PAS 25:1999

Plastics frames for use in gully tops and manhole tops for pedestrian areas

ICS 93.080.30

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

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Foreword

In preparing EN 124, Technical Committee CEN/TC165, Wastewater engineering, made provision for manhole tops and gully tops to be made of materials other than those specified in EN 124:1994, **6.1.1**.

BS EN 124:1994, **6.1.3** requires that for any other materials all requirements of EN 124 shall be met and that an approved independent body shall establish any other relevant requirements and testing methods.

Accordingly, a working group was established to prepare a supplementary specification to BS EN 124 to cover plastics materials used in the construction of frames for manhole tops and gully tops, conforming to BS EN 124, but not for use in the highway.

This Product Assessment Specification, PAS 25, has been published to provide an interim specification in the absence of defined performance criteria within BS EN 124. The intention of this Product Assessment Specification is to demonstrate the suitability of certain plastics materials that may be used in frames of manhole tops and gully tops. This Product Assessment Specification contains tests on the plastics material of the frame only; some clauses require the use of the compatible cover or grating to be used in the frame. It is not intended that plastics frames should be supplied separately. Units conforming to BS EN 124 have always to be supplied with the cover, or grating, *and* the frame.

This Product Assessment Specification is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

Acknowledgement is given to the following organizations who were consulted in the development of this specification:

British Plastics Federation;

BSI Product Services and Standards Development.

Product certification. Users of this Product Assessment Specification are advised to consider the desirability of third-party certification of products conforming to this Product Assessment Specification.

1 Scope

This Product Assessment Specification is applicable to plastics materials used in the manufacture of frames for gully tops and manhole tops, used in Group 1 and 2 areas, as defined in BS EN 124:1994, clause **5**. This Product Assessment Specification does not apply to products for use in the highway.

It establishes material and performance requirements for plastics materials used in the manufacture of frames conforming to BS EN 124:1994, **6.1.3**. It specifies the test methods and requirements to be applied but it does not cover arrangements for sampling or for frequency of testing for assessment of conformity, which should be covered contractually.

BS EN 124:1994 requires that units shall always be supplied with the cover, or grating, *and* the frame. Some of the performance requirements involve testing of the frame together with the cover, grating or supporting unit with which it is intended to be used.

NOTE Attention is drawn to BS 4660, which covers requirements for resistance to surface loadings for gully gratings, grating assemblies, rodding eyes and sealing plates, and to BS 7158 which covers requirements for plastics inspection chambers.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Product Assessment Specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However parties to agreements based on this Product Assessment Specification are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

BS 1247-2:1990, *Manhole steps — Plastics encapsulated manhole steps.*

BS 1755-1:1982, *Polymer and plastics technology — Glossary of terms used in the plastics industry* (BS ISO 472:1988).

BS 2782-1:Methods 120A, 120B, 120D and 120E:1997, *Methods of testing plastics — Thermal properties — Determination of Vicat softening temperature of thermoplastics* (BS EN ISO 306:1997).

BS 2782-11:Method 1103A:1995, *Plastics piping and ducting systems — Test method for visually assessing effects of heating* (BS EN 763:1995).

BS 3412:1992, *Methods of specifying general purpose polyethylene materials for moulding and extrusion.*

BS 5139:1991, *Method of specifying general purpose polypropylene and propylene copolymer materials for moulding and extrusion.*

BS EN 124:1994, *Gully tops and manhole tops for vehicular and pedestrian areas — Design requirements, type testing, marking, quality control.*

BS EN 295-3:1991, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Test methods.*

3 Plastics materials

3.1 Weathering

The material from which the frame is produced shall comprise one of the following plastics, incorporating or blended with other ingredients as necessary to enable manufacture of a frame conforming to BS EN 124 and other requirements of this Product Assessment Specification, as applicable:

a) unplasticized polyvinyl chloride (PVC-U) plastic, to be specified as black and otherwise in respect of other ingredients and/or properties as appropriate (see **3.2**).

b) polyethylene (PE) plastic, as defined in BS 1755-1:1982, to be specified as grade W in accordance with BS 3412:1992 including the designation applicable to the method of processing to be used for the manufacture of the frame and in respect of other ingredients and/or properties as appropriate;

c) polypropylene (PP) plastic, as defined in BS 1755-1:1982, or propylene plastic, as defined in BS 1755-1:1982, (see note) to be specified in accordance with BS 5139:1991 as light-stabilized and black together with the designation applicable to the method of processing to be used for the manufacture of the frame and in respect of other ingredients and/or properties as appropriate.

