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AMENDMENT 2
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**Plastics piping systems for hot and
cold water installations — Crosslinked
polyethylene (PE-X) —**

**Part 2:
Pipes**

AMENDMENT 2

*Systèmes de canalisations en plastique pour les installations d'eau
chaude et froide — Polyéthylène réticulé (PE-X) —*

Partie 2: Tubes

AMENDEMENT 2



Reference number
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This document was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 155, *Plastics piping systems and ducting systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Part 2: Pipes

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Normative references

Replace the reference to "EN 578" with the following:

ISO 7686, *Plastics pipes and fittings — Determination of opacity*

Replace the reference to "EN 579" with the following:

ISO 10147, *Pipes and fittings made of crosslinked polyethylene (PE-X) — Estimation of the degree of crosslinking by determination of the gel content*

Replace the reference to "EN 743" with the following:

ISO 2505, *Thermoplastics pipes — Longitudinal reversion — Test method and parameters*

Replace the reference to "EN 921" with the following:

ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method*

ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces*

4.2

Replace all references to "EN 921:1994" with "ISO 1167-1 and ISO 1167-2".

5.2

Replace the reference to "EN 578" with "ISO 7686".

6.2.2, Table 2

Replace Table 2 with the following table:

Table 2 — Pipe dimensions for dimension class A
(sizes conform to ISO 4065 and are applicable for all classes of service conditions)

Dimensions in millimetres

Nominal size DN/OD	Nominal outside diameter d_n	Mean outside diameter ^a $d_{em,min}$ $d_{em,max}$		Pipe series			
				S 6,3	S 5	S 4	S 3,2
				Wall thicknesses e_{min} and e_n			
12	12	12,0	12,3	—	1,3 ^a	1,4	1,7
16	16	16,0	16,3	1,3	1,5	1,8	2,2
20	20	20,0	20,3	1,5	1,9	2,3	2,8
25	25	25,0	25,3	1,9	2,3	2,8	3,5
32	32	32,0	32,3	2,4	2,9	3,6	4,4
40	40	40,0	40,4	3,0	3,7	4,5	5,5
50	50	50,0	50,5	3,7	4,6	5,6	6,9
63	63	63,0	63,6	4,7	5,8	7,1	8,6
75	75	75,0	75,7	5,6	6,8	8,4	10,3
90	90	90,0	90,9	6,7	8,2	10,1	12,3
110	110	110,0	111,0	8,1	10,0	12,3	15,1
125	125	125,0	126,2	9,2	11,4	14,0	17,1
140	140	140,0	141,3	10,3	12,7	15,7	19,2
160	160	160,0	161,5	11,8	14,6	17,9	21,9
180	180	180,0	181,7	13,3	16,4	20,1	24,6
200	200	200,0	201,8	14,7	18,2	22,4	27,4
225	225	225,0	227,1	16,6	20,5	25,2	30,8
250	250	250,0	252,3	18,4	22,7	27,9	34,2

NOTE A non-preferred wall thickness of 1,1 mm is permitted for dimension $d_n = 12$.

^a The level of the tolerances conforms to Grade A in ISO 11922-1.

6.2.2, Table 6

Replace Table 6 with the following table:

Table 6 — Tolerance on wall thicknesses

Dimensions in millimetres

Minimum wall thickness		Tolerance ^a	Minimum wall thickness		Tolerance ^a
e_{\min}		x	e_{\min}		x
>	≤		>	≤	
1,0	2,0	0,3	19,0	20,0	2,1
2,0	3,0	0,4	20,0	21,0	2,2
3,0	4,0	0,5	21,0	22,0	2,3
4,0	5,0	0,6	22,0	23,0	2,4
5,0	6,0	0,7	23,0	24,0	2,5
6,0	7,0	0,8	24,0	25,0	2,6
7,0	8,0	0,9	25,0	26,0	2,7
8,0	9,0	1,0	26,0	27,0	2,8
9,0	10,0	1,1	27,0	28,0	2,9
10,0	11,0	1,2	28,0	29,0	3,0
11,0	12,0	1,3	29,0	30,0	3,1
12,0	13,0	1,4	30,0	31,0	3,2
13,0	14,0	1,5	31,0	32,0	3,3
14,0	15,0	1,6	32,0	33,0	3,4
15,0	16,0	1,7	33,0	34,0	3,5
16,0	17,0	1,8	34,0	35,0	3,6
17,0	18,0	1,9			
18,0	19,0	2,0			

^a The tolerance is expressed in the form ${}^+x_0$ mm, where "x" is the value of the tolerance given. The level of the tolerances conforms to Grade V in ISO 11922-1.

Clause 7, Table 7

Replace the reference to "EN 921 of 1994" with "ISO 1167-1 and ISO 1167-2".

Clause 8, Table 8

Replace Table 8 with the following table:

Table 8 — Physical and chemical characteristics of pipes

Characteristic	Requirement	Test parameters		Test method
		Parameter	Value	
Longitudinal reversion	≤ 3 %	Temperature Duration of exposure for: $e_n \leq 8$ mm $8 \text{ mm} < e_n \leq 16$ mm $e_n > 16$ mm Number of test pieces	120 °C 1 h 2 h 4 h 3	Method B of ISO 2505 (oven test)
Thermal stability by hydrostatic pressure testing	No bursting during the test period	Sampling procedure End cap Orientation Type of test Hydrostatic (hoop) stress Test temperature Test period Number of test pieces	^a Type a) Not specified Water-in-air 2,5 MPa 110 °C 8760 h 1	ISO 1167-1/ ISO 1167-2
Crosslinking - peroxide PE-Xa - silan PE-Xb - electron beam PE-Xc - azo PE-Xd - UV-light initiated PE-Xe	≥ 70 % ≥ 65 % ≥ 60 % ≥ 60 % ≥ 70 %	Shall conform to ISO 10147		ISO 10147
^a The sampling procedure is not specified. For guidance see ISO/TS 15875-7.				