

Plasma and HVOF spraying grades

Nickel-base	Particle size μm	C %	Si %	B %	Fe %	Cr %	Ni %	Mo %	Others %	Hardness		Recommended use/Features/Comments
										HRC	HV ₃₀	
625	20-53	≤ 0.03	0.4	–	0.75	21.5	Bal.	9.0	Nb=3.6		200**	IN 625 ¹⁾
C276-m	20-53	0.12	0.5	–	3.0	15.5	Bal.	16.0	W=4.5 Mn=1.2 V=0.5		260**	C 276 ¹⁾
1616-02	20-53	0.20	1.0	–	0.5	20.0	Bal.	–	Mn=0.75		280*	Bond coat for ceramic coatings.
1660-02	20-53	0.75	4.3	3.1	3.7	14.8	Bal.	–	–		780*	Alloys for coating steam or gas turbine blades or other applications requiring extremely dense plasma coatings.
1660-22	20-53	0.90	4.3	3.3	4.2	16.3	Bal.	–	–		820**	The layer can be rendered completely dense by heat.

Cobalt-base	Particle size μm	C %	Si %	Fe %	Cr %	Ni %	Co %	Mo %	W %	Hardness		Recommended use/Features/Comments
										HRC	HV ₃₀	
2628-02	20-53	0.25	0.9	1.5	27.0	2.5	Bal.	5.5	–		300**	Stellite 21 ²⁾ Stellite 6 ²⁾ Stellite 12 ²⁾ Triballoy 400 ²⁾ Cobalt base for corrosion and oxidation resistance. Better hot hardness values than for equivalent nickel base.
2637-02	20-53	1.1	1.0	1.5	28.5	1.5	Bal.	–	4.4		380*	
2641-02	20-53	1.4	1.1	1.0	28.5	1.5	Bal.	–	8.0		420*	
HB400	15-45	≤ 0.05	2.8	0.5	9.7	0.5	Bal.	29.5	–		500**	

Iron-base	Particle size μm	C %	Si %	Fe %	Cr %	Ni %	Mo %	Mn %	Others %	Hardness		Recommended use/Features/Comments
										HRC	HV ₃₀	
316L	20-53	≤ 0.03	0.8	Bal.	17.0	12.0	2.5	1.5	–		160**	316L ³⁾
410L	20-53	≤ 0.03	0.5	Bal.	12.5	–	–	0.1	–		220*	410L ³⁾
3650-02	20-53	1.75	1.3	Bal.	28.0	16.0	4.5	0.8	–		500**	

* Indicative value
** Measured value

Recommended use
Features
Comments



Photo courtesy of Praxair

HVOF is the surfacing method of choice when extremely high-density coatings are required. The process is easily automated and very little subsequent machining is required.

Characteristics	Flame spraying	HVOF spraying	Plasma spraying
Gas temperature (°C)	3000	2600-3000	12000-16000
Spray rate (kg/h)	1-9	1-9	2-8
Particle velocity (M/s)	>50	>700	>450
Bond strength (MPa)	7-83 + fused	48-80	14-48
Coating thickness (mm)	0.1-3	0.05-2.5	0.1-2.5
Hardness (HRC)	20-60	20-60	20-60
Porosity (%) cold spray	10-15	>3	2-5
Porosity (%) fused	~1-2	<3	~1-2