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Reinforced plastics composites — Specifications for pultruded profiles — Part 1: Designation

Verstärkte Kunststoffverbundwerkstoffe — Spezifikationen für pultrudierte Profile — Teil 1: Bezeichnung

Composites en plastiques renforcés — Spécifications pour les profilés pultrudés — Partie 1 : Désignation

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Foreword

This document has been prepared by CEN /TC 249, "Plastics".

This document is currently submitted to the Formal Vote.

Part 1 of this European Standard, EN 13706, establishes a data-block system for the designation of profiles made by the pultrusion process from fibre reinforced plastic composites using a format and coding system established by the International Standards Organisation (ISO) which is common to most fibre reinforced thermoset and thermoplastic materials. The system is intended to be applied only to materials ready for use.

The designation system is based on the premise that pultruded profiles can be divided into generic families based on the polymer matrix used, the nature of the reinforcement and the in-service performance required.

The system is intended for the designation of a particular profile (or a small group of similar profiles) within a generic family.

It is not intended to specify by this system the chemical composition or the volumetric content of the materials making up the profile but to designate the profile for identification purposes only. It is the responsibility of the producer of the profile to provide the appropriate designation.

The data-block system is also the basis for the specification given in Parts 2 and 3 of this standard.

EN 13706 consists of the following parts, under the general title *Reinforced plastics composites - Specifications for pultruded profiles*.

- *Part 1 : Designation*
- *Part 2 : Methods of test and general requirements*
- *Part 3 : Specific requirements*

Annexes A to E of Part 2 are normative and Annexes F and G are informative.

1 Scope

1.1 This Part 1 of EN 13706 establishes a data block system for the designation of pultruded profiles made from fibre reinforced plastics composites.

1.2 The types of pultruded profiles are differentiated from each other by a classification system based on information about type of polymer matrix used, the reinforcement material, the type of reinforcement and the additional in-service performance features (e.g. fire retardancy, UV stability).

1.3 This European Standard is applicable to pultruded profiles made from fibre reinforced plastics composites only. It applies to materials ready for use in the form of straight lengths of section, or in coils, for structural applications (see clause 3.3 EN 13706-2).

This European Standard does not apply to the following types of pultruded profile :

- profiles designed primarily for their electrical properties ;
- profiles which are classified as non-structural, that is having properties below the minimum required to conform to the grade E17 (see Table 1 of clause 4.4, EN 13706-3).

1.4 This Part 1 of EN 13706 does not provide engineering data, performance data or data on service conditions which may be required to specify a profile for a particular application. If such additional properties are required, when ever possible, they shall be determined in accordance with the test methods specified in Part 2 of EN 13706.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 472, *Plastics – Vocabulary*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in ISO 472 apply. Additional terms and definitions are defined in Clause 3 of EN 13706-2.

4 Designation System

This designation system for pultruded profiles is based on the standardised pattern given below. It is applicable to specifications described in Part 3 of EN 13706.

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

For unambiguous coding, the individual-item block is subdivided into a maximum of 5 data blocks comprising the following information :

- the description block shall be separated from the standard number block by a comma ;
- spaces shall be inserted between blocks ;
- the first character in the first individual item block shall be a dash ;
- individual item blocks shall be separated from each other by a comma ;
- if a data block is not used, this shall be indicated by two commas (,,).

NOTE This standardised pattern is a modification of the frame text given in ISO 1043-2, adapted to the designation of these reinforced products.

In this standard the Description block shall use the term “Pultrusion”.

4.1 Data block 1

In this data block, the profile shape is represented by a single code letter in position 1 and in position 2 the reinforcement material is represented by a single code letter for each type of reinforcement employed with the order of the letters determined by their relative fibre volume content in the profile. In position 3, any additional process used in the profile is given by a single code letter. The code letters used are given in Table 1.

Table 1 — Code letter terms in Data Block 1

Position 1 Profile Shape		Position 2 Reinforcement Material		Position 3 Additional Processes	
B	Box Section	A	Aramid-fibre	V	Surface veil
I	I Beam	C	Carbon-fibre	C	Surface coating
L	Angle	G	Glass-fibre	P	Peel-ply
O	Round Tube	P	Polyethylene fibre	Z	Other
T	T Section	Z	Other		
U	Channel				
W	Wide Flange Beam				
Z	Other shapes				

4.2 Data block 2

In this data block, the resin system employed is represented by a single code letter in position 1.

The code letters used are given in Table 2.

For the purposes of this designation the code letter I includes Isophthalic and Terephthalic resin and the code letter O includes Orthophthalic and Tetrahydrophthalic based resin systems.

Table 2 — Code letter in Data Block 2 for resin types

Code letter	Polymer Type
O	Orthophthalic polyester
I	Isophthalic polyester
V	Vinyl ester
E	Epoxy
P	Phenolic
A	Acrylic
D	DCPD (dicyclopentadiene) resins
T	Thermoplastic
Z	Other

In position 2, specific non-structural properties required to meet the general service conditions for which the profile is designed shall be designated by an identification letter in accordance with Table 3. More than one of these properties may be combined within an individual pultruded section. This is shown by including the designatory letter for each property without a space between them. In this case the letters should be written in the order given in Table 3.

Table 3 — Code letters in Data Block 2 for the specific property of the resin

Code Letter	Property
F	Fire retardant
U	UV stabilised
Z	Other

These properties may be achieved by the addition of additives to the resin formulation. Different additives may be used to achieve similar properties in the profile. The choice of additives should not be seen in isolation because they may affect other properties of the profile. This designation does not differentiate between different additives neither does it quantify the level of performance. The minimum properties given in Part 3 of EN 13706 shall be maintained in the presence of these resin modifications.

4.3 Data block 3

In this data block the code number for the grade of the profile, as listed in Part 3 of EN13706, Specific Requirements (see Table 1 of Clause 4.4), shall be given.

NOTE The code number relates directly to the Effective Flexural Modulus of the full section profile determined in accordance with the method given in Clause 6 of EN 13706-2. Two grades, E17 or E23, are currently defined.

5 Example designation

A designation for box section profile in a glass-fibre reinforced, fire retardant isophthalic, using a surface veil.

Pultrusion EN 13706 -BGV, IF, E23,,,

Description	Pultrusion
ISO Standard	EN 13706
Data Block 1 (shape and reinforcement)	box section glass fibre reinforcement surface veil
Data Block 2 (resin and specific properties)	isophthalic polyester fire retardant
Data Block 3 (mechanical properties)	full section flexural modulus 23GPa
Data Block 4	no indication
Data Block 5	no indication