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DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 177

[Docket No. 95F-0191]

Indirect Food Additives: Polymers

AGENCY: Food and Drug Administration, HHS.

ACTION: Final rule.

SUMMARY: The Food and Drug Administration (FDA) is amending the food additive regulations to provide for the safe use of polyester carbonate resins produced by the condensation of 4,4'-isopropylidenediphenol, carbonyl chloride, terephthaloyl chloride, and isophthaloyl chloride. The finished resins are composed of 45 to 85 mole percent ester, of which up to 55 mole percent is the terephthaloyl isomer, as articles or components of articles in contact with food. This action responds to a petition filed by the General Electric Co.

DATES: This regulation is effective (*insert date of publication in the Federal Register*); written objections and requests for a hearing by (*insert date 30 days after date of publication in the Federal Register*).

ADDRESSES: Submit written objections to the Dockets Management Branch (HFA-305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852.

FOR FURTHER INFORMATION CONTACT: Julius Smith, Center for Food Safety and Applied Nutrition (HFS-215), Food and Drug Administration, 200 C St. SW., Washington, DC 20204, 202-418-3091.

SUPPLEMENTARY INFORMATION: In a notice published in the **Federal Register** of July 31, 1995 (60 FR 39000), FDA announced that a food additive petition (FAP 5B4470) had been filed by

the General Electric Co., 1 Lexan Lane, Mt. Vernon, IN 47620–9364. The petition proposed to amend the food additive regulations in § 177.1585 *Polyestercarbonate resins* (21 CFR 177.1585) to provide for the safe use of polyestercarbonate resins produced by the condensation of 4,4'-isopropylidenediphenol, carbonyl chloride, terephthaloyl chloride, and isophthaloyl chloride. The finished resins are composed of 45 to 85 percent ester, of which up to 55 percent is the terephthaloyl isomer, as articles or components of articles in contact with food. (The agency will subsequently use mole-percent to describe these resins because this term better describes the resin composition.)

In its evaluation of the safety of this food additive, FDA has reviewed the safety of the additive itself, the starting materials used, and the chemical impurities that may be present in the additive resulting from its manufacturing process. Although the additive itself has not been shown to cause cancer, it has been found to contain residual amounts of methylene chloride, which has been shown to cause cancer in test animals. Residual amounts of reactants and manufacturing aids, such as methylene chloride, are commonly found as contaminants in chemical products, including food additives.

I. Determination of Safety

Under the general safety standard of section 409(c)(3)(A) of the Federal Food, Drug, and Cosmetic Act (the act) (21 U.S.C. 348(c)(3)(A)), a food additive cannot be approved for a particular use unless a fair evaluation of the data available to FDA establishes that the additive is safe for that use. FDA's food additive regulations (21 CFR 170.3(i)) define safe as "a reasonable certainty in the minds of competent scientists that the substance is not harmful under the intended conditions of use."

The food additives anticancer, or Delaney, clause of the act (409(c)(3)(A)) provides that no food additive shall be deemed safe if it is found to induce cancer when ingested by man or animal. Importantly, however, the Delaney clause applies to the additive itself and not to the impurities in the additive. That is, where an additive itself has not been shown to cause cancer, but contains a carcinogenic impurity, the additive is properly evaluated under the general safety standard using

risk assessment procedures to determine whether there is a reasonable certainty that no harm will result from the intended use of the additive (*Scott v. FDA*, 728 F.2d 322 (6th Cir. 1984)).

II. Safety of Petitioned Use of the Additive

FDA estimates that the petitioned use of the additive, polyestercarbonate resins, as food packaging, will not significantly increase the overall exposure to polyestercarbonate oligomers, monomers, *p*-cumylphenol, and methylene chloride above the exposure from the currently regulated uses of these polyestercarbonate resins (Ref. 1).

FDA does not ordinarily consider chronic toxicological studies to be necessary to determine the safety of an additive use of which will result in such low exposure levels (Ref. 2), and the agency has not required such testing here. However, the agency has reviewed the available toxicological data on the additive and concludes that the estimated small dietary exposure resulting from the petitioned use of this additive is safe.

