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Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging —

Part 1: Designation system and basis for specification

Plastiques — Recyclat mixte de polypropylène (PP) et polyéthylène (PE) —

Partie 1: Système de désignation et base de spécification

Reference number
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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastics*.

ISO 18263 consists of the following parts, under the general title *Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging*:

— *Part 1: Designation system and basis for specification*

— *Part 2: Preparation of test specimens and determination of properties*

Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging —

Part 1: Designation system and basis for specification

1 Scope

This part of ISO 18263 establishes a system which can be used as the basis for specifications for mixtures of polypropylene (PP) and polyethylene (PE) recyclate.

It covers mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging for moulding and extrusion. Recyclate from packaging used for the transport, handling, or storage of hazardous goods shall not be used.

It does not apply to mixtures of recyclates and virgin resin.

It does not apply to the mixtures containing special type of PE or PP, for example, PE-UHMW, TPO, etc.

The types of mixtures of PP and PE recyclate are differentiated from each other by a classification system based on appropriate levels of the designatory properties.

a) Composition

b) Melt mass-flow rate

c) Density

d) Colour

It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 18263 does not provide engineering data, performance data, or data on processing conditions which may be required to specify a material for a particular application and/or method of processing. If additional properties are required, they shall be determined in accordance with the test methods specified in ISO 18263-2, if applicable.

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 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

ISO 1183 (all parts), *Plastics — Methods for determining the density of non-cellular plastics*

ISO 18263-2, *Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging — Part 2: Preparation of test specimens and determination of properties*

3 Designation system

3.1 General

The designation system for mixtures of PP and PE recyclate is based on the following standardized pattern.

Designation						
Description block (optional)	Identity block					
	International Standard number block	Individual item block				
		Data block 1	Data block 2	Data block 3	Data block 4	Data block 5

The designation consists of an optional description block reading “Thermoplastics” and an identity block comprising the International Standard number and an individual item block. For unambiguous designation, the individual item block is subdivided into five data blocks comprising the following information:

— Data block 1: Identification of the composition of mixtures of PP and PE recyclate by code-letter as shown in Table 1 (see 3.2).

— Data block 2: Position 1: Colour (see 3.3).

Position 2: Form (see 3.3).

— Data block 3: Fillers or reinforcing material, its form, and its content in the recyclate.

Data block 3 is not used.

— Data block 4: Designatory properties (see 3.5).

— Data block 5: For the purpose of specification, a fifth data block containing additional information may be used (see 3.6).

The first character of the individual item block shall be a hyphen. The data blocks shall be separated from each other by commas.

If a data block is not used. This shall be indicated by doubling the separation sign, i.e. by two commas (,,).

Terminal commas may be omitted.

For part marking the first two blocks of the designation are used, connected with a hyphen, and placed between the punctuation marks “>” and “<” where no spaces are used between the codes.

3.2 Data block 1

In this data block, after the hyphen, the mixtures of PP and PE recyclate is identified by using the code-letter listed in Table 1.

Table 1 — Code-letter indicating the composition of mixtures of PP and PE recyclate in data block 1

Code-letter	Composition: PP(REC) + PE(REC)
PP-M1(REC)	100 % > PP(REC) ≥ 85 % (by mass)
PP-MPO(REC)	85 % > PP(REC) ≥ 60 % (by mass)
MPO(REC)	60 % > PP(REC) > 40 % (by mass) or 60 % > PE(REC) > 40 % (by mass)

Table 1 *(continued)*

Code-letter	Composition: PP(REC) + PE(REC)
PE-MPO(REC)	85 % > PE(REC) ≥ 60 % (by mass)
PE-M1(REC)	100 % > PE(REC) ≥ 85 % (by mass)

3.3 Data block 2

In this data block, after the hyphen, colour and form of mixtures are represented by one code-letter in position 1 and its physical form by a second code-letter in position 2.

Table 2 — Code-letters used for colour and form of materials in data block 2

Code-letter	Colour of material (position 1)	Code-letter	Form (position 2)
C	Coloured	G1	Pellets
N	Natural	G2	Flake
		G3	Beads
		D	Powder

3.4 Data block 3

The data block 3 is not used in this part of ISO 18263.

3.5 Data block 4

3.5.1 General

In this data block, the melt mass-flow rate (MFR) is represented by a three-figure code-number (3.5.2) and density by a two-figure code-number (3.5.3). The two codes are separated from each other by a hyphen.

If no specific information is given in either position, the letter X shall be used.

If a property value falls on or near a range limit, the manufacturer shall state which range will designate the material. If subsequent individual test values lie on, or either side of the range limit because of manufacturing tolerances, the designation is not affected.

NOTE Not all combinations of the values of the designatory properties are provided by current available materials.

3.5.2 Melt mass-flow rate

The melt mass-flow rate (MFR) shall be determined in accordance with ISO 1133-1 at a temperature of 230 °C with a load of 2,16 kg. The melt mass-flow rate is represented by a three-figure code-number as specified in Table 3.

Table 3 — Code-number used for melt mass-flow rate in data block 4

Code-number	Range of melt mass-flow rate (g/10 min)
010	<1
020	1 ≤ but < 3
045	3 ≤ but < 7
105	7 ≤ but < 14
160	14 ≤ but < 20
250	20 ≤ but < 30
300	≥30

3.5.3 Density

The density shall be determined to two decimal places using an extrusion plastometer extrudate in accordance with ISO 1183 series which can measure by the method of below a decimal point measuring to triple figures. The density is represented by a two-figure code-number as specified in Table 4.

Table 4 — Code-number used for density in data block 4

Code-number	Range of density (g/cm^3)
91	<0,92
93	0,92 ≤ but <0,94
95	0,94 ≤ but <0,96
97	≥0,96

3.6 Data block 5

Indication of additional requirements in optional data block 5 is a way of transforming the designation of a material into a specification for a particular application. This can be done, for example, by reference to a suitable national or industrial standard.

4 Examples of designations

PE(REC) with 15 % by mass of PP(REC) mixture recyclate without colour agent and having a pellets form, an MFR of 1,2 g/10 min (020) and a density of 0,952 g/cm^3 (95) would be designated.

Designation							
Description block (optional) Thermoplastics	Identity block						
	International Standard number block	Individual item block					
		Data block 1	Data block 2		Data block 3	Data block 4	Data block 5
		Polymer	Characteristics		Fillers, etc	Properties	Additional information
			Colour	Form			
	18263–1	PE-M1(REC)	N	G1	no use	020–95	optional
>Part marking<							
No	No	Yes	Yes		No	Yes	No