

DIN 8062

DIN

ICS 23.040.20

Supersedes
DIN 8062:1988-11

**Unplasticized polyvinyl chloride (PVC-U) pipes –
Dimensions
English version of DIN 8062:2009-10**

Rohre aus weichmacherfreiem Polyvinylchlorid (PVC-U) –
Maße

Englische Übersetzung von DIN 8062:2009-10

Tuyaux en chlorure de polyvinyle non plastifié (PVC-U) –
Dimensions

Traduction anglaise de DIN 8062:2009-10

Document comprises 15 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original shall be considered authoritative.



A comma is used as the decimal marker.

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Foreword

This document has been prepared by Working Committee NA 054-05-01 AA *Außendurchmesser und Betriebsdrücke* of the *Normenausschuss Kunststoffe* (FNK) (Plastics Standards Committee).

See Annex A for the relationship to International Standard ISO 161-1 published by the International Organization for Standardization.

Attention is drawn to the possibility that some elements of this document may be the subject of patent rights. DIN shall not be held responsible for identifying any or all such patent rights.

Amendments

This standard differs from DIN 8062:1988-11 as follows:

- a) The title has been changed.
- b) The content has been editorially revised.
- c) Materials PVC-U-K and PVC-HI have been deleted.
- d) Information regarding pipe series and pressure ratings have been deleted from the tables giving dimensions.
- e) Information on pipe series S = 5 has been added.
- f) A table giving allowable working pressures for a safety factor SF = 2 is now included.
- g) The table giving tolerances on mean outside diameters has been expanded to include tolerances on out-of-roundness.
- h) Values in the table giving dimensions have been harmonized with ISO 4065.
- i) The table giving allowable working pressures for pipes conveying fluids to which PVC-U is resistant has been deleted.
- j) The average density of pipes has been increased to 1,42 g/cm³.
- k) In the table giving outside diameters, wall thicknesses and masses, the masses have been calculated for an average density of 1,42 g/cm³.

Previous editions

DIN 8062: 1941x-07, 1959-03, 1960x-07, 1966-09, 1971-04, 1974-02, 1988-11

1 Scope

This standard applies to unplasticized polyvinyl chloride (PVC-U) pipes that meet the requirements of DIN 8061.

Attention is brought to the fact that there are European product standards which apply to specific applications; these are to be complied with where relevant. Some of these product standards are listed in the bibliography for the information of users of this standard. Please note that because European Standards are continually being developed, this list is not exhaustive.

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.

DIN 8061, *Unplasticized polyvinyl chloride (PVC-U) pipes — General quality requirements and testing*

DIN EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification, designation, and design coefficient*

ISO 4065, *Thermoplastic pipes — Universal wall thickness table*

ISO 11922-1, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 pipe series number

S
nominal pipe series number taken from ISO 4065

NOTE To calculate wall thickness e using equation (1), the “calculated values” for S specified in ISO 4065 are to be used.

$$e = \frac{d}{2S+1} \quad (1)$$

3.2 standard dimension ratio

SDR

ratio of the nominal outside diameter of a pipe to its nominal wall thickness

NOTE Calculated using equation (2).

$$\text{SDR} = 2S + 1 \approx \frac{d}{e} \quad (2)$$

where S is the nominal pipe series number.

4

3.3

out-of-roundness

ovality

difference between the measured maximum outside diameter and the measured minimum outside diameter in the same cross-section of the pipe

4 Material

The MRS classification of PVC-U material for pipes is based on its long-term hydrostatic strength at 20 °C over 50 years with water as the exposure medium and at a suitable pressure, and is specified in DIN EN ISO 12162. The minimum long-term hydrostatic strength (MRS) is 25 MPa.

5 Safety factors

Safety factors are specified in product standards.

6 Dimensions and designation

6.1 General

The principle dimensions for designating pipes are shown in Figure 1.

