

**Advanced Targets Materials Co., Ltd**

**Your reliable partner for  
Sputtering targets and arcing cathodes!**



**Advanced Targets**

# The application of PVD decorative coatings

PVD technology is widely used in the processing and manufacturing of Household Products, kitchen and bathroom hardware, lamps, marine supplies, jewelry, handicrafts and other decorative products.

PVD技术广泛应用于家居用品、厨卫五金、灯具、船舶用品、珠宝首饰、工艺品等装饰产品的加工制造。

## 装饰性PVD涂层的特性

- 丰富多彩的颜色
- 优异的抗恶劣环境
- 易清洗，不褪色

## Performance of decorative coating

- Various of different color
- Excellent resistance to harsh environment
- Easy to clean and colorfast



# Advantage of PVD decorative coatings

## PVD decorative coatings can ensure that :

- The coated products have metal appearance and uniform color;
- Durable surface, anti-oxidation, anti-corrosion, permanent good appearance under various basic air and direct sunlight environmental conditions;
- Harmless to the environment and avoid chemical poisoning and VOC emission;
- Excellent adhesion - it can bend more than 90 degrees without cracking or peeling (PVD coating holds high adhesion and durability). Other technologies, including electroplating and spraying, can not be compared with it.

## PVD装饰涂层能够保证镀膜产品具有以下特性

1. 金属外观，颜色均匀一致；
2. 耐久的表面，抗氧化，抗腐蚀，在各种基本的空气和直射阳光环境条件下永久保持良好外观；
3. 对环境无害，避免化学中毒和VOC的散发；
4. 卓越的附着力 - 可以折弯90度以上不发生裂化或者剥落（PVD镀膜持有很高附着力和耐久力），其它的技术，包括电镀，喷涂都不能与其相比



## Our targets in decorative coatings • 我司靶材在装饰镀涂层中的应用



Our targets are popular used in those following decorative coatings:

- Household products: chairs and dining tables;
- Kitchenware: such as tableware, faucet;
- Jewelry, such as necklaces, watches
- Lamps, automobile wheels, etc.

And has achieved good cooperation with world-famous brands.

我司靶材广泛应用于以下装饰性涂层：

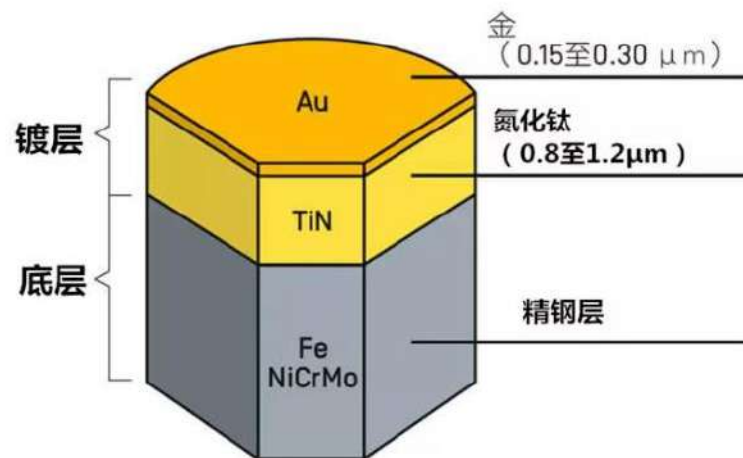
- 家居日用品，如椅子，餐桌；
- 厨卫用品，如餐具，水龙头；
- 珠宝首饰，如项链，手表
- 灯具，汽车轮毂等。

并与世界知名品牌取得了良好的合作。

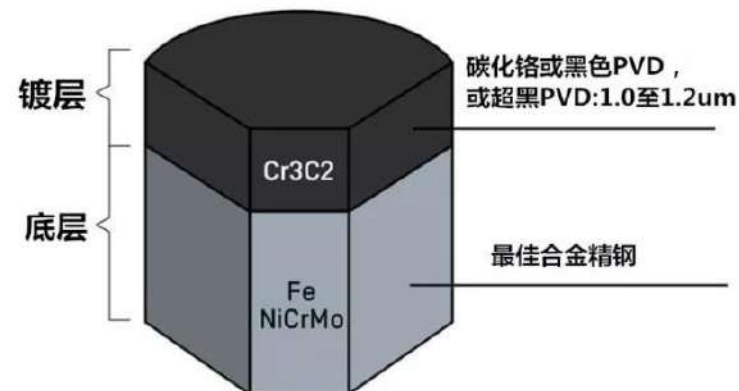


## PVD decorative coatings in watch • 手表领域的PVD装饰镀膜

1. Rolex  
Adventure gold



2. Bvlgari  
Sports black



## Different Materials sputtering targets for decorative coatings:

装饰性涂层中的常见靶材:

### Single alloy

Cr(99.5%),Ti(Gr1,Gr2,Ta-1),Zr(702-99.2%),Cu,

### Binary alloy

TiAl (50/50at%,70/30at%)

### Other OEM targets



## Popular size sputtering targets for decorative coatings:

装饰性涂层中的常见靶材尺寸:

Item Dimension	Cr 99.5%	Cr 99.5%	Ti Gr2	Ti Gr1	TiAl 50/50at%	TiAl 70/30at%	Zr 99.2%
D90*32mm	●		●	●	●	●	●
D100*40mm	●		●	●	●	●	●
D120*15mm	●			●	●	●	
D120*25mm	●		●	●	●	●	●
333*100*8mm	●		●	●		●	●
482*114*12mm	●		●	●	●	●	●
1100*120*12mm	●			●	●		●
1470*114*12mm	●		●	●	●	●	●
1701*132*12mm	●		●	●	●	●	●
ID132.5* OD148.5*L750mm		●					
Process	HIP	Spray	E-beam	E-beam	HIP	HIP	Melting





## Popular size sputtering targets for decorative coatings:

装饰性涂层中的常见靶材尺寸:

Ti- sputtering targtes-99.8% (Gr1)-D100\*40mm



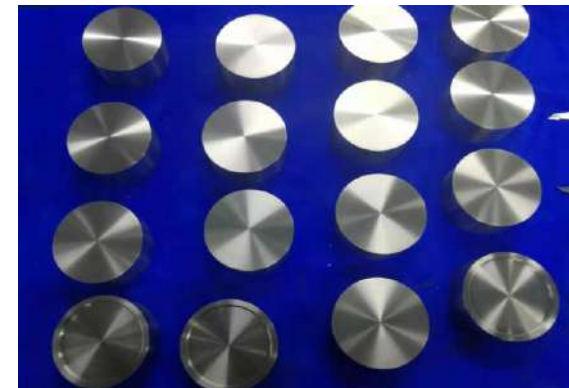


## Popular size sputtering targets for decorative coatings:

装饰性涂层中的常见靶材尺寸:

Ti- sputtering targets-99.8% (Gr1)-D100\*40mm

Cr- sputtering targets-99.5% (Gr1)-D100\*50mm



## Popular size sputtering targets for decorative coatings:

装饰性涂层中的常见靶材尺寸:

sputtering target Plate type (Ti /Cu/Cr)



## Popular size sputtering targets for decorative coatings:

装饰性涂层中的常见靶材尺寸:

Large size tube type sputtering targets



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## Different targets for different color & 不同靶材与不同装饰镀膜颜色

At present, most coating centers realize different colors of coatings by adjusting the input gas and using different material targets.

