Fusion Alloys, INC.

Metal Powders for Industry

FUSION ALLOYS, INC.

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FUSION ALLOYS, INC

A single convenient source for all metal powders:
Pure, alloyed, or Intermetallic.

Fusion Alloys provides a unique metalurgical service. With complete in-plant production facilities, backed by more than five decades of experience, Fusion Alloys covers the full spectrum of metal powder technology...

Elemental metal powders, both pure and technical grades

Pre-Mixed, Pre-Blended or Pre-Alloyed powders in any particular size and distribution.

Intermetalic compound powders such as carbides, nitrides, oxides and borides.

Powders crushed, milled and classified to precise particle size.

Special purpose alloy powders for such applications as diamond tool setting, Hard-facing, protective coatings, and Flame or plasma spraying,

New powder development: Powder test and evaluation.

Pilot production of parts by powder metalurgy.

Whatever your metal powder requirements , Fusion Alloys' know-how and experience are as close as your telephone. A single call will bring detailed information about availability and cost ... plus technical assistance in specifying the metal powder which will best meet your needs.

A short-form listing of standard powders, both elemental and alloyed, stocked by Fusion Alloys is shown over-leaf ... but this extensive list is by no means complete. Fusion Alloys is continually adding new powders to its commercial list to meet new metalurgical requirements. If the specific powder you need is not listed, call Fusion Alloys to determine availability.

Phone: 1-(248)- 410-2477

Matrix Alloys for Diamond Tool Setting

Alloy Powders For Hot Pressed Matrixes

1. Tungsten carbide- Cobalt system

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cr	Apparent Density gr/c.in.
FA-106	WC+6% Co	A 89-91	2600-2650	14.8	42-46
FA-113	WC+13% Co	A 86-88	2250-2620	14.2	41-45
FA-116	WC+16% Co	A 84-86	2480-2550	13.8	40-45
FA-120	WC+20% Co	A 83-85	2450-2520	13.5	39-44
FA-125	WC+25% Co	A 82-84	2450-2500	13.1	38-42
FA-130	WC+30% Co	A 81-83	2430-2500	12.5	37-41
FA-135	WC+35% Co	A 80-82	2400-2450	12.2	37-40
FA-140	WC+40% Co	A 78-81	2400-2420	12.0	36-40
FA-145	WC+45% Co	A76-80	2380- 2400	11.5	35-40
FA-150	WC+50% Co	A75-78	2350-2400	11.0	35-39
FA-155	WC+55% Co	A74-76	2340-2400	10.6	34-38
FA-160	WC+60% Co	A74-76	2330-2380	10.2	33-37
FA-170	WC+70% Co	A 72-76	2200-2250	10.0-10.2	33-37

NOTE: Alloys FA-116 thru FA-170 can be altered to lower the hot pressing temperature to 2020-2150°F, maintaining the same physical properties with basically the same alloy.

To order this feature specify the FA- number and the suffix LM for the low melting option.

Tap Density gr/c.in.	Description	Application
81-85 80-84	These Matrixes belong to the "Cemented Carbides" family of alloys.	Cutting tools, water way inserts, reaming shell inserts,wear resistant parts and inserts.
79-83 78-82 77-81	The physical properties and application are principally determined by Cobalt content and particle size of the components. Carbides with less than 20% Co are used mostly in producing cutting tools and metal working dies; carbides with 16% to 60% Co are used mostly in producing diamond tools.	Cluster tools, abrading tools, reaming shells, heavy duty wheel dressers, single point tools, impregnated tools, and mining drill bits.
77-80 76-80 75-79	These matrixes contanig 25% to 45% Co exhibit high shock resistance and hardness.	Impregnated tools, mining drill bits and crowns, thin- wall drill bits, polishing head segments and hones.
74-78 72-75 70-74 68-72	The standard alloys of this group are based on a fine grade of Tungsten Carbide and Cobalt in order to assure the high hardness and toughness of the matrixes; however, where high wear resistance is essential, a courser grade of alloy is available upon request.	Abrading tools, mining tool bits and inserts, grinding wheels, cut-off wheel segments, masonry and concerete saw segments.
68-72		Saw Blades

Matrix Alloys for Diamond Tool Setting
Alloy Powders for Hot Pressed Matrixes
2. Tungsten Carbide and Tungsten Base Group