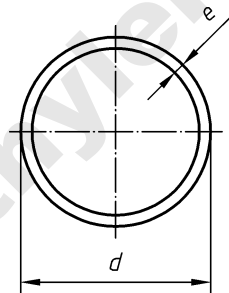


Figure 1 — Outside diameter and wall thickness

Designation of a pipe with an outside diameter $d = 32$ mm and a wall thickness $e = 1,8$ mm made from PVC-U:

Pipe DIN 8062 — 32 × 1,8 — PVC-U

62 Outside diameters, wall thicknesses, S/SDR series and masses

Table 1 — Outside diameters, wall thicknesses, S/SDR series and masses

Dimensions in millimetres

d		Pipe series S																					
		Standard dimension ratio SDR																					
		63		25		20		16,7		12,5		10		8		6,3		5		4			
		127 ^a		51		41		34,4		26		21		17		13,6		11 ^c		9 ^c			
e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b	e	Mass ^b		
mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m		
5																				1,0	0,020		
6																					1,0	0,025	
8																					1,0	0,035	
10																				1,0	0,045	1,2	0,054
12																				1,1	0,062	1,4	0,074
16														1,2	0,091	1,5	0,108	1,8	0,125				
20														1,5	0,139	1,9	0,168	2,3	0,199				
25														1,5	0,177	1,9	0,215	2,3	0,255	2,8	0,299		
32														1,6	0,243	1,9	0,280	2,9	0,405	3,6	0,489		
40														1,6	0,307	2,4	0,442	3,0	0,642	4,5	0,761		
50														1,5	0,366	2,0	0,469	3,0	0,678	4,6	0,995	5,6	1,18
63						1,6	0,491	1,9	0,571	2,5	0,739	3,0	0,866	3,8	1,08	4,7	1,31	5,8	1,571	7,0	1,85		
75						1,9	0,683	2,2	0,793	2,9	1,01	3,6	1,24	4,5	1,52	5,6	1,85	6,8	2,191	8,4	2,64		
90						2,2	0,957	2,7	1,15	3,5	1,46	4,3	1,77	5,4	2,18	6,7	2,64	8,2	3,172	10,1	3,80		
110	0,964	2,2	1,18	2,7	1,41	3,2	1,66	4,2	2,14	5,3	2,65	6,6	3,24	8,1	3,91	10,0	4,700	12,3	5,64				
125	1,10	2,5	1,50	3,1	1,84	3,7	2,16	4,8	2,75	6,0	3,39	7,4	4,13	9,2	5,04	11,4	6,094	14,0	7,28				
140	1,23	2,8	1,86	3,5	2,31	4,1	2,69	5,4	3,47	6,7	4,24	8,3	5,18	10,3	6,30	12,7	7,593	15,7	9,14				
160	1,41	3,2	2,44	4,0	2,99	4,7	3,49	6,2	4,55	7,7	5,55	9,5	6,75	11,8	8,23	14,6	9,963	17,9	11,9				
180	1,59	3,6	3,06	4,4	3,71	5,3	4,43	6,9	5,66	8,6	6,97	10,7	8,54	13,3	10,4	16,4	12,589	20,1	15,0				
200	1,77	3,9	3,67	4,9	4,56	5,9	5,44	7,7	7,02	9,6	8,64	11,9	10,5	14,7	12,8	18,2	15,522	22,4	18,6				
225	1,99	4,4	4,67	5,5	5,77	6,6	6,85	8,6	8,81	10,8	10,9	13,4	13,4	16,6	16,2	20,5	19,640	25,2	23,5				
250	2,0	4,9	5,73	6,2	7,22	7,3	8,43	9,6	10,912	11,9	13,3	14,8	16,4	18,4	20,0	22,7	24,152	27,9	28,9				

Table 1 (continued)

