International Standard 4597/1

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Plastics — Hardeners and accelerators for epoxide resins — Part 1 : Designation

Plastiques — Durcisseurs et accélérateurs pour résines époxydes — Partie 1 : Désignation

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4597/1 was developed by Technical Committee ISO/TC 61, *Plastics,* and was circulated to the member bodies in February 1978.

It has been approved by the member bodies of the following countries :

Austria	India	South Africa, Rep. of
Belgium	Iran	Spain
Bulgaria	Israel	Switzerland
Canada	Italy	Turkey
Czechoslovakia	Japan	United Kingdom
Egypt, Arab Rep. of	Korea, Rep. of	USA
France	Mexico	Yugoslavia
Germany, F.R.	Poland	
Hungary	Romania	

No member body expressed disapproval of the document.

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Plastics — Hardeners and accelerators for epoxide resins — Part 1 : Designation

1 Scope and field of application

This part of ISO 4597 specifies a method of designation for epoxide 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 Reference

ISO 3219, *Plastics — Polymers in the liquid, emulsified or dispersed state — Determination of viscosity with a rotational viscometer working at 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 the table.

— 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 the table.

NOTES

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 the table.

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 on 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 epoxide resin

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 the table).

— The second group of two digits designates modifiers and solvents (see the table).

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

— The final group of two digits designates additives (see the table).

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 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.

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

Table

Rank	I and II	III and IV	V	VI
	Principal properties			Secondary property
	Chemical base[1]	Organic modifiers or solvent[1]	Viscosity[2] at 23 °C and $\gamma = 10\ s^{-1}$ Pa·s	Additives
Class				
00	Not designated	Not designated	Not designated	Not designated
01	Unmodified aliphatic polyamines	None	< 0,25	None
02	Modified aliphatic polyamines	Reactive agent	> 0,25 to 1	Fillers
03	Unmodified aromatic polyamines	Non-reactive agent	> 1 to 5	Colorants, 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	Thixotrope	
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 anhydrides and acids			
41	Dicyandiamide and derivatives			
42	Boronhalide complexes			
43	Organometallic complexes			
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			

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

2) 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.