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BRITISH STANDARD 4514 : 1969

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METRIC UNITS

29-4-83

S/S by 1983 edn. SPECIFICATION FOR

UNPLASTICIZED PVC SOIL AND

VENTILATING PIPE, FITTINGS

AND ACCESSORIES



BRITISH STANDARDS INSTITUTION



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**Amendment Slip No. 1, published 19 March, 1971
to BS 4514 : 1969**

**Unplasticized PVC soil and ventilating pipe,
fittings and accessories**

Revised text

Clause 2.4. In the last line delete '0.5 %' and substitute '0.032 g'.

Fig. 5. Straight coupling. Delete the existing figure and substitute the following:

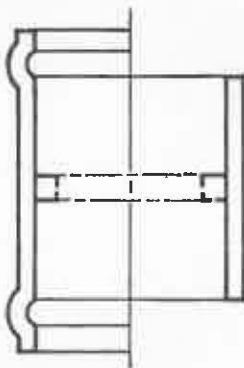


Table 8. Inspection doors. For the nominal size 3 pipe delete '75 mm (3.00 in) round' and substitute '65 mm (2.56 in) round'.

Clause 6. In the first line delete '1.8 m, 2.4 m, 3.0 m and 3.6 m (6ft, 8ft, 10ft and 12ft)' and substitute '2 m, 3 m and 4 m'.

Clause 12. In the second line delete 'no part of the 'weld line' shall open completely' and substitute 'at no place along its length shall the 'weld line' open through the complete thickness of the fitting.'

Appendix B. Delete the first sentence and substitute the following:

'The test shall be carried out whenever there is a change in the material from which the pipe is made or any major change in processing conditions.'

AMD 1288

**Amendment Slip No.2, published 31 October, 1973
to BS 4514 : 1969**

**Unplasticized PVC soil and ventilating pipe,
fittings and accessories**

Revised text

Clause 3.1 In lines one and two delete

'9/103 or 9/100 respectively, of BS 2660†' and substitute '00 E 53 or 10 A 07 respectively, of BS 4800†'.

Delete the footnote referring to BS 2660 and substitute the following:

†BS 4800, 'Paint colours for building purposes'.



**Amendment Slip No.3, published 31 August 1978
to BS 4514 : 1969**

**Unplasticized PVC soil and ventilating pipe,
fittings and accessories**

Revised text

Page 2. In the list of references, delete the entire existing reference to BS 2494 : Part 2 and substitute the following:

'BS 2494. Materials for elastomeric joint rings for pipework and pipelines.'

Delete the entire existing reference to BS 2660 and substitute the following:

'BS 4800. Paint colours for building purposes.'

Under the existing reference to BS 2782 insert the following:

'Methods 120A to 120E. Determination of the Vicat softening temperature of thermoplastics.

Methods 320A to 320F. Tensile strength, elongation and elastic modulus.

Method 540A. Determination of resistance to change upon exposure under glass to daylight.'

In the list of references, after 'CP' delete ' . . . * ' and substitute '312'.

After 'Part 2. Unplasticized PVC' delete the fullstop and insert 'pipework for the conveyance of liquids under pressure.'

Insert the following new reference in the correct numerical sequence:

'CP 304. Sanitary pipework above ground.'

At the foot of the page delete the associated footnote.

Gr 2



Foreword. Delete paragraph 3. At the end of the existing text insert the following:

‘This standard was published in 1969. In 1978 it was amended, the principle changes being as follows:

- (1) to designate nominal sizes in millimetres, without any change in the specified dimensional values;
- (2) to eliminate statements of properties in imperial units;
- (3) to re-specify the socket dimensions in Table 2 for 110 and 160 mm sizes;
- (4) to use a 3 mm straining rate in the tensile test in accordance with agreement within ISO/TC 138, Plastics pipes, fittings and valves for the transportation of fluids, and insert the consequential specification of the elongation at break at a higher value.’

Clause 1. Scope. In line 4 after ‘CP’ delete ‘...’ and substitute ‘312’.