Dimensions in millimetres

d		Pipe series S																	
		Standard dimension ratio SDR																	
		63		20		16,7		12,5		10		8		6,3		5		4	
mm	e	127 ^a		41		34,4		26		21		17		13,6		11 ^c		9 ^c	
		Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm	Mass ^b kg/m	e mm
280	2,2	3,03	5,5	7,21	6,0	7,81	8,2	10,6	12,0	15,1	13,4	16,8	20,8	25,1	20,6	25,4	30,3	31,3	36,4
315	2,5	3,83	6,2	9,15	7,7	11,2	9,2	13,3	13,5	19,2	15,0	21,2	26,0	31,8	23,2	28,6	38,3		
355	2,8	4,79	7,0	11,6	8,7	14,3	10,4	17,0	15,2	24,3	16,9	26,8	33,1	40,2	26,1				
400	3,2	6,19	7,9	14,7	9,8	18,1	11,7	21,4	17,1	30,8	19,1	34,2	41,8	51,0	29,4				
450	3,6	7,76	8,8	18,4	11,0	22,8	13,2	27,2	19,2	38,9	21,5	43,3	26,7						
500	4,0	9,51	9,8	22,7	12,3	28,3	14,6	33,4	21,4	48,1	23,9	53,4	29,7						
560	4,4	11,8	11,0	28,5	13,7	35,3	16,4	42,0	23,9	60,1	26,7	66,8							
630	5,0	14,9	12,3	35,9	15,4	44,6	18,4	53,0	26,9	76,1	30,0	84,4							
710	5,6	18,8	13,9	45,6	17,4	56,8	20,7	67,1	30,3	96,6									
800	6,3	23,9	15,7	58,0	19,6	72,0	23,3	85,1											
900	7,1	30,3	17,6	73,1	22,0	90,7	26,3	108											
1 000	7,9	37,2	19,6	90,4	24,5	112	29,2	133											
1 200	9,5	53,6	23,5	130	29,4														
1 400	11,1	73,1	27,4	177															
1 600	12,6	94,5	31,3	231															

^a SDR 127 is a special series for ventilation pipelines with a minimum wall thickness of $e = 1,8$ mm.

^b The mass has been calculated taking an average density of $1,42 \text{ g/cm}^3$. For deviating densities the mass is to be corrected proportionally. Half the specified tolerance has been added to the wall thickness; values have been rounded off to a maximum of three decimal places.

^c SDR 9 and SDR 11 are special series for pipelines and apparatus used in the chemical industry. The pipes withstand at least the pressures specified for SDR 13,6; they have greater wall thicknesses than SDR 13,6 pipes to ensure welding suitability and allow for plastic forming.

6.3 Tolerances on mean outside diameter and out-of-roundness

Table 2 — Tolerances on mean outside diameter and out-of roundness

Dimensions in millimetres

Outside diameter <i>d</i>	Tolerance on mean outside diameter ^a	Tolerance on out-of-roundness ^b	
		SDR 51 and SDR 34,4 ^c	SDR 26 to SDR 9 ^d
5	0,2	1,2	0,5
6	0,2	1,2	0,5
8	0,2	1,2	0,5
10	0,2	1,2	0,5
12	0,2	1,2	0,5
16	0,2	1,2	0,5
20	0,2	1,2	0,5
25	0,2	1,2	0,5
32	0,2	1,3	0,5
40	0,2	1,4	0,5
50	0,2	1,4	0,6
63	0,3	1,5	0,8
75	0,3	1,6	0,9
90	0,3	1,8	1,1
110	0,4	2,2	1,4
125	0,4	2,5	1,5
140	0,5	2,8	1,7
160	0,5	3,2	2,0
180	0,6	3,6	2,2
200	0,6	4,0	2,4
225	0,7	4,5	2,7
250	0,8	5,0	3,0
280	0,9	6,8	3,4
315	1,0	7,6	3,8
355	1,1	8,6	4,3
400	1,2	9,6	4,8
450	1,4	10,8	5,4
500	1,5	12,0	6,0
560	1,7	13,5	6,8
630	1,9	15,2	7,6
710	2,0	17,1	8,6
800	2,0	19,2	9,6
900	2,0	21,6	10,8
1 000	2,0	24,0	12,0
1 200	2,1	28,8	14,4
1 400	2,2	33,6	16,8
1 600	2,5	38,4	19,2

^a The tolerances on the mean outside diameter *d* are equivalent to the following grades as in ISO 11922-1: grade D for *d* ≤ 50 mm; grade C for *d* > 50 mm.

