

Plastics pipework (thermoplastics materials) —

Part 6: Code of practice for the installation of unplasticized PVC pipework for gravity drains and sewers

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Cooperating organizations

The Plastics Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

British Plastics Federation*	Engineering Equipment Users' Association*
British Resin Manufacturers' Association	Era Technology Ltd
Chemical Industries Association*	Institution of Production Engineers
Department of Industry (Chemicals and Textiles)	Ministry of Defence*
Department of the Environment (Building Research Establishment)	Plastics and Rubber Institute*
Department of the Environment (PSA)*	Post Office
Department of Trade (Metrology, Quality Assurance, Safety and Standards Division)	Royal Institute of British Architects*
Electrical, Electronic and Insulation Association (BEAMA)	Rubber and Plastics Research Association of Great Britain*
Electrical Installation Equipment Manufacturers' Association (BEAMA)	Society of Chemical Industry
	Society of Motor Manufacturers and Traders Limited

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Agrément Board	Institution of Chemical Engineers
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British Gas Corporation	Institution of Gas Engineers
British Steel Industry	Institution of Municipal Engineers
British Valve Manufacturers' Association Ltd	Institution of Public Health Engineers
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Department of the Environment	Ministry of Agriculture, Fisheries and Food
Department of the Environment (Housing and Construction)	National Association of Plumbing, heating and Mechanical Services Contractors
Electricity Supply Industry in England and Wales	National Water Council
Incorporated Association of Architects and Surveyors	Oil Companies Materials Association
Institute of Plumbing	Society of Chief Building Regulation Officers
	Water Companies' Association
	Water Research Centre
	Welding Institute

This British Standard, having been prepared under the direction of the Plastics Standards Committee, was published under the authority of the Executive Board and comes into effect on 28 November 1980

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Contents

	Page
Cooperating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 References	1
3 Flow properties	1
4 Types of joints	5
5 Storage, handling and transport	6
6 Inspection	6
7 Installation	7
8 Inspection and testing	12
9 Cleaning and repair	12
Appendix A Tests for suitability of soil material (imported or local) for surrounding buried plastics pipes	14
Figure 1 — Discharge rates of clean sewers made from unplasticized PVC pipes in the nominal size range from 110 to 630 for different gradients based on a roughness, k_s , of 0.006 mm	2
Figure 2 — Discharge rates of mature sewers made from unplasticized PVC pipes in the nominal size range from 110 to 630 for different gradients	3
Figure 3 — Details of concrete surround	6
Figure 4 — Alternative to concrete surround as shown in Figure 3	7
Figure 5 — Bedding details for a pipe in a narrow trench	9
Figure 6 — Bedding details for a pipe in a wide trench	10
Figure 7 — Unplasticized PVC pipe passing through a wall	12
Figure 8 — Sections through typical adaptors to join unplasticized PVC pipes to pipes of other materials	13
Table 1 — Sizes of pipe specified in BS 4660 and BS 5481	1
Table 2 — Suitable materials for bedding and surrounding pipes	8
Publications referred to	Inside back cover

Foreword

The preparation of the various Parts of this standard has been authorized in order to present the details of comparative physical, chemical and mechanical properties of the various plastics pipes, to guide the selection for different applications and consequently, to define sound practice in the installation of such pipes.

This code of practice was originally intended to be published as a new Part of CP 312 "*Plastics pipework (thermoplastics material)*", but, as the existing three Parts of that code are under revision, a new series has been started as BS 5955, into which the three Parts will be revised. Parts 4 and 5 will be published at a later date.

Part 1 of CP 312¹⁾ deals with the selection of the most suitable pipework materials. Part 2 of CP 312¹⁾ makes recommendations for the installation of unplasticized PVC pipework for the conveyance of liquids under pressure and Part 3 of CP 312¹⁾ deals similarly with polyethylene pipework.

This Part of this standard provides recommended practice for the use of unplasticized PVC pipes and fittings to convey by gravity surface water, foul sewage and sub-soil water. It supplements the information in CP 301 and CP 2005.

