

제품소개서

PRODUCT SPECIFICATION

製品紹介書

Tantalum/Niobium Products

Hyun Rare Metal Refine

대한민국 창조경제혁신센터 보육기업

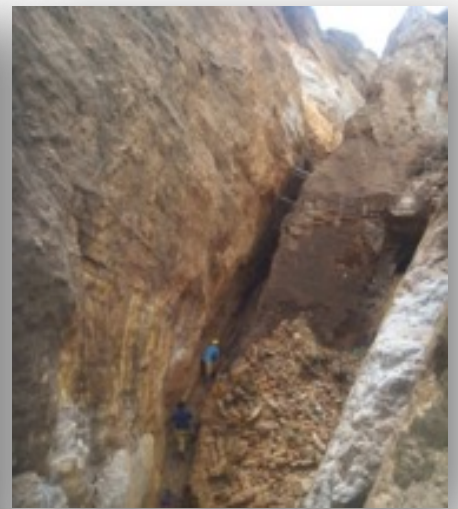
大韓民國の創造經濟の革新センターの育成企業

HRMR is a protégé of the Creative Economy Innovation Center of South Korea.

긴 여정 끝에 미래를 열어 갑니다.
인간을 사랑하고 기술을 존중합니다.
資源의 유한함과 創意의 무한함을 소중히 생각합니다.
HRMR이 소유한 광산에서 채굴한 탄탈원석으로
제조한 탄탈륨/니오븀 제품입니다.
최고의 제품을 안정적으로 공급하겠습니다.

長い旅の末、未来を開いて行きます、
人間を愛し、技術を大事にします、
資源の有限さと創意の限りなさを重く考えます、
HRMRの所有の鉱山から採掘されたタンタル原石で製造した
タンタリウム/ニオブムの製品でございます、
最高の製品を安定的に供給させていただきます、

HRMR is finally ready to lead the future after a long endeavor.
We promote the prosperity of the world and its unrelenting innovation.
Resources are scarce, but we cherish the creativity of human mind.
HRMR's world class tantalum/niobium products are guaranteed to be a
reliable long term supply.



제품리스트 製品リスト

No.	Category	Product
1	Compound	High-Purity Tantalum Pentoxide Ta ₂ O ₅
2		Common Grade Tantalum Pentoxide Ta ₂ O ₅
3		Tantalum Carbide TaC
4		Tantalum & Niobium Carbide (Ta,Nb)C
5		Lithium Niobite Multiple Crystal & Lithum Tantalite Multiple Cristal
6	Ta Powder	High-capacitance-tantalum powder series
7		Medium-voltage tantalum powder series
8		High-voltage-tantalum powder series
9	Metal	Ingots
10		Foil, Sheet and Plate
11		Strip and Coil
12		Target
13		Rod and Bar
14		Wire
15		Tube
16		Spinneret Tantalum sheet
17		Tantalum Electrode of Copper Core
18		Abnormal Shape Products
19	Mineral Trade	Mineral Ore Trade



High- Purity Tantalum Pentoxide Ta2O5



HPTO-2 used for LT, **HPTO-3** used for optical glass
Appearance: White powder.
Application: For Lithium Tantalite single crystal and additive in special optical glass.
Packing: Packed in iron drums of 25~50Kgs net each with inner sealed double plastic bags of 25KGS net each.

Ta2O5 99.99%min (Excluding Nb F and L.O.I)

Impurity Contained (ppm max)			
Grade	HTO-1	HTO-2	HTO-3
Ta2O5	>99.995%	99.99%	99.99%
Al	1	1	1
As	0.1	1	1
B	1	1	1
Bi	0.5	2	2
Ca	1	5	5
Cl	5	10	10
Co	0.1	1	1
Cr	1	3	3
Cu	1	3	3
F	15	50	75
Fe	1	3	3
K	1	5	5
Mg	1	2	2
Mn	0.5	2	2
Mo	0.5	2	2
Na	3	5	5
Nb	5	10	10
Ni	0.5	3	3
Pb	0.5	3	3
Sb	3	5	10
Si	3	10	15
Sn	1	1	1
Ti	1	1	1
V	0.5	1	1
W	0.2	3	3
Zr	0.5	1	1
L.O.I	0.10%	0.10%	0.10%
SIZE	-60mesh	-60mesh	-60mesh

Common Grade Tantalum Pentoxide Ta2O5



Appearance: White powder.
Application: For Tantalum metal billet and powder, Tantalum Carbide, Ceramic capacitor and additive in special optical glass.
Packing: Packed in iron and plastic drums of 25~50Kgs net each with inner sealed double plastic bags of 25KGS net each.