^b Out-of-roundness (also called "ovality") is the difference between the measured maximum outside diameter and the measured minimum outside diameter in the same cross-section of the pipe. Pipes shall meet the out-of-roundness requirement at the time of manufacture. Specifying out-of-roundness requirements for SDR 127 pipes is not practical.

^c Tolerances are in accordance with ISO 11922-1 as follows: grade N for *d* ≤ 250 and grade M for *d* > 250.

^d Tolerances are in accordance with ISO 11922-1 as follows: 0,5 × grade M.

6.4 Tolerances on wall thickness

Table 3 — Tolerances on wall thickness

Dimensions in millimetres

Wall thickness <i>e</i>	Tolerance ^a	Wall thickness <i>e</i>	Tolerance ^a
up to 1	+0,3 0	over 16 up to 17	+1,9 0
over 1 up to 2	+0,4 0	over 17 up to 18	+2 0
over 2 up to 3	+0,5 0	over 18 up to 19	+2,1 0
over 3 up to 4	+0,6 0	over 19 up to 20	+2,2 0
over 4 up to 5	+0,7 0	over 20 up to 21	+2,3 0
over 5 up to 6	+0,8 0	over 21 up to 22	+2,4 0
over 6 up to 7	+0,9 0	over 22 up to 23	+2,5 0
over 7 up to 8	+1 0	over 23 up to 24	+2,6 0
over 8 up to 9	+1,1 0	over 24 up to 25	+2,7 0
over 9 up to 10	+1,2 0	over 25 up to 26	+2,8 0
over 10 up to 11	+1,3 0	over 26 up to 27	+2,9 0
over 11 up to 12	+1,4 0	over 27 up to 28	+3 0
over 12 up to 13	+1,5 0	over 28 up to 29	+3,1 0
over 13 up to 14	+1,6 0	over 29 up to 30	+3,2 0
over 14 up to 15	+1,7 0	over 30 up to 31	+3,3 0
over 15 up to 16	+1,8 0	over 31 up to 32	+3,4 0
^a The given values have been calculated on the following basis: Tolerances = +0,1 <i>e</i> + 0,2 mm; rounded up to the nearest 0,1 mm. A local increase in wall thickness of +0,2 <i>e</i> is permissible for <i>e</i> ≤ 10 mm, and an increase of +0,15 <i>e</i> is permissible for <i>e</i> > 10 mm. The mean measured value shall lie within the specified tolerances.			

7 Allowable working pressures

7.1 Allowable working pressures for pipes conveying water

The allowable working pressures specified in Tables 4 and 5 have been calculated using equation (3) on the basis of long-term hydrostatic strengths taken from the reference lines given in DIN 8061 and taking a safety factor SF into consideration.

$$p = \frac{\sigma}{S \cdot SF} \cdot 10 \quad (3)$$

where

p is the allowable working pressure, in bar¹⁾;

σ is the relevant long-term hydrostatic strength taken from the reference lines in DIN 8061, in MPa;

S is the pipe series number taken from ISO 4065 (calculated value).

7.2 Allowable working pressures for pipes conveying other liquids

In the case of pipes conveying liquids which can be hazardous when not handled properly, it is recommended that further information be obtained from the pipe manufacturer. Additional information is given in Supplement 1 to DIN 8061.