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cc	Apparent Density gr/cu.in	Tap Density gr/cu.In	Description	Application
FA-201	WC+Co+Cu	C 10-15	1900-1950	10.5-11.5	45-55	72-77	These Tunsten Carbide and Tungsten Base alloys produce matrixes of high Toughness, hardness and wear resistance.	Glass cutting and grinding
FA-202	WC+Fe+Ni	C 24-28	2300-2400	12.0-12.2	60-65	90-100		
FA-203	WC+Fe+Ni	C 27-32	2000-2100	11.0-12.0	62-67	85-95	Tungsten Carbide and Tungsten particles of specially selected particle size distribution produce a strong support for diamonds, while the relatively low hot pressing temperature of these alloys are beneficial to diamonds as well as to steel shanks.	All types and sizes of diamond tools: mining drill bits, wheel dressers, saw segments, grinding and abrading tools for refractories, reaming sheels, rotary tools, cluster tools, cut-off segments, impregnated tools, and core bits.
FA-204	WC+Ni	C 33-38	2200-2300	11.2-12.2	62-67	100-110		
FA-205	WC+Ni	C 35-37	2200-2300	11.5-12.3	45-55	75-80		
FA-206	WC+Ni+Cu	C 40-43	2000-2100	11.8-12.0	60-65	90-100		
FA-207	WC+Fe+Cu	C 42-46	2350-2400	12.0-12.3	85-90	110-120	These alloys are self-fluxing and self-brazing; therefore they can be hot pressed directly onto steel shanks and into tool holders.	
FA-208	WC+Ni+Cu	C 46-50	2000-2100	11.7-12.2	62-65	95-105		
FA-209	WC+CrC+Fe	C 50-55	2350-2400	12.0-12.5	85-90	100-105	The high tap density of these metal powders causes the travel under heat and preassure to be short; this permits the graphite molds to be shallow.	
FA-210	WC+Co+Cu	C 53-60	2000-2100	11.9-12.2	63-66	96-105		
FA-211	W+Cu+Ni	C 8-10	2000-2050	10.5-11.0	45-55	65-75	Alloys FA-211 and 212 as matrixes are tough, but readily machineable.	Thin wall bits, impregnated tools, single-point tools where machine finishing Is requred.
FA-212	W+Cu+Fe	B 85-95	1950-2000	9.5-10.5	65-70	85-95		
FA-213	WC+Fe+Ni	A 75-80	2200-2250	10.8-11.1	36-40	70-78	FA-213 is a very hard and tough alloy.	Concrete cutting segments and masonry core bits.
FA-214	W+Co+Cu+Ag	B 95-100	1800-1900	10.3-10.5	40-45	70-78		
FA-215	WC+Cu+Cr+Ni	C 30	1680-1700	11.2-11.4	58-63	95-100	FA-215 and 216 are relatively low melting alloys.	Impregnated tools with Synthetic diamonds.
FA-216	WC+Co+Cu+W	C 55-58	2000-2050	11.9-12.2	60-65	95-105		

Matrix Alloys For Diamond Tool Setting

Alloy Powders for Hot Pressed Matrixes

3-a Iron, Nickel, and Cobalt Base Alloys

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cc	Apparent Density gr/cu.in.
FA-301	Fe+Cu	B 95-100	1800-1850	7.5-8.0	52-57
FA-302	Fe+Cu	C 32-36	1800-1850	7.5-8.0	51-55
FA-303	Fe+Ni+Co	B 75-85	2150-2200	6.9-7.3	45-50
FA-304	Fe+Ni+Co	B 80-90	2170-2210	6.8-7.2	45-50
FA-305	Fe+Ni	B 90-100	2300-2350	7.2-7.6	55-60
FA-306	Fe+Cu+WC	C 30-33	2000-2050	8.0-8.2	40-45
FA-307	Fe+Cu+WC	B 70-78	1800-1900	7.9-8.1	40-45
FA-308	Ni+Cu+Ag	B 65-70	1300-1400	7.5-7.8	65-70
FA-309	Fe+Cu+Zn	B 65-75	1700-1750	7.3-7.7	38-42
FA-310	Fe+Cu+Ni	B 80-85	1800-1850	7.8-8.2	35-40
FA-311	Ni+Cu	B 70-80	1850-1900	7.6-8.2	35-40
FA-312	Ni+Cu+WC	B 80-90	1750-1820	8.6-9.0	40-45
FA-313	Co+Cu+Mo	B 63-70	2100-2200	7.8-8.0	35-40
FA-314	Co+Cu+Sn	B 85-95	1650-1750	9.1-9.25	40-45
FA-315	Ni+Cr+Cu	C 30-35	1820-1860	7.5-8.1	52-57
FA-316	Fe+Cu+B+Sn	C 20-23	C. 1700	8.3-8.5	52-56
FA-317	Fe+Cu+B+Sn	C 32-36	C. 1800	8.2-8.4	52-56
FA-318	Fe+Cu+B	B 88-95	1700-1750	7.7-8.1	50-55
FA-319	Fe+Cu+Ni+Sn	B 85-90	C. 1600	7.5-8.1	50-55
FA-320	Co+Ni	B 94-100	2150-2200	8.8-9.1	40-50
FA-321	Co+Fe+Mo	B 75-85	2250-2300	8.7-8.9	35-45
FA-322	Co+Cu+Sn+Zr	B 85-95	1650-1750	9.1-9.25	40-45