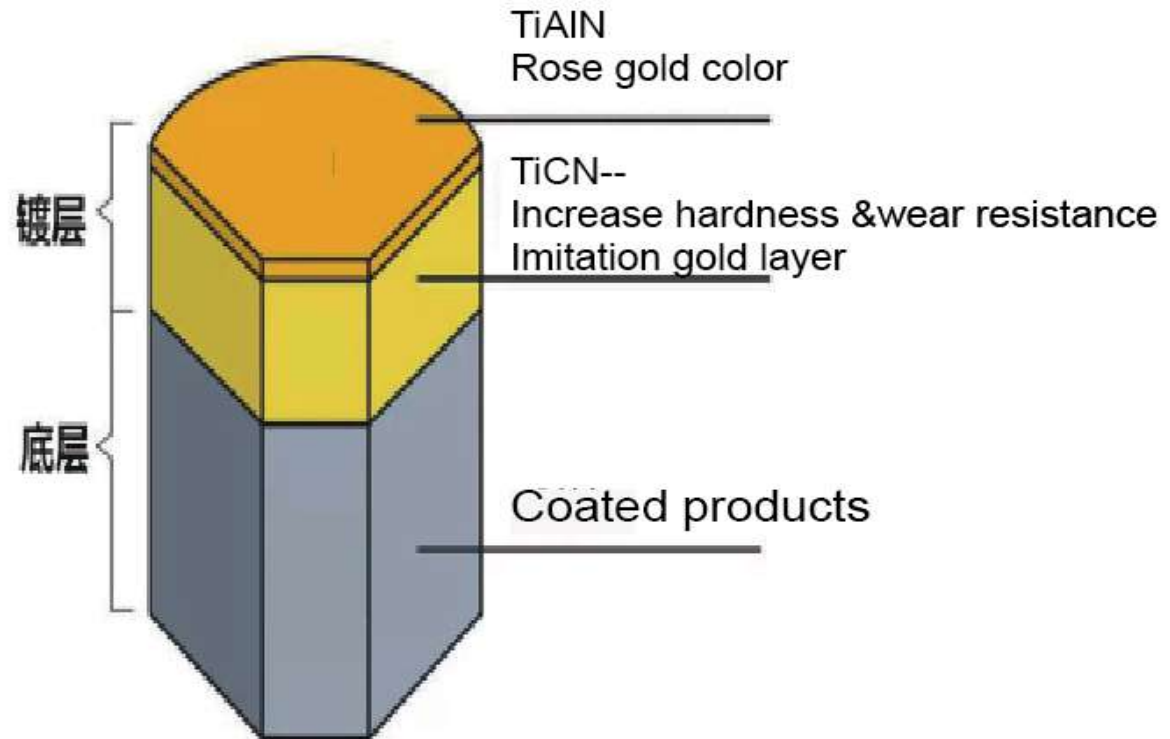
	Color	Nano-hardness [GPa] by Fisher Nanoindenter	Coating thickness [μm]	Coefficient of friction [μ] PoD (at RT, 50% humidity)	Max. service temperature [°C]
1 TiN	Gold	24 - 26	1 - 10	0.4	600
2 TiCN	Grey	36 - 38	1 - 3	0.25	450
3 TiAlN	Violet grey	36 - 38	1 - 5	0.5	700
4 TiAlCN	Red violet	34 - 36	1 - 5	0.25	450
5 AlTiN	Blue grey	36 - 38	1 - 5	0.6	900
6 CrN	Silver	21 - 23	1 - 10	0.5	700
7 CrTiN	Satin silver	28 - 30	1 - 10	0.4	700
8 ZrN	White gold	21 - 23	1 - 5	0.4	550
9 AlCrN	Grey	36 - 38	1 - 5	0.5	900
10 AlTiCrN	Grey	36 - 38	1 - 5	0.5	900
11 ALL4	Grey	36 - 38	1 - 5	0.5	900
12 nACo	Blue violet	39 - 41	1 - 4	0.4	1200
13 nACrCo	Grey	39 - 41	1 - 4	0.5	1100
14 TiXCo3	Copper	42 - 44	1 - 4	0.4	900
15 TiXCo4	Grey	42 - 44	1 - 4	0.4	900
16 PSiX	Red brown	42 - 44	1 - 4	0.4	1100
17 BorAC	Grey	38 - 40	1 - 5	0.5	900
18 BorAX	Copper	42 - 44	1 - 4	0.4	1100
19 TiB2	Satin silver	32 / 38	1 - 5	0.4	600
20 WC/C	Dark grey	15 - 18	1 - 3	0.1 - 0.2	300
21 DLC1: TiCN + a-C:H:Me	Anthracite	36 / 20	1 - 3	0.1 - 0.2	400
22 DLC1: nACrCo + a-C:H:Me	Anthracite	39 / 20	1 - 3	0.1 - 0.2	400
23 DLC2: TiN + a-C:H:Si	Anthracite	> 25	1 - 3	0.1 - 0.2	400
24 DLC2: CrN + a-C:H:Si	Anthracite	> 25	1 - 3	0.1 - 0.2	400
25 DLC2: CrTiN + a-C:H:Si	Anthracite	> 25	1 - 3	0.1 - 0.2	400
26a DLC3: Cr + ta-C/a-C in PL411	From rainbow colors to anthracite	45 - 50	0,3 - 1	0.1	450
26b DLC3: Cr + ta-C/a-C in PL711	Anthracite	> 30	1 - 2	0.1	450
27 nACoX	Dark grey	30 - 32	4 - 10	0.5	1200

