INTERNATIONAL STANDARD

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Plastics — Hardeners and accelerators for epoxy resins —

Part 1: **Designation**

Plastiques — Durcisseurs et accélérateurs pour résines époxydes —

Partie 1: Désignation

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 4597-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 12, *Thermosetting materials*.

This second edition cancels and replaces the first edition (ISO 4597-1:1983), the table of which has been revised to include two additional classes of chemical compound (classes 40 and 44).

Plastics — Hardeners and accelerators for epoxy resins —

Part 1: Designation

1 Scope

This part of ISO 4597 specifies a method of designation for epoxy resin hardeners and accelerators.

The object of this designation method is to allocate to each commercial product a group of digits, called the "designation", giving in a coded form certain information on the product: chemical base, modifiers and solvents, viscosity and additives.

Thus all products having similar properties and therefore likely to have the same uses will have the same designation, so aiding users in their choice if producers list the designation in their data sheets.

2 Normative references

The following referenced documents are indispensable for the application 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 3219, *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate*

3 Designation system

The hardeners and accelerators are designated by four groups of two digits, separated by intervals. The first three groups refer to principal properties and the final group refers to a secondary property.

— Each successive group of two digits corresponds to a different property in the list given in Table 1.

— The position (or rank I and II, III and IV, etc.) of each successive group of two digits in the group indicates the property to which it refers.

— The numerical value of each successive group of two digits in the designation indicates the class (01, 02, 03, etc.) which corresponds to a certain composition or to a certain range of values of the property, as given in Table 1.

NOTE 1 Not every combination of property classifications will be achievable in practice. Note that the designation of a material will not correspond, except by chance, with a horizontal row in Table 1.

NOTE 2 The value of the property in positions V and VI to be taken into consideration in defining in which class a product belongs is the mean value found in manufacture and normally given in data sheets.

In view of the inevitable variations in production, independently measured values for a resin designated as being in a particular class for a given property may possibly fall

— either in the next lower class if the average value of the property is near the lower limit of the designation;

— or in the next higher class if the average value is near the upper limit.

4 Designation of a hardener or accelerator for epoxy resins

Following the designation system described in Clause 3, a product shall be designated by four groups of two digits, separated by intervals.

— The first group of two digits designates the chemical base (see Table 1).

— The second group of two digits designates modifiers and solvents (see Table 1).

— The third group of two digits designates the viscosity of the product (see Table 1).

— The final group of two digits designates additives (see Table 1).

EXAMPLE A hardener or accelerator designated by 06 12 02 00 is a product based on modified cycloaliphatic polyamine, with accelerator and solvent, viscosity between 0,25 Pa·s and 1 Pa·s, without indication of additives.

NOTE The designation does not exempt the producer from giving in his literature the actual values of the designated properties, together with tolerances of manufacture and measurement.

5 Special properties

These properties are not included in the designation.

If they are necessary, they shall be given as actual values only and reference shall be made to the relevant International Standards for the test methods.

Table 1

Class	Rank I and II	Rank III and IV	Rank V	Rank VI
	Principal properties			Secondary property
	Chemical base[a]	Organic modifiers or solvent [a]	Viscosity [b] at 23 °C and $\gamma = 10\ s^{-1}$ Pa·s	Additives
00	Not designated	Not designated	Not designated	Not designated
01	Unmodified aliphatic polyamines	None	$\leqslant$ 0,25	None
02	Modified aliphatic polyamines	Reactive agent	> 0,25 to 1	Fillers
03	Unmodified aromatic polyamines	Non-reactive agent	> 1 to 5	Colorant, organic or inorganic
04	Modified aromatic polyamines	Solvent	> 5 to 15	Fillers and colorants
05	Unmodified cycloaliphatic polyamines	Accelerator	Liquid > 15	Emulsifying agent
06	Modified cycloaliphatic polyamines	Reactive agent with solvent	Semisolid	
07	Unmodified polyaminoamides	Reactive agent with accelerator	Solid	
08	Modified polyaminoamides	Reactive agent with solvent and accelerator	Thixotropic	
09	Formulated amine hardeners	Non-reactive agent with solvent		
10	Tertiary amines	Non-reactive agent with accelerator		
11		Non-reactive agent with solvent and accelerator		
12		Accelerator with solvent		
20	Condensation polymers of amine derivatives with formaldehyde (urea-formaldehyde, melamine-formaldehyde, etc.)			
31	Unmodified aliphatic acids and anhydrides			
32	Unmodified cycloaliphatic acids and anhydrides			
33	Unmodified aromatic acids and anhydrides			
34	Modified acids and anhydrides			
35	Halogenated acids and anhydrides			
40	Hydrazide derivatives			
41	Dicyandiamide and derivatives			
42	Boronhalide complexes			
43	Organometallic complexes			
44	Onium salts			
46	Polythiols			
47	Condensation polymers of phenol-formaldehyde type			
48	Phenols and derivatives			
49	Other compounds with hydroxyl group			
50	Free isocyanates			
51	Blocked isocyanates			
60	Ketoimines			
70	Imidazoles and derivatives			

[a] The chemical bases and organic modifiers are indicated by two digits; class 1 is written as 01, class 2 as 02, etc.

[b] Test method: ISO 3219, which concerns the use of rotational viscometers with definite shear rate. However, any other viscometer specified in an International Standard may be used provided that it gives the same results.

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