NOTE For the purposes of this Product Assessment Specification, PP is used to signify both polypropylene plastics and propylene plastics.

3.2 Vicat softening temperature

When tested in accordance with BS 2782-1:Method 120A:1997 the plastics material shall have a Vicat softening temperature of not less than 79 °C (method A of BS EN ISO 306:1997).

4 Frames

4.1 Resistance to stress relief

4.1.1 *Moulded PVC-U frames*

When tested in accordance with BS 2782-11:Method 1103A (method A of BS EN 763:1995) for 30 min at 150 °C, frames shall satisfy the following requirements as applicable.

a) Moulded frames shall show no weld line splitting (see note).

b) For frames with one or more injection points, the depth of crack penetration in the area of the injection point(s) shall be not greater than 2 mm, or not greater than 50 % of the wall thickness at the point of measurement, whichever is the lesser.

NOTE Weld lines may become more pronounced and exhibit localized sinking, but this does not constitute failure if it is not accompanied by splitting.

4.1.2 *Polypropylene (PP) frames and polyethylene (PE) frames*

When tested in accordance with BS EN 295-3:1991, **16.3** the frame shall have no visible defects.

4.2 Impact resistance of polyolefin frames

When subjected to a single blow by testing in accordance with BS 1247-2:1990, appendix F the frame shall show no visible cracks.

NOTE. The presence of stress marking without visible cracks does not constitute failure.

4.3 Impact resistance at low temperature

When tested as follows, there shall be no visible cracking of the frame following the test.

The complete frame shall be conditioned at (−10 ± 0.5) °C for 4 h. Immediately afterwards the side of the frame shall be subjected to an impact energy of 12 J (Group 1 area of BS EN 124:1994) or 24 J (Group 2 area of BS EN 124:1994) using the method described in BS 1247-2:1990, appendix F, with an impactor having a hemispherical face of 30 mm radius.

4.4 Thermal stability

When tested as follows, in each case, immediately following the test, there shall be no visible cracking of the frame.

Two complete frames shall be conditioned for 30 days at a temperature of 60 °C. The samples shall be allowed to cool to room temperature. One of the samples shall then be subjected to the cold impact test described in **4.3** and the other sample shall be subjected to the permanent set test described in BS EN 124:1994, **8.3.1**, using an unconditioned cover.

4.5 Resistance to petrol

WARNING Fire Hazard Warning and Fume Hazard To Health Warning: ***Test method may be dangerous to health. Ensure testing is undertaken by a suitably competent person. Ensure necessary precautions are taken.***

When tested as follows, there shall be:

a) no visible deterioration of the frame following the exposure to the reference solution;

b) no visible cracking of the frame following the permanent set test.

A complete frame shall be positioned face-up in a well-ventilated room at ambient temperature. 200 ml of reference solution (60 % vol. toluene, 40 % vol. *n*-heptane) shall be poured randomly onto the frame. The reference solution shall be allowed to evaporate off the frame naturally. This procedure shall be repeated at intervals of 24 h ± 30 min for a period of 7 days.

The frame shall be inspected 24 h ± 30 min after the final cycle and any visible deterioration recorded.

The frame and cover shall then be subjected to the permanent set test described in BS EN 124:1994, **8.3.1** using an unconditioned cover.

5 Marking

Frames shall, in addition to markings conforming to BS EN 124:1994, clause **9**, include the following marking in a clear and durable form adjacent to the "BS EN 124:1994" marking:

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Bibliography

BS 4660:1989, *Unplasticized polyvinyl chloride (PVC-U) pipes and plastics fittings of nominal size 110 and 160 for below ground gravity drainage and sewerage.*

BS 7158:1989, *Plastics inspection chambers for drains.*

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