In the associated footnote delete ‘...’ and substitute ‘312’; in the same line delete ‘(In course of preparation.)’.

In the footnote, after ‘Part 2, ‘Unplasticized PVC’’ delete the fullstop and insert ‘pipework for the conveyance of liquids under pressure.’

Clause 2.3. In line 1 delete ‘Method 102J of BS 2782*’ and substitute ‘Method 120B of BS 2782 : Part 1 : Methods 120A to 120E : 1976*’.

Clause 3.2. In lines 1 and 2 delete ‘Method 507A of BS 2782*’ and substitute ‘the method described in BS 2782 : Part 5 : Method 540A*’.

In the associated footnote, after ‘plastics’ delete the existing full point, substitute a comma; then insert the following:

‘Part 1, ‘Thermal properties’, Methods 120A to 120E, ‘Determination of the Vicat softening temperature of thermoplastics’.

Part 5, ‘Optical and colour properties’, Method 540A, ‘Determination of resistance to change upon exposure under glass to daylight’.

Clause 5.2. In line 1 of the note delete ‘3, 4 and 6’ and substitute ‘82 mm, 110 mm and 160 mm’.

Clause 5.3. In line 1 delete ‘3, 4 and 6’ and substitute ‘82 mm, 110 mm and 160 mm’.

Table 1. Dimensions of pipes and fittings. Delete the existing table and the footnote † and substitute the following:

TABLE 1. DIMENSIONS OF PIPES AND FITTINGS

Nominal size	Minimum outside diameter	Maximum outside diameter	Minimum wall thickness	
			pipe	fittings
mm	mm	mm	mm	mm
82	82.4	82.8	3.2	3.2
110	110.0	110.4	3.2	3.2
160	160.0	160.6	3.3	3.5

NOTE. The minimum wall thickness of pipes and fittings sockets, where they are supported by the pipe, may be reduced by up to 10 % of the specified values. Further, the wall thickness of the ring seal socket zone may be reduced by up to 25 % of the specified values.

Table 2. Minimum dimensions of joint sockets. Delete the existing table and substitute the following:

TABLE 2. MINIMUM DIMENSIONS OF JOINT SOCKETS

Nominal size	a (minimum)	b (minimum)	c (minimum)	d expansion allowance (minimum)
mm	mm	mm	mm	mm
82	37	35	3.8	} 9.53
110	48	40	5.0	
160	58	50	6.4	

In the accompanying note 1 delete '1'; in line 2 of the same note delete '(12 ft)'.

Delete note 2 entirely.

Figure 2. Fittings for soil and ventilating pipe. In the text relating to the 'Bend' and that relating to the 'Equal single branch' delete '3, 4 and 6' and substitute '82 mm, 110 mm and 160 mm'; in the text relating to the 'Equal double branch' delete '4' and substitute '110 mm'.

Table 3. Bends. Delete the existing table and substitute the following:

TABLE 3.
BENDS

θ	Entry	Nominal sizes
		mm
$92\frac{1}{2}^{\circ}$	swept	82, 110 and 160
104°	swept	110
$112\frac{1}{2}^{\circ}$	swept	} 82, 110 and 160
135°	swept or unswept	

Table 4. Equal single branches. Delete the existing table and substitute the following:

TABLE 4.
EQUAL SINGLE BRANCHES

θ	Entry	Nominal sizes
		mm
$92\frac{1}{2}^{\circ}$	swept	82, 110 and 160
104°	swept	82 and 110
$112\frac{1}{2}^{\circ}$	swept (preferred)	} 82, 110 and 160
	or unswept	
135°	unswept	

Table 5. Equal double branches. Delete the existing table and substitute the following:

TABLE 5.
EQUAL DOUBLE BRANCHES

θ	Entry	Nominal sizes
		mm
$92\frac{1}{2}^{\circ}$	swept	} 110
104°	swept	
135°	unswept	

Table 6. Unequal single branches. Delete the existing table and substitute the following:

