
International Standard



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Plastics — Epoxide resins — Part 1 : Designation

Plastiques — Résines époxydes — Partie 1 : Désignation

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Descriptors : plastics, epoxy resins, designation.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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 3673/1 was developed by Technical Committee ISO/TC 61, *Plastics*, and was circulated to the member bodies in October 1978.

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

Australia	France	Poland
Austria	Germany, F. R.	Romania
Belgium	Hungary	South Africa, Rep. of
Bulgaria	Iran	Spain
Canada	Italy	Switzerland
China	Japan	Turkey
Czechoslovakia	Korea, Rep. of	USA
Egypt, Arab Rep. of	Mexico	USSR
Finland	New Zealand	

The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

Plastics — Epoxide resins — Part 1 : Designation

1 Scope and field of application

This International Standard specifies a method of designation for epoxide resins.

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, approximate values of main properties and the nature of modifiers, solvents or additives.

Thus, all products having similar characteristics and therefore likely to have the same uses will have the same designation, so aiding users in their choice, provided that manufacturers quote the "designation" in their data sheets.

2 References

ISO 1675, *Plastics — Liquid resins — Determination of density by the pycnometer method.*

ISO 3001, *Plastics — Epoxide compounds — Determination of the epoxide equivalent.*

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

Epoxide resins shall be designated by the symbol "EP" for epoxide, followed by a group of five digits (corresponding to principal characteristics), followed by an interval, followed by three digits (corresponding to secondary characteristics) as follows :

- each digit, except the first two digits which shall be taken together, shall correspond to one of the characteristics given in the table;
- the position (I and II, III, IV, etc.) of each digit in the group shall indicate the characteristic to which it refers;
- each digit for a property shall indicate the class (1, 2, 3, etc.) corresponding to a certain range of values of the property, as given in the table.

NOTES

1 Not every combination of property classification will be achievable in practice.

Note also that the designation of a material will not correspond, except by chance, with a horizontal row.

2 The value of each property in positions III, IV 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.

Because of inevitable variations in manufacturing conditions, a product supposedly belonging to a given class for one property may incidentally fall, in some cases :

- in the adjacent lower class if the mean value of this property is near the lower limit of the designation class;
- in the adjacent upper class if the mean value is near the upper limit.

4 Designation of an epoxide resin

In accordance with the designation system described in clause 3, an epoxide resin shall be designated by a group of five digits followed by a group of three digits, the two groups being separated by an interval.

The first group of five digits refers to the principal characteristics and the final three digits to the secondary characteristics.

If one of the characteristics, usually designated by a digit indicating the class, is not specified, a small "x" shall be inserted at the appropriate place in the designation.

Example : An epoxide resin designated by EP 03361 3xx is a resin based on an aliphatic-glycidyl ether (or ester), viscosity between 1 and 5 Pa·s, epoxide equivalent between 291 and 525, without modifying agent, density between 1,15 and 1,19 g/cm³, without an indication for additives or any special indications.

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

5 Special properties

These properties shall not be included in the designation, but, if necessary, they shall be given in actual values only, and reference made to the relevant International Standards for the test methods.

Examples of such properties are electrical properties and optical properties, both of which will be the subjects of future International Standards.

Table — Characteristics of epoxide resins

Designation order number	I and II	III	IV	V	VI	VII	VIII
Characteristic	Principal characteristic				Secondary characteristic		
	Chemical base ¹⁾	Viscosity at 23 °C and shear rate 1 s ⁻¹	Epoxide equivalent	Organic modifiers or solvents	Density at 23 °C	Additives ²⁾	Special indications ²⁾
Units	—	Pa·s (= 10 P)	—	—	g/cm ³	—	—
Methods Class	—	ISO 3219	ISO 3001	—	ISO 1675	—	—
x	Not designated (ND)	ND	ND	ND	ND	ND	ND
1	Bisphenol A-glycidyl ether	< 0,25	< 115	None	< 1,10	None	Material of specified burning characteristics ³⁾
2	Aromatic-glycidyl ethers (or esters)	> 0,25 to 1	116 to 150	Reactive agent	1,10 to 1,14	Fillers	Content of hydrolysable chlorine below 0,2 %
3	Aliphatic-glycidyl ethers (or esters)	> 1 to 5	151 to 175	Non-reactive agent	1,15 to 1,19	Colorants organic or inorganic	Low tendency to crystallize
4	Cycloaliphatic-glycidyl ethers (or esters)	Fluid > 5	176 to 210	Organic solvent	1,20 to 1,29	Fillers and colorants	Water-soluble
5	Epoxide-cycloolefins	Semi-solid	211 to 290	Reactive agent and organic solvent	1,30 to 1,39	Emulsifying agents	Heat-resistant
6	Epoxide-novolac	Solid	291 to 525	Non-reactive agent and organic solvent	1,40 to 1,59	—	—
7	Halogenated epoxides	Thixotropic	526 to 1 025	—	1,60 to 1,80	—	—
8	Other glycidic nitrogenous derivatives	—	1 026 to 2 050	—	—	—	—
9	Heterocyclic compounds	—	> 2 050	—	—	—	—
10	Epoxide-olefins	—	—	—	—	—	—

1) The chemical basis shall be indicated by two digits :

class x is written xx;
class 1 is written 01;
class 2 is written 02; etc.
class 10 is written 10.

For a mixture with equal proportions of two resins of different chemical base, the symbol "xx" (not designated) may be used.

2) The most important one shall be indicated, if there are several additives or "special indications".

3) For a complete assessment of fire performance of a material, information is required on, at least, the following properties :

- ignitability;
- combustibility;
- flammability;
- heat release;
- smoke release;
- noxious gas release.

Appropriate methods of test are under study and will, where applicable, be included in ISO 3673/2.