

Reviewed and unaltered version of the December 2007 issue

This is a continuation of the instructions on the production of microsections in Leaflet DVS 2310-1 and of the comparison between professional and defective microsection preparations in DVS 2310-2, and includes micrographs produced in industrial plants, universities and metallography laboratories. The preparation instructions contained in the appendix to DVS 2310-3 are to be interpreted merely as a suggested solution for successful preparation. Alternative preparation methods can also lead to the same result.

The micrographs are intended to show common qualities of sprayed coatings that can be achieved with the different spraying methods. By adjusting the coating parameters such as gas type, amount of gas, grain fraction of powders, speed of movement, particle size and particle speed, it is possible to influence the quality of coating to a certain degree; the coating properties thus influenced include porosity, adhesion and dilution of particles. The qualities of coating represented should therefore be viewed only as examples.

Appendix

Table 1. Examples of common sprayed coatings.

Figure no.	Base material	Substrate	Topcoat	Spray process
1	Steel, unalloyed	–	NiCrBSi	Powder flame
2	Brass	–	Mo	Wire flame
3	Steel, unalloyed	–	Cr ₃ C ₂ -NiCr	HVOF
4	Steel, unalloyed	–	WC/Co 90/10	HVOF
5	Steel, unalloyed	–	ZnAl	Arc
6	Steel, unalloyed	–	13% Cr steel	Arc
7	Steel, unalloyed	–	AlSi20	APS
8	Steel, unalloyed	–	CrNiMo	APS
9	Steel, unalloyed	NiCr 80/20	Al ₂ O ₃	APS
10	Steel, unalloyed	NiCr 80/20	Al ₂ O ₃ /TiO ₂	APS
11	Cr steel	–	Cr ₂ O ₃	APS
12	Ni based	MCrAlY	ZrO ₂ +Y ₂ O ₃	VPS/APS

In order to ensure reproducible quality, microsection preparation must therefore be carried out with semi-automatically-automated grinding and polishing processes on suitable grinding and polishing machines.

In order to ensure reproducible preparation results, all the details of specimen preparation, including specimen size, cutting method, embedding method, grinding and polishing agents, number of grinding and polishing cycles, clamping pressures, grinding and polishing times and other parameters must be clearly adhered to. See leaflet DVS 2310-1.

In order to avoid disputes, the preparation procedure should be agreed between the contracting parties.

Appendix:

Examples of common sprayed coatings, **Table 1.**

Preparation instructions, **Table 2.**

Micrographs, **Figures 1 to 12.**

Table 2. Preparation instructions.

Figure	Embedding: cold Grinding (300 rpm) S: SiC wet D: diamond							Polish (150 rpm)					Contrast etching agent
	Par	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Par	Stage 1	Stage 2	Stage 3	Stage 4	
1	S	180	–	–	–	–	–	D	6	3	1	OPS	none
	KD	–	15	–	–	–	–	T	HK	HS	KF	KT	
	Z	flat	4	–	–	–	–	Z	5	5	5	1,5	
	P	120	100	–	–	–	–	P	80	80	80	50	
2	S	180	400	800	1200	2400	4000	D	3	1	OPS	OPS+NaOH	none
	D	–	–	–	–	–	–	T	KF	KF	KT	KT	
	Z	flat	2	2	2	2	2	Z	2,5	2	1	1	
	P	150	100	100	100	100	100	P	100	100	100	100	
3	S	220	320	500	–	–	–	D	3	OPS	–	–	none
	D	–	–	–	30	30	–	T	KF	KT	–	–	
	Z	3	2	2	10	5	–	Z	1 ... 2	0,5	–	–	
	P	120	110	100	80	40	–	P	70	30	–	–	
4	S	–	–	–	–	–	–	D	3	1	OPS	–	
	D	63	30	10	–	–	–	T	KF	KF	KT	–	
	Z	flat	6	6	–	–	–	Z	2 ... 3	2 ... 3	3	–	
	P	220	220	220	–	–	–	P	120...150	120...150	100	–	
5	S	320	–	–	–	–	–	D	6	3	1	–	none
	KD	–	15	–	–	–	–	T	–	BW	KF	–	
	Z	flat	4	–	–	–	–	Z	5	5	5	–	
	P	120	100	–	–	–	–	P	80	80	80	–	
6	S	180	400	800	1200	–	–	D	3	1	OPS	OPS+NaOH	none
	D	–	–	–	–	–	–	T	KF	KF	KT	KT	
	Z	flat	2	2	2	–	–	Z	2,5	2	1	1	
	P	150	130	120	100	–	–	P	100	100	100	100	
7	S	180	400	800	1200+W	2400+W	4000	D	3	1	OPS	OPS+NaOH	none
	D	–	–	–	–	–	–	T	KF	KF	KT	KT	
	Z	1	1	1	1	1	1	Z	3	3	1	1	
	P	120	120	120	100	100	–	P	100	100	90	90	
8	S	180	400	800	1200	–	–	D	3	1	OPS	OPS+NaOH	none
	D	–	–	–	–	–	–	T	KF	KF	KT	KT	
	Z	flat	2	2	–	–	–	Z	2,5	2	1	1	
	P	150	130	120	100	–	–	P	100	100	100	100	
9	S	180	–	–	–	–	–	D	3	1	OPS	–	none
	D	–	–	–	1	–	–	T	KF	KF	KT	–	
	Z	3	4	4	4	–	–	Z	3	3	5	–	
	P	150	180	180	180	–	–	P	150	150	120	–	
10	S	200	300	400	600	–	–	D	6	3	–	–	
	D	–	–	–	–	–	–	T	HK	HK	–	–	
	Z	flat	1	1	1	–	–	Z	4 ... 5	4 ... 5	–	–	
	P	–	–	–	–	–	–	P	–	–	–	–	