Tap Density gr/cu.in	Description	Application
65-70 58-65	All these alloys are self- bonding and self-fluxing. Except for Alloys FA-305 and 313, they are all self-brazing; therefore, they can be hot pressed directly onto steel shanks or into tool holders. FA-303 and 304 have a very low co-efficient of thermal expansions. These alloys are also stainless. Alloys FA-308 and 309 expand after hot pressing and cooling. Alloy FA-319 is a low temperature forming, steel gray alloy. Enhanced diamond wetting Alloy FA-323 is stainless and corrosion resistant wheels.	Small diamond tools.
65-70		Stainless diamond tools and grinding wheels, rotary tools, and wheels.
65-70		
65-75		Cut-off segments.
62-66		Glass edging and grinding.
55-60		Cut-off segments.
85-90 50-55		Small tools, mostley pressed in-side steel holders.
55-65		Small tools, wire drawing dies, grinding wheels, and electrolytic grinding wheels.
55-65		
60-65		Various tools and segments.
55-60		Special tools.
55-65		Glass tile and stone cutting tools, grinding wheels with continuous or segmented rims.
70-75		
60-64 60-64		Glass grinding.
60-65 60-65		Small tools.
60-70 55-65		Concrete cutting segments and masonry core bits.
55-65		Impregnated diamond tools and wheels. Diamond tools exposed

Matrix Alloys for Diamond Tool Setting
Alloy Powders for Hot Pressed Matrixes
3-B Iron, Nickel, Cobalt Base Alloys

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cr	Apparent Density gr/c.in.	Tap Density gr/c.in.	Description	Application
FA-324	Co-Ni-Fe-WC	A 75-80	2000-2100	12.0	38-42	75-79		Asphalt and hard concrete cutting tools.
FA-325	Fe-Cu-Co-WC	C 32-38	1900-2000	9.1-9.4	40-45	75-80	Very hard and tough matrix with very low hot pressing temperature.	Impregnated tools, concrete cutting tools,
FA-326	Co-Cr-Ni-WC	G 100-105	2000-2100	9.2-9.4	50-55	80-83		and cut off segments.
FA-327	Co-Cr-Ni-W	G 90-95	2000-2100	9.5-9.6	52-55	80-83	For special applications Alloys FA 326,327,328,329,330 and 331 are also offered in a very fine grade.	
FA-328	Fe-Cu-Co	C 30-35	1950-2000	8.1-8.3	38-45	50-60		
FA-329	Co	B 100-105	1950-2000	9-9.1	35-40	50-55		
FA-330	Co-Zr	B 100-105	2000-2050	9-9.1	32-38	50-55		
FA-331	Cu-Co-Sn-Zr	B 85-90	1750-1770	9.1-9.25	40-45	55-65		Cut off segments and high polishing wheel.
FA-332	Ni-Sn-P	B 107-110	1750-1800	8.8-8.9	40-45	54-65	Strong,goldish,self-brazing alloy.	Special Tools.
FA-333	Co-Cu-Fe-Ag	C 35-40	1500-1580	8.7-8.9	35-40	58-68	Hard, strong, self-brazing alloy. Low temperature hot pressing.	Grinding wheels and reamers.
FA-334	Cu-Ni-W-Sn	B 105-110	1950-2000	9.1-9.3	40-45	60-63		Hard refractories and Ceramic grinding.

