BS 7722:2010

BSI Standards Publication

Surface covered PVC-U profiles for windows and doorsets – Specification

bsi.

...making excellence a habit.™

Publishing and copyright information
The BSI copyright notice displayed in this document indicates when the document was last issued.

ISBN 978 0 580 68797 6

ICS 83.140.99; 91.060.50

The following BSI references relate to the work on this standard:
Committee reference B/538/1+2
Draft for comment 10/30208325 DC

Publication history
First published March 1994
Second edition, November 2002
Third (present) edition, June 2010

Amendments issued since publication

Date	Text affected

Contents

Summary of pages
This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 10, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 June 2010. It was prepared by Subcommittee B/538/1, *Windows*, and Subcommittee B/538/2, *Doors*, under the authority of Technical Committee B/538, *Doors, windows, shutters, hardware and curtain walling*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 7722:2002, which is withdrawn.

Relationship with other publications

The requirements for windows and doorsets made from profiles conforming to this British Standard are given in BS 7412.

Information about this document

This is a full revision of the standard, and introduces the following principal changes:

- updating of references;
- changes taking into account the publication of BS EN 12608:2003.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This standard does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

1 Scope

This British Standard specifies requirements for PVC-U extruded hollow profiles for windows and doorsets in which any surface to be exposed externally is covered by means of an adhesive layer (foil) prior to fabrication. It applies to both the completed product, and the base profile prior to covering.

It applies up to the point of fabrication into windows or doorsets, provided the profiles have been stored in accordance with the system supplier's recommendations.

It does not apply to white profiles without a surface covering layer; these are specified in BS EN 12608.

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.

BS 3900-D8, *Methods of test for paints – Part D8: Determination of colour and colour difference: principles*

BS 3900-D9, *Methods of test for paints – Part D9: Determination of colour and colour difference: measurement*

BS 3900-D10, *Methods of test for paints – Part D10: Determination of colour and colour difference: calculation*

BS 6100-6, *Building and civil engineering – Vocabulary – Part 6: Construction parts*

BS 6100-11, *Building and civil engineering – Vocabulary – Part 11: Performance characteristics, measurement and joints*

BS 7412, *Specification for windows and doorsets made from unplasticized polyvinyl chloride (PVC-U) extruded hollow profiles*

BS EN 479, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors – Determination of heat reversion*

BS EN 12608:2003, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors – Classification, requirements and test methods*

BS EN 12956:1999, *Wallcoverings in roll form – Determination of dimensions, straightness, spongeability and washability*

BS EN ISO 105-A01, *Textiles – Tests for colour fastness – Part A01: General principles of testing*

BS EN 20105-A02, *Textiles – Tests for colour fastness – Part A02: Grey scale for assessing change in colour*

BS EN ISO 2409 (BS 3900-E6), *Paints and varnishes – Cross-cut test*

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

3 Terms and definitions

For the purposes of this British Standard the terms and definitions given in BS 6100-6, BS 6100-11, BS 7412, BS EN 12608 and the following apply.

3.1 auxiliary profile
profile other than a main profile (**3.4**)

NOTE For example, glazing beads.

3.2 base profile
profile without a covering layer

3.3 laminated foil
plastics layer bonded with an adhesive to cover a surface of a profile

3.4 main profile
profile that has a load-bearing function within the sash, outer frame or mullion/transom of a window or doorset

3.5 non-white
colour other than those described in BS EN 12608:2003, Clause **1**

3.6 sight surface
surface of a profile that is exposed to view when the window or door is closed

3.7 transfer foil
protective surface layer carried on a release medium and bonded to the surface of a profile by the application of heat and pressure

4 Raw materials

Base profiles shall be made from materials that conform to BS EN 12608:2003, **5.1**, except where the base profile is made from material types ERMa or RMa, in which case those surfaces subsequently covered with a protective layer (foil) need not have the 0.5 mm skin of new material specified in BS EN 12608.

5 Properties of base profiles

Tolerances on dimensions, perimeter wall thickness and surface flatness shall be in accordance with BS EN 12608.

If internal webs are present, they shall be controlled so that reinforcement can be fitted without prior machining of the webs and so that the integrity of the drainage chamber is not breached. Conformity to this requirement shall be determined by visual inspection.

6 Properties of the profile after the application of the covering layer

NOTE 1 It is strongly recommended that the covered surfaces of profiles are protected to minimize the risk of surface damage prior to and during installation. Annex A gives advice on the use of protective tapes.

NOTE 2 Annex B gives a summary of the applicability of the requirements in this clause to auxiliary and main profiles.

6.1 Conditioning of test samples

For all the tests referred to in this clause, the test specimen shall be conditioned at (23 ± 5) °C for at least 1 h prior to testing.

