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Specification of polypropylene drinking straws

Spécifications des pailles à boire en polypropylène

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Foreword

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The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

Introduction

Despite worldwide use, polypropylene drinking straws lack standards and specifications. This International Standard provides general requirements for dimensions and performance properties to ensure consistent, quality products.

Specification of polypropylene drinking straws

1 Scope

This International Standard specifies the general characteristics, requirements and methods for testing of polypropylene (PP) drinking straws (herein after called PP straws). It is applicable to PP straws having an inner diameter of 3 mm to 12 mm.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 1873-2, *Plastics — Polypropylene (PP) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ISO 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*

ISO 19069-1, *Plastics — Polypropylene (PP) moulding and extrusion materials — Part 1: Designation system and basis for specifications*

3 Terms and definitions

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

3.1
plastic drinking straw
thin tube of plastic for sucking up liquid from a container

3.2
straight straw
straw with a straight tube

3.3
flexible/bendable straw
straw with an angle-adjustable bellows segment

3.4
spoon straw
straw with a spoon-shaped end, intended for slushes

3.5
sharp tip straw
straw with a sharp tip, intended for insertion through film sealed containers

3.6
extendable straw
straw composed of concentric sections whose length is extended by pulling the inner tube out of the outer one

3.7
pack
primary packaging

4 Raw materials

A suitable grade of PP conforming to the food contact requirements of the intended market shall be utilized in the manufacture of PP straws. Additives, e.g. colorants, if used, shall also be of food grade. Printing is not allowed on the straws. The designation and specification of different grades of polypropylene are described in ISO 19069-1 while the relevant properties are determined using the methods described in ISO 1873-2.

5 Requirements

The following are requirements provided for general guidance. Additional requirements shall be as agreed upon between the interested parties.

5.1 Appearance

PP straws shall be free of visible contaminants and any structural defects such as visible cracks or splits.

5.2 Tolerance on dimensions

5.2.1 Inner diameter

The tolerance of the inner diameter of straws shall be within ±0,3 mm of the nominal diameter.

5.2.2 Length

The tolerance of the length of straws shall be within ±3 mm of the nominal length if the nominal length is less than or equal to 250 mm. In case the nominal length is more than 250 mm, the tolerance shall be within ±5 mm of the nominal length.

5.2.3 Wall thickness

Wall thickness of straws shall not be less than 2 % of the nominal diameter.

5.2.4 Uniformity of wall thickness

The difference between the maximum and minimum wall thickness shall be less than 0,05 mm (excluding the thickness of colour stripes).

5.3 Properties

5.3.1 Resistance to bending

When tested in accordance with 6.4.1, the straws shall not rupture.

5.3.2 Heat endurance

There shall be no deformation and/or colour fading after testing in accordance with 6.4.2.

5.3.3 Cold endurance

The straws shall not crack after testing according to 6.4.3.

6 Test methods

6.1 Conditioning and testing atmosphere

Dimensional measurement and testing shall be carried out at ambient temperature, as specified in ISO 291.

6.2 Appearance inspection

Inspection for visible contaminants and any structural defects of the straws shall be conducted under normal light.

6.3 Dimensional measurement

6.3.1 Inner diameter

Measure the inner diameter of a straw at one end, using a profile projector or other suitable means, capable of reading to 0,01 mm or less. For extendable straws, the measurement shall be done at the outer tube.

6.3.2 Length

The length of a straw shall be measured using a graduated ruler or other suitable means, capable of reading to 0,5 mm or less.

Flexible/bendable straws shall be measured as received.

Extendable straws shall be measured at their full extension.

6.3.3 Wall thickness

Measure the wall thickness of a straw at two positions of each end using devices complying with the requirements in ISO 4593, capable of reading to 0,001 mm or less.

6.3.4 Uniformity of wall thickness

From the values of the wall thickness obtained per 6.3.3, calculate the difference between the maximum and minimum wall thickness.

6.4 Properties

6.4.1 Bending test

Bend a straw 90° and release at five different points along its length (including the flexible part of flexible straws). Examine thoroughly for any rupture.

A pipette bulb may be used to draw distilled water into the straw to identify any signs of rupture.

6.4.2 Heat endurance test

Immerse the entire length of the straws in a beaker filled with (95 ± 2) °C distilled water. Put the beaker in an oven at a constant temperature of (50 ± 2) °C for 30 min. Remove the straws from the water, spread them out and leave at ambient temperature for 30 min. Examine thoroughly for any visible deformation and colour fading.

Flexible/bendable straws shall be tested as received.

Extendable straws shall be tested at their full extension.