

SURFACING ALLOYS
TECH-HVOF SELECTOR CHART

COLMONOY®
(nickel-based)



ALLOY	NOMINAL COMPOSITION (%)										ROCKWELL HARDNESS (C-scale)	SUPPLIED AS*	DESCRIPTION AND GENERAL USES
	B	C	Co	Cr	Fe	Mo	Si	W	Ni	Others			
43 _{HV}	1.2	0.2		4.0	0.3	3.0	2.8		Bal	P: 2.2	35-40	Atomized Powder	Excellent crack resistance, lower hardness and slightly lower abrasion resistance and more corrosion resistance than 52DJ and 53HV. Finished by carbide tools or grinding.
52 _{DJ}	2.4	0.5		13.5	4.0		3.7		Bal		45-50	Atomized Powder	Similar to Colmonoy 62DJ, but has better crack resistance with slightly lower abrasion resistance and similar corrosion resistance. Finer than standard HV particle size distribution. Finish by grinding.
53 _{HV}	2.4	0.5		13.5	4.0		3.7		Bal		45-50	Atomized Powder	Similar to Colmonoy 63HV, but has better crack resistance with slightly lower abrasion resistance and similar corrosion resistance. Finished by grinding.
62 _{DJ}	3.0	0.6		14.0	4.0		4.2		Bal		57-63	Atomized Powder	Hard nickel-chromium-boron alloy with excellent abrasion and corrosion resistance. Finer than standard HV particle size distribution. Finish by grinding.
63 _{HV}	3.0	0.6		14.0	4.0		4.2		Bal		57-63	Atomized Powder	Hard nickel-chromium-boron alloy with excellent abrasion and corrosion resistance. Finished by grinding.
69 _{HV}	3.5	0.5		16.5	3.0	3.0	5.1		Bal	Cu: 2.0	58-63	Atomized Powder	Abrasion resistant alloy enhanced with more chromium. molybdenum and copper for better corrosion resistance. Finished by grinding.
88 _{HV}	3.0	0.6		15.0	3.5		4.0	15.5	Bal		58-63	Atomized Powder	A unique alloy contains chromium and tungsten borides and carbides for maximum abrasion and corrosion resistance. For high-temperature, highly abrasive applications. Finished by grinding or CBN tools.
276 _{HV}		<0.02	<2.5	16.0	5.0	16.0	<1.0	4.2	Bal	Mn: <1.0 V: <0.35	99	Atomized Powder	Nickel-based superalloy powder, similar to Hastelloy C276, with the alloyed elements of chromium, molybdenum and tungsten with higher PREN number. Coatings are made using this alloy offering higher corrosion resistance with excellent pitting resistance and crevice corrosion.
625 _{HV}		<0.1		22.0	<5.0	9.0	<0.5		Bal	Al: <0.4 Mn: <0.5 Nb: 3.7 Ti <0.4	97	Atomized Powder	A high-strength, corrosion-resistant alloy with excellent toughness from cryogenic temperatures to 1050°C (1922°F). It resists pitting, crevice, and stress-corrosion cracking, making it ideal for seawater and aggressive chemical environments.
686 _{HV}		<0.02		21.5	<2.0	16.0	<0.95	3.8	Bal	Mn: <0.5 P: <0.04 Ti: 0.07	99	Atomized Powder	Nickel-based superalloy with high levels of chromium, molybdenum and tungsten, achieving one of the highest ratings possible for pitting corrosion resistance. Coatings made using Colmonoy® 686 also offer outstanding general and crevice corrosion resistance and have a low coefficient of friction.
5800-505 _{HV}	1.2	3.0		6.8	2.0		1.9	38.2	38.2	WC- 12Co: Bal	58	Atomized Powder	Colmonoy® 5800-505 HV is a composite hardsurfacing alloy containing both atomized matrix and tungsten carbide with 12% cobalt.
6006-505 _{HV}	1.5	0.3		7.0	2.0		2.1		37.1	WC- 12Co: Bal	>900 HV	Atomized Powder	Nickel alloy matrix with tungsten carbide for excellent abrasion resistance and toughness in severe wear environments. Colmonoy® 6006-505HV performs reliably at temperatures up to 482°C (900°F), making it ideal for high-stress industrial applications.

Colmonoy® Powders supplied as HV or DJ particle size distributions:
HV -63+20 µm
DJ -53+5 µm

SURFACING ALLOYS
TECH-HVOF SELECTOR CHART

WALLEX™
(cobalt-based)