6.2 Appearance and finish

6.2.1 General

The sight surfaces of surface covered profiles shall be uniform and free from defects such as foreign bodies, cracks, sink marks, die lines, ripples, bulges, scratches or other surface defects when viewed by normal or corrected vision at a range of 1 m in 45° north sky light, viewing perpendicular to the surface as described in BS EN ISO 105-A01.

Where the colour of a profile is specified, it shall be specified in terms of the foil manufacturer's reference or its CIE LAB L*, a*, b* values in accordance with BS 3900-D9.

6.2.2 Single colour profiles

The total colour difference (ΔE*), measured in accordance with BS 3900-D8, BS 3900-D9, and BS 3900-D10, between any profile and the manufacturer's stated reference colour shall not exceed the manufacturer's declared value.

NOTE 1 For instrumental colour measurement, the use of spectrophotometers is preferred. Tri-stimulus colorimeters should only be used for white or near-white colours. The measurement procedure should be chosen accordingly.

NOTE 2 $\Delta E^* = 1$ from a reference colour equates to a potential colour difference $\Delta E^* = 2$ between two components which might be visible to the naked eye.

6.2.3 Non-uniform colour and texture profiles

Reference samples of non-uniform colour and texture surface covered profiles shall be maintained, demonstrating the extremes of permissible variation for comparison of the consistency of colour and appearance.

Applied texture surfaces shall have the pattern applied uniformly. Each textured surface shall match the reference sample when viewed by normal or corrected vision at a range of 1 m in 45° north sky light, viewing perpendicular to the surface as described in BS EN ISO 105-A01.

Each colour and any pattern shall match the reference sample when similarly viewed.

6.2.4 Manufacturing tolerances

Tolerances on dimensions shall be in accordance with BS EN 12608:2003, **5.3**.

6.3 Heat ageing

When tested in accordance with BS EN 12608:2003, **5.7**, surface covered profiles shall have no bubbles within the foil of more than 1 mm in diameter, and no cracks, surface irregularities or delamination.

NOTE 1 There is no requirement for the flexible element of rigid/flexible co-extrusions.

NOTE 2 An increase in gloss does not constitute failure.

6.4 Weldability

When tested in accordance with the method given in BS EN 12608:2003, **5.9**, the mean weld failure stress shall be not less than 25 MPa and no individual result shall fall below 20 MPa.

NOTE The second moment of area is calculated using profile dimensions prior to foiling.

6.5 Heat reversion

When tested in accordance with BS EN 479, the heat reversion of the two largest opposing sight surfaces of the main profiles shall be not greater than 2%, and the heat reversion of auxiliary profiles shall be not greater than 3%.

Where both sight surfaces are covered, the difference in heat reversion between these surfaces shall be not greater than 0.4%.

NOTE For glazing beads which are to be used externally, a limit of 2% of the heat reversion is recommended.

6.6 Impact resistance at low temperature

Main profiles shall be tested in accordance with BS EN 12608:2003, **5.6** but with an impactor of mass 0.5 kg and a drop height of 750 mm.

NOTE This mass and drop height are specified in line with UEAtc MOAT 57 [1], which has been used successfully in Europe for many years.

No sample shall exhibit cracking through the entire wall thickness of the profile. No more than one test piece shall fail.

Ten samples per sight surface of profiles designed to be exposed externally shall be tested. Ten samples per sub-sill profile shall be tested on the upper sight surface and no more than one test piece shall fail.

6.7 Colour fastness

When tested in accordance with BS EN 12608:2003, **5.8.3**, surface coverings shall meet the requirements specified in that clause.

NOTE 1 If the surface covering has been tested for colour fastness in accordance with this clause by an accredited laboratory, no further testing of the covering on individual profile systems is required and the covered profile adopts the climatic zone performance of the foil.

Where surface coverings are tested for colour fastness under the severe climate as defined in BS EN 12608, the overall profile rating shall also be severe when all sight surfaces are covered.

For white profiles, the total colour difference (ΔE^*), measured in accordance with BS 3900-D8, BS 3900-D9, and BS 3900-D10, shall be not more than 5.

For non-white profiles, there shall be no colour change greater than 3 on the grey scale when measured in accordance with BS EN 20105-A02.

NOTE 2 Instrumental methods can be used for non-white colours when the colour change ΔE^* should be not more than 4.

6.8 Adhesive bond strength for laminated foiled surfaces

When tested in accordance with Annex C, there shall be no more than 25 mm of peel occurring between bonded foil and profile either:

a) before the foil stretches and shears; or

b) when the pre-determined maximum load is achieved.

6.9 Adhesions test for transfer foiled surfaces

When tested in accordance with BS EN ISO 2409 (BS 3900-E6) using adhesive tape, the coating shall conform to classification 0.

