

*Wear Less, Save More!*

WEAR RESISTANT MATERIALS & SOLUTIONS



# Introduction



**CS Wear Resistant Material Co Limited** specialized in thermal spray and welding alloy consumables based on advanced technology with continuous renovation in advanced alloy design, powder production process, quality control and application methods, our main products are Nickel-based, Cobalt-based, Iron-based powders, Nickel (cobalt) based powders mixed with Tungsten Carbide powders, Continuous cast rod, Cobalt based electrode and Tungsten carbide tube wire, they are widely used in OXY spraying and fusion, HVOF spraying, PTA overlaying, laser cladding, induction fusion, TIG welding, PM, MIM, centrifugal casting, HIP, as well as 3D printing.

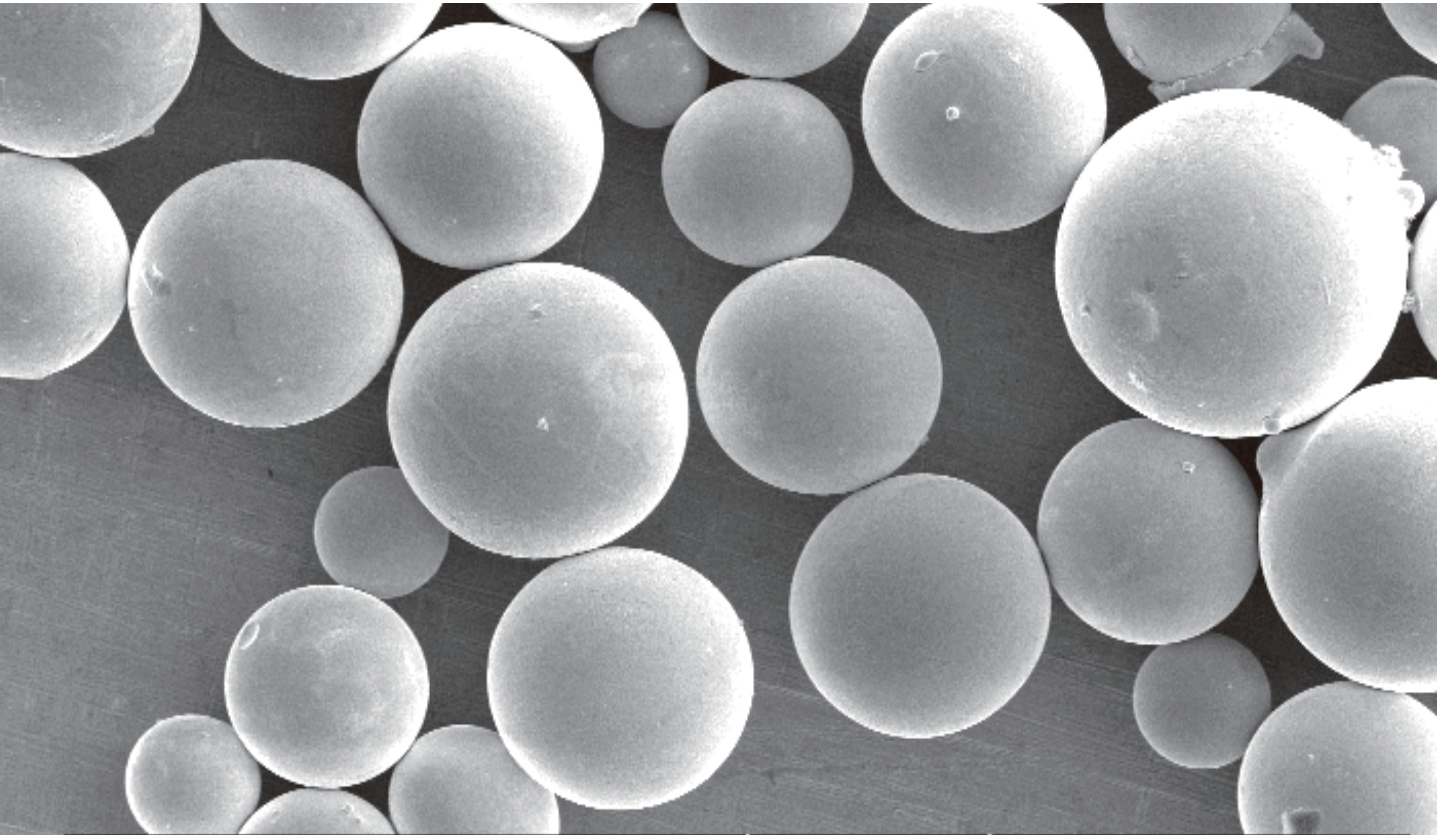
We have strong production base, with annual supply capacity of around 2000 tons. Our factory are ISO9001 certified, based on which we strictly run our quality management system, our internal control standards have been formulated and continuously improved according to the principle of "Plan-Do-Check-Act". We have the world's most advanced and complete testing equipment such as Thermo Fisher ICAP 7000 and PRO, Leco CS 744, Leco ONH836, Spectro MAXx, Olympus portable spectrometer, Olympus metallurgical microscope, Laser particle analyzer, PTA welding, Laser cladding and other advanced equipment, and we can do quick and accurate analysis on raw materials and products, so we are able to guarantee long-term stability of high quality product and timely technical services.



We have has a strong R&D team and state-of-art laboratory equipment for our technical team to keep improving our technology and running research and development of new products, new processes and new applications, we also have strong ability to provide customized product solution based on customer's specified needs.

Through many years of market expansion, our company provides customers with high-quality products in many industries, such as new energy machinery, plastic machinery, iron and steel metallurgy, petroleum and petrochemical machinery, mining machinery, glass mold, air valves, valves, 3D printing and so on, we have customers throughout international markets such as Asia, Europe, North America, and the Middle East.

We are a wear materials supplier, but we are also a service provider, we pay high attention to pre-sales and after-sales service technically and commercially, get in touch with us now, tell us about your needs and discuss with us the problems you are dealing with, we will able to come up with a wear material solution and tackle your problems!



