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**Plastics pipes and fittings — Butt
fusion jointing procedures for
polyethylene (PE) piping systems**

AMENDMENT 1

*Tubes et raccords en matières plastiques — Modes opératoires
d'assemblage par soudage bout à bout de tubes et raccords en
polyéthylène (PE)*

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Annex B

Replace [Table B.1](#) with the following:

Table B.1 — Examples of parameters for dual low-pressure fusion jointing procedure

Nominal outside diameter d_n mm	Nominal wall thickness e_n mm	Minimum bead-up size mm	Minimum heat soak time ^a s	Cooling-cycle reduced pressure MPa	Minimum cooling time in machine under pressure ^b min	Minimum cooling time out of the machine min
250	22,7	2	285	0,025	17	c
315	28,6	3	346	0,025	19	c
400	36,4	3	424	0,025	23	c
500	45,5	3	515	0,025	30	c
630	57,3	3	633	0,025	42	c
710	64,5	3	705	0,025	52	c
800	72,7	3	787	0,025	65	c
900	81,8	3	878	0,025	82	c
1 000	90,9	3	970	0,025	101	c

^a The minimum heat soak time, in seconds, is $10 \times e_n + 60$. It is highly recommended that heater temperatures at the upper end of the range be used in low ambient conditions.

^b The minimum cooling time in the machine under pressure is $(0,015 \times e_n^2 - 0,47 \times e_n + 20)$ at a pressure of $(0,025 \pm 0,002 + \text{drag pressure})$ MPa and an ambient temperature of (23 ± 2) °C. This is the cooling time for the butt joint when still in the machine and under pressure. Cooling times may be shortened and should be lengthened depending on ambient temperatures (approximately 1 % per 1 °C).

^c A cooling time out of the machine and before rough handling may be recommended.

Annex C

Replace [Table C.1](#) with the following:

Table C.1 — Examples of parameters for single high-pressure fusion jointing procedure

Nominal outside diameter d_n mm	Nominal wall thickness e_n mm	Minimum heat soak time ^a s	Minimum bead size after heating ^b mm	Maximum heater plate removal time ^c s	Minimum cooling time in machine under pressure min	Minimum cooling time out of the machine min
32	3,0	30 to 36	1	5	1	d
63	5,8	58 to 70	2	6	2	d
110	10,0	100 to 120	3	7	4	d
200	18,2	182 to 218	4	10	8	d
315	28,6	286 to 343	5	13	12	d
400	36,4	364 to 437	6	16	16	d
500	45,5	455 to 546	8	18	20	d
630	57,3	573 to 688	10	22	25	d
1 000	90,9	909 to 1 091	15	30	39	d

^a The minimum heat soak time, in seconds, is $(11 \pm 1) \times e_n$. It is highly recommended that heat soak times and heater temperatures at the upper end of the range be used in low ambient conditions.

^b The minimum bead size on the heater plate at the end of the heat soak time is $1 + 0,15 \times e_n$ and is generated through thermal expansion of the PE material only.

^c The heater plate removal time, in seconds, is according to ISO 12176-1. These times are a maximum. Every effort should be made to reduce these times wherever possible, to protect molten surfaces against rapid cooling.

^d A cooling time out of the machine and before rough handling may be recommended.