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ISO TC 93

Secretariat: BSJ

Starch acetates — Specifications and test methods

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see ~~www.iso.org/directives~~www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see ~~www.iso.org/iso/foreword.html~~www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 93, *Starch (including derivatives and by-products)*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at ~~www.iso.org/members.html.~~www.iso.org/members.html.

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Introduction

Starch consists mainly of amylose and amylopectin. Amylose is a linear molecule of α-D-glucopyranosyl units, linked by (1-4)-α-linkages. Amylopectin is a highly branched polymer of α-D-glucopyranosyl units, linked by (1-4)-α-linkages and by (1-6)-α- linkages that constitute the branch points. In general, each glucose unit possesses a maximum of three hydroxyls that can undergo chemical substitution. A fourth substitution is also possible at carbon four (4) if that carbon is not involved in a glycosidic bond. Native starches can be chemically modified for improved functionality. The most common sources of native starch used in these modifications are various roots, tubers, cereals and legumes. Modified starches are used in applications requiring special properties that are not attainable by their respective native starches.

Acetylated forms of food starches (including those extracted from hybrid crops such as high-amylose maize) are widely accepted additives that are used in the food industry globally. Starch acetate (INS[1] No. 1420), is produced by esterification of food starch with acetic anhydride or vinyl acetate, with the acetyl groups not exceeding more than 2,5 % of the acetylated product.

[1] International Numbering System for Food Additives.

Starch acetates — Specifications and test methods

1 Scope

This document specifies the physical, chemical and microbiological requirements for and test methods of starch acetates.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1666, *Starch — Determination of moisture content — Oven-drying method*

ISO 3188, *Starches and derived products — Determination of nitrogen content by the Kjeldahl method — Titrimetric method*

ISO 3947, *Starches, native or modified — Determination of total fat content*

ISO 11212-1, *Starch and derived products — Heavy metals content — Part 1: Determination of arsenic content by atomic absorption spectrometry*

ISO 11212-2, *Starch and derived products — Heavy metals content — Part 2: Determination of mercury content by atomic absorption spectrometry*

ISO 11212-3, *Starch and derived products — Heavy metals content — Part 3: Determination of lead content by atomic absorption spectrometry with electrothermal atomization*

ISO 11212-4, *Starch and derived products — Heavy metals content — Part 4: Determination of cadmium content by atomic absorption spectrometry with electrothermal atomization*

ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*

ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 °C by the pour plate technique*

ISO 4833-2, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 2: Colony count at 30 °C by the surface plating technique*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0,95*

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Official Method AOAC 2011.14: 2011, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Phosphorus, Sodium, and Zinc in Fortified Food Products. Microwave Digestion and Inductively Coupled Plasma-Optical Emission Spectrometry

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at ~~https://www.iso.org/obp~~https://www.iso.org/obp

— IEC Electropedia: available at ~~https://www.electropedia.org/~~https://www.electropedia.org/

3.1
starch
carbohydrate polymer consisting of a large number of glucose units linked together primarily by alpha 1-4 glycosidic bonds

Note 1 to entry: The starch polymers come in two forms: (1) linear (amylose) and (2) branched through alpha 1-6 glycosidic bonds (amylopectin), with each glucose unit possessing a maximum of three hydroxyls that can undergo chemical substitution.

3.2
native starch
starch extracted from plant cells in its natural state as granules, which has not been subjected to any form of modification resulting in physical and/or chemical change

3.3
starch acetate
modified starch esterified with acetic anhydride or vinyl acetate

Note 1 to entry: It is gluten free and can be used as a stabilizer, thickener, binder~~,~~ and emulsifier during food and cosmetic processing.

4 Requirements

4.1 Physical indexes

Physical indexes shall comply with the requirements given in Table 1.

Table 1 — Physical requirements of starch acetates

Item	Description
Appearance	Powder, granule, coarse particles
Colour	White or nearly white
Microscopy	Granular structure typical of the starch source Typical polarization cross

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