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1 Area of application

This supplement includes the assessment of welded joints executed by means of heated tool sleeve welding (HD) in pipeline construction (e.g. water, waste water, industrial, domestic plumbing and geothermal piping systems) which were welded, for example, according to the DVS 2207-1 technical code (PE-HD), the DVS 2207-11 technical code (PP) or the DVS 2207-15 technical code (PVDF). Analogously, this technical code can also be applied to other materials (e.g. PB). The specified assessment criteria are based on experience up to a diameter of 125 mm.

The DVS 2202-1 technical code (July 2006) is being revised at present. In future, the welding processes will be divided into process-related supplements.

- Supplement 1:
Heated tool butt welding including non-contact processes (HS and IR)
- Supplement 2:
Sleeve welding with an incorporated heating element (HM)
- Supplement 3:
Heated tool sleeve welding (HD)
- Supplement 4:
Hot gas fan and string-bead welding (WF and WZ)
- Supplement 5:
Hot gas extrusion welding (WE)

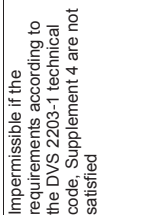
The entire scope of Section 7.4 (Table 2) of the DVS 2202-1 technical code is being replaced with the publication of the DVS 2202 technical code, Supplement 3.

Non-destructive and destructive tests and inspections are utilised. The tests and inspections used for the evaluation of the welding execution are listed in the following table.

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 Deutscher Verband für Schweißen und verwandte Verfahren e.V., and those participating in the drawing up of the document.

DVS, Technical Committee Working Group "Joining of Plastics"

2 Characteristics and assessment of welded joints executed by means of heated tool sleeve welding (HD)

Cons. no.	Characteristics	Description	Testing and inspection according to	Assessment group I	Assessment group II
2.1	External findings of the joint 	Different bead formation (b) or non-existent bead on one or both sides (a) (in part or around the entire weld circumference) due to: – excessive heated tool temperature (b) – excessive preheating time (b) – diameter of the pipe, the sleeve or the heated tool outside the permissible tolerances (a and b) – inadequate heated tool temperature (a) – inadequate preheating time (a) – inadequate fixing time – tilted/twisted insertion (a) – deformation due to improper clamping	Visual Additional testing and inspection necessary according to the DVS 2203-6 technical code, Supplement 1 and assessment according to the DVS 2203-1 technical code, Supplement 4	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied
2.2		Simple bead formation due to: – inadequate preheating time – inadequate heated tool temperature – impermissible tolerances of the pipe, the fitting or the heated tool – unequal temperatures of the joining members	Additional testing and inspection necessary according to the DVS 2203-6 technical code, Supplement 1 and assessment according to the DVS 2203-1 technical code, Supplement 4	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied
2.3		High melt emergence, e.g. due to: – excessive heated tool temperature – excessive preheating time – incorrect movement of the joining parts, e.g. due to deficient fixing – impermissible tolerances	Additional testing and inspection necessary according to the DVS 2203-6 technical code, Supplement 1 and assessment according to the DVS 2203-1 technical code, Supplement 4	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied	Impermissible if the requirements according to the DVS 2203-1 technical code, Supplement 4 are not satisfied
2.4	Angular deviation (shape defect) 	Pipes welded into the sleeve diagonally on one or both sides with or without slight twisting, e.g. – setting-up error – deficient manufacturing Note: The angular deviation is a defect which may entail other defects (e.g. twisting) and melt emergence (...). For the assessment of the angular deviation the pipe curvature must be taken into consideration in the case of ring coil goods.	"Angle determination" according to the DVS 2206-5 technical code	Impermissible if $e \geq 1^\circ$	Impermissible if $e \geq 2^\circ$