

Technical Code DVS 2207-3 Supplement 1

Welding thermoplastic materials

Hot-gas string-bead welding, hot-gas welding with torch separate from filler rod

Welding parameters

Technical Committee in DVS
Working Group W 4 "Joining Plastics"

This publication has been drawn up by a group of experienced specialists working in an honorary capacity and its consideration as an important source of information is recommended. The user should always check to what extent the contents are applicable to his particular case and whether the version on hand is still valid. No liability can be accepted by the DVS – Deutscher Verband für Schweißen und verwandte Verfahren e.V., and those participating in the drawing up of the document.

This supplement to Guideline DVS 2207-3 contains welding parameter reference values for hot-gas string-bead welding and hot-gas welding with torch separate from filler rod. They apply to manual welding with the equipment described in Guideline DVS 2207-3 Supplement 2 and the materials listed in Table 1.

Before the parameters are applied, the information provided by the semi-finished product manufacturer must also be taken into account.

By coordinating the parameters for hot-gas temperature, gas quantity and welding speed, it must be ensured that the parts to be joined are plasticised to a depth of at least 0.3 mm at the joint.

Table 1. Welding parameter reference values

Welding-process	Materials	Abbreviation	Hotgas-temperature ¹⁾ [°C]	Hotgas-volume-flow ²⁾ [l/min]	Welding-speed ³⁾ [mm/min]	Welding force [N]		
						3 mm wire Ø	4 mm	
Hot-gaswelding with the torch separate from the filler rod (WF)	High-density polyethylene	PE ⁴⁾	300...320	40 - 60	70...100	8...10	20... 25	
	Polypropylene, Type 1, 2, 3	PP-H, PP-B, PP-R	305...315		60...100			
	Unplasticised polyvinyl chloride	PVC-U	330...350		70...100			
	Chlorinated polyvinyl chloride	PVC-C	340...360		60...100	15...20		
	Polyvinylidene fluoride	PVDF	350...370		40...60	25...30		
Hot-gas string-bead welding (WZ)	High-density polyethylene	PE ⁴⁾	300...340	45 - 60	250...350	15...20	25...35	
	Polypropylene, Type 1, 2, 3	PP-H, PP-B, PP-R	300...310					
	Unplasticised polyvinyl chloride	PVC-U	350...370					
	Chlorinated polyvinyl chloride	PVC-C	370...390		180...220	20...25		30...35
	Polyvinylidene fluoride	PVDF	365...385		200...250			

¹⁾ Measured at the centre of the main nozzle orifice, 5 mm into the nozzle

²⁾ Cold air intake volume at ambient pressure

³⁾ depending on the filler material diameter, the welding temperature and the weld joint geometry

⁴⁾ PE 63, PE 80, PE 100