# Alloy Powders

All Powder supplied by CS Wear are produced by advanced gas-atomization and water-atomizing process, resulting in chemical uniformity, low oxygen content, and good sphericity, resulting in excellent flow and non-sticking properties. In overlaying or spraying, uninterrupted powder feeding is ensured without stick on torches or block feeding paths. Many powder size specifications are available. The quality level has reached a high level appreciated by both domestic and international customers.

# Nickel Base Powder



These powders include Ni-B-Si, Ni-Cr-B-Si, Ni-Cr-B-Si-P, Ni-Cr-B-Si-Cu-Mo, Ni-Cr-B-Si-W, Ni-Cr, and Ni-Cu alloys. They are used for applications demanding corrosion resistance or oxidation resistance. Under 500 °C, they have excellent low-stress abrasion and adhesive wear resistance. These powders can be applied by a variety of processes, such as, oxyacetylene spraying or overlaying, HVOF/HVAF spraying, plasma transferred arc (PTA) overlaying, plasma spraying, laser cladding, induction fusion, centrifugal casting, 3D printing and powder metallurgical processing. Key applications include valve gates, ball valve surface, valve seats, pistons, extrusion screws, barrels, glass molds, steel mill rolls, wire drawing rolls, oil pumping shafts, fan blades, screw conveyors and tungsten carbide tools.

## NICKEL BASE POWDER

粉末 Powder	硬度 HRC	化学成分 Chemical Composition											规格 Mesh	典型用途 Typical Application	
		C	Cr	Si	W	Fe	Mo	Ni	Co	Mn	B	其他Others			
BNi5		0.01	19.00	10.10				Bal						270/D目	钎焊 Brazing
BNi7		0.01	14.00					Bal				P:10.00	270/D目	钎焊 Brazing	
BNi10		0.01	29.00	4.00				Bal				P:6.00	270/D目	钎焊 Brazing	
BNi11		0.02	26.00	4.80		18.50		Bal				P:6.00	270/D目	钎焊 Brazing	
Ni15AA		0.03	0.45	2.70		0.45		Bal		0.05	0.90	Cu:20.0	180/500目	WC系列喷焊层打底层 Bonding layer for WC coatings	
Ni20	20	0.03	4.00	2.20		0.50		Bal			0.70	P:2.2	180/500目	玻璃模具、各种成型模等 Glass molds or other molds	
Ni20PTA	20	0.05	25.00	1.80		4.50		Bal		0.50	0.50		80/230目	玻璃模具、各种成型模 Glass molds or other molds	
Ni22AA	22	0.20	0.10	2.85		0.50		Bal		0.50	1.45		180/500目 100/270目	玻璃模具、各种成型模 Glass molds or other molds	
NiBSi20	28	0.05Max	0.50	3.20		0.80		Bal			1.30		100/270目	玻璃模具、各种成初模 Glass molds or other molds	
Ni22M1	26	0.03	0.50	3.00		0.50		Bal		0.50	1.00	P:2.2	180/500目	玻璃模具、各种成型模 Glass molds or other molds	
Ni26PTA	28	0.03	5.50	3.20		2.50		Bal		0.50	1.10		100/270目	玻璃模具、各种成型模 Glass molds or other molds	
Ni26-1PTA	25	0.05	4.50	3.20		2.50		Bal		0.50	1.00		100/270目	玻璃模具、各种成型模 Glass molds or other molds	
Ni26HPTA	29	0.08	8.50	3.20		2.50		Bal			1.10	Cu:2.00	100/270目	玻璃模具、各种成型模 Glass molds or other molds	
Ni27	27	0.05Max	3.50	2.40		3.00		Bal			0.90	P:2.30	180/500目	玻璃模具、各种成型模 Glass molds or other molds	
Ni31M	31	0.05Max	4.00	2.40		3.00		Bal			0.90	P:2.30	180/500目	玻璃模具、各种成型模 Glass molds or other molds	
Ni30PTA	29	0.05Max	0.5Max	3.20		1.00Max		Bal			1.40		100/270目	玻璃模具、阀座 glass molds or valve seat inserts	
Ni35AA CuMo	46	0.30	12.00	3.70		3.00	2.70	Bal			1.80	Cu:2.20	150/300目	玻璃模具、各种成型模 Glass molds or other molds	
Ni37M	35	0.15	4.50	2.80				Bal		0.5Max	1.00	P:2.50	180/500目	玻璃模具、冲头、各种成初模 Glass molds, forging dies and heads	
Ni40PTA	40	0.03	0.30	3.50		0.40		Bal			1.90		100/270目	玻璃模具、冲头、各种成初模 Glass molds, forging dies and heads	
Ni40AA	40	0.30	7.50	3.50		2.30		Bal			1.70		150/300目	螺旋送料器、模芯等 Screw conveyors, forging mold parts	
Ni45	45	0.25	7.50	3.50		5.00Max		Bal			2.20		150/300目	螺旋送料器、模芯等 Screw conveyors, forging mold parts	
Ni45PTA	46	0.05	7.50	3.80		5.00Max		Bal			2.00		150/300目	冲头、阀门、柱塞 Forging heads, valves	
Ni50	46	0.05	6.54	2.80		1.00		Bal		0.35	1.00	P:1.70	180/500目	玻璃模具、各种成型模 Glass molds or other molds	