TABLE 6.
UNEQUAL SINGLE BRANCHES

θ	Entry	Nominal sizes
		mm
$92\frac{1}{2}^{\circ}$	swept	110 x 82
$92\frac{1}{2}^{\circ}$	swept (preferred) or unswept	160 x 110
104°	swept	110 x 82
104°	swept (preferred) or unswept	160 x 110
135°	unswept	160 x 110

Table 7. Unequal double branches. Delete the existing table and substitute the following:

TABLE 7.
UNEQUAL DOUBLE BRANCHES

θ	Entry	Nominal sizes
		mm
$92\frac{1}{2}^{\circ}$	swept (preferred) or unswept	160 x 110
104°	swept (preferred) or unswept	

Figure 4. Offset. In line 1 of the accompanying note delete '3, 4 and 6' and substitute '82 mm, 110 mm and 160 mm'; in line 2 delete '(6 in)'.

Figure 5. Straight coupling (as amended by Amendment No.1). Delete '3, 4 and 6' and substitute '82 mm, 110 mm and 160 mm'.

Figure 6. Socket plug. Delete '3, 4 and 6' and substitute '82 mm, 110 mm and 160 mm'.

Figure 7. Level invert reducer. In line 1 of the accompanying note delete '3 x 2 and 4 x 2' and substitute '82 mm x 2 and 110 mm x 2'; in line 3 delete '4 x 3 and 6 x 4' and substitute '110 mm x 82 mm and 160 mm x 110 mm'.

Table 8. Inspection doors (as amended by Amendment No.1). Delete the existing table and substitute the following:

TABLE 8. INSPECTION DOORS

Nominal size of pipe	Clear minimum opening size
mm	
82	65 mm round or 75 mm x 50 mm oval
110	} 75 mm round or 100 mm x 50 mm oval
160	

Figure 8. W.C. pan connections. In line 1 of the accompanying note delete '3' and substitute '82 mm'; in line 3 delete '3 in' and substitute '82 mm' and delete '4' and substitute '110 mm'; in line 4 delete '3½ in' and '3 in' and substitute respectively '89 mm' and '76 mm'; in line 5 delete '2½ in' and substitute '63 mm'.

Table 9. Bossed connections. Delete the existing table and substitute the following:

TABLE 9. BOSSSED CONNECTIONS

Nominal size of pipe	Nominal sizes of connection
mm	
82	1¼ and 1½
110	} 1¼, 1½ and 2
160	

Clause 6. Length of pipe (as amended by Amendment No.1). In the last line delete $\left(\begin{smallmatrix} + & \frac{1}{2} \\ - & 0 \end{smallmatrix} \text{ in} \right)$.

Clause 8. Tensile properties of pipe. In line 2 delete '(6500 lbf/in²)' and in line 3 delete '40 %' and substitute '80 %'.

Clause 10. Impact requirement for pipe. In line 2 delete '; 28.9 ft lbf'.

Clause 11. Hydrostatic pressure requirement. In line 2 delete '(10 lbf/in²)'.

Clause 13. Elevated temperature cycling requirement. In line 4 delete '(¼ in)'.

Clause 16. Rubber sealing rings. At the end of the existing clause delete 'BS 2494, Part 2*' and substitute 'BS 2494*'.

In the associated footnote delete the existing text and substitute the following:

* BS 2494, 'Materials for elastomeric joint rings for pipework and pipelines'.

Clause A.1.1 Form of test specimen. In line 2 delete ' $(7 \pm 0.5 \text{ in}^2)$ ' and in line 4 delete ' $(0.125 \pm 0.010 \text{ in})$ '.

Appendix B. Tensile test (as amended by Amendment No.1). Delete the entire existing text and substitute the following:

'The test shall be carried out once in each month of production. The pipe shall be tested by the method described in BS 2782 : Part 3 : Methods 320A to 320F* subject to the following requirements.

(1) The specimen shall be cut longitudinally from a length of pipe by either procedure A or procedure B, as follows.