It should be noted that pipes and fittings dealt with in this Part of this standard are those which comply with the requirements either of BS 4660 or of BS 5481, and are available with the Kitemark, indicating that their manufacture is subject to supervision under a BSI Certification Scheme.

Unplasticized PVC pipes and fittings manufactured in accordance with the appropriate British Standard may differ in certain design details between manufacturers and attention is, therefore, drawn to the specific installation instructions available from the appropriate manufacturer.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ To be revised as the corresponding Part of BS 5955, in due course.

1 Scope

This Part of BS 5955 sets out information supplementary to that given in CP 301 and CP 2005 on the use of unplasticized PVC (uPVC) pipes and fittings for the conveyance by gravity of surface water, foul sewage and sub-soil water.

This code relates to unplasticized PVC pipes and fittings manufactured in accordance with BS 4660 in respect of 110 mm and 160 mm sizes and with BS 5481 in respect of sizes 200 mm to 630 mm, and used in the construction of gravity drains and gravity sewers. Details of the sizes of pipes specified in BS 4660 and BS 5481 are given in Table 1.

If it is proposed to use these pipes and fittings with untreated trade waste or with prolonged discharges at high temperature ($> 60\text{ }^{\circ}\text{C}$) reference should be made to CP 312-1 and/or to the manufacturer. It should be noted that it is normally a requirement that the temperature of trade effluent at the point of discharge to public sewers should not exceed $43\text{ }^{\circ}\text{C}$.

The information given is considered to be good practice in normal conditions in the United Kingdom, but it is appreciated that in certain localities there may be special conditions which will require modifications to these recommendations.

Building drainage installations are required to comply with regulations and byelaws (administered by local authorities) the details of which are dependent on the geographical location of the installations.

Unplasticized PVC pipes for gravity drains and gravity sewers differ from pipes considered in CP 312-2 in that they are not normally subject to internal hydraulic pressures except in unusual circumstances, e.g. when a blockage occurs or in an inverted siphon. However, they are subject to external loads due to the backfill and those transmitted from traffic.

Attention is drawn to the possible hazards involved in the site work of the installation of pipes; due attention should be paid to relevant safety regulations including the Health and Safety at Work etc, Act 1974.

This code is not applicable to pipes laid at depths exceeding 6 m to the top of the pipes.

Table 1 — Sizes of pipe specified in BS 4660 and BS 5481

Relevant British Standard	Nominal size ^a	Mean outside diameter ^b mm		Extreme individual outside diameter mm	
		min.	max.	min.	max.
4660	110	110.0	110.4	108.0	112.4
	160	160.0	160.6	157.1	163.5
5481	200	200.0	200.6	196.3	204.3
	250	250.0	250.7	245.4	255.4
	315	315.0	315.9	309.2	321.8
	(355)	355.0	356.0	348.4	362.6
	400	400.0	401.0	395.2	408.5
	(450)	450.0	451.0	441.5	459.5
	500	500.0	501.0	490.5	510.5
	(560)	560.0	561.0	549.3	571.7
	630	630.0	631.0	617.9	643.1

^a Non-preferred sizes are indicated in parentheses.

^b Mean outside diameter is defined as the arithmetic mean of any two diameters at right angles to each other.

2 References

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

3 Flow properties

For the purpose of calculating flow rates through unplasticized PVC pipes, reference should be made to the Colebrook-White equation, Figure 1 and Figure 2 have been derived using values for roughness (k_s) given in the "Hydraulic Research Station Charts"²⁾, 4th edition (metric), 1978 and "Tables for the hydraulic design of pipes"²⁾ (metric edition), 1977 for the sizes of unplasticized PVC pipes dealt with in this code.

It is recommended that the information given in Figure 2(b) is used only for velocities less than 1 m/s.

These values of roughness are for guidance only and may need future modification in the light of continuing research work.

²⁾ Obtainable from HMSO.