## NICKEL BASE POWDER

粉末 Powder	硬度 HRC	化学成分 Chemical Composition											规格 Mesh	典型用途 Typical Application	
		C	Cr	Si	W	Fe	Mo	Ni	Co	Mn	B	其他 Others			
Ni60A	60	0.80	16.50	4.40		8.00		Bal					3.30		150/300目 冲头、阀门、柱塞 Forging heads, valves, pistons
Ni60AA	59	0.75	16.50	4.20		5.00Max		Bal					2.80		150/300目 冲头、阀门、柱塞 Forging heads, valves, pistons
Ni60L	56	0.60	15.50	4.00		15.00Max		Bal					2.80		150/300目 磨具、凸轮、柱塞及排气阀 Grinding tools, cam gears, pistons, exhaust valves
Ni60AL	56	0.60	15.50	4.00		5.00Max		Bal					2.80		150/300目 磨具、凸轮、柱塞及排气阀 Grinding tools, cam gears, pistons, exhaust valves
Ni55	55	0.60	16.00	4.00		5.0Max	2.50	Bal					2.80	Cu:2.50	150/300目 磨具、凸轮、柱塞及排气阀 Grinding tools, cam gears, pistons, exhaust valves
Ni6325L	58	0.80	15.00	4.00		5.00Max		Bal		0.20Max			3.00	Cu:2.50	150/300目 磨具、凸轮、柱塞及排气阀 Grinding tools, cam gears, pistons, exhaust valves
Ni60	61	0.90	16.50	4.40		15.00Max		Bal					3.30		150/300目 阀门、模具、螺杆 Valves, molds, extrusion screws
Ni60M	60	0.80	15.00	4.20		15.0Max		Bal					3.00		150/300目 柱塞、阀门、泵叶、螺杆等 Pistons, valves, pump blades, extrusion screws
Ni65	64	1.10	17.50	4.50		15.0Max		Bal					3.50		150/300目 阀门、模具、螺杆 Valves, molds, extrusion screws
NiWC35	—	2.00	10.50	3.60		10.00Max		Bal					3.00	W:28.00	150/300目 柱塞、阀门、泵叶、螺杆等 Pistons, valves, pump blades, extrusion screws
Ni56PTA	54	0.80	20.50	5.20		5.00Max		Bal					2.20		150/300目 阀门、模具、螺杆 Valves, molds, extrusion screws

## NICKEL BASE POWDER+CLADDED WC

粉末 Powder	硬度 HRC	化学成分 Chemical Composition	应用工艺 Coating Process	规格 Mesh	典型用途 Typical Application
NiWC5	60	95%Ni60+5%WC	火焰喷焊 OXY spraying	150/300目 150/400目	螺杆、机筒、柱塞 Extrusion screws, barrels, pistons
NiWC10	62	90%Ni60+10%WC	火焰喷焊 OXY spraying	150/300目 150/400目	螺杆、机筒、柱塞 Extrusion screws, barrels, pistons
NiWC15	62	85%Ni60+15%WC	火焰喷焊 OXY spraying	150/300目 150/400目	阀门、柱塞 Valves, pistons
NiWC20	63	80%Ni60+20%WC	火焰喷焊 OXY spraying	150/300目 150/400目	阀门、机筒、柱塞 Valves, barrels, pistons
NiWC25	63	75%Ni60+25%WC	火焰喷焊 OXY spraying	150/300目 150/400目	阀门、机筒、柱塞 Valves, barrels, pistons
NiWC30	64	70%Ni60+30%WC	火焰喷焊 OXY spraying	150/300目 150/400目	阀门、机筒、柱塞 Valves, barrels, pistons
NiWC35	65	65%Ni60+35%WC	火焰喷焊 OXY spraying	150/300目 150/400目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors

## NICKEL BASE POWDER MIXED WITH TUNGSTEN CARBIDE POWDER

粉末 Powder	硬度 HRC	化学成分 Chemical Composition	应用工艺 Coating Process	规格 Mesh	典型用途 Typical Application
Ni15WC	≥60	Ni60+15%WC	火焰喷焊 OXY spraying	150/400目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni20WC	≥60	Ni60+20%WC	火焰喷焊、离心浇铸 OXY spraying、Centrifugal casting	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni25WC	≥60	Ni60+25%WC	火焰喷焊、离心浇铸 OXY spraying、Centrifugal casting	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni30WC	≥60	Ni60+30%WC	火焰喷焊、离心浇铸 OXY spraying、Centrifugal casting	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni35WC	≥60	Ni60+35%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni40WC	≥60	Ni60+40%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni45WC	≥60	Ni60+45%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni50WC	≥60	Ni60+50%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni55WC	≥60	Ni60+55%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni60WC	≥60	Ni60+60%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors
Ni65WC	≥60	Ni60+65%WC	火焰喷焊、PTA、激光熔覆 OXY spraying、PTA、Laser Cladding	150/400目 80/300目	拉丝轮、风机叶片、螺旋输入器等 Wiredrawing pulling wheels, fan blades, screw conveyors

## NICKEL BASE SUPER ALLOY

粉末 Powder	化学成分Chemical Composition										应用工艺 Coating Process	规格 Mesh	典型用途 Typical Application	
	C	Cr	Si	W	Fe	Mo	Ni	Co	Mn	Nb				
NiCr20	0.20Max	20.00	1.00		0.50Max		Bal		0.50Max			HVOF	53/20μm	HVOF
NiCr50	1.00Max	50.00	1.00		0.50Max		Bal		0.50Max			Plasma Spraying	106/45μm	造纸泵、电厂沸水器以及含V、S等腐蚀性气体介质 Pulp-making pumps, power generation boilers, parts in a corrosive environment containing vanadium and sulphur
Ni625	0.10	20.0-23.0	/	/	5.00	8.0-10.0	Bal	/	/	3.15-4.15		HVOF/PTA	53/20μm	耐海水腐蚀部件、航天航海配件、化学工业 Parts subject to seawater corrosion, such as, in aerospace or aeronautical industry and chemical processing
Ni-C	0.10	16.50	0.90	4.50	5.50	17.00	Bal	2.0Max	0.90			HVOF	53/20μm	造纸机械 Paper-making machine
Ni-SuperC	0.05Max	23.00				18.00	Bal					HVOF	53/20μm	造纸机械 Paper-making machine
Ni276	0.01Max	15.50	0.03	4.00		16.00	Bal	2.5Max	1.00			HVOF	53/20μm	虚抗高温腐蚀和高温氧化场合 Parts subject to corrosion and high temperature oxidation
Mnonel 400	0.15Max		1.25		1.50	Ti:2.00	Bal		3.50	Cu:28.00		HVOF	53/20μm	化学、石化和海洋开发设备 Chemical or petrochemical processing equipment parts





# Cobalt Base Powder

Cobalt base alloys typically contain tungsten and carbon for strengthening. Carbon has low solid solubility in cobalt and therefore, most of it partitions in WC, W<sub>2</sub>C and M<sub>6</sub>C or other carbides. These hard phases have a strengthening effect, making such alloys maintain high hardness and strength at temperatures under 800 °C. The cobalt-chromium-tungsten-carbon alloys generally have excellent properties to resist high temperature wear, oxidation and thermal fatigue.