FDA has evaluated the safety of this additive under the general safety standard, considering all available data and using risk assessment procedures to estimate the upper-bound limit of lifetime human risk presented by methylene chloride, the carcinogenic chemical that may be present as an impurity in the additive. This risk evaluation of methylene chloride has two aspects: (1) Assessment of exposure to the impurity from the petitioned use of the additive; and (2) extrapolation of the risk observed in the animal bioassay to the conditions of probable exposure to humans.

A. Methylene Chloride

FDA has estimated the exposure to methylene chloride from the petitioned and regulated uses of polyestercarbonate resins as articles intended to contact food to be no more than 4.9 parts per billion in the daily diet (3 kilogram), or 15 micrograms per person per day (Ref. 1). The agency used data in the National Toxicology Program Report No. 306 (January 1986), on inhalation studies in F344/N rats and B6C3F₁ mice to estimate the upper-bound limit of lifetime human risk from

exposure to this chemical resulting from the petitioned and regulated uses of the additive (Ref. 3). The authors reported that the test material caused an increased incidence of liver cell neoplasms and lung neoplasms in both male and female B6C3F₁ mice.

Based on the agency's estimate that exposure to methylene chloride will not exceed 15 micrograms/person/day, FDA estimates that the upper-bound limit of lifetime human risk from the regulated and petitioned uses of the polyestercarbonate resins is 1×10^{-7} or 1 in 10 million (Ref. 4). Because of numerous conservative assumptions used in calculating the exposure estimate, the actual lifetime-averaged individual exposure to methylene chloride is likely to be substantially less than the estimated exposure, and therefore, the probable lifetime human risk would be less than the upper-bound limit of lifetime human risk. Thus, the agency concludes that there is reasonable certainty that no harm from exposure to methylene chloride would result from the petitioned use of the additive.

B. Need for Specifications

The agency has also considered whether specifications are necessary to control the amount of methylene chloride present as an impurity in the additive. The agency finds that the specification currently in § 177.1585 is adequate to insure that the risk from methylene chloride resulting from the petitioned use of the polyestercarbonate resins in contact with food is insignificant and that use of the resins is safe.

III. Conclusion on Safety

FDA has evaluated the data in the petition and other relevant material. Based on this information, the agency concludes that the proposed uses for the food additive in food-contact articles are safe, that the food additive will achieve its intended technical effect, and that the regulations in § 177.1585 should be amended as set forth in the codified of this document.

In accordance with § 171.1(h) (21 CFR 171.1(h)), the petition and the documents that FDA considered and relied upon in reaching its decision to approve the petition are available for

inspection at the Center for Food Safety and Applied Nutrition by appointment with the information contact person listed previously. As provided in § 171.1(h)(2), the agency will delete from the documents any materials that are not available for public disclosure before making the documents available for inspection.

IV. Environmental Impact

The agency has carefully considered the potential environmental effects of this action. FDA has concluded that the action will not have a significant impact on the human environment, and that an environmental impact statement is not required. The agency's finding of no significant impact and the evidence supporting that finding, contained in an environmental assessment, may be seen in the Dockets Management Branch (address above) between 9 a.m. and 4 p.m., Monday through Friday.

V. Paperwork Reduction Act of 1995

This final rule contains no collection of information. Therefore, clearance by the Office of Management and Budget under the Paperwork Reduction Act of 1995 is not required.

VI. Objections

Any person who will be adversely affected by this regulation may at any time on or before (*insert date 30 days after date of publication in the **Federal Register***), file with the Dockets Management Branch (address above) written objections thereto and may make a written request for a public hearing on the stated objections and the grounds for the objection. Each objection shall be separately numbered, and each numbered objection shall specify with particularity the provision of the regulation to which objection is made and the grounds for the objection. Each numbered objection on which a hearing is requested shall specifically so state. Failure to request a hearing for any particular objection shall constitute a waiver of the right to a hearing on that objection. Each numbered objection for which a hearing is requested shall include a detailed description and analysis of the specific factual information intended to be presented in support

of the objection in the event that a hearing is held. Failure to include such a description and analysis for any particular objection shall constitute a waiver of the right to a hearing on the objection. Three copies of all documents shall be submitted and shall be identified with the docket number found in brackets in the heading of this document. Any objections received in response to the regulation may be seen in the Dockets Management Branch between 9 a.m. and 4 p.m., Monday through Friday.

