used as it stands.
 - (3) The physical state of this sheet as indicated by Canada in paragraph 11 above and the sample submitted to the Committee show that, to the naked eye, this article is in no way different from a sheet of metal of Section XV.
20. In the light of paragraphs 14 and 15 above, it can be seen that Canada bases its arguments on the article's use and the capacity of the laminated polymer (mixture of conductive carbon black and non-conductive polymers) to expand when the voltage increases and to revert to its initial position afterwards. In this connection, it can be imagined that the presence of the nickel layers over the core of plastics is deliberate to prevent the whole from losing its shape; the nickel layers serve as heat insulators and if they were not present in the product, the latter would disappear with the application of excessive current. Since "PolySwitch" reverts to its initial form once overvoltage is no longer applied (as indicated by Canada in paragraph 13 above), the properties of plastics laid down by Note 1 to Chapter 39 would not seem to be met. Thus, the main issue to be resolved for the classification of this product is to determine whether it is a sheet of plastics laminated with

nickel as argued by Canada, or a sheet of nickel laminated with plastics as maintained by the majority of delegates and the Secretariat at the Committee's last session. The Secretariat draws the Committee's attention to the fact that it is to classify the "PolySwitch" sheet (intermediate product) which goes into the manufacture of "PolySwitch" (finished product) used as resettable fuses, whose functioning is described by Canada in the Annex hereto.

21. In the light of the foregoing, the Secretariat maintains its opinion already expressed in paragraphs 2 to 7 of Doc. NC0061E1. GIR 3 (b) is applied to determine the essential character of the article and Note 1 (d) to Chapter 75 is applied to arrive at the classification of the "PolySwitch" sheet in subheading 7506.10.

IV. CONCLUSION

22. The Committee is invited to re-examine the classification of "PolySwitch", taking account of the text provided by Canada and the Secretariat's comments in paragraphs 19 to 21 above, and to decide what action to take on this matter.

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How PolySwitch devices function

PolySwitch devices are made from a conductive polymer blend of specially formulated plastics and conductive materials. At normal temperatures, the conductive particles form low-resistance chains in the polymer (see Figure). However, if the current rises above the device's rating, the increased power generation raises the polymer's internal temperature to the point at which its crystallites melt and become amorphous. This increase in volume during the amorphous phase causes separation of the conductive particles and results in a non-linear increase in the resistance of the device. This increased resistance reduces to a minimal level the amount of current that can flow under the fault condition.

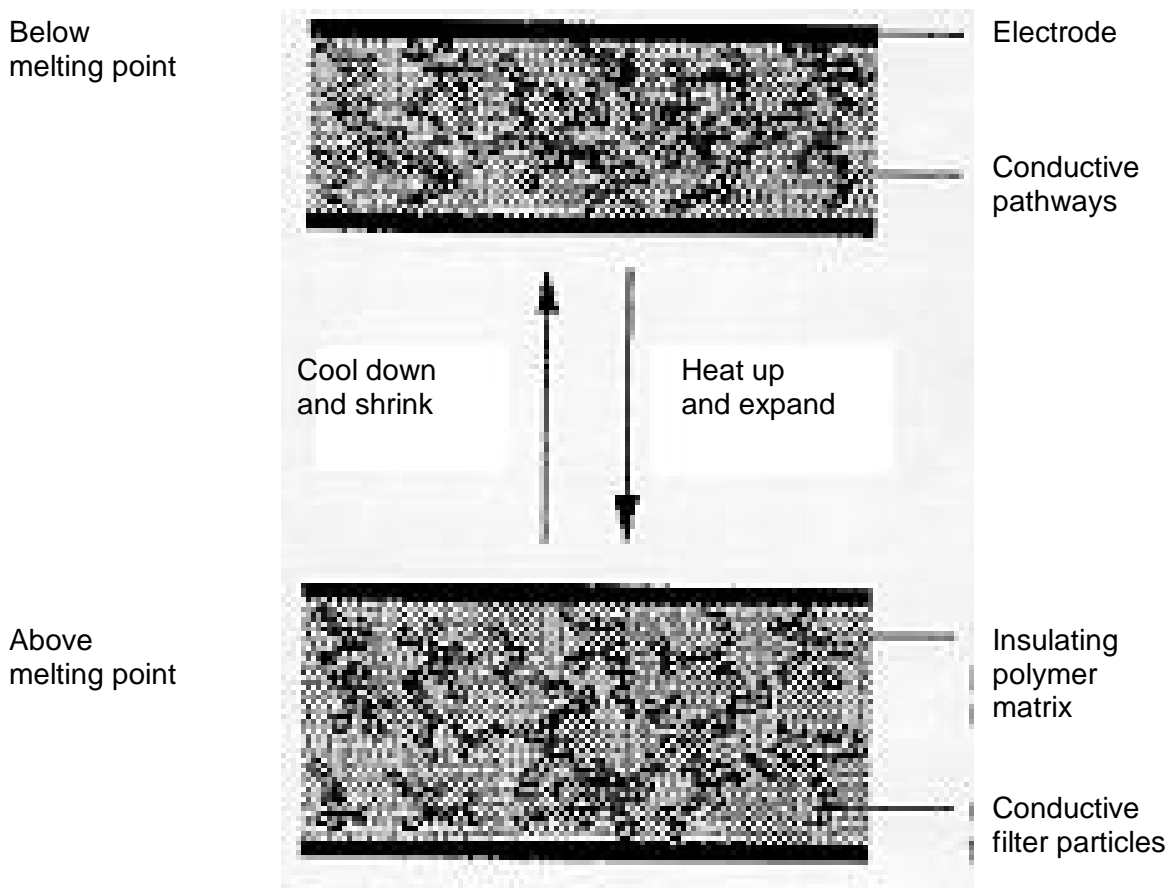


Figure : How a PolySwitch PPTC device functions