Cobalt has a hexagonal-close-packed (hcp) crystal structure at temperatures below 417 °C. Intrinsically, it has low coefficient of friction resulting in excellent wear resistance. At temperatures above 417 °C, cobalt transforms from hcp to fcc (face-centered-cubic) crystal structure, thereby, generating thermal stresses. Therefore, it is recommended that in weld overlaying and spraying, the parts being coated are pre-heated to 500-600 °C to avoid cracking in the coating or overlay

## COBALT BASE POWDER

粉末 Powder	硬度 HRC	化学成分Chemical Composition									规格 Mesh	典型用途 Typical Application
		C	Cr	Si	W	Fe	Mo	Ni	Co	Mn		
Co1	52	2.40	30.00	1.00	12.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	阀座、轴承、刀口、旋转密封环等 Valve seats, bearings, cutting blades, seal rings
Co6	42	1.20	30.00	1.00	4.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	阀座、轴承、刀口、旋转密封环等 Valve seats, bearings, cutting blades, seal rings
Co12	46	1.40	30.00	1.00	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	针阀座、导向辊、阀座等 Needle valve seats, guide rolls, valve seats
Co12H	48	1.60	30.00	1.00	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目 300/500目	发动机气门、高温高压阀门、涡轮机叶片 Engine valves, high temperature pressure valves, turbo blades
Co21	26	0.30	28.00	1.20	-	≤3.00	5.50	≤3.00	Bal	≤1.00	100/270目	汽轮机耐热气冲蚀部件 Steam turbine parts for resisting high temperature degradation and erosion
Co6H	45	1.30	30.00	1.50	5.50	3.00Max	0.80	3.0Max	Bal	1.00Max	100/270目	发动机气门、高温高压阀门、涡轮机叶片 Engine valves, high temperature pressure valves, turbo engine blades
Co12N	50	1.30	29.00	0.80	8.50	≤3.00	≤1.00	11.00	Bal	≤1.00	100/270目	高温高压阀门、锯齿、螺旋推杆等 High temperature pressure valves, saw teeth, extrusion screws
CoFH	42	1.40	28.00	1.20	12.00	3.00Max	0.80	22.50	Bal	0.50	100/270目	发动机气门 Engine valves
Co12HB	50	0.95	30.00	1.10	8.00	4.50	≤1.00	3.00	Bal	≤0.50	100/270目	高温高压阀门、锯齿、螺杆 High temperature pressure valves, saw teeth, extrusion screws
Co190	60	3.30	26.00	0.80	14.00	3.00Max	1.0Max	3.00Max	Bal	1.00Max	100/270目	石油钻头 Oil drilling heads
Co3PM	54	2.40	32.00	0.90	13.00	2.00Max	0.5Max	2.50	Bal	0.50Max	100/270目	发动机气门 Engine valves
Co20	60	2.30	32.00	1.00	18.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00	300/500目	轴承套筒、耐磨板等 Bearing sleeves, wear plates
Co20PM	60	2.50	35.00	0.80	18.50	0.25	-	≤3.00	Bal	≤1.00	-270目	轴承套筒、耐磨板等 Bearing sleeves, wear plates
CoSFW	60	2.45	10.50	2.60	32.50	≤2.50	-	9.00	Bal	-	140/325目	镀锌线轴套、衬套 Galvanizing line bearing sleeves and shaft sleeves
CoSF12	60	1.00	18.00	2.80	8.50	≤2.00	≤0.30	14.00	Bal	≤0.50	300/500目	轴承套筒、耐磨板等 Bearing sleeves, wear plates
CoSF20	48	1.45	19.00	3.00	15.00	≤2.00	0.5Max	14.00	Bal	≤0.50	-270目	轴承套筒、耐磨板等 Bearing sleeves, wear plates
CoX-40	33	0.80	25.50	0.40	7.50	1.00Max	1.0Max	10.50	Bal	0.50Max	100/270目	汽轮机耐热气冲蚀部件 Steam turbine parts for resisting high temperature degradation and erosion
CoT400	50	0.08Max	8.50	2.50	-	1.50Max	28.50	1.50	Bal	-	100/270目 300/500目	镀锌线轴套、衬套 Galvanizing line bearing sleeves and shaft sleeves
CoT800	56	0.08Max	25.00	3.60	-	1.50Max	28.50	1.50	Bal	-	100/270目	镀锌线轴套、衬套 Galvanizing line bearing sleeves and shaft sleeves

# Iron Base Powde



Iron base powder are basically iron-carbon alloys with additions of chromium, boron and silicon. They are typically used on mechanical parts for resisting wear and weak acid corrosion under the temperature of 500°C. Even though their properties are not as good as nickel, cobalt base alloys, they are readily available and inexpensive, making them popular in less critical applications.

