
British Standard

Polytetrafluoroethylene (PTFE) materials and products

Part 1. Polytetrafluoroethylene powders for moulding
and extrusion

Section 1.2 Method of specifying

Matériaux et produits en polytétrafluoroéthylène (PTFE)

Partie 1. Poudres de polytétrafluoroéthylène pour moulage et extrusion

Section 1.2 Méthode de spécification

Werkstoffe und Erzeugnisse aus Polytetrafluoroethylen (PTFE)

Teil 1. PTFE in Pulverform zum Formpressen

Section 1.2 Verfahren zur Spezifizierung

Foreword

This Section of BS 6564 has been prepared under the direction of the Plastics Standards Policy Committee.

This Section of Part 1 provides a method of specifying PTFE powders according to a defined procedure with specified test methods.

The other Parts and Section of BS 6564 are as follows.

Part 1 Polytetrafluoroethylene powders for moulding and extrusion

Section 1.1 Specification

Part 2 Specification for fabricated unfilled polytetrafluoroethylene products

*Part 3 Specification for fabricated glass fibre filled polytetrafluoroethylene products

Attention is drawn to the need to read BS 6564 : Section 1.1 in conjunction with BS 6564 : Section 1.2 because of their interaction.

Warning. It is essential that tobacco products are kept well away from areas where they could be contaminated by PTFE dust. The smoking of tobacco products contaminated by PTFE can result in a temporary flu-like condition, known as 'polymer fume fever'. This condition is the only adverse effect observed in humans to date. The symptoms do not ordinarily occur until several hours after inhalation of the fumes and pass off within 36 h to 48 h even in the absence of treatment. Observations indicate that these attacks have no lasting effects and that the effects are not cumulative.

When heated above 260 °C, PTFE will begin to degrade and the rate of degradation will increase with increasing temperature. The gases produced during degradation will vary according to the temperature and other conditions but will invariably contain toxic components and good ventilation is therefore essential.

NOTE. It is strongly recommended that users of this standard refer to BFPA Publication No. 254/1, *Industrial health and safety for PTFE polymers*† for further information.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

* In preparation.

† Available from the British Fluoropolymers Processors' Association, 5 Belgrave Square, London SW1X 8PH.

Amendment No. 1
published and effective from 1 May 1992
to BS 6564 : Part 1 : Section 1.2 : 1989

Polytetrafluoroethylene (PTFE) materials
and products
Part 1. Polytetrafluoroethylene powders for
moulding and extrusion
Section 1.2 Method of specifying

Revised text

AMD 7125
May 1992

Clause E.4 Procedure

In paragraph 1, line 1, delete 'figure 9' and substitute 'figure 8'.

In the last paragraph, lines 5 and 6, delete 'of the dimensions shown in figure 9' and substitute 'and using test specimen reference marks set 10 mm apart as shown in figure 9'.

AMD 7125
May 1992

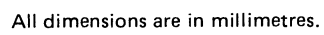
Figure 9. Test specimen/knife-edged die dimensions for use in the determination of tensile strength and elongation at break

Delete the existing figure and substitute the new figure 9 attached.

AMD 7125
May 1992

Clause F.4 Procedure

In the last paragraph, line 3, delete 'parallel' and substitute 'with their principal axes normal'.