Ta2O5 99.%~99.9% min (Excluding Nb F and L.O.I)

Impurity Contained (ppm max)		
Grade	CTO-1	CTO-2
Ta2O5	99.90%	99.0%~99.5%
Nb	0.05	0.05
Ti	0.001	0.002
W	0.001	0.002
Mo	0.001	0.002
Cr	0.001	0.002
Mn	0.001	0.002
Fe	0.005	0.01
Ni	0.001	0.002
Cu	0.001	0.002
Al	0.001	0.002
Si	0.005	0.01
F	0.05	0.1
Pb	0.001	0.002
Sn	0.002	0.005
Ca	0.002	0.005
Mg	0.001	0.002
Zr	0.001	0.002
C	0.005	0.008
S	0.003	0.006

Tantalum Carbide **TaC**

TaC 99.6%



Appearance: Yellow Brown powder.
Application: For hard alloys additive.
Packing: Packet in iron drums of 25~100 KGS net each with inner sealed bags of 5KGS or 25KGS net each.

Impurity Contained (wt% max)		
Grade	TaC-1	TaC-2
TAC	≥99.6	≥99.0
Carbon-Total	≥6.2	≥6.2
Carbon-Free	0.1	0.15
N	0.05	0.05
Al	0.005	0.005
Ca	0.005	0.005
Fe	0.05	0.1
K	0.003	0.005
Na	0.003	0.005
Nb	0.3	1
Si	0.008	0.01
Ti	0.008	0.015
O	0.1~0.25	0.1~0.25
FSSS Size	0.8~3μ m	≤3μ m

Tantalum & Niobium Carbide **(Ta,Nb)C**



Appearance: Yellow- Brown.
Application: For hard alloys additive.
Packing: Packed in iron drums of 25KGS~100KGS net each inner sealed bags of 5 or 25KGS net each.

Impurity Contained (wt%max)					
Grade	TNC9 1	TN C82	TNC7 3	TNC6 4	TNC5 5
TaC:NbC	9 : 1	8 : 2	7 : 3	6 : 4	5 : 5
Ta (min)	84	74.4	65.4	56	46.7
Nb (max)	9	17.7	26.6	35.4	44.2
Carbon-total (min)	6.6	7.16	7.6	8.12	8.6
Carbon-free (max)	0.15				
N	0.5				
Al	0.005				
Ca	0.005				
Fe	0.1				
K	0.005				
Na	0.005				
Si	0.01				
Ti	0.01				
O	0.25				
Ti	0.01				
FSSS Size	0.8~3μm				

LiTaO3 and LiNbO3

LiTaO3

Ta ₂ O ₅	93.0~94.0
Li ₂ O	6.0~7.0
Impurity Contained (ppm max)	
K	2
Na	5
Fe	3
Zr	1
Nb	5
Al	3
F	15
Ca	3
W	5
Mo	1
Sb	4
Loss on Ignition	0.1%
Curie Temp	603±2°C

LiTaO3 and LiNbO3 are widely used in surface acoustic wave filters, interdigital transducers, optical modulators, electro-optical switches, pyroelectric IR detectors, etc.

LiTaO3 と LiNbO3は 表面音波のフィルター、櫛目變換器、音響光學變調器、電子光學スイッチ及び焦電氣 IRの探知器などに広く使われる



LiNbO3

Ta ₂ O ₅	93.0~94.0
Li ₂ O	6.0~7.0
Impurity Contained (ppm max)	
K	2
Na	5
Fe	3
Zr	1
Nb	5
Al	3
F	15
Ca	3
W	5
Mo	1
Sb	4
Loss on Ignition	0.1%
Curie Temp	603±2°C

Appearance: In crystalline with white color.

Application: For single crystals producing.

Packing: Packed in iron drums of ≤50KGS net each with inner sealed double plastic bags of 25KGS net each.