WEAR LESS SAVE MORE

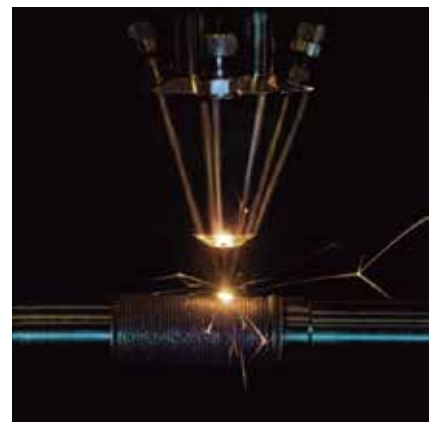
## IRON BASE POWDER

粉末 Powder	硬度 HRC	化学成分 Chemical Composition									规格 Mesh	应用工艺 Coating Process
		C	Cr	Si	Fe	Mo	Ni	Mn	B	其他Others		
Fe101	57-62	1.45	6.00	2.00	Bal		8.00	1.80	3.00		10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe103	57-62	1.45	4.50	2.00	Bal		8.00	1.80	3.00		10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe105	57-62	1.45	8.00	2.00	Bal	1.50	8.00	0.80	2.80	Co:2.50 W:3.50	10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe105-1	57-62	1.80	9.50	2.80	Bal	1.50	11.50	1.80	3.20	Co:1.50	10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe106W-1	58-62	1.45	5.00	2.00	Bal	0.20	8.00	1.00	3.00	Co:0.50 W:0.50	10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe108	53-58	1.45	5.00	2.00	Bal		11.00	1.25	3.00		10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe109	60-65	2.00	12.00	2.25	Bal	6.00	4.50	1.50	3.30		10/200目	机筒内壁离心浇铸 Centrifugal casting on cylinder ID surface
Fe304	-	0.03	18.00	0.60	Bal		10.00	0.30			100/270目	PTA堆焊 激光熔覆 PTA Overlaying, Laser Cladding
Fe316L	-	0.03	17.00	0.80	Bal	2.50	12.00	0.50			100/270目	PTA堆焊 激光熔覆 PTA Overlaying, Laser Cladding
Fe316LB	-	0.03	18.00	1.50	Bal	2.50	12.00				100/270目	PTA堆焊 激光熔覆 PTA Overlaying, Laser Cladding
LCF20	-	0.05	18.50	1.10	Bal	2.00	11.00	0.04	0.60		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF25	23-28	0.10	17.00	0.90	Bal	1.30	6.30	0.30	0.70		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF30	27-33	0.12	17.00	1.00	Bal		5.50	0.30	0.70		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF35	32-38	0.12	16.90	1.00	Bal		5.00	0.30	0.70		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF40	37-43	0.12	19.80	1.00	Bal	1.40	2.50	0.30	0.90		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF45	42-48	0.13	16.70	1.10	Bal		4.50	0.30	0.65		100/270目	PTA堆焊 激光熔覆 PTA Overlaying, Laser Cladding
LCF50	47-53	0.16	18.50	1.10	Bal	0.50	2.50	0.60	1.00		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF55	52-58	0.18	18.20	1.10	Bal	0.50	1.00	0.50	1.20		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
LCF60	57-63	0.16	18.50	1.20	Bal	0.50	0.80	0.50	1.40		100/270目	PTA堆焊 激光熔覆 PTA Overlaying Laser Cladding
Fe253	35-40	1.89	28.50	1.20	Bal	5.50	17.00	0.60			100/270目	PTA堆焊 PTA Overlaying,
Fe253H	40-45	2.20	28.50	1.30	Bal	6.40	11.50	0.70	1.40		100/270目	PTA堆焊 PTA Overlaying
Fe190M	60.00	2.90	30.00	2.00	Bal	3.00	5.00		2.30		100/270目	PTA堆焊 PTA Overlaying,



# Laser Cladding Alloy Powder

With the significant advancement made in laser technology, laser cladding has gained increasing acceptance. Compared to the traditional overlaying processes, it has the advantage of low distortion, low dilution, near net shape after cladding, and fine microstructure for superior properties. However, because of concentration of heat, it could cause stress cracking. Based on our understanding of the laser cladding process, we had developed a family of powders especially for laser cladding. Our customers have endorsed them unanimously



## LASER CLADDING ALLOY POWDER

	粉末 Powder	硬度 HRC	化学成分 Chemical Composition									规格 Mesh	
			C	Cr	Si	W	Fe	Mo	Ni	Co	B		
镍基 Nickel Base Powder	LCN20LC	-	0.02	4.50	3.25	-	2.30	-	Bal	-	1.00	100/270目	
	LCN25LC	25	0.01	0.40	3.20	-	3.25	-	Bal	-	1.25	100/270目	
	LCN30LC	30	0.10	18.70	3.00	-	4.50	-	Bal	-	0.80	100/270目	
	LCN35LC	35	0.25	7.60	3.00	-	4.70	-	Bal	-	2.20	100/270目	
	LCN40LC	40	0.30	12.10	3.65	-	0.80	-	Bal	-	1.80	100/270目	
	LCN45LC	45	0.70	19.10	5.25	-	5.10	-	Bal	-	1.90	100/270目	
	粉末 Powder	硬度 HRC	化学成分 Chemical Composition										规格 Mesh
			C	Cr	Si	W	Fe	Mo	Ni	Co	Mn		
钴基 Cobalt Base Powder	Co1	52	2.40	30.00	1.00	12.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	
	Co6	42	1.20	30.00	1.00	4.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	
	Co12	46	1.40	30.00	1.00	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	
	Co12H	48	1.60	30.00	1.00	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	100/270目	
	Co21	25	0.30	28.00	1.20	-	≤3.00	5.50	≤3.00	Bal	≤1.00	100/270目	
	Co6H	44	1.30	30.00	1.50	5.50	3.00Max	0.80	3.0Max	Bal	1.00Max	100/270目	
	Co12N	50	1.30	29.00	0.80	8.50	≤3.00	≤1.00	11.00	Bal	≤1.00	100/270目	
	CoFH	42	1.40	28.00	1.20	12.00	3.00Max	0.80	22.50	Bal	0.50	100/270目	
	粉末 Powder	硬度 HRC	化学成分 Chemical Composition									规格 Mesh	
			C	Cr	Si	W	Fe	Mo	Ni	B	Mn		
铁基 Iron Base Powder	LCF20	-	0.05	18.50	1.10	-	Bal	2.00	11.00	0.60	0.04	100/270目	
	LCF25	25	0.10	17.00	0.90	-	Bal	1.30	6.30	0.70	0.30	100/270目	
	LCF30	30	0.12	17.00	1.00	-	Bal	-	5.50	0.70	0.30	100/270目	
	LCF35	35	0.12	16.90	1.00	-	Bal	-	5.00	0.70	0.30	100/270目	
	LCF40	40	0.12	19.80	1.00	-	Bal	1.40	2.50	0.90	0.30	100/270目	
	LCF45	45	0.13	16.70	1.10	-	Bal	-	4.50	0.65	0.30	100/270目	
	LCF50	50	0.16	18.50	1.10	-	Bal	0.50	2.50	1.00	0.60	100/270目	
	LCF55	55	0.18	18.20	1.10	-	Bal	0.50	1.00	1.20	0.50	100/270目	
	LCF60	60	0.16	18.50	1.20	-	Bal	0.50	0.80	1.40	0.50	100/270目	