6.10 Scrubbability of covering layer

NOTE If the surface covering has been tested for scrubbability in accordance with this clause by an accredited laboratory, no further testing on individual profile systems is required.

When tested in accordance with BS EN 12956:1999, Clause **6** and using 320 cycles, the test piece, when viewed by normal or corrected vision at a range of 1 m in 45° north sky light viewing perpendicular to the surface, as described in BS EN ISO 105-A01, shall not exhibit any damage, e.g. erosion of the surface covering causing a change of colour or exposure of the underlying layers, which would detract from its appearance.

7 Marking

7.1 Main profiles

Main profiles shall be marked legibly and visibly in an unobtrusive position, not visible when the window or door is closed, at least every 1 m along the length of the profile with the following information:

a) name or trade mark of the manufacturer;

b) reference to this British Standard, i.e. BS 7722:2010 [1)];

c) climatic zone classification;

d) wall thickness classification;

e) in case of recycled material, RM_a as defined in BS EN 12608;

f) production code sufficient to enable traceability (e.g. date, machine and/or shift number).

EXAMPLE ABC Ltd – BS 7722 – M – C – 93.04.17,38,2

---

1) Marking BS 7722:2010 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Optional additional information contained within the mark may include:

- profile type/code;
- level of third party involvement (attestation).

NOTE Profiles already marked in accordance with BS EN 12608 will need to have additional marking to show compliance with BS 7722, applied subsequently at the time of foiling.

7.2 Auxiliary profile

Auxiliary profiles shall be marked, either on the profile itself or on the packaging, with the following information:

a) name or trade mark of the manufacturer;

b) reference to this British Standard, i.e. BS 7722:2010 [2)];

c) climatic zone classification;

d) production code sufficient to enable traceability.

EXAMPLE XYZ Ltd – BS 7722 – S – 93,368

[2)] Marking BS 7722:2010 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Annex A (informative) Advice on the use of protective tapes

Covered surfaces are often protected by means of adhesive tape to prevent damage to the decorative layer during handling. Generally this tape is of the low-tack type. In order to prevent any change to the tack properties that might result in damage to the surface covering, it is recommended that the profile and finished items are not stored in direct sunlight.

When windows and doorsets are to be installed in places where the risk of damage remains after the removal of the protective tape, it might be necessary to provide alternative protective measures, such as boarding up.

Annex B (informative) Applicability of requirements to auxiliary and main profiles

Table B.1 shows which requirements in this British Standard are applicable to auxiliary profiles and which to main profiles.

Table B.1 **Applicability of requirements to auxiliary and main profiles**

Test	Reference	Auxiliary profiles	Main profiles
Appearance and finish	**6.2.1, 6.2.2, 6.2.3**	Y	Y
Manufacturing tolerances	**6.2.4**	N	Y
Heat ageing	**6.3**	N	Y
Weldability	**6.4**	N	Y
Heat reversion	**6.5**	Y	Y
Impact resistance at low temperature	**6.6**	N	Y
Colour fastness	**6.7**	Y	Y
Adhesive bond strength for laminated foiled surfaces	**6.8**	Y	Y
Adhesions test for transfer foiled surfaces	**6.9**	Y	Y
Scrubbability of covering layer	**6.10**	Y	Y
Marking	Clause **7**	Y	Y

Annex C (normative) Adhesive bond strength test for laminated foil profiles

C.1 Principle

Profiles are tested to determine that the laminated foils are adequately adhered to the base profile.

C.2 Apparatus

C.2.1 *Equipment*, to provide a means of applying a pre-determined load to a tear strip on a foil covered profile test piece either by static masses or by tension using a tensile testing machine (see Figure C.1 and Figure C.2).

C.2.2 *Steel straight edge and scalpel or sharp blade* for cutting.

C.2.3 *Self-adhesive masking tape*.

C.3 Preparation of test pieces

Lay self-adhesive masking tape across the face of the profile length to be foiled at suitable intervals (e.g. 400 mm) in order to provide a leading edge of sufficient for the test. Cover the surface in foil in the normal manner. Cut the test pieces from the profile length by centralizing the masking tape between adjacent saw cuts. Make parallel straight cuts using the steel straight edge and scalpel at least 50 mm beyond the edge of the masking tape to create a flap or tear strip.

NOTE The 25 mm wide tear strip shown in Figure C.1 is convenient for testing main profiles. A narrower strip might be required for ancillary profiles.

C.4 Conditioning

After curing the adhesive in accordance with manufacturer's recommendations, condition the test pieces at (20 ± 5) °C for at least 18 h prior to testing.