Procedure A. The pipe shall be heated to and flattened at a temperature of 125°C to 130°C , and the specimen then machined or routed out from the tube wall. The profile of the test piece shall be as shown in Fig. 1 of BS 2782 : Part 3 : Methods 320A to 320F : 1976*. For routed specimens the edges of the specimen shall be polished to remove notches.

Procedure B. The specimen shall be punched from a section of pipe heated to a temperature of 125°C to 130°C and shall then be flattened. The cutting edges of the punch shall have the profile as shown in Fig. 1 of BS 2782 : Part 3 : Methods 320A to 320F : 1976* and they shall be free from notches.

(2) The elongation at break and tensile strength shall be measured as described in Method 320C of BS 2782 : Part 3 : Methods 320A to 320F : 1976* but at a straining rate of 3 mm per minute.'

At the end of the existing footnote, after 'plastics' insert a comma and the following:

'Part 3, 'Mechanical properties', Methods 320A to 320F, 'Tensile strength, elongation and elastic modulus.'

Clause C.2 Form of test specimen. In line 3 delete ' (12 in) '; in line 4 delete ' (4.0 in) ' and in line 5 delete ' $(\frac{1}{2} \text{ in})$ '.

Clause D.2 Apparatus. In line 2 of item (3) delete ' (1.0 in) '; in line 1 of item (4) delete ' (9 in) ' and in line 3 delete ' (0.1 in) '; in line 2 of item (5) delete ' $(78.6 \pm 0.4 \text{ in})$ '.

Clause D.3 Procedure. In line 2 delete ' (78.6 in) '.

Clause E.2 Procedure. In line 1 delete ' (10 lbf/in^2) '.

Clause G.2 Procedure. In line 1 of item (1) and line 1 of item (3) delete ' $(7\frac{1}{2} \text{ gallons})$ '.

Appendix J. Notes on fixings for use with unplasticized PVC soil and ventilating pipes, fittings and accessories. In line 2 of item (6) delete '(2 in)'; in line 2 of item (7) delete '(1 in)'.

Table 10. Recommended maximum support distances. Delete the existing table and substitute the following:

TABLE 10. RECOMMENDED MAXIMUM SUPPORT DISTANCES

Nominal size	Maximum support distance for horizontal pipes	Maximum support distance for vertical pipes
mm	m	m
82	0.9	1.8
110	0.9	1.8
160	1.2	1.8

Amendment Slip No. 4
published and effective from 31 March 1981
to BS 4514 : 1969

Unplasticized PVC soil and ventilating pipe,
 fittings and accessories

Revised text

Page 2. In the list of references (as amended by Amendment No. 3) in the title for BS 1213 delete 'pan (dimensions and workmanship)' and substitute 'pans dimensions & workmanship'.

Under the existing reference to BS 4800 insert the following:

'BS 5503. Specification for vitreous china washdown WC pans with horizontal outlet.

Part 1. Connecting dimensions.

Part 2. Materials, quality, performance and dimensions other than connecting dimensions.

BS 5627. Specification for plastics connectors for use with horizontal outlet vitreous china WC pans.'

Contents. Delete '14. Ovality of pipe 18' and substitute '14. Text deleted'.

Table 1. Dimensions of pipes and fittings. Delete the existing table and note (as amended by Amendment No. 3) and substitute the following:

TABLE 1. DIMENSIONS OF PIPES AND FITTINGS

Nominal size	Outside diameter (mean)		Outside diameter (extreme)		Minimum wall thickness	
	min.	max.	min.	max.	pipe	fitting
	mm	mm	mm	mm	mm	mm
82	82.4	82.8	81.0	84.3	3.2	3.2
110	110.0	110.4	108.0	112.4	3.2	3.2
160	160.0	160.6	157.1	163.5	3.3	3.5

NOTE 1. The preferred method of measuring the mean outside diameter is by the use of a diameter tape.

NOTE 2. The extreme outside diameters apply only to pipe and spigots of fittings.

