AS 2070, Part 1—1980
UDC 678.742:664

Australian Standard 2070, Part 1—1980

PLASTICS MATERIALS FOR FOOD CONTACT USE

Part 1—POLYETHYLENE

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 30 July 1980, and was published on 1 October 1980.

To keep abreast of progress in industry, Australian Standards are subject to continuous review and are kept up-to-date by the issue of amendments or new editions as necessary. It is important therefore that standards users ensure that their standards are up-to-date. Full details of all SAA publications will be found in the Annual List of Australian Standards; these details are supplemented by listings in the SAA monthly journal 'The Australian Standard'. Information on the Annual List and 'The Australian Standard' may be obtained from any sales office of the Association, where details are also available of the current status of individual standards. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

AUSTRALIAN STANDARD

PLASTICS MATERIALS FOR FOOD CONTACT USE

Part 1 POLYETHYLENE

AS 2070, Part 1—1980

First published 1977
Second edition 1980

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 2020 5

PREFACE

This standard was originally published in 1977, having been 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.

In this edition the opportunity has been taken to incorporate the various amendments that have been published to the 1977 edition and to include some minor editorial updating.

This standard is one of a series dealing with plastics for food contact and sets out the requirements for polyethylene (polythene) plastics materials for use in the manufacture of plastics items for food contact use.

Polyethylene is made by polymerizing ethylene alone or in combination with other monomers. Catalysts and various other additives are necessary to polymerize ethylene to produce polyethylene. Polyethylene polymer as produced may be used with or without further additives to manufacture plastics items for food contact use. In some cases, e.g. in the preparation of plastics film, the plastics material manufacturer or the compounder may incorporate additives such as colourants into the polymer in a post polymerization process.

Other standards in this series 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 (as AS 2171) 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 polyethylene 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 the published standard concerning the additives or other substances to be used in the preparation of polyethylene 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 1 . . —Colourants*
AS 2171	Code of Practice for the Manufacture of Plastics Items for Food Contact Applications
BS 2782	Methods of Testing Plastics Part 1—Effect of Temperature

*In course of preparation.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
PLASTICS MATERIALS FOR FOOD CONTACT USE

PART 1—POLYETHYLENE

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*, as a 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

*In course of preparation.

the polymer to be used in the preparation of plastics materials intended for food contact use.

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 standard specifies requirements for polyethylene (polythene) plastics materials (in the form of granules or powder) for the manufacture of plastics items for food contact use.

NOTE: This standard does not apply to polyethylene for the manufacture of polyethylene pipe for potable water. AS 1159, Polyethylene (Polythene) Pipe for Pressure Applications, applies in this case.

2 DEFINITIONS. For the purpose of this standard, the following definition applies in addition to the definitions given in AS 1886:

Ethylene units—those units derived from ethylene as specified in Clauses 3.1 (a) and 3.1 (b).

3 COMPOSITION OF POLYETHYLENE.

3.1 General Requirements. Polyethylene shall be produced by—

(a) the polymerizing of ethylene;

(b) the polymerizing of ethylene with any of the monomers specified in Clause 3.3; or

(c) the blending of any of the polymers specified in Clause 3.4.

All monomers and polymers used in the production of polyethylene shall comply with the appropriate standards in the AS 2070 series.

Where additives are required in the production of polyethylene, only those substances specified in Clauses 3.5 to 3.8 shall be used.

3.2 Percentage of Ethylene Units in Polyethylene. The resultant polymer shall contain not less than 50 percent by mass of ethylene units.

3.3 Permissible Monomers. Ethylene may be used alone or in combination with any of the following monomers in the production of polyethylene:

(a) Hydrocarbons of the alkene-1 or alkadiene types containing up to 8 carbon atoms, provided that there is a minimum of 85 percent by mass of ethylene units in the resultant polymer.

(b) Vinyl acetate, provided that there is a minimum of 94 percent by mass of ethylene units in the resultant polymer.

(c) Ethyl acrylate, provided that there is a minimum of 92 percent by mass of ethylene units in the resultant polymer.

3.4 Polymer Blends. Blends of the following polymers may be used in the production of polyethylene:

(a) Polymers produced by polymerizing the monomers specified in Clause 3.3.

(b) Polymers specified above in (a) with polypropylene, polybutylene, poly*iso*butylene, ethylene vinyl acetate copolymer and polystyrene or admixtures thereof, provided that the polystyrene does not exceed 10 percent by mass of the resultant polymer.