C.5 Procedure

Support the test piece on the free running rollers and apply a pre-determined force equal to 2 N/mm width of tear strip without shock for 1 min to the foil flap.

Apply the force either by slowly releasing a pre-determined weight or by gradually applying equivalent force with a tensile testing machine.

NOTE It is considered that in the case where static masses are applied, the nearest 0.5 kg increment to the calculated force is sufficient. For example, the 2 N/mm width of tear strip corresponds to a mass of 5.097 kg; for test purposes an applied mass of 5 kg is considered adequate.

Measure the peel occurring between the covering and the profile either:

a) before the foil stretches and shears; or

b) when the predetermined maximum load is achieved.

Figure C.1 **Preparation of test specimens**

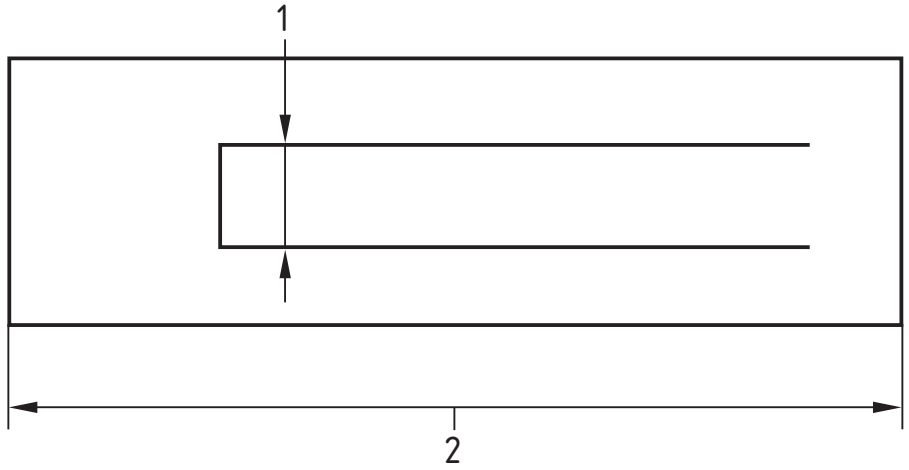
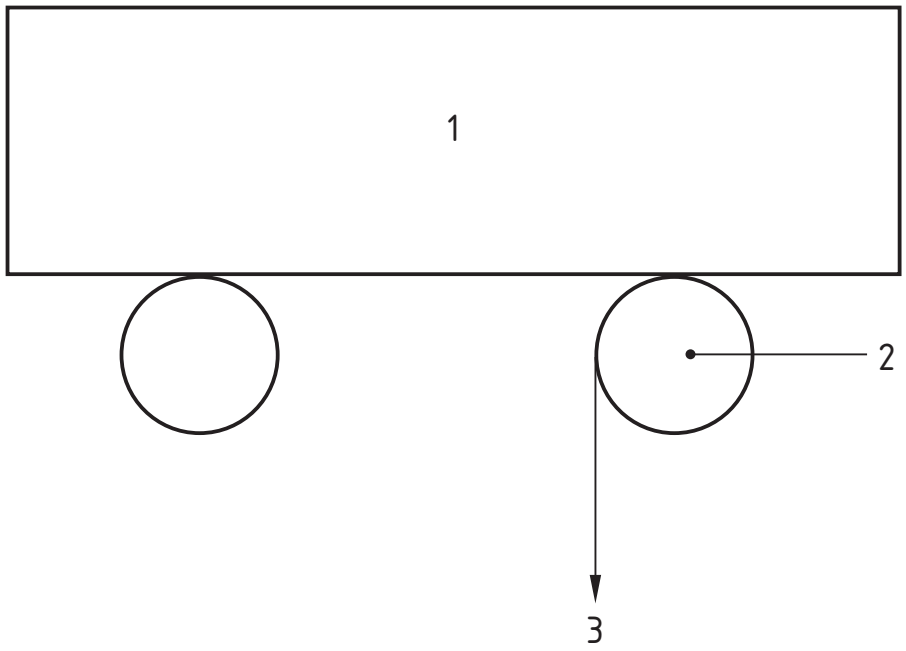


Figure C.2 **Static weights method**



Key

1 Profile sample

2 Rollers, nominal diameter 75 mm

3 Force applied to foil strip

Bibliography

[1] EUROPEAN UNION OF AGRÉMENT. *UEAtc Technical Report for the assessment of windows in coloured PVC-U*. UEAtc MOAT No. 57. Garston, Watford: European Union of Agrément, 1995. [3)]

[3)] General Secretariat: British Board of Agrément, PO Box 195, Bucknalls Lane, Garston, Watford, Herts WD25 9BA. Tel: +44 1923 665300. Fax: +44 1923 665301. E-mail: mail@ueatc.com

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™