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Australian Standard 2070, Part 3—1979

PLASTICS MATERIALS FOR FOOD CONTACT USE

Part 3—STYRENE PLASTICS MATERIALS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

THE FOLLOWING SCIENTIFIC, INDUSTRIAL, CONSUMER AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Federation of Consumer Organizations

Australian Institute of Food Science and Technology

CSIRO, Division of Food Research

Confederation of Australian Industry

Council of Australian Food Technology Associations Incorporated

Department of Health

Department of Health, Queensland

Department of Science and the Environment

Health Commission of New South Wales

Health Commission of Victoria

Packaging Council of Australia

Plastics Institute of Australia Incorporated

Public Health Department, Western Australia

University of New South Wales

This standard, prepared by Committee CS/13, Plastics for Food Contact, was approved on behalf of the Council of the Standards Association of Australia on 19 March 1979, and was published on 1 June 1979.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

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AUSTRALIAN STANDARD

PLASTICS MATERIALS FOR FOOD CONTACT USE

Part 3

STYRENE PLASTICS MATERIALS

AS 2070, Part 3—1979

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PREFACE

This standard was prepared at the request of the Commonwealth Government by the Association's Committee on Plastics for Food Contact under the direction of the Consumer Standards Advisory Committee.

It is one Part of a series dealing with plastics for food contact and sets out the requirements of styrene plastics materials for use in the manufacture of plastics items for food contact use.

Styrene polymers are made by polymerizing styrene alone or in combination with other monomers. Catalysts and various other additives are necessary to polymerize styrene to produce polystyrene. In addition, various blowing agents are necessary to produce expandable styrene polymers. Styrene polymers as produced may be used with or without further additives to manufacture plastics items for food contact use. In some cases the plastics materials manufacturer or the compounder may incorporate additives such as colourants into the polymer.

Other Parts in this series of standards specify the requirements for various other plastics materials for food contact use. Where appropriate, any restrictions on the use of additives in plastics for the packaging of specific food types are stated, based on current toxicological data. However, the committee recognizes that the available toxicological data are incomplete.

A code of practice for the manufacture of plastics items for food contact use has been published, and test methods for checking the migration of compounds from plastics materials into food simulants are in the course of preparation.

It is emphasized that these standards need to be used in combination to provide a system of control of the migration of substances from plastics materials into food.

In preparing this standard, the committee has collated a list of additives that may be used in the production of styrene plastics materials for food contact use. In general only those additives that have been approved by any of the following sources have been included:

(a) The Netherlands Packaging and Food Utensils Regulations.

(b) The U.S. Food and Drug Administration Regulations.

(c) The West Germany Federal Health Department recommendations.

(d) BPF/BIBRA* Code for Plastics for Food Applications.

Requests for alterations to this standard concerning the additives or other substances to be used in the preparation of styrene plastcis materials intended for food contact use should be made to SAA and must include relevant information.

*British Plastics Federation/British Industrial Biological Research Association

This standard requires reference to the following standards:

AS 1886 Glossary of Terms Relating to Plastics

AS 2070 Plastics Materials for Food Contact Use
Part .. — Colourants*

AS 2171 Code of Practice for the Manufacture of Plastics Items for Food Contact Applications.

*In course of preparation.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
PLASTICS MATERIALS FOR FOOD CONTACT USE

PART 3—STYRENE PLASTICS MATERIALS

FOREWORD

The various Parts of this standard together with AS 2171 and the test methods* are intended to apply in every case where plastics materials are in contact with foodstuffs, e.g. in food processing equipment, food utensils and the plastics components of other food packaging materials.

The packaging and processing of food introduces the possibility of the migration or transfer of substances from the plastics packaging or wrapping materials into the food. It is essential that the formulation of the plastics materials is such that any migration of substances into the food from the plastics packaging or wrapping materials is minimized and if migration occurs no known toxic hazard will exist to the consumer of the food.

Toxic effects generally can be either *acute*, being more or less immediate following a single dose of a toxic substance as is the case in most forms of accidental poisoning, or *chronic*, being the result of repeated ingestion of a number of small doses each in themselves insufficient to cause an immediate acute reaction but in the long term having a cumulative effect.

The occurrence of acute toxicity due to plastics materials in contact with food is most unlikely since only trace quantities of potentially toxic materials are likely to migrate. Chronic effects however are possible where small quantities of biologically active substances transfer from packaging materials and are ingested in small amounts over a long period of time.

The high-molecular-mass polymer itself does not pose a toxic hazard, being inert and essentially insoluble in food.

In the preparation of the plastics material, numerous additives are used and the nature of these is dependent on the type of polymer being produced. Examples of the additives which may be used are catalysts, suspension and emulsifying agents, stabilizers and polymerization inhibitors. These additives are bound either chemically or physically into the polymer and may be present in their original or altered form. In addition, the polymerization process may leave trace quantities of residual monomer or low-molecular-mass polymer in the product. It is therefore necessary to specify the purity of the polymer to be used in the preparation of plastics materials intended for food contact use.

*In course of preparation.

It is also necessary to consider the migration of substances from the plastics packaging materials and their levels in the food. The extent to which migration occurs will depend upon such factors as the contact area, the rate of transfer, the type of plastics material, the temperature and the contact time. It is therefore necessary to consider the intrinsic toxicity of each ingredient in the plastics material, and its ability to migrate under extreme conditions in an original or altered form and the amounts of such ingredients which may be safely ingested.

The migration of substances from the packaging into the food is also related to the type of food packaged in the plastics material. For example, foods such as alcoholic beverages, and edible fats and oils may extract substances more readily than dry foods such as cereals.

SPECIFICATION

1 SCOPE. This Part of this standard specifies requirements for styrene plastics materials including expandable styrene plastics materials (in the form of granules or powder) for use in the manufacture of plastics items for food contact use.

2 DEFINITIONS. For the purpose of this Part of the standard, the terms given in AS 1886 apply.

3 COMPOSITION OF STYRENE POLYMERS.

3.1 General Requirements. Styrene polymers shall be produced by—

(a) the polymerizing of styrene alone or in combination with any of the monomers specified in Clause 3.3, using only those catalysts specified in Clause 3.5;

(b) from any of the polymers specified in Clause 3.4.

All polymers used in the production of styrene polymers shall comply with the appropriate Parts of this standard.

Where additives are required, only those substances specified in Clauses 3.6 to 3.11 shall be used.

3.2 Percentage of Styrene Units in Styrene Polymers. The resultant polymer shall contain not less than 70 percent by mass of styrene units.

3.3 Permissible Monomers. Styrene may be used alone or in combination with any of the following monomers in the production of styrene polymers:

(a) Styrene substituted in the benzene ring or the vinyl group by halogens or alkyl groups.

(b) Acrylonitrile, provided that the resultant polymer contains not more than 5 percent by mass of units derived from this monomer.

(c) Acrylic, fumaric, itaconic, maleic or methacrylic acids and their anhydrides.

(d) Esters of the acids specified in (c) with saturated monohydric aliphatic alcohols (C_1-C_3).

(e) Butadiene.

(f) Divinylbenzene.

(g) Vinyl ethers of saturated monohydric aliphatic alcohols.

(h) Vinyl esters of monobasic aliphatic acids.

The styrene monomer content shall not exceed 0.3 percent by mass of the styrene polymers.

The acrylonitrile monomer content shall not exceed 0.01 percent by mass of the styrene polymers.