Capacitor Grade Ta Powder 콘덴서급의 tantalum powder



High-capacitance-tantalum powder series

Special requirements to be agreed upon
By the supplier and buyer

80,000~200,000 μ FV/g 파우더는
2017년 상반기 출하 예정

Electrical Properties



Grade	Capacitance(+10%-5%) (μ FV/g)	Dc leakage (nA/ μ FV)	Dissipation Factor{ % }	Breakdown Voltage { V }
HRMR16-500	50000	≤ 0.6	≤ 25	≥ 120
HRMR16-400	40000	≤ 0.4	≤ 20	≥ 120
HRMR16-300	30000	≤ 0.3	≤ 20	≥ 120
HRMR16-260	26000	≤ 0.35	≤ 20	≥ 120
HRMR16-220	22000	≤ 0.35	≤ 20	≥ 120
HRMR25-150	15000	≤ 0.4	≤ 15	≥ 150
HRMR25-120	12000	≤ 0.4	≤ 15	≥ 150

Chemical Compositions (Maximum values,ppm)

Grade	O	C	N	H	Fe	Ni	Cr	Si	Ti	Nb	Na	K	W	Mo
HRMR16-500	3100	50	600	100	30	15	15	20	5	10	10	30	15	5
HRMR16-400	2800	50	300	100	30	15	15	20	5	10	10	25	15	5
HRMR16-300	2500	50	300	100	30	15	15	20	5	10	10	20	15	5
HRMR16-260	2300	50	300	100	30	15	15	20	5	10	10	20	15	5
HRMR16-220	2200	50	180	100	30	15	15	20	5	10	10	15	15	5
HRMR25-150	2200	50	120	80	30	15	15	20	5	10	10	15	15	5
HRMR25-120	2200	50	120	80	30	15	15	20	5	10	10	15	15	5

Physical Properties

Grade	Bulk Density(g/cm ³)	Average Fisher Size(μ m)	Particle Size Distribution (-325mesh%)
HRMR16-500	1.5-2.8	3.0-4.5	≤ 35
HRMR16-400	1.5-2.5	3.0-4.5	≤ 35
HRMR16-300	1.5-2.5	3.0-4.5	≤ 35
HRMR16-260	1.5-2.5	3.0-4.5	≤ 35
HRMR16-220	1.5-2.5	3.5-5.0	≤ 35
HRMR25-150	2.5-4.5	4.0-7.0	≤ 35
HRMR25-120	2.5-4.5	4.0-7.0	≤ 35

Capacitor Grade Ta Powder コンデンサー級のタンタリウム粉



Medium-voltage tantalum powder series

Special requirements to be agreed upon
By the supplier and buyer



Electrical Properties

Grade	Capacitance(+10%-5%) (μ FV/g)	Dc leakage (nA/ μ FV)	Dissipation Factor{ % }	Breakdown Voltage { V }
HRMR35-100	10000	≤ 0.4	≤ 12	≥ 190
HRMR35- 80	8000	≤ 0.4	≤ 12	≥ 190
HRMR40- 60	6000	≤ 0.4	≤ 10	≥ 240
HRMR40- 45	4500	≤ 0.4	≤ 10	≥ 240
HRMR40- 42	4200	≤ 0.4	≤ 8	≥ 240

Chemical Compositions (Maximum values,ppm)

Grade	O	C	N	H	Fe	Ni	Cr	Si	Ti	Nb	Na	K	W	Mo
HRMR35-100	2200	50	100	30	15	15	20	5	50	10	10	20	20	10
HRMR35- 80	2100	50	100	30	15	15	20	5	50	10	10	20	20	10
HRMR40- 60	1800	50	80	25	15	15	20	5	50	10	10	20	20	10
HRMR40- 45	1800	50	80	25	15	15	20	5	50	10	10	20	20	10
HRMR40- 42	1700	50	70	25	15	15	20	5	50	10	10	20	20	10

Physical Properties

Grade	Bulk Density(g/cm ³)	Average Fisher Size(μ m)	Particle Size Distribution (-325mesh%)
HRMR35-100	1.5-3.0	2.5-4.5	≤ 30
HRMR35- 80	1.5-3.5	4.0-9.0	≤ 30
HRMR40- 60	2.0-4.0	4.0-9.0	≤ 30
HRMR40- 45	2.0-4.5	4.5-9.5	≤ 30
HRMR40- 42	2.0-5.5	5.0-10.0	≤ 30

Capacitor Grade Ta Powder コンデンサー級のタンタリウム粉



High-voltage-tantalum powder series

Special requirements to be agreed upon
By the supplier and buyer



Electrical Properties

Grade	Capacitance(+10%-5%) (μ FV/g)	