1) 1 bar = 0,1 MPa

**Table 4 — Allowable working pressure for PVC-U pipes
with a safety factor (SF) = 2,5**

Temperature °C	Years of service	Pipe series S									
		63	25	20	16,7	12,5	10	8	6,3	5	4
		Standard dimension ratio SDR									
		127	51	41	34,4	26	21	17	13,6	11	9
Allowable working pressure ^a bar											
10	5	2,1	5,2	6,5	7,8	10,4	13,0	16,3	20,9	26,0	32,8
	10	2,0	5,1	6,4	7,6	10,2	12,7	15,9	20,4	25,4	32,0
	25	2,0	4,9	6,2	7,4	9,9	12,3	15,4	19,7	24,6	30,9
	50	1,9	4,8	6,0	7,2	9,6	12,0	15,1	19,3	24,0	30,2
	100	1,9	4,7	5,9	7,1	9,4	11,8	14,7	18,8	23,5	29,5
20	5	1,7	4,4	5,5	6,6	8,8	11,0	13,7	17,5	21,9	27,5
	10	1,7	4,3	5,3	6,4	8,5	10,7	13,4	17,1	21,3	26,8
	25	1,6	4,1	5,1	6,2	8,2	10,3	12,9	16,4	20,5	25,8
	50	1,6	4,0	5,0	6,0	8,0	10,0	12,5	16,0	20,0	25,0
	100	1,5	3,9	4,9	5,8	7,8	9,7	12,2	15,6	19,4	24,4
30	5	1,4	3,5	4,4	5,3	7,1	8,8	11,1	14,1	17,6	22,2
	10	1,4	3,4	4,3	5,1	6,8	8,6	10,7	13,7	17,1	21,5
	25	1,3	3,3	4,1	4,9	6,6	8,2	10,3	13,2	16,4	20,7
	50	1,3	3,2	4,0	4,8	6,4	8,0	10,0	12,7	15,9	20,0
40	5	1,1	2,7	3,4	4,1	5,4	6,8	8,5	10,8	13,5	17,0
	10	1,0	2,6	3,3	3,9	5,2	6,5	8,2	10,4	13,0	16,4
	25	1,0	2,5	3,1	3,7	5,0	6,2	7,8	9,9	12,4	15,6
	50		2,4	3,0	3,6	4,8	6,0	7,5	9,6	12,0	15,1
50	5		1,9	2,4	2,9	3,8	4,8	6,0	7,6	9,5	12,0
	10		1,8	2,3	2,7	3,6	4,6	5,7	7,3	9,1	11,5
	25		1,7	2,2	2,6	3,5	4,3	5,4	6,9	8,6	10,9
60	5		1,2	1,5	1,8	2,4	3,0	3,8	4,8	6,0	7,5
	10		1,1	1,4	1,7	2,3	2,8	3,6	4,5	5,7	7,1
	25		1,1	1,3	1,6	2,1	2,6	3,3	4,2	5,3	6,6

^a The allowable working pressures have been calculated on the basis of the strength values specified in DIN 8061 for PVC-U. The allowable working pressure is normally lower in the actual pipeline systems, as they comprise pipes, fittings, valves, and various connection techniques, for example.

Table 5 — Allowable working pressures for PVC-U pipes with a safety factor (SF) = 2,0