ALLOY	NOMINAL COMPOSITION (%)										ROCKWELL HARDNESS (C-scale)	SUPPLIED AS*	DESCRIPTION AND GENERAL USES
	B	C	Co	Cr	Fe	Mo	Si	W	Ni	Others			
6 _{HV}		1.1	Bal	29.0				4.5		Ni, Fe, Si, Mo	38-46	Atomized Powder	Cobalt-Chrome Tungsten Carbide (Co-Cr-Tu-C) alloy with excellent resistance to erosion and cavitation.
12 _{HV}		1.5	Bal	29.0	2.0		1.5	8.5		Ni, Mo, Mn	43-53	Atomized Powder	Cobalt-based alloy that has high heat, abrasion and wear resistance. It has low coefficient of friction and is non-galling. It retains high hardness at red heat, and recovers full hardness after exposure to temperatures as high as 1100°C.
40 _{HV}	2.0	0.6	Bal	16.2	2.0		1.9	7.6	23.5		41-46	Atomized Powder	A cobalt-nickel alloy powder that forms deposits similar to those of Wallex 50, but softer. Finished with carbide tools and grinding. Developed as a lower tem- perature alternative for many cobalt-6 applications.
50 _{HV}	3.4	0.8	Bal	19.0	2.0		2.8	10.0	18.0		56-61	Atomized Powder	Good corrosion resistance and low coefficient-of-friction provides good metal-to-metal wear protection (not involving much impact). For bushings, knives, and cams. Finished by grinding.
55 _{HV}	2.0	2.3	Bal	12.0	1.2		1.7	34.8	12.6		58	Atomized Powder	Composite hard-surfacing alloy containing both atomised and crushed powders. The matrix is a highly abrasion and corrosion resistant cobalt-nickel alloy. Wallex 55 are enriched with extremely hard tungsten carbide particles.

Wallex® Powders supplied as HV particle size distributions:
-63+20 µm
-45+15 µm

WALLCARB™
(carbide powders)

86/10/4			10.0	4.0						WC: 86.0	>1,000 HV	Agglomerated and Sintered Powder	Ideal for severe conditions, offering wear and corrosion resistance up to 450°C (840°F). It provides high-chrome finishes through grinding or lapping, making it suitable for abrasive wear, erosion, and fretting, especially when extra corrosion protection is needed compared to 88WC-12Co coatings.
90/10									10.0	WC: 90.0	>1,000 HV	Agglomerated and Sintered Powder	Tungsten carbide coatings resist fretting, abrasion, and sliding wear, ideal for dry environments. Use above 500°C (930°F) is not recommended due to oxidation. WC-Ni coatings offer better corrosion resistance than WC-Co, but WC-Co-Cr provides superior protection.
73/20/7				20.0					7.0	WC: 73.0	>1,000 HV	Agglomerated and Sintered Powder	Ideal for resisting fractures from flexing and torsional stresses, this coating is effective in abrasive environments and offers more ductility than tungsten carbide cobalt. Suitable for use in acids and alkalis (except nitric acid), it performs well up to 730°C (1350°F) and is resistant to wear and corrosion in hydrous solutions, making it suitable for oil, gas, and paper industries.
75/25		10.0		70.0	<0.5				20.0	Cr ₂ C ₃ : 75.0	>900 HV	Agglomerated and Sintered Powder	Ideal for applications requiring both wear and corrosion resistance, protecting against abrasion, fretting, and erosion at temperatures up to 870°C (1600°F). They are effective thermal spray alternatives to hard chromium plating, offering superior corrosion resistance in chloride, acidic, and alkaline environments, although HCl should be avoided.
80/20		10.2		Bal	<0.5				16.0	Cr ₂ C ₃ : 80.0	>900 HV	Agglomerated and Sintered Powder	Ideal for applications such as hydraulic cylinders, piston rods in earth-moving equipment, and furnace rolls in metal production. Also ideal for sieves, cones, and dampening fountain rollers where hard chrome plating alternatives are needed, especially in environments containing NaCl or NaOH. Not recommended for use in HCl environments.
88/12			12.0							WC: 88.0	>1,000 HV	Agglomerated and Sintered Powder	These coatings provide superior resistance to abrasive and erosive wear, being harder than 83WC-17Co due to higher tungsten carbide content. They withstand sliding, hammer, abrasion, and fretting wear at temperatures up to 480°C (900°F) in non-corrosive environments.
83/17			17.0							WC: 83.0	>1,000 HV	Agglomerated and Sintered Powder	WallCarb™ 83/17 HVOF powder offers superior toughness and fretting resistance over 88/12 due to higher cobalt content. Its tungsten carbide-based coatings protect against fretting, abrasion, erosion, impact, cavitation, and sliding wear, making it a viable alternative to hard chromium plating for non-corrosive media below 500°C (930°F).

WallCarb™ Powders supplied as particle size distributions:
-45+15 µm
-38+10 µm
-30+5 µm (86/10/4 and 75/25 only)

SURFACING ALLOYS
TECH-HVOF SELECTOR CHART



COLFEROLOY™ STAINLESS STEEL
(iron-based)

ALLOY	NOMINAL COMPOSITION (%)										SUPPLIED AS*	DESCRIPTION AND GENERAL USES
	B	C	Co	Cr	Fe	Mo	Si	W	Ni	Others		
316 _{HV}		<0.03		17.0	Bal	2.5	<1.0		12.0			Austenitic stainless steel alloy with good corrosion resistance and high impact, tensile, and creep strength at elevated temperatures. Contains 2.5% molybdenum and <0.03% carbon for excellent resistance to pitting and crevice corrosion, especially in chloride-rich environments. Ideal for processing equipment, valves, heat exchangers, augers, tanks, and vessels across oil & gas, food, marine, pulp & paper, medical, and automotive industries. Finished by grinding or filing.

Colferoloy™ Powders supplied as HV particle size distributions:
-63+20 µm

The information provided herein is given as a guideline to follow. It is the responsibility of the end user to establish the process information most suitable for their specific application(s). Wall Colmonoy assumes no responsibility for failure due to misuse or improper application, or for any incidental damages arising out of the use of this material or process.