

Aquatherm Technical Bulletin

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Butt fusion heating and cooling times DVS 2207-11

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The standard referenced for butt fusion of polypropylene pipe, DVS 2207-11, was updated in 2017 to provide for reduced heating and cooling times. During the revision process, these changes were not evaluated for multi-layer, fiber-composite (MF) pipes. Aquatherm has now completed the testing and evaluation of these changes and has adopted them for use across all sizes/SDRs of Aquatherm MF piping.

The following is a brief description of the butt fusion parameters and identification of any changes between the previous version (2008) and current standard (2017). Any changes are noted in **red**.

Table 1 – Changes other than heat/cool times

Item	Description of change
Permissible gap between pipe ends after facing/planing	No change
Permissible misalignment of pipe ends (max 10% of wall thickness)	No change
Heater temperature, 210±10°C (410±18°F)	No change
Equalizing pressure (previously alignment pressure in 2008) - Bead-up/adjustment in Installer Manual	No change to actual interfacial pressure (14.5 psi), just name change
Preheating pressure (previously heating-up pressure in 2008) - Heating pressure in Installer Manual	No change to actual interfacial pressure (14.5 psi), just name change
Joining pressure - Machine pressure in Installer Manual	No change
Bead height	No change for existing sizes/wall thicknesses, added requirement for wall thickness above 1.97 in. (50-70mm)

Table 2 - Reduction in Heating Times from 2008 Edition

Wall, mm	Heat time, sec.		Reduction
	DVS 2207-11		
	2008	2017	
4.5	135	53	-61%
7	175	81	-54%
12	245	135	-45%
19	330	206	-38%
26	400	271	-32%
37	485	362	-25%
50	560	450	-20%
70	NA	546	New

Table 3 - Reduction in Fusion/Cooling Times from 2008 Edition

Wall, mm	DVS 2207-11				Reduction at 60- 80°F
	2008	2017			
		Ambient temperature at time of fusion			
	Standard	≤60°F (≤15°C)	60-80°F (15-25°C)	>80°F (>25°C)	
4.5	6	4	5	6.5	-17%
7	12	6	7.5	9.5	-38%
12	20	9.5	12	15.5	-40%
19	30	14	18	24	-40%
26	40	19	24	32	-40%
37	55	27	34	45	-38%
50	70	36	46	61	-34%
70	NA	50	64	85	New

Reducing cooling time under pressure, removal of equipment

Butt fusion needs to cool under pressure to ensure proper connections. Cooling times under pressure for butt fusion connections can be reduced if the joint is supported properly and not subjected to any loads for the remainder of the cooling time.

For example, at 70°F the cooling time for 6 in., SDR 11 pipe can be reduced from 14 minutes to 9 minutes if the joint is not subjected to any stress for the remaining 5 minutes.

Table 4 – Reduced cooling times under pressure with no load on joint and proper support

Wall, mm	Cooling time, minutes			
	DVS 2207-11 (2017)			
	≤60°F	60-80°F	>80°F	Reduced time*
4.5	4	5	6.5	3.5
7	6	7.5	9.5	5
12	9.5	12	15.5	8
19	14	18	24	12
26	19	24	32	16
37	27	34	45	23
50	36	46	61	31
70	50	64	85	43

*No load on joint, properly supported for the full duration of the standard cooling time