



# SLOVENSKI STANDARD

## SIST EN 295-1:1996/A3:2000

01-november-2000

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### Keramične cevi, fazonski kosi in spoji za odvod odpadne vode in kanalizacijo - 1. del: Zahteve

Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 1:  
Requirements

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -  
kanäle - Teil 1: Anforderungen

Tuyaux et accessoires en gres et assemblages de tuyaux pour les réseaux de  
branchement et d'assainissement - Partie 1: Exigences

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Ta slovenski standard je istoveten z: EN 295-1:1991/A3:1999

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#### **ICS:**

23.040.50	Cevi in fitingi iz drugih materialov	Pipes and fittings of other materials
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

**SIST EN 295-1:1996/A3:2000**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 295-1:1991/A3

March 1999

ICS 23.040.50

English version

## Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 1: Requirements

Tuyaux et accessoires en grès et assemblages de tuyaux pour les réseaux de branchement et d'assainissement - Partie 1: Exigences

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -kanäle - Teil 1: Anforderungen

This amendment A3 modifies the European Standard EN 295-1:1991; it was approved by CEN on 28 January 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

This Amendment EN 295-1:1991/A3:1999 to EN 295-1:1991 has been prepared by Technical Committee CEN/TC 165 "Waste water engineering", the secretariat of which is held by DIN.

This Amendment to the European Standard EN 295-1:1991 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

For adaptation of EN 295-1:1991 to new published European Standards amendments were necessary.

EN 295-1:1991 in the French version contains editorial mistakes concerning the use of auxiliary verbs. For adaptation of the French version to the English and German version this amendment also contains a list of additional editorial amendments concerning only the French version and therefore are not put at disposal in English and German language.

The CEN-members will decide whether the changes will be published separately from the original version of EN 295-1:1991 or the changes will be incorporated in a revised publication of the standard. These options are allowed under clause M.3 of the CEN/CENELEC internal regulations Part 3.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Amendments to EN 295-1

1. Sub-clause 1.2 Delete "EN 29002 : 1987  
Quality Systems - Model for quality assurance in production and installation"
2. Sub-clause 1.2 Delete "ISO/DIS 4633:1986  
Rubber seals - Joint rings for water supply, drainage sewerage pipelines - Specification of materials"
3. Sub-clause 1.2 Insert "EN 681-1:1996  
Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Part 1 : Vulcanized rubber"
4. Sub-clause 2.1 second paragraph Replace "defects" with "imperfections"
5. Sub-clause 2.5 Delete "Table 3" . Insert new Table 3

**Table 3 : Deviation from straightness in mm/m-nominal length**

< DN 150	≥ DN 150 ≤ DN 250	DN >250
5,0	4,5	4,0

6. Sub-clause 2.9 Delete "Table 4". Insert new table 4 and note

**Table 4 : Crushing strength (FN) in kN/m DN 100 and 150**

Nominal size (DN)	Crushing strength (FN)			
	100	(22)	28	34
150	(22)	28	34	40

NOTE : Brackets around the strengths denote strengths where there are no dimensions given in Table 12

7. Delete "Table 5". Insert new table 5 and notes.

Table 5 : Crushing strength (FN) in kN/m DN ≥ 200

Nominal size (DN)	Class number					
	L*)	95	120	160	200	240
200			(24)	32	40	48
225			(28)	36	45	54
250			(30)	40	50	60
300			36	48	60	72
350			42	56	70	
400			48	64	80	96
450		43	54	72		
500		48	60	80		
600	48	57	72	96		
700	60	67	84			
800	60	76	96			
1 000	60	95				
1 200	60					

NOTE : Brackets around the strengths denote strengths where there are no dimensions given in Table 11 and 12  
\*) Lower strength pipes

8. Delete table 6. Insert New Table 6

Table 6 : Bending moment resistance (BMR) in kN.m for crushing strength values (FN) in kN/m

Nominal size (DN)	FN		BMR		FN		BMR	
	FN	BMR	FN	BMR	FN	BMR	FN	BMR
100	22	1,0	28	1,3	34	1,7	40	2,0
150	22	2,8	28	3,4	34	4,0	40	4,6
200	24	5,2	32	6,2	40	7,4	48	8,6
225	28	6,5	36	7,4	45	9,0	54	10,6

9. Sub-clause 2.14 Delete title, insert new title "Watertightness of pipes, bends and junctions".  
Insert in first line after "pipes" " , bends, junctions".  
Insert in 4th line before "internal" "wetted".