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Matrix Alloys For Diamond Tool Setting

Alloy Powders For Hot Pressed Matrixes.

4. Copper Base Alloys

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cc	Apparent Density gr/cu.in
FA-401	Cu+Sn	B-60-75	1420-1470	8.1-8.3	42-46
FA-402	Cu+Sn	B-75-85	1400-1450	8.0-8.2	42-46
FA-403	Cu+Sn	B-80-95	1350-1400	7.8-8.0	40-45
FA-404	Cu+Sn	B-90-100	1340-1380	7.7-7.9	45-50
FA-405	Cu+Fe+Sn	B-60-70	1400-1450	7.6-7.8	42-46
FA-406	Cu+Sn+P	B-62-78	1400-1450	8.1-8.3	42-46
FA-407	Cu+Sn+P	B-77-87	1400-1430	8.0-8.2	42-46
FA-408	Cu+Sn+P	B-82-95	1380-1400	7.8-8.8	40-45
FA-409	Cu+Co+Sn	B-80-90	1650-1750	8.8-9.0	40-45
FA-410	Cu+Ni+Sn	B-70-90	1600-1700	7.8-8.0	35-40
FA-411	Cu+Fe+Ni+Sn	B-90-100	1800-1900	7.9-8.3	35-40
FA-412	Cu+W+Ni	C-8-10	2000-2050	10.3-10.5	35-40
FA-413	Cu+Fe+Zn+Co	B-80-90	1650-1750	7.5-7.7	35-40
FA-414	Cu+W+Fe	B-90-95	1950-2000	9.8-10.0	50-55
FA-415	Cu+Ni+Sn+Ti	C-30-35	1750-1800	7.6-7.8	35-40
FA-416	Cu+Ni+Cr+Sn	C-35-40	1800-1850	7.8-8.0	55-65
FA-417	Cu+Fe+B+Sn	B-88-95	1700-1750	7.7-8.1	50-55
FA-418	Cu+Sn+Ag+Ni	B-95-100	1200-1250	8.3-8.8	55-60
FA-419	Cu+Fe+Sn+Cd	B-35-40	1700-1800	7.9-8.2	50-60
FA-420	Cu+Ni+Zn	B-75-80	1700-1750	7.9-8.0	50-60
FA-421	Cu+Zn+Sn	B-80-90	1850-1900	7.9-8.1	55-60
FA-422	Cu+Ni+B+Si	B-80-90	1950-2200	7.8-8.1	55-60
FA-423	Cr+Cu+Ni+Zn	B-82-84	1700-1800	8.3-8.5	50-55
FA-424	Fe+Cu+Zn+Ni	B-88-96	1650-1700	8.4-8.6	48-53

Tap Density gr/cu.in	Description	Application
55-65	For different applications and loading conditions, Alloys FA-401 through 408 are offered in two grades: 1. Standard, with apparent density of 40-55 gr/cu. In.	Tungsten Carbide grinding wheels, continuous rim cut-off wheels, cut-off segments.
55-65		
55-65		Gem grinding.
60-65		
55-65	2. Fine with apparent density of-25-30 gr/cu.in.	Peripheral wheel centers.
55-65		Peripheral and cut-off grinding wheels made on steel centers, glass cutting wheels.
55-65	Alloys FA-401, 404 and 406 can be supplied in any particle size or particle size distribution.	
55-65		
55-65		Stone and construction material, cut-off segments.
55-65	Alloy FA-413 expands on cooling and is recommended for tools which are directly pressed into tool holders.	Wheels for electrolytic grinding.
55-65		
50-55		Various tools, hones, grinding heads, inserts, and small tools.
55-65	Alloys FA-411,413, and 414 are well suited for everyday production- of small and medium size diamond tools. They are very tough, adhere well to diamonds and require relatively low temperature for hot pressing.	
64-70		
50-55		Glass grinding and edging tools and wheels.
65-75		Small tools.
60-65		
68-72		Special tools, grinding wheels, and buttons.
70-75	Alloy FA-418 is a very tough, low temperature forming alloy.	
70-75	Alloy FA-419 is a strong , very soft alloy.	Preformed grinding wheel centers and wheel bodies.
70-75		
68-72	These are relatively low melting alloys.	Impregnated tools with synthetic diamonds.
65-70		

Matrix Alloys For Diamond Tool Setting

Alloy Powders For Hot Pressed Matrixes.