VII. References

The following references have been placed on display in the Dockets Management Branch (address above) and may be seen by interested persons between 9 a.m. and 4 p.m., Monday through Friday.

1. Memorandum dated April 25, 1996, from the Chemistry Review Branch (HFS-247), to the Indirect Additives Branch (HFS-216) entitled "FAP 5B4470 (MATS 825, M2.0 and 2.1—General Electric Company (GE) Polyester carbonate (PEC) resins. Submission dated 6-1-95."

2. Kokoski, C. J., "Regulatory Food Additive Toxicology" in *Chemical Safety Regulation and Compliance*, edited by F. Homburger, J. K. Marquis, and S. Karger, New York, NY, pp. 24-33, 1985.

3. "Toxicology and Carcinogenesis Studies of Dichloromethane (Methylene Chloride) (CAS Reg. No. 75-09-2) in F344/N Rats and B6C3F₁ Mice (Inhalation Studies)," National Toxicology Program Technical Report Series, No. 306 (January 1986).

4. Memorandum, dated June 4, 1996, from the Indirect Additives Branch, (HFS-216), to Executive Secretary, Quantitative Risk Assessment Committee (QRAC), (HFS-308), entitled "Estimation of Upper-bound Lifetime Human Risk from Methylene Chloride in Polyester carbonate Resins, the Subject of FAP 5B4470 (General Electric Co.)."

List of Subjects in 21 CFR Part 177

Food additives, Food packaging.

Therefore, under the Federal Food, Drug, and Cosmetic Act and under authority delegated to the Commissioner of Food and Drugs, 21 CFR part 177 is amended as follows:

PART 177—INDIRECT FOOD ADDITIVES: POLYMERS

1. The authority citation for 21 CFR part 177 continues to read as follows:

Authority: 21 U.S.C. 321, 342, 348, 379e.

2. Section 177.1585 is amended by revising paragraphs (a) and (c)(1) to read as follows:

§ 177.1585 Polyester carbonate resins.

* * * * *

(a) Polyester carbonate resins (CAS Reg. No. 71519–80–7) are produced by the condensation of 4,4'-isopropylidenediphenol, carbonyl chloride, terephthaloyl chloride, and isophthaloyl chloride such that the finished resins are composed of 45 to 85 molepercent ester, of which up to 55 molepercent is the terephthaloyl isomer. The resins are manufactured using a phthaloyl chloride/carbonyl chloride mole ratio of 0.81 to 5.7/1 and isophthaloyl chloride/terephthaloyl chloride mole ratio of 0.81/1 or greater. The resins are also properly identified by CAS Reg. No. 114096–64–9 when produced with the use of greater than 2 but not greater than 5 weight percent *p*-cumylphenol (CAS Reg. No. 599–64–4), as an optional adjuvant substance in accordance with paragraph (b)(2) of this section.