10. Sub-clause 2.18 Delete sub-clause, insert new sub-clause and Table 7

### 2.18 Airtightness

Pipes, bends, junctions and pipe sections shall be tested in accordance with clause 13 of EN 295-3:1991.

The barrels shall be tested by either method LA, LB, LC or LD given in table 7 and shall withstand an initial air pressure  $p_0$ . The measured drop in pressure  $\Delta p$  shall not be greater than the values given in table 7 for the appropriate test method, nominal size (DN) and testing time.

Table 7 : Air test: initial pressure, pressure drop and testing times

Testing method	Initial pressure	Drop in pressure	Testing time in min								
			DN 100	DN 150	DN 200	DN 225	DN 300	DN 400	DN 600	DN 800	DN 1000
	$p_0$ mm water gauge	$\Delta p$ mm water gauge									
LA	100	25	5	5	5	5	7	10	14	19	24
LB	500	100	4	4	4	5	6	7	11	15	19
LC	1000	150	3	3	3	4	4	5	8	11	14
LD	2000	150	1,5	1,5	1,5	1,5	2	2,5	4	5	7

11. Sub-clause 3.1.1 Delete "ISO/DIS 4633 <sup>1</sup>"

Insert "EN 681-1"

Delete the second paragraph

Delete footnote "(1) To be changed to EN... when published"

12. Table 7 Renumber to Table 8

13. Sub-clause 3.1.2 2nd line delete "table 7". Insert "table 8".

14. Table 8 Renumber to Table 9

15. Sub-clause 3.1.3 4th line delete "table 8". Insert "table 9".

16. Insert new sub-clause 3.1.5

### 3.1.5 Creep resistance of rigid fairing materials

Rigid fairing materials used in socket joints shall meet the requirements of either 3.1.5.1 or 3.1.5.2.

#### 3.1.5.1 Deformation

When tested in accordance with 23.1 of EN 295-3:1991 the regression values for  $t=10^0$  and  $t=10^4$  shall be less than 5% and 8% respectively where  $t$  is in minutes.

#### 3.1.5.2 Indentation

When tested in accordance with 23.2 of EN 295-3 : 1991 the indentation after  $(24^{+0,50})$  h shall be less than 0,5 mm.

17. Sub-clause 3.1.5 Renumber to 3.1.6

18. Table 9 Renumber to Table 10

19. Sub-clause 3.3 3rd line delete "table 9". Insert "table 10".

20. Sub-clause 3.6 Delete sub-clause, insert new sub-clause

### 3.6 Joint interchangeability

Table 11 covers dimensional jointing systems for which the socket or socket fairing internal diameter ( $d_s$ ) is the controlling dimension. Table 12 covers dimensional jointing systems for which the spigot outside diameter ( $d_o$ ) is the controlling dimension (see figure 1). Pipes and fittings of the same dimensional jointing system of the same nominal size, and the same class are directly interchangeable. Other jointing systems are permitted provided that the pipes and fittings also comply with 2.2 and provided the joint assemblies comply with 3.1 where appropriate and 3.3 to 3.5, 3.7 to 3.9. Manufacturers of jointing systems with dimensions differing from tables 11 and 12 shall, when necessary, offer adaptors to connect to the dimensional requirements of systems given in tables 11 and 12.

