



SLOVENSKI STANDARD
oSIST prEN ISO 16396-1:2021

01-september-2021

Polimerni materiali - Poliamidni (PA) materiali za oblikovanje in ekstrudiranje - 1. del: Sistem označevanja in podlage za specifikacije (ISO/DIS 16396-1:2021)

Plastics - Polyamide (PA) moulding and extrusion materials - Part 1: Designation system and basis for specifications (ISO/DIS 16396-1:2021)

Kunststoffe - Polyamid (PA)-Formmassen für das Spritzgießen und die Extrusion - Teil 1: Bezeichnungssystem, Produktkennzeichnung und Basis für Spezifikationen (ISO/DIS 16396-1:2021)

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Plastiques - Matériaux à base de polyamide (PA) pour moulage et extrusion - Partie 1: Système de désignation et base de spécifications (ISO/DIS 16396-1:2021)

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ICS:

83.080.20 Plastomeri Thermoplastic materials

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DRAFT INTERNATIONAL STANDARD

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Plastics — Polyamide (PA) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

ICS: 83.080.20

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ISO/DIS 16396-1:2021(E)

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 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.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 16396-1:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

- Deleted “marking of products” in subtitle “Part 1: Designation system, marking of products and basis for specifications”
- Changed abbreviation of “Injection moulding” back to “M” in the table in [table 4](#)
- Added “Multiple processing modes” in [table 4](#)
- Updated the ISO 1874-2 to ISO 16396-2

A list of all parts in the ISO 16396 series can be found on the ISO website.

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.

Introduction

ISO 1874-1:2010 is complex and does not fit with daily practice anymore. In practice, ISO 1043 and ISO 11469 are, in combination, 'improperly' being used as a designation system for, e.g. marking. The aim of this International Standard is to simplify the data block system and to connect more to ISO 1043 and ISO 11469, where the first two blocks are used for generic identification and marking of products.

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Plastics — Polyamide (PA) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

1 Scope

This part of ISO 16396 establishes a system of designation for polyamide (PA) moulding and extrusion materials, which can be used as the basis for specifications.

The types of polyamide plastics are differentiated from each other by a classification system based on appropriate levels of the designatory properties

- a) viscosity number and
- b) tensile modulus of elasticity
- c) nucleating additive

and on information about composition, intended application and/or method of processing, important properties, additives, colorants, fillers, and reinforcing materials.

The designation system is applicable to all polyamide homopolymers, copolymers, and blends.

It applies to unmodified materials ready for normal use and materials modified, for example, by colorants, additives, fillers, reinforcing materials, and polymer modifiers.

This part of ISO 16396 does not apply to the following materials:

- a) monomer casting-type polyamides of PA 6;
- b) monomer casting-type polyamides of PA 12.

It is not intended to imply that materials having the same designation give the same performance. This part of ISO 16396 does not provide engineering data, performance data, or data on processing conditions which can be required to specify a material. If such additional properties are required, they will be determined in accordance with the test methods specified in ISO 16396-2, if suitable.

In order to designate a thermoplastic material to meet particular specifications, the requirements are to be given in data block 5 (see 3.1).

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 307, *Plastics — Polyamides — Determination of viscosity number*

ISO 1043-1:2011, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*

ISO 16396-2, *Plastics — Polyamide (PA) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

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3 Designation system

3.1 General

The designation system for thermoplastics is based on the following standard pattern:

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

Figure 1 — Data block designation system

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: Position 1: Identification of the plastic by its abbreviated term (PA), in accordance with SO 1043-1 and information about the composition of the polymer.
Position 2: Information on the use of plasticizer (P) or impact modifier (I) (see 3.2).
- Data block 2: Position 1: Fillers or reinforcements and their nominal content.
Position 2: Flame retardant information.
Position 3: Declaration of recyclate (R) (see 3.3).
- Data block 3: Position 1: Intended application and/or method of processing. Positions 2 to 8: Important properties, additives, and supplementary information (see 3.4).
- Data block 4: Designatory properties (see 3.5).
- Data block 5: For the purpose of specification, the fifth data block contains appropriate information (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 can be omitted.

Note 1 to entry Data blocks 1 and 2 together form the part marking symbol, connected with a hyphen, and placed between the punctuation marks ‘>’ and ‘<’, where no spaces are used between the codes.

EXAMPLE

Designation

Description block (optional)	Identity block										
	Thermo-plastics	ISO Standard	Individual-item block								Additional information
Data block 1			Data block 2			Data block 3		Data block 4	Data block 5		
Polymer			Performance and origin			Application and processing		Properties			
Type			Additive	Filler	Flame retardant	Recy-clate	Process-ing	Characteris-tics			
	16396	PA 6	P	(GF+MD) 25	FR(30)	(R50)	M	A	S14-060		
>Part marking<											
No	No	Yes	Yes	No	No	No	No	No	No	No	

Designation: ISO 16396-PA 6-P,(GF+MD)25 FR(30) (R50),MA,S14-060,, Part marking: >PA 6-P-(GF+MD)25FR(30)(R50)<

3.2 Data block 1

In this data block, after the hyphen, the plastic is identified by its abbreviated term (PA) in accordance with ISO 1043-1 and a symbol indicating the composition as specified in [Table 1](#).

Polyamides containing a plasticizer can be designated by adding the letter P after the symbol, separated from it by a hyphen (example: PA 610-P).

Polyamides containing an impact modifier can be designated by adding the letter I after the symbol, separated from it by a hyphen (example: PA 6-I).

Examples of symbols indicating the chemical structure of copolyamide materials are given in [Table 2](#).

Table 1 — Symbols indicating the chemical structure of polyamide materials in data block 1

Symbol	Name and chemical structure
Aliphatic - One monomer	
PA x	Polyamide, where x represents the number carbon atoms in the monomer. Examples: PA 6: Polyamide 6, homopolymer based on ε-caprolactam. PA 11: Polyamide 11, homopolymer based on 11-aminoundecanoic acid (see annex A).
Aliphatic - Two monomers - Diamine / dicarboxylic acid	
PA xy	Polyamide, where - x represents the number carbon atoms in the diamine and - y represents the number of carbon atoms in the dicarboxylic acid (see Annex A). Examples: PA 46; Polyamide 46, homopolymer based on tetramethylenediamine and adipic acid PA 612; Polyamide 612, homopolymer based on hexamethylenediamine and dodecanedioic acid
Semi aromatic - Two monomers - (aromatic) Diamine / (aromatic) dicarboxylic acid	