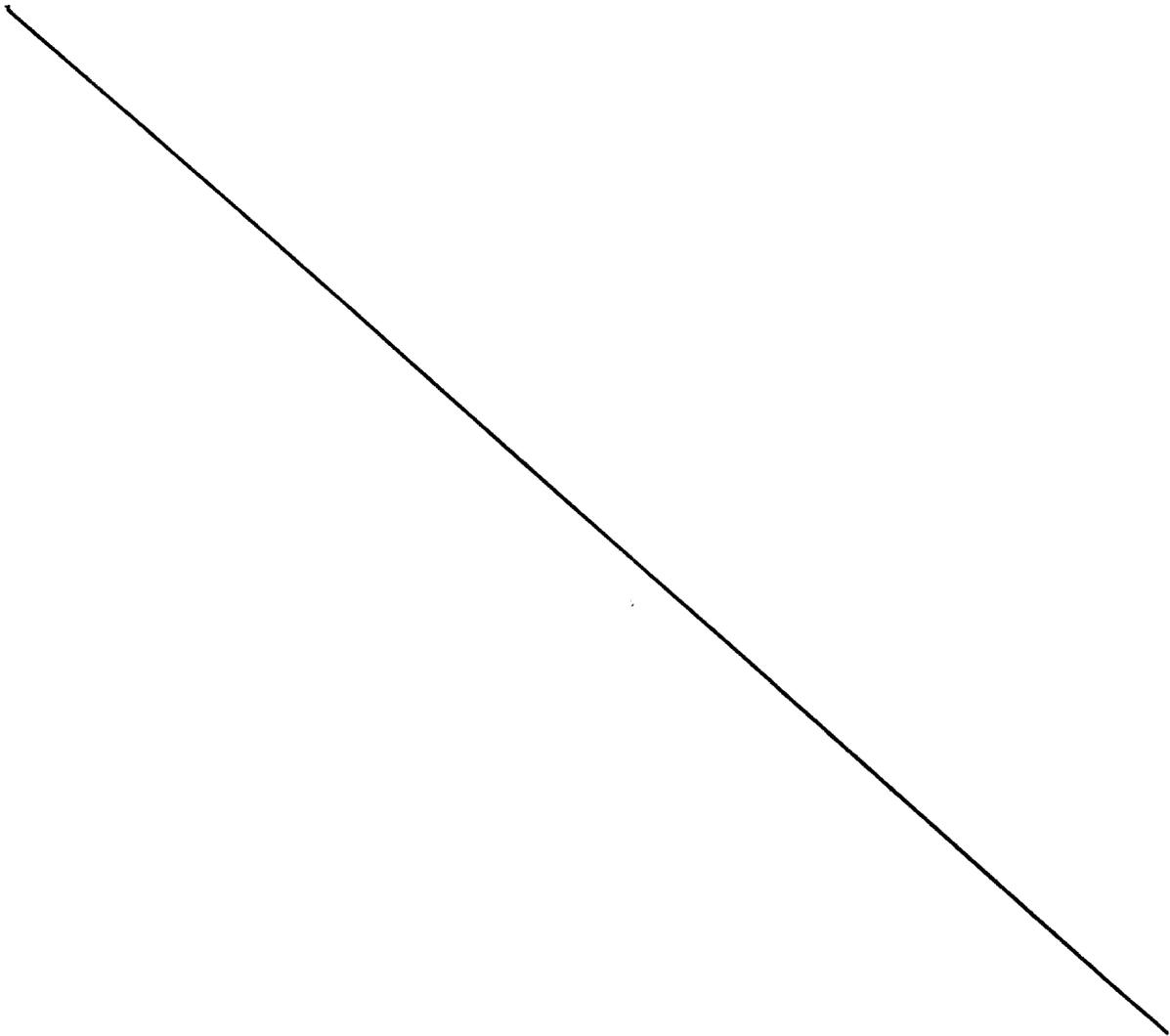
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(c) * * *

(1) *Specifications.* Polyester carbonate resins identified in paragraph (a) of this section can be identified by their characteristic infrared spectrum. The resins shall comply with either or both of the following specifications:

(i) The solution intrinsic viscosity of the polyester carbonate resins shall be a minimum of 0.44 deciliter per gram, as determined by a method entitled “Intrinsic Viscosity (IV) of Lexan® Polyester carbonate Resin by a Single Point Method Using Dichloromethane as the Solvent,”

developed by the General Electric Co., September 20, 1985, which is incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies are available from the Office of Premarket Approval, Center for Food Safety and Applied Nutrition (HFS-215), Food and Drug Administration, 200 C St. SW., Washington, DC 20204, or may be examined at the Center for Food Safety and Applied Nutrition's Library, Food and Drug Administration, 200 C St. SW., rm. 3321, Washington, DC, or at the Office of the Federal Register, 800 North Capitol St. NW., suite 700, Washington, DC; or

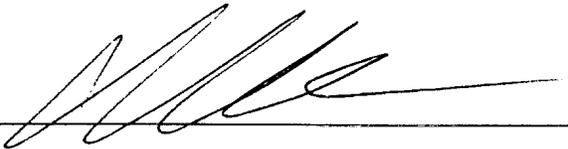


(ii) A minimum weight-average molecular weight of 27,000, as determined by gel permeation chromatography using polystyrene standards.

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Dated: May 10 1999

May 10, 1999



William K. Hubbard
Associate Commissioner for Policy Coordination

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