Contents

	Page
Foreword	Inside front cover
Committees responsible	Back cover
Method	
1 Scope	2
2 Definitions	2
3 Designation	2
4 Properties and tolerances	2
Appendices	
A Method for the determination of bulk density	4
B Method for the determination of particle size	6
C Method for the determination of the flow time of granular PTFE powders	9
D Method for the determination of density	10
E Method for the determination of tensile strength and elongation at break: moulded disc method	13
F Method for the determination of tensile strength and elongation at break: moulded cylinder method	15
G Information to be declared with the product	17
Tables	
1 Minimum requirements	2
2 Additional properties	3
3 BS 410 sieve data	7
4 Data for the example on determining particle size	7
Figures	
1 Details of the funnel used for the determination of bulk density	4
2 Volumetric cup and cup stand for the determination of bulk density	5
3 Levelling device for the determination of bulk density and flow time	6
4 Example plot : particle size	8
5 Funnel for determination of flow time	9
6 Volumetric cup and cup stand for the determination of flow time	11
7 Mould assembly for the preparation of specimens for the determination of density	12
8 Mould assembly for the preparation of specimens for the determination of tensile strength and elongation at break: moulded disc method	14
9 Test specimen/knife-edged die dimensions for use in the determination of tensile strength and elongation at break	15
10 Mould assembly for the preparation of specimens for the determination of tensile strength and elongation at break: moulded cylinder method	16
11 General arrangement in press : tensile strength and elongation at break : moulded cylinder method	18

Method

1 Scope

This Section of BS 6564 describes a method of specifying unfilled and glass fibre filled polytetrafluoroethylene (PTFE) powders for moulding and extrusion. Associated test methods are also given.

NOTE. The titles of publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Section of BS 6564 the following definitions apply.

2.1 nominal value. A typical physical property value indicated for a material by a supplier.

2.2 declared value. A physical property value characteristic of a batch or consignment of material and stated by a supplier.

3 Designation

The following designation system, in which the PTFE powders are classified according to their type, method of processing, additives, if any, and designatory properties, shall be used.

The designation shall consist of the following information.

(a) The number and date of this standard, i.e. BS 6564/1.2 : 1989.

(b) The type of powder, i.e.

A: granular powder;
B: presintered powder; or
C: coagulated dispersion.

(c) The method of processing, i.e.

E: ram extrusion grade;
F: general purpose free-flowing grade;
N: moulding non-free-flowing grade; or
P: paste extrusion grade.

(d) The presence or not of additives, i.e.

G: glass fibre filled;
X: pigmented; or
Y: natural or non-pigmented

'G' shall be followed immediately by either '5', '15' or '25' to denote the percentage glass fibre filler content by mass.

(e) The designatory properties as coded and determined by the methods given in table 1 (see also 4.1).

Example. A 15 % (m/m) glass fibre filled, granular, pigmented, general purpose free-flowing grade of PTFE powder having a bulk density of 700 kg/m³, a particle

size of 600 µm and a flow time of less than 10 s is designated as:

BS 6564/1.2 : 1989, A, F, G15X, 221.

4 Properties and tolerances

4.1 Minimum requirements

The minimum requirements to be specified shall be the bulk density, particle size (for 50 % retention) and flow time. The bulk density shall be the nominal value ± 50 kg/m³, the particle size shall be the nominal value ± 75 µm and the flow time shall be the nominal value ± 25 %. For particle sizes less than 250 µm the measurement is inappropriate and therefore the nominal value for use in arriving at the designation code in table 1 shall be '< 250 µm'. In a similar way nominal flow time values greater than 20 s shall be '> 20 s'.

NOTE. Where the tolerances on the nominal values cause the ranges of the properties to exceed the limits of the code in table 1, the supplier will decide the code to be allocated for the designation.

Table 1. Minimum requirements

Property	Values	Code	Method of test
Bulk density (kg/m ³)	< 500 500 to 800 > 800	1 2 3	Appendix A
Particle size (50 % retention) (µm) (see note 1)	< 250 250 to 800 > 800	1 2 3	Appendix B
Flow time (s) (see note 2)	Inappropriate < 10 10 to 20 > 20	0 1 2 3	Appendix C
NOTE 1. For PTFE powders with a particle size of less than 250 µm, the measurement of particle size is inappropriate. NOTE 2. For coagulated dispersion powders for paste extrusion, the measurement of flow time is inappropriate.			

4.2 Additional properties

Additional properties as given in table 2 and determined by the methods detailed therein, if appropriate, shall be selected for inclusion in the designation depending on the specific characteristics required for processing and the properties of the fabricated product.

NOTE. The purchaser should establish his own correlation between the properties of the fabricated product and the properties required for their achievement.