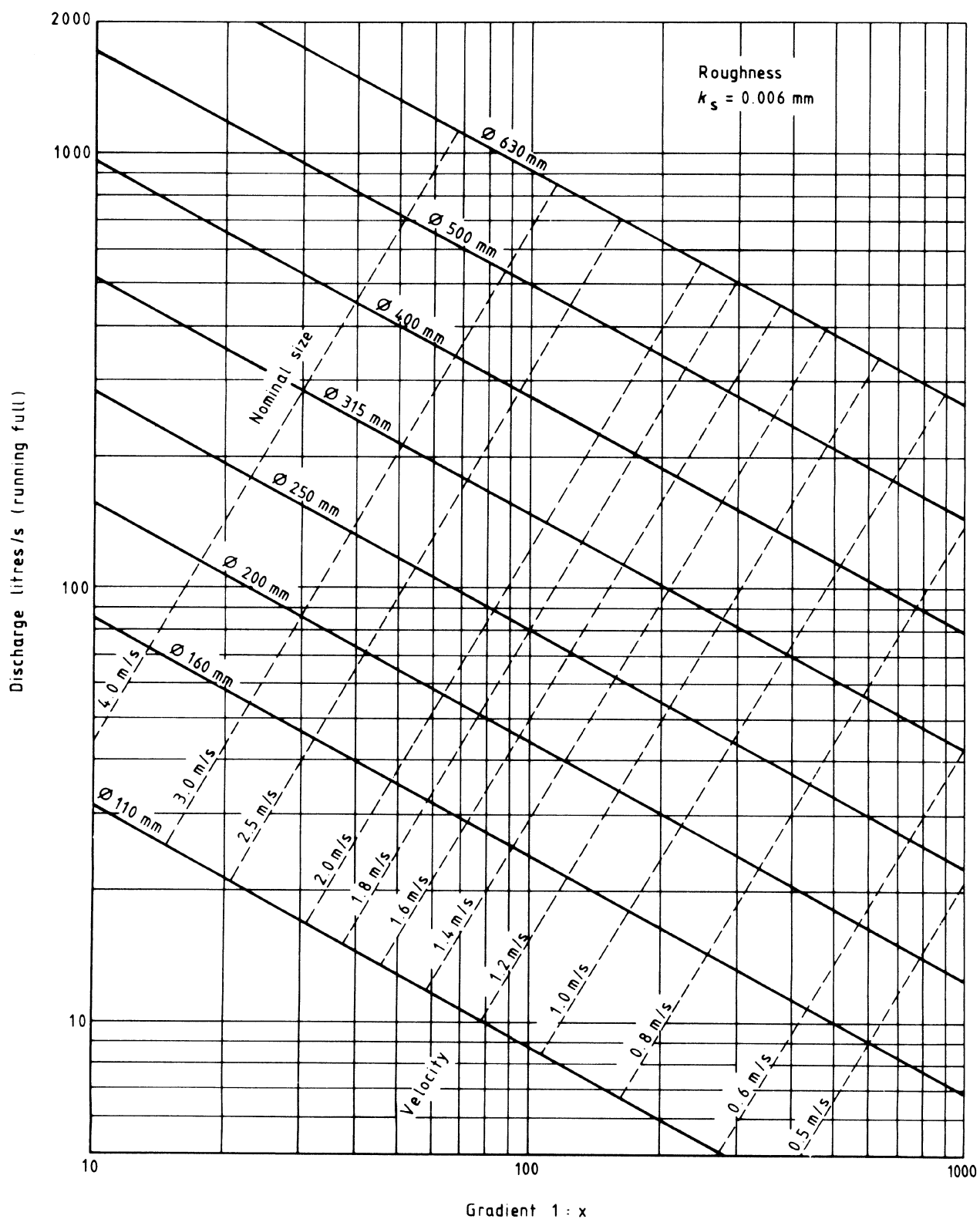


Figure 1 — Discharge rates of clean sewers made from unplasticized PVC in the nominal size range from 110 to 630 for different gradients based on a roughness, k_s , of 0.006 mm