4-b Copper Base Alloys

Alloy Code	Predominant Components	Hardness Rockwell Scale	Hot Pressing Temperature °F	Density gr/cc	Apparent Density gr/cu. In.	Tap Density Gr/Cu.In.	Description	Application
FA- 425	Cu-Sn-Zr	B-80-85	1350-1400	8.7-8.0	45-50	60-65		Diamond grinding, glass grinding.
FA- 426	Co-Cu-Sn	B-100-105	1400-1450	8.8-9.0	40-45	55-60	Alloys of Relatively	Glass grinding, reaming, borozon tools.
FA-427	Co-Cu-Sn-P	B-70-75	1400-1450	8.8-9.0	40-45	55-60	low	Glass grinding.
FA-428	Co-Cu-Sn	B-110-115	1420-1500	8.7-8.9	45-50	55-60	Hot pressing temperature	Borozon tools and grinding wheels.
FA-429	Cu-Sn	B-90-100	1320-1380	7.9-8.1	42-46	55-65		Diamond cutting and grinding.

Matrix Alloys For Diamond Tool Settig

Alloy Powders For Infiltrated Matrixes

Alloy Code	Predominant Components	Commonly used Infiltrants	Hardness after Infiltrant	Infiltration Rockwell Scale	Apparent Density gr/c.In.
FA-501	WC	Cu+Zn+Ni	Cu+Zn+Ni	C 15-20	60-65
FA-502	WC	Cu+Zn+Ag Cu+Ni+Sn	Cu+Zn+Ni	C 20-25	65-75
FA-503	WC	Cu+Mn+Zn	Cu+Zn+Ni	C 25-30	75-85
FA-504	WC	Cu+Ag	Cu+Zn+Ni Cu+Mn+Zn	C 30-35 C 40-45	85-95
FA-505	WC+CrC	Cu+Ag+Ni	Cu+Zn+Ni	C 35 and over	80-85
FA-506	WC	Cu Ag	Cu Cu+Mn+Zn	B 95-100 C 35-42	55-60
FA-507	WC	Cu+Ag Alloys	Cu	B 85-90	40-45
FA-508	WC+Co	Cu+Zn+Ni	Cu+Zn+Ni	B 100-110	35-40
FA-509	W		Cu Cu+Zn+Ni	B 80-90 C 30-35	100-105 85-90
FA-510	Fe+Cu	Cu Cu+Ag Alloys	Cu+Ni+Zn	B 70-80	40-45
FA-511	Fe+Cu	Cu+Ni+Zn	Cu+Ni+Zn	B 62-70	40-43
FA-512	WC+Ti	Cu+Zn+Ni	Cu+Zn+Ni	C 35-40	85-95

Tap Density gr/c.in.	Description	Application
85-90 95-100 105-115 120-130 105-115	To properly support diamonds and to make the infiltration uniform, Alloys FA-501 through 505 are based on a selected particle size distribution of mono-carbide of tungsten. The high tap density of these alloys guarantees good mold packing and dimentional stability after infiltration. It is advantageous to cold press and pre-sinter the tools made from Alloys FA-506 and 507 prior to infiltration.	Mining drill bits, masonry core bits, thin-wall core bits, impregnated tools, rotary wheel dressers, hones, cluster tools.
95-100 75-85 75-80	Alloy FA-508 forms a two-phase structure ideal for tools used in cutting and grinding vitreous materials.	Tools, grinding wheels, cut off segments for masonry, stone, glass and other construction materials.
145-155	Alloy FA-509 is very tough, but easy to machine, tungsten base matrix.	Single point tools,cluster tools.
47-52 46-50	Alloys FA-510 and 511 are based on special iron and steel powders to secure uniform and free infiltration.	Various face set or impregnted tools and grinding wheels.
120-130	Very tough and hard matrix and very easy to infiltrate.	Mining bits, masonry core bits, thin wall core bits.

Matrix Alloys For Diamond Tool Setting.