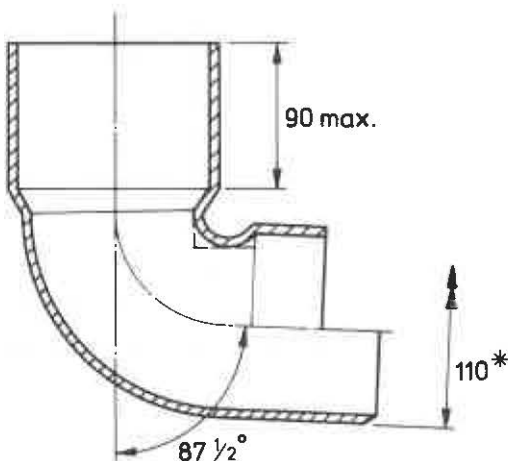
NOTE 3. The minimum wall thickness of pipes and fittings sockets, where they are supported by the pipe, may be reduced by up to 10 % of the specified values. Further the wall thickness of the ring seal zone may be reduced by up to 25 % of the specified values.

Figure 1. Socket dimensions. Make the existing note 'NOTE 1' and add a new note as follows:

'NOTE 2. If a ring seal is retained by means of a snap cap there is no requirement in respect of dimension c.'

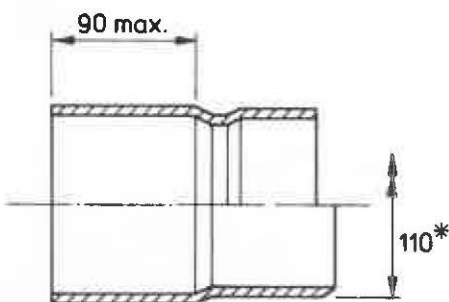
Figure 8. W.C. pan connections. Delete the existing figure and note (as amended by Amendment No. 3) and substitute the following new figures and notes.

Knuckled or swept



*See note 1.

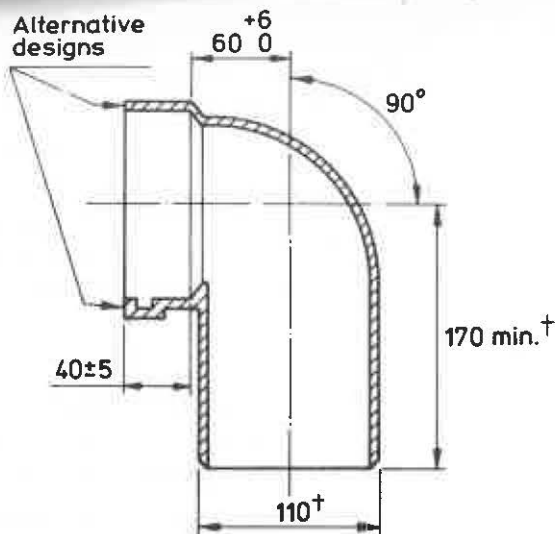
Fig. 8a. $87\frac{1}{2}^\circ$ Bend for turned 'P' trap



*See note 1.

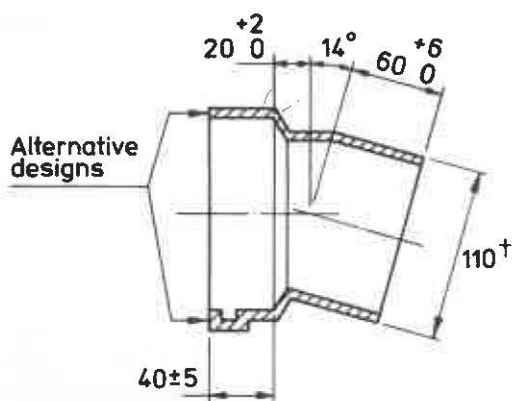
Fig. 8b. Straight connector

Fig. 8. W.C. pan connections



†See note 2.

Fig. 8c. 90° Bend for 'S' and turned 'P' trap



†See note 2.

Fig. 8d. 14° Bend for 'P' trap

All dimensions are in millimetres.

Fig. 8 (concluded)