

Nominal Chemical Composition

Alloy Base/ Designation	B	C	Co	Cr	Fe	Mn	Mo	Ni	Si	W	Cu
Nickel Base / Deloro®											
Deloro Alloy 22	1.5	.2*		1.0*	1.0*			Bal	3.0		
Deloro Alloy 35	1.6	.5*		3.7	2.5*			Bal	3.2		
Deloro Alloy 40	1.7	.3		7.5	2.0			Bal	3.5		
Deloro Alloy 46	1.8	.2*		1.0*	1.0*		.5*	Bal	2.0		
Deloro Alloy 50	2.3	.45		11.0	3.0			Bal	3.9		
Deloro Alloy 55	2.75	.55		13.0	4.0			Bal	4.2		
*Deloro Alloy 60	3.1	.65		15.0	4.2			Bal	4.2		
Deloro Alloy 61	3.3	.9		17.0	4.2			Bal	4.3		
Deloro Alloy 75	4.0	.5		16.0	2.5		3.0	Bal	4.0		3.0
Cobalt Base / Stellite®											
Stellite Alloy 157	2.4	.1	Bal	22.0	2.0*			2.0*	1.6	4.5	
Stellite Alloy SF1	2.2	1.3	Bal	19.0	3.0	1.0*		13.0	3.0	13.0	
Stellite Alloy SF6	1.6	.7	Bal	19.0	3.0*	1.0*		13.5	2.3	7.5	
Stellite Alloy SF12	1.8	1.0	Bal	19.0	3.0	1.0*		13.0	2.8	9.0	
Stellite Alloy SF20	3.0	1.3	Bal	19.0	2.0	1.0*		13.0	2.8	15.0	
Stellite Alloy 6166	3.5	.8	Bal	19.0	1.0			18.0	2.75	10.0	
Tungsten Carbide / Stelcar™											
Stelcar Composite Alloy 6153	1.3	3.4		6.0	1.5			39.5	2.0	Bal	

Tungsten Carbide / Stelcar™

	Nickel Matrix	Tungsten Carbide	Cobalt Matrix
Stelcar Composite Alloy 1	50	50	
Stelcar Composite Alloy 2	65	35	
Stelcar Composite Alloy 3	85	15	
Stelcar Composite Alloy 6173	20	80	
Stelcar Composite Alloy 6344	25	75	
Stelcar Composite Alloy 6154		50	50
Stelcar Composite Alloy 6155		50	50
Stelcar Composite Alloy 6167		50	50

Grades	Mesh size	Micron
M	120/325	125/45
S	140/400	106/38
H	230/400	63/38

* = Maximum

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SPRAY & FUSE POWDERS

Applications

Spray and fuse powders are usually applied to the surface of cylindrical parts such as pump shafts, packing gland sleeves and pistons. Typical applications are:

- Ammonia applicators
- Arbors
- Calender rolls
- Cams
- Fan blades
- Glass molds
- Pump plungers
- Shafts
- Valve seats
- Valve stems

Process

The spray and fuse (flame spray) hardfacing process uses manual or automatic equipment to deposit finely divided, semimolten particles. Spraying with oxyacetylene gas allows thin, hard coatings to be applied quickly and uniformly. Deposits ranging from 0.020 to 0.060 in.

(0.51 to 1.5 mm) thick can be made by building up several layers at a rate of 0.005 to 0.010 in. (0.13 to 0.25 mm) per pass.

Maximum buildup is about 0.080 in. (2 mm). Deposit thickness is controlled by the traverse speed of the torch, speed of rotation (when done between centers on cylindrical parts), powder flow, and the number of layers applied.

Deposit rates of 8 to 12 lb. (3.5 to 5.5 kg) an hour can be achieved. Spray and fuse hardfacing is particularly effective on small cylindrical parts as well as on irregular shapes. Cylindrical parts can be sprayed and fused between centers on a converted lathe, when the work should travel at about 150 sfpm (0.8 m/s).

Coatings applied by cold spraying are under a certain degree of tension stress and, for this reason, the fusing

operation should immediately follow spraying. This procedure eliminates any risk of the coating cracking before the heat required for fusing is applied. Fusion is carried out using a conventional oxyacetylene torch provided with a large multi-jet nozzle designed to spread the heat over a wide area.

To fuse, a sprayed component should be heated uniformly to approximately 650 degrees F (343 degrees C). The torch is then played over the area where it is intended to start fusion raising the temperature of this area to about 1400 degrees F (760 degrees C). Movement of the torch is then stopped and the heat is concentrated at the starting point. The temperature at this position is allowed to rise gradually to 2000 degrees F (1093 degrees C) and the phenomenon of brazing is unmistakably observed and serves to indicate that fusion is taking place. Once fusion has been initiated the torch should be moved slowly along the part so that the fusion bond traverses the entire sprayed surface. The fusing operation once started should not be interrupted and none of the sprayed area should be omitted.