Alloy Powders For Cold Pressed And Sintered Matrixes

Alloy Code Code	Predominant Components	Hardness after Sintering Rockwell Scale	Sintering Temperature °F	Density gr/cc
FA-106 To 170	WC+Co	A 91-70	2450-2850	10.2-14.2
FA-401 To 404	Cu+Sn	B 60-100	1350-1550	7.4-7.6
FA-406 To 408	Cu+Sn+P	B 60-100	1470-1550	7.4-7.7
FA-601	Cu+Zn	H 75-85	1600-1650	7.5
FA-602	Cu+Zn	H 65-75	1620-1650	7.8
FA-603	Cu+Ni+Zn	H 75-85	1750-1800	7.6
FA-604	Fe+Cu	B 73-93	2020-2070	6.9
FA-605	Fe+Cu	B 86-95	2020-2070	7.4
FA-606	W+Cu+Ni	C 20-30	2450-2500	16.8
FA-607	W+Cu+Fe+Mn	B 80-90	1900-1960	10.0
FA-608	Cu+Fe+Ni+Sn	B 85-100	1800-1850	7.8
FA-609	WC+Cu+Ni	B 80-90	1800-1850	9.2
FA-610	WC+Cu+Sn	B 30-35	1500-1600	8.2
FA-611	Cu+Co+Sn	B 70-80	1600-1700	7.9
FA-612	Cu+Ni+Cr+Sn	C 30-35	1900-1950	8.0

Description	Application
Cemented carbides	See- WC+co Matrixes.
Bronzes and Phosphor Bronzes	See- Copper Base Matrixes.
Bronzes and Phospher Bronzes	See- Copper Base Matrixes.
Brasses and Nickel-Silvers	Various diamond tools, impregnated tools, cluster tools.
Alloys that duplicate the properties of infiltrated matrixes.	Variouse diamond tools, impregnated tools, cluster tools.
Extremely tough, rigid alloys, but easily machinable.	Chatter- free tools.
Easily workable, Alloys FA-607 abd 608 are also readily machinable.	Small tools, cluster tools, abrading inserts, impregnated tools.
Two-phase alloys for tools which cut or grind vitreous and other brittle materials.	Cut-off and grinding wheels for glass and masonry materials, and cut-off segments.

Raw Materials and Production Implements for the Diamond Tool Industry

1. Tungsten Metal Powder

Grade	W 65	W 100	W 200	W XX	W XXX
Purity	99.9 min.	99.2	99.5 min.	99.9 min.	99.9 min.
Screen Analysis					
On 60	6% max.				
On 100	15-25%	6%			
On 200	40-50%	40-50%	10%Max.	100%	
On 325	10-20%	20-30%	45-55%	Thru 200 mesh	
Thru 325	6% Max.	15-25%	45-55%		
Avg. Particle Size Microns	30-40	20-25	15-20	2-7	4-7
App. Density Gr/cu.In.	95-110	135-140	90-100	45-50	50-57

Any other grade of Tungsten available upon request.

2. Tungsten Carbide (6.05-6.12% total carbon and .08% max. graphitic carbon):

Grade	JK-31	JK-100	JK-200	SK-01	SK-05
Recommended Application	Wear resistant parts.			Tool Grades.	
Screen Analysis					
On 60	6% Max.				
On 100	15-25%	5%Max.			
On 200	35-45%	40-50%	5% Max.	100%	
On 325	30-40%	30-40%	45-50%	Thru 200 mesh	
Thru 325	15% max.	20-30%	45-50%		
Avg. Particle size Size Microns	30-40	20-35	15-20	2-5	4-7
App. Density gr /cu.in.	95-115	90-110	105-120	55-65	75-85

Any other grade of Tungsten Carbide available upon request.

Raw Materials and Production Implements for the Diamond Tool Industry, Cont.

3. Cast Tungsten Carbide and Carbides of other than Tungsten refractory metals, in any mesh and particle size distribution.

4. Tungsten Carbide-Cobalt Grit with 6% or 13% Cobalt in different mesh sizes as supporting particles for diamonds.

5. Iron Powder to facilitate infiltration and to increase the bond between the matrix and the steel shank or blank.

6. Infiltrants (in form of rods, powders, rings and pre- cast shapes):
   A) Copper
   B) Copper- Silver Zinc
   C) Copper-Nickel-Zinc
   D) Copper-Silicon
   E) Copper-Beryllium
   F) Copper-Manganese-Zinc
   G) Others on request.

7. Hard-facing and corrosion resistant alloys in three types for:
   A) Plasma-spraying
   B)Thermo- spraying
   C) Adhesive Coating

8. Tungsten Carbide-Cobalt Waterway Inserts; standard NX, AX, BX and EX, as well as specially fabricated shapes produced to clients' specifications.

9. Chatter- free tool shank material made from an alloy of high rigidity and high modulus of elasticity.