### Seven common coating color systems: 七大常见镀膜色系:

1. IP 玫瑰金  
Rose gold, pink gold, red gold, Russian gold
2. IP 金色  
Gold, 24k,
3. 仿金色  
Imitation gold series, Similar gold
4. 银灰色系  
Grey, Silver, Metal color
5. 黑色系  
Black color, night color, Dark color
6. 蓝色系  
Blue color, Sky color
7. 紫色系  
purple, Lavender



## More about red gold color coating & 玫瑰金涂层引申



Some other rare elements are added to achieve different colors

or to change the properties of the coating。

可以通过添加一些其它的稀有元素，用来达到不同的色调或用来改变镀层的性能，



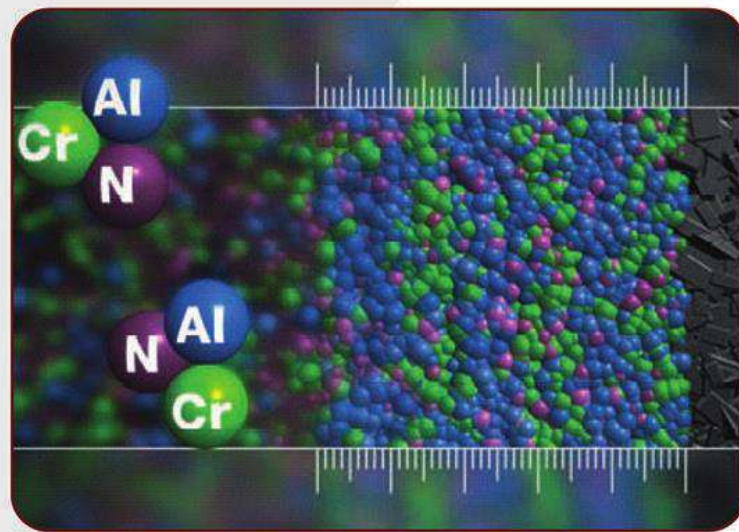
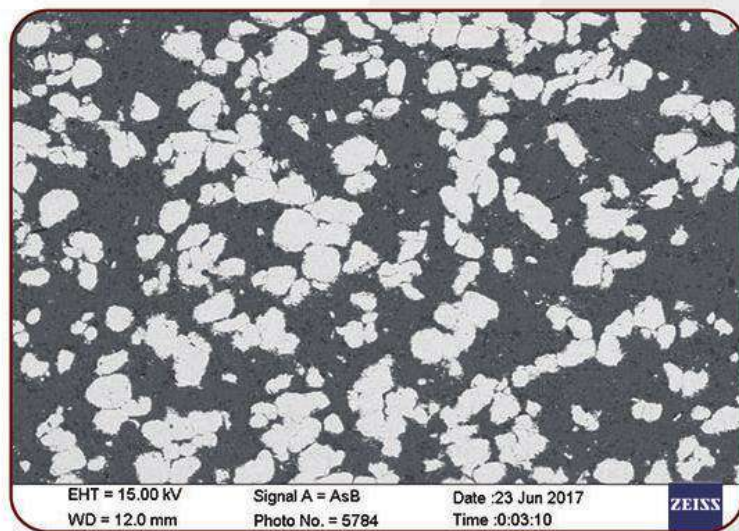
## Our strength

Ti&TiAl&Cr sputtering targets and arcing cathodes are mainly used in those decorative coating. Form a special surface color or increase the oxidation resistance and corrosiveness of the product. Advanced Targets Materials Co.,Ltd, with our years of experience, we can promise all clients:

- Smooth surface without pore, scratch and other imperfection
- Grinding or lathing edge, no cutting marks
- Unbeatable level of material purity & High ductility
- Homogeneous micro structure
- Laser marking for your special item with name, brand, purity size and so on