Temperature °C	Years of service	Pipe series S									
		63	25	20	16,7	12,5	10	8	6,3	5	4
		Standard dimension ratio SDR									
		127	51	41	34,4	26	21	17	13,6	11	9
Allowable working pressure ^a bar											
10	5	2,6	6,5	8,2	9,8	13,0	16,3	20,4	26,1	32,5	40,9
	10	2,5	6,3	8,0	9,5	12,7	15,9	19,9	25,4	31,7	39,9
	25	2,4	6,1	7,7	9,2	12,3	15,4	19,3	24,6	30,7	38,7
	50	2,4	6,0	7,5	9,0	12,0	15,1	18,8	24,1	30,0	37,8
	100	2,3	5,9	7,4	8,8	11,8	14,7	18,4	23,5	29,3	36,9
20	5	2,2	5,5	6,9	8,2	11,0	13,7	17,1	21,9	27,3	34,4
	10	2,1	5,3	6,7	8,0	10,7	13,4	16,7	21,4	26,6	33,5
	25	2,0	5,1	6,4	7,7	10,3	12,9	16,1	20,6	25,6	32,3
	50	2,0	5,0	6,3	7,5	10,0	12,5	15,6	20,0	25,0	32,0
	100	1,9	4,8	6,1	7,3	9,7	12,2	15,2	19,4	24,2	30,5
30	5	1,8	4,4	5,5	6,6	8,8	11,1	13,8	17,7	22,0	27,8
	10	1,7	4,3	5,4	6,4	8,6	10,7	13,4	17,1	21,3	26,9
	25	1,6	4,1	5,2	6,2	8,2	10,3	12,9	16,5	20,6	25,9
	50	1,6	4,0	5,0	6,0	8,0	10,0	12,4	15,9	19,9	25,0
40	5	1,3	3,4	4,2	5,1	6,8	8,5	10,6	13,5	16,9	21,2
	10	1,3	3,2	4,1	4,9	6,5	8,2	10,2	13,0	16,3	20,5
	25	1,2	3,1	3,9	4,6	6,2	7,8	9,7	12,4	15,5	19,5
	50	1,2	3,0	3,8	4,5	6,0	7,5	9,4	12,0	15,0	18,8
50	5		2,4	3,0	3,6	4,8	6,0	7,4	9,5	11,9	14,9
	10		2,3	2,9	3,4	4,6	5,7	7,1	9,1	11,4	14,3
	25		2,1	2,7	3,2	4,3	5,4	6,8	8,6	10,8	13,6
60	5		1,5	1,9	2,2	3,0	3,8	4,7	6,0	7,5	9,4
	10		1,4	1,8	2,1	2,8	3,6	4,4	5,7	7,1	8,9
	25		1,3	1,7	2,0	2,6	3,3	4,1	5,3	6,6	8,3

^a The allowable working pressures have been calculated on the basis of the strength values specified in DIN 8061 for PVC-U. The allowable working pressure is normally lower in the actual pipeline systems, as they comprise pipes, fittings, valves, and various connection techniques, for example.

8 Form supplied

Pipes shall be supplied in specified lengths complying with the tolerances specified in Table 6.

Table 6 — Tolerances for pipe lengths

Form supplied		Tolerances ^a
Straight lengths	Lengths ≤ 12 m	± 10 mm
	Lengths > 12 m	subject to agreement
^a For a temperature of (23 ± 2) °C.		

Pipe ends shall be cut as square as possible to the pipe axis and be free of burrs.

9 Marking

Pipes conforming to this standard shall be permanently marked with at least the following information at 1 m intervals.

- Manufacturer's symbol e.g. xyz;
- material designation PVC-U;
- DIN number DIN 8061/8062;
- outside diameter × wall thickness e.g. 32 × 2,9;
- date of manufacture e.g. 19.02.09;
- machine number e.g. 7.

This marking shall only be applied to pipes which are not covered by other standards or technical rules on specific applications.

Annex A
(informative)

Explanatory notes

This standard has been developed by FNK Working Committee NA 054-05-01 AA *Außendurchmesser und Betriebsdrücke*. It conforms to ISO 161-1 as regards outside diameters, and to ISO 4065 as regards wall thickness specifications for S/SDR numbers. It also conforms to ISO 11922-1 as regards tolerances on outside diameter, out-of-roundness and wall thickness.

The standard covers the entire delivery range of PVC-U pipes for all relevant applications.

Long-term tests and experience have shown that the anticipated service life of PVC-U pipes at operating temperatures up to 20 °C can be extended from 50 years to at least 100 years (see Tables 4 and 5).

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Bibliography

DIN EN 1401-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*

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DIN EN 1452-2, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 2: Pipes*

DIN EN 1456-1, *Plastics piping systems for buried and above ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for piping components and the system*

DIN EN ISO 15493, *Plastics piping systems for industrial applications — Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) — Specifications for components and the system — Metric series*

ISO 161-1, *Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series*

- [1] Egon Barth: *Das Langzeitverhalten von PVC-U-Rohren mit unterschiedlicher Stabilisierung* (The long-term behaviour of PVC-U pipes with different types of stabilization), *Kunststoffrohrverband e.V.*, Bonn (December 2005)