21. Table 10 Delete Table 10 insert new Table 11

Table 11 : Dimensions and tolerances for socket controlled jointing systems

DN	Class Number	FN kN/m	System A		System B		System C		System D	
			d <sub>4</sub> <sup>*</sup> mm	± mm	d <sub>4</sub> <sup>*</sup> mm	± mm	d <sub>4</sub> <sup>*</sup> mm	± mm	d <sub>4</sub> <sup>*</sup> mm	± mm
100	-	(28)								
100	-	34							146,8	0,5
150	-	28					197,0	0,5		
150	-	34					202,0	0,5	204,5	0,5
150	-	40	185,8	0,2	195,0	0,5	208,0	0,5	212,5	0,5
200	(120)	24								
200	160	32			250,0	0,5	260,0	0,5	265,0	0,5
200	200	40	244,5	0,2	252,0	0,5	269,0	0,5	269,0	0,5
200	240	48	248,5	0,2	254,0	0,5	275,0	0,5		
225	(120)	28								
225	160	36	276,0	0,2					294,6	0,5
225	200	45	281,0	0,2			300,0	0,5	306,0	0,5
250	(120)	30								
250	160	40	306,8	0,2	309,0	0,5	317,5	0,5	331,3	0,6
250	200	50	313,0	0,2	313,0	0,5	328,0	0,5	336,5	0,6
250	240	60	319,0	0,2	319,0	0,5	341,5	0,5		
300	120	36					375,5	0,5		
300	160	48	367,7	0,25			371,5	0,5	385,8	0,6
300	200	60	373,7	0,25			388,0	0,5	409,8	0,6
300	240	72					398,5	0,5		
350	120	42					431,5	0,5	443,0	0,7
350	160	56					433,5	0,5	455,0	0,7
350	200	70					459,0	0,5	474,3	0,7
400	(95)	38								
400	120	48					483,5	0,5		
400	160	64					507,5	0,5	521,0	0,75
400	200	80					515,5	0,5	545,0	0,75
400	240	96					523,5	0,5		
450	95	43							572,0	0,75
450	120	54					547,0	0,5	583,1	0,75
450	160	72					579,0	0,5	600,0	0,75
500	95	48					609,0	0,5	639,0	0,5
500	120	60					605,0	0,5	651,5	0,5
500	160	80					637,0	0,5	662,3	0,5
600	L	48					697,0	0,5		
600	95	57					720,0	0,5	739,8	0,5
600	120	72					737,5	0,5	751,0	0,5
600	160	96					758,0	0,5		
700	L	60					826,5	0,5	842,0	0,6
700	95	67					840,0	0,5	854,4	0,6
700	120	84					871,0	0,5		
800	L	60					932,0	0,5	958,6	0,7
800	95	76					950,0	0,5	967,6	0,7
800	120	96					976,0	0,5		
1000	L	60					1152,5	0,5	1179,3	0,8
1000	95	95					1203,0	0,5	1195,5	0,8
1000	(120)	120								
1200	L	60					1380,0	0,5		

\*) d<sub>4</sub> is the internal diameter of socket or socket fairing.NOTE : d<sub>4</sub> is measured within 20 mm of the shoulder of the socket.

22. Table 11. Delete Table 11. Insert new Table 12.

**Table 12 : Dimensions and tolerances for spigot controlled jointing systems**

DN	Class Number	FN	System E		System F		System G		System H	
			$d_3^*$ mm	$\pm$ mm	$d_3^*$ mm	$\pm$ mm	$d_3^*$ mm	$\pm$ mm	$d_3^*$ mm	$\pm$ mm
100	-	(22)								
100		28			128	1,5			122,0	1,5
100		34			131	1,5				
100		40	122	1,5	138	2,0	131,40	2,0	131,40	2,0
150	-	(22)								
150	-	28			182	2,0			178,0	1,5
150	-	34			186	2,0	187,75	2,75		
150	-	40	178	1,5	194	2,0	187,75	2,75		
200	(120)	24								
200	160	32	231	2,0	242	3,0	244,90	4,00		
200	200	40	234	2,0	248	3,0	244,90	4,00		
200	240	48	237	2,0	254	3,0				
225	(120)	28								
225	160	36	259	2,0	271	3,0	278,00	4,00		
225	200	45	263	2,0	281	3,0	278,00	4,00		
225	240	54	266	2,0						
250	(120)	30								
250	160	40	287	3,0	299	3,0				
250	200	50	292	3,0						
250	240	60	296	3,0	318	4,0				
300	120	36					374,00	4,00		
300	160	48	348	4,0	355	4,0	380,00	4,00		
300	200	60	354	4,0			380,00	4,00		
300	240	72	357	4,0	381	4,0				
400	120	48	459	5,0			498,00	5,00		
400	160	64	469	5,0						
400	200	80	476	5,0						
500	160	80	590	5,0						
600	160	96	716	6,0						

\*)  $d_3$  is the mean value of the spigot outside diameter (i.e. circumference  $\div \pi$ ).

23. Sub-clause 6.1 2nd paragraph after "in kNm if" delete "appropriate" insert "applicable"