钛、钛铝、铬溅射靶主要用于装饰涂层，以形成特殊的表面颜色或增加产品的抗氧化性和腐蚀性。

凭借多年的经验，我们可以向所有客户承诺：所有靶材表面光滑，无气孔、划痕等缺陷；高纯度，高延展性；均匀维管组织结构，同时为您的特殊物品进行激光标记，包括名称、品牌、纯度、尺寸等，以便进行整个产品流程追踪



# Titanium (Ti) Targets specification

Item:	Purity wt%	Gas impurity, Ppm, ≤				Metal impurity, ppm, ≤
		C	N	O	H	Fe
Ti	≥99.8%	300	300	1000	150	1000
Ti Ta1&Gr1,Gr2	≥99.7%	800	300	1800	150	2000

编号 No.:20211105386

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中国认可  
国际互认  
检测  
TESTING  
CNAS L0642



## 检验检测报告 INSPECTION & TESTREPORT

编号 No.: 20211105386

检验类别 Testing Category: 委托检测 Entrusted test

委托单位: 河北宏靶科技有限公司 Advanced Targets Materials Co., Ltd

单位地址: /

联系电话 Telephone: 17611262957

样品名称: Ti

样品状态: 样屑 Chips

规格型号: /

页码 Page: 1/2

样品数量: 1

牌号: /

### 1、测试项目 Test Item: 化学成分分析 Chemical composition analysis

测试方法 Test Method: C: GB/T 4698.14-2011; Fe: GB/T 4698.2-2011; N, O: GB/T 4698.7-2011;

S\*: 金属中碳硫测定方法 Determination of carbon and sulfur in metals

测试地点 Test Place: 北京市怀柔区雁栖经济开发区兴科东大街 11 号

No.11,Xingke East Street, Yanqi Economic Development Area, Huairou District, Beijing

样品编号 Registered No. of the Samples	样品原编号 No. of the Samples from Customer	C(w%)	N(w%)	O(w%)	S(w%)	Fe(w%)
20211105386 001	Ti	<0.0020	<0.0050	0.036	<0.0020	0.092
备注 Note		/				





## Other relevant knowledge about titanium targets

关于钛靶材的其他相关知识：



**Data 1: chemical composition of Titanium target**

Item:	N ≤	C ≤	H ≤	Fe ≤	O ≤	Al ≤	V ≤
GR1	0.03	0.08	0.05	0.2	0.18		
GR2	0.03	0.08	0.015	0.3	0.25		
GR3	0.03	0.08	0.015	0.3	0.35		
GR4	0.05	0.08	0.015	0.5	0.4		
GR5	0.05	0.08	0.015	0.4	0.2	5.5-6.75	3.5-4.5
GR6	0.03	0.08	0.015	0.3	0.2	4.0-4.6	
GR7	0.03	0.08	0.015	0.5	0.25		
GR9	0.03	0.08	0.015	0.25	0.15	2.5-3.5	2.0-3.0
GR11	0.03	0.08	0.015	0.2	0.18		
GR12	0.03	0.08	0.015	0.3	0.25		

**Date sheet 1: Purity grades in different countries**

Chemical formula	China	America	Russia	Japan
Industrial pure titanium	TA1	GR1	BT1-0	TP270
Industrial pure titanium	TA1-1	GR1	BT1-100	
Industrial pure titanium	TA2	GR2		TP340
Industrial pure titanium	TA3	GR3		TP450
Industrial pure titanium	TA4	GR4		TP550
Ti-5AL-2.5Sn	TA7	GR6	BT5-1	TP5250
Ti-0.05Pd	TA8	GR16		
Ti-0.05Pd	TA8-1	GR17		
Ti-0.2Pd	TA9	GR7		TP340pb
Ti-0.2Pd	TA9-1	GR11		
Ti-0.3Mo-0.8Ni	TA10	GR12		
Ti-BAL-1Mo-1V	TA11	Ti-811		
Ti-6.5AL-1Mo-1V-2Zr	TA15			



# Chromium(Cr) targets spec.

Item:	Purity wt%	Gas impurity, Ppm, ≤				Metal impurity, ppm, ≤		
		C	N	O	S	Fe	Al	Si
Cr	≥99.5%	200	500	1500	100	1600	1200	2000



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检测  
TESTING  
CNAS L0642

## 检验检测报告 INSPECTION & TESTREPORT

编号 No.: 20211105377

页码 Page: 1/2

检验类别 Testing Category: 委托检测 Entrusted test

委托单位: 河北宏靶科技有限公司 Advanced Targets Materials Co., Ltd  
Customer

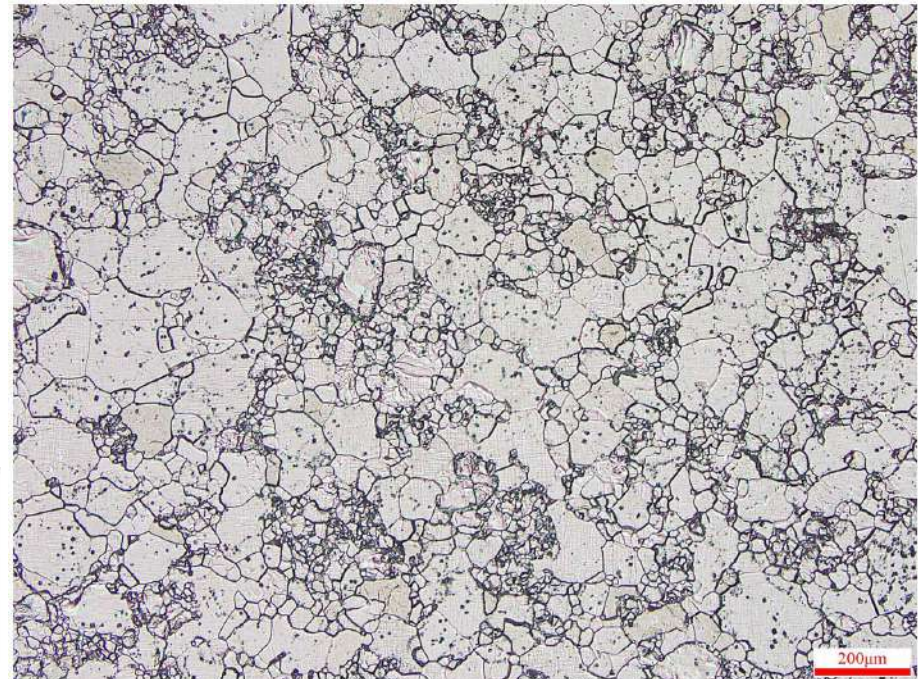
单位地址: /  
Address

联系电话 Telephone: 17611262957

样品名称: Cr-99.5%  
Sample Description

样品数量: 1  
Sample Quantity

样品编号 Registered No. of the Samples	样品原编号 No. of the Samples from Customer	Fe(wt%)	Si(wt%)	C(wt%)	N(wt%)	O(wt%)
20211105377 001	2108E5-3M	0.14	0.083	0.0028	0.010	0.090
样品编号 Registered No. of the Samples	样品原编号 No. of the Samples from Customer	S(wt%)	Al(wt%)			
20211105377 001	2108E5-3M	<0.0020	0.040			
备注 Note	/					



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# TiAl alloy targets spec.



## 检验检测报告

### INSPECTION & TESTREPORT

编号 No.: 20211105371

页码 Page: 1/2

检验类别 Testing Category: 委托检测 Entrusted test

委托单位: 河北宏靶科技有限公司 Advanced Targets Materials Co., Ltd

单位地址: /

Address

联系电话 Telephone: 3701202997

样品名称: TiAl

Sample Description

样品状态: /

样品数量: 1

Sample Quantity

批号: /

编号 No.: 20211105371

页码 Page: 2/2



#### 1. 测试项目 Test Item: 化学成分分析 Chemical composition analysis

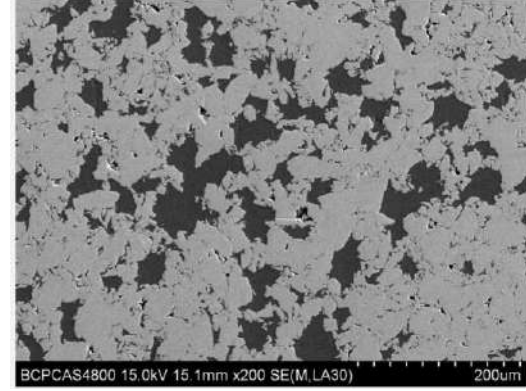
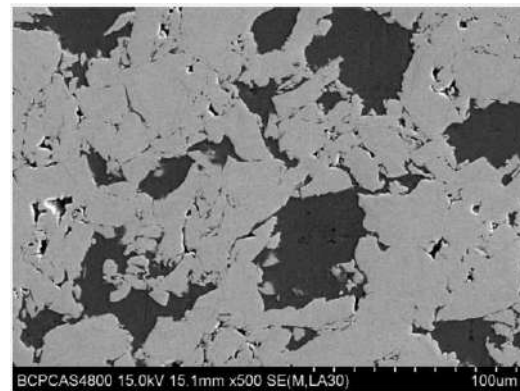
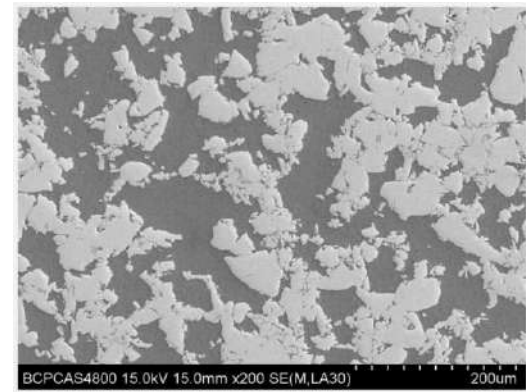
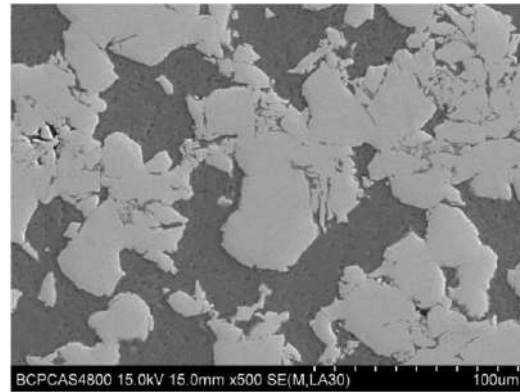
测试方法 Test Method: C\*, S\*: 金属中碳硫测定方法 Determination of carbon and sulfur in metals

Fe\*, Si\*: ICP-AES; N, O: GBT 4698.7-2011; Ti\*: 滴定法 Titration

测试地点 Test Place: 北京市怀柔区雁栖经济开发区兴科东大街 11 号

No.11, Xingke East Street, Yanqi Economic Development Area, Huairou District, Beijing

样品编号 Registered No. of the Samples	样品原编号 No. of the Samples from Customer	Ti(wt%)	Fe(wt%)	Si(wt%)	C(wt%)	S(wt%)
20211105371-001	2107TA19.4-1M	81.18	0.030	0.0098	0.032	0.0075
样品编号 Registered No. of the Samples	样品原编号 No. of the Samples from Customer	O(wt%)	S(wt%)			
20211105371-001	2107TA19.4-1M	0.37	<0.0050			
备注 Note		2/2				



Composition	Purity wt%	Main content (wt%)		Gas impurity (ppm)				Metal impurity (ppm)	
		Ti	Al	C	N	O	S	Fe	Si
TiAl 70/30at%		X±1wt%	Balance	300	300	4500	50	600	400
TiAl 50/50at%		X±1wt%	Balance	300	300	4000	50	800	400



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# Our certification & 公司认证

宏靶科技，让您的镀膜更出众！



Choose Advanced Targets to strengthen your advantages in hard coatings!

# Your reliable partner for sputtering targets and arcing cathodes!

**Contact:** Frank chen, 8613522719901, frank\_chen@atargets.com

**website:** [www.Atargets.com](http://www.Atargets.com)

**Factory:** No.9 Keyuan road, High-tech business development zone, Zhuozhou, Hebei.

**Beijing Office:** Tecent Marker Space A425, Huilongguan East Road No.338.  
Changping District, Beijing