# Centrifugal Casting Alloy Powder



Due to the development of fiber-reinforced plastics, inorganic fillers are increasingly used in making halogen-free plastics. Making such plastics demands superior properties to resist wear and corrosion on the extruder components, especially, extrusion screws and barrels. As a result, bi-metallic barrels are increasingly used. To satisfy both the demanding requirements on the properties of the interior barrel surface and the centrifugal casting process, our company has developed a series of powders to meet the challenge. These powders are iron, nickel, cobalt base alloys as well as Ni+WC. We are the only domestic supplier of gas-atomized powders for centrifugal casting. Their low melting points, low oxygen and impurities result in porosity-free, fine-grained structures with superior wear and corrosion resistance.

WEAR LESS SAVE MORE

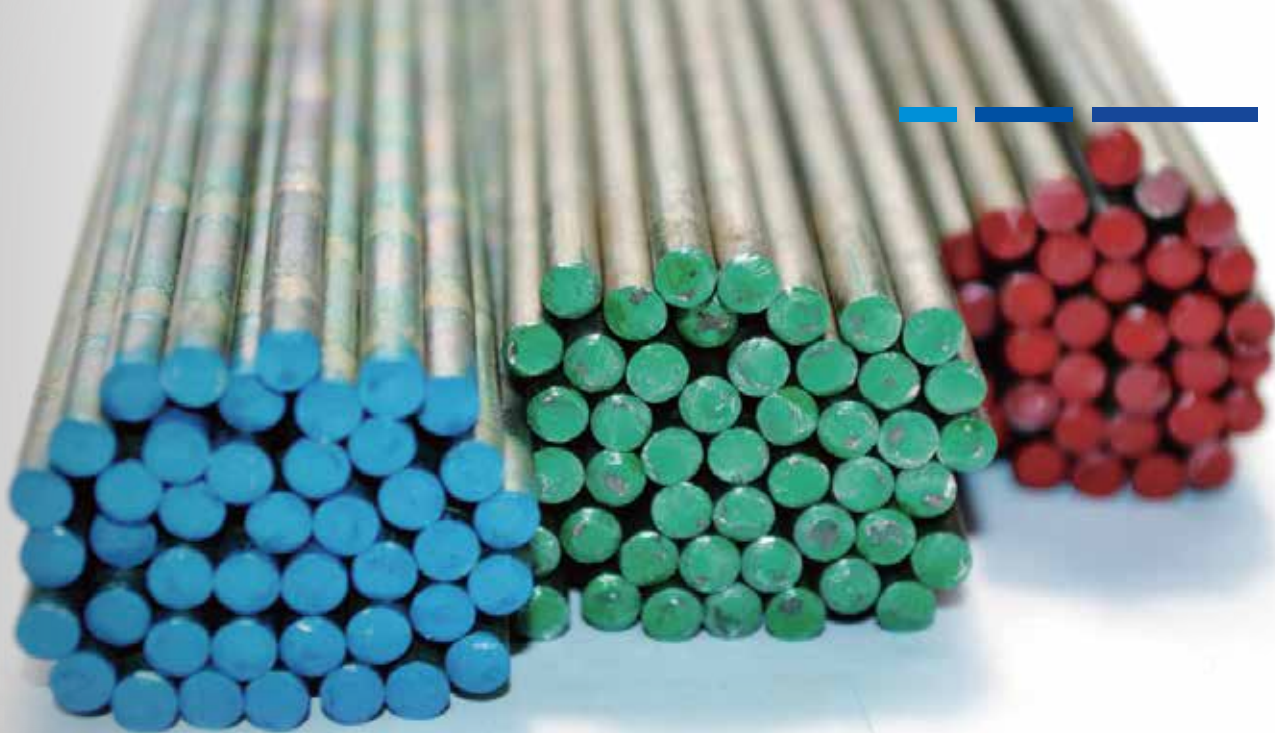
## LASER CLADDING ALLOY POWDER

	粉末 Powder	硬度 HRC	化学成分 Chemical Composition									规格 Mesh
			C	Cr	Si	Fe	Mo	Ni	Mn	B	其他 Others	
铁基 Iron Base Powder	Fe101	60	1.45	6.00	2.00	Bal	-	8.00	1.80	3.00	-	10/200目
	Fe103	60	1.45	4.50	2.00	Bal	-	8.00	1.80	3.00	-	10/200目
	Fe105W	60	1.45	8.00	2.00	Bal	1.50	8.00	0.80	2.80	Co:2.50 W:3.50	10/200目
	Fe105W-1	60	1.80	9.50	2.80	Bal	1.50	11.50	1.80	3.20	Co:1.50	10/200目
	Fe106W-1	60	1.45	5.00	2.00	Bal	0.20	8.00	1.00	3.00	Co:0.50 W:0.50	10/200目
	Fe108	56	1.45	5.00	2.00	Bal	-	11.00	1.25	3.00	-	10/200目
	Fe109	63	2.00	12.00	2.25	Bal	6.00	4.50	1.50	3.30	-	10/200目
Ni+WC			化学成分 Chemical Composition									
	粉末 Powder	硬度 HRC	C	Cr	Si	Fe	Mo	Ni	Mn	B	其他 Others	规格 Mesh
	NiWC301	62	0.20	7.60	4.20	1.00	-	Bal	0.50	3.30	W:5.00	150/400目
	NiWC302	61	0.40	7.20	4.00	1.00	-	Bal	0.50	3.10	W:10.00	150/400目
	NiWC303	63	0.60	6.80	3.80	1.00	-	Bal	0.50	3.00	W:15.00	150/400目
	NiWC304	61	0.80	6.40	3.60	1.00	-	Bal	0.50	2.70	W:20.00	150/400目
	NiWC305	63	1.00	6.00	3.30	1.00	-	Bal	-	2.60	W:25.00	150/400目
	NiWC306	61	1.20	5.60	3.20	1.00	-	Bal	0.50	2.40	W:30.00	150/400目
	NiWC307	63	1.40	5.20	3.00	1.00	-	Bal	-	2.20	W:35.00	150/400目
	NiWC308	61	1.60	4.80	2.70	1.00	-	Bal	0.50	2.00	W:40.00	150/400目
NiWC309	63	1.80	4.40	2.50	1.00	-	Bal	-	1.90	W:45.00	150/400目	





# Continuous Cast Rod



We use an advanced technology to produce continuous cast rods of cobalt and nickel base alloys. The sizes include 2.7, 3.2, 4.0, 4.8 and 8.0 mm. These alloy rods have not only chemical uniformity but also low impurities. Their weld puddles have good flow-ability desired by a variety of weld overlaying processes to make high quality and low porosity overlays. The alloy rods have smooth surface and uniform diameter for easy feeding. The length can be supplied as requested. The rods are especially suitable for oxyacetylene and tungsten inert gas (TIG or GTAW) welding.

类型 Alloy Family	牌号 Alloy	硬度 HRC	化学成分 Chemical Composition										工艺 Process	直径 Diameter
			C	Cr	Si	W	Fe	Mo	Ni	Co	Mn	B		
钴基 Cobalt Base Rod	Co1	55	2.45	30.00	1.00	13.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00	-	OXY or TIG	Φ3.2 Φ4.0 Φ4.8
	Co6	42	1.30	27.00	1.00	4.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00	-		
	Co12	47	1.40	30.00	1.30	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00	-		
	Co21	26	0.30	28.00	1.20		≤3.00	5.50	≤3.00	Bal	≤1.00			
	Co190	58	3.20	26.00	1.00	14.00	≤3.00	≤3.00	≤1.00	Bal	≤1.00	-		
镍基 Nickel Base Rod	Ni60AA	60	0.90	15.00	4.50	-	≤5.00	-	Bal	-	-	-	Φ4.0 Φ4.8	
	Ni50AA	50	0.50	13.00	3.60	-	4.00	2.50	Bal	≤1.25	-	2.50		
	Ni55AA	55	0.60	15.00	4.00	-	3.50	≤3.00	Bal	≤1.00	≤3.00	3.00		

# Electrode

With strong technical strength, various testing equipment and perfect quality assurance system, our company is a supplier of various wear-resistant welding rods and special welding rod. The electrodes provided to the customers have the characteristics of low eccentricity, good coating strength, less spatter and beautiful weld formation. We can supply a full range of cobalt based alloy welding electrodes and provide customers with varieties of surfacing process solutions. Specifications:  $\Phi 2.5\text{mm}-\Phi 5.0\text{mm}$



牌号 Alloy	硬度 HRC	化学成分 Chemical Composition										典型用途 Application
		C	Cr	Si	W	Fe	Mo	Ni	Co	Mn	P	
Co1	52	2.40	30.00	1.00	12.00	≤3.00	≤1.00	≤3.00	Bal	≤1.00		阀座、轴承、刀口等 valve seat inserts, bearing, cutter edge, ect.
Co6	42	1.20	30.00	1.00	4.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00		发动机气门、高温高压阀门、涡轮机叶片 engine valve, high temperature & pressure valves and turbine blade
Co12	46	1.40	30.00	1.00	8.50	≤3.00	≤1.00	≤3.00	Bal	≤1.00		高温高压阀门、锯齿、螺旋推杆等 high temperature and pressure valves, sawteeth, screw flights, ect.
Co21	26	0.30	28.00	1.20		≤3.00	5.50	≤3.00	Bal	≤1.00		涡轮机叶片、阀座、热冲模 turbine blades, valve seat, brass casting die

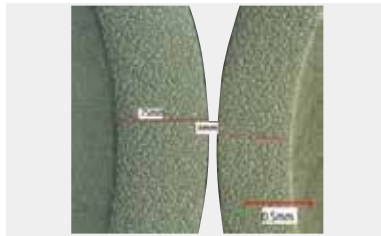
# 3D Printing Powders

With the development of technology, 3D printing is gradually popularized and applied in various industries. 3D printing can achieve high accuracy and high complexity, which cannot be manufactured by the traditional methods. Our company has developed a series of 3D printing powders according to customers' requirements

粉末 Powder	化学成分 Chemical Composition									
	C	Cr	Si	Fe	Mo	Ni	Mn	Co	Ti	其他Others
Fe304	0.03	18.00	0.60	Bal		10.00	0.30			
Fe316L	0.03	17.00	0.80	Bal	2.50	12.00	0.50			
QT450	3.89		2.50	Bal			0.52			
Ni625	0.02	18.50	1.30	4.00	10.00	Bal	0.30			nb;3.5
CoX40	0.80	25.00	0.40	0.80	0.80	10.00	0.30	Bal		W:7.50
CoCrMo	0.25	28.00	0.80		6.00		0.60	Bal		
CoCrWMoW	0.02	24.00	0.75		7.00		0.20	Bal		w:5.00
CoCrW	0.05	28.00	0.90	0.20			0.30	Bal		W:8.50
Ni718	0.05	19.00	0.35	20.00	3.00	Bal	0.30	1.00	1.00	nb:5.00
TC4	0.05			0.10					Bal	Al:6.00 v:4.00

# Components

PROCESSES:  
SLURRY COATING

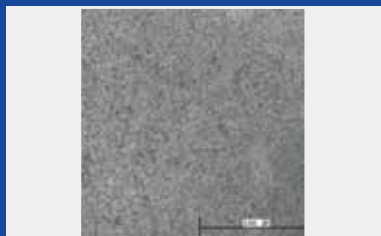


Microstructure (Maximum thickness: 2MM)



INSIDE COATING (Hardness $\geq$ HRC60)

PROCESSES: HIP

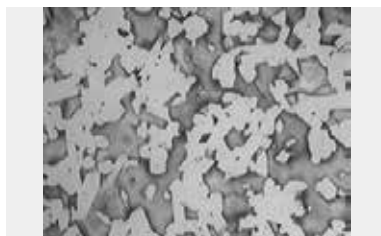


HIP Microstructure 200X



HIP Barrel

PROCESSES: PM

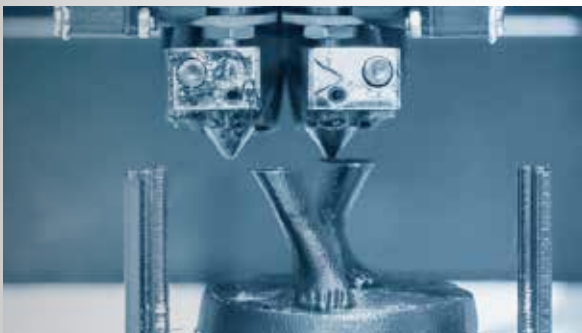


Nickel base + WC(Hardness $\geq$ HRC60)



POWDER COATING

# Application Process



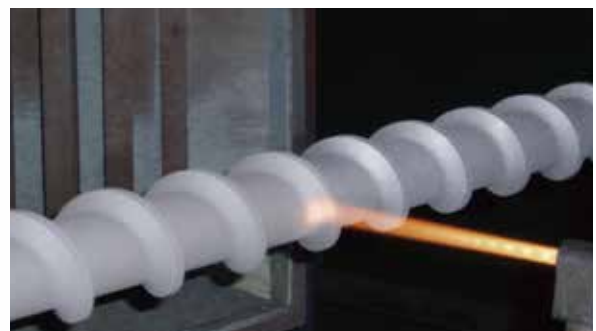
3D PRINTING



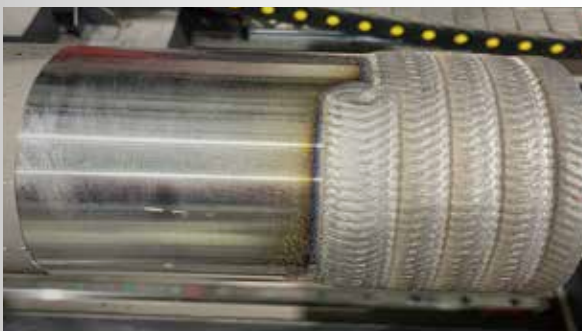
HIP



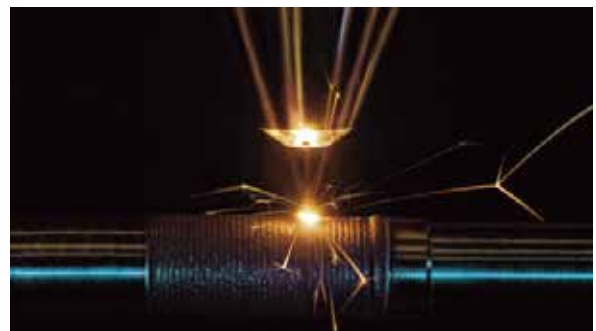
INDUCTION FUSION



THERMAL SPRAYING



PTA



LASER CLADDING

# STABLE PRODUCTION    CONSISTANT QUALITY

ADVANCED EQUIPMENT, PROFESSIONAL TEAM, SCIENTIFIC METHOD

1

Raw material inspection

2

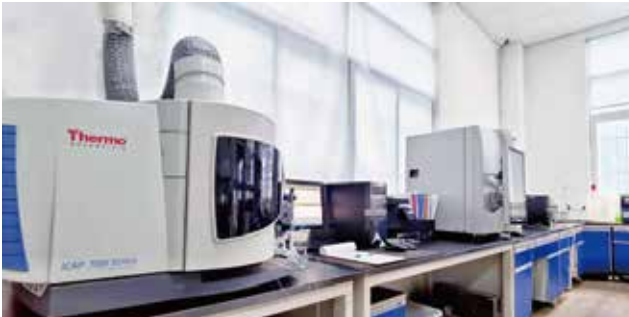
Pre-furnace inspection

3

Semi-Finished inspection

4

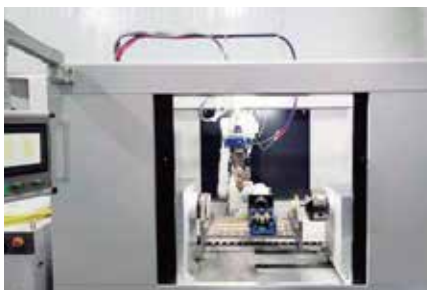
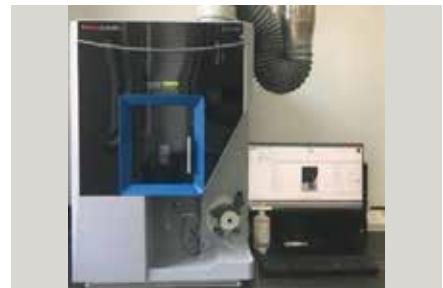
Finished-products inspection



RESEARCH AND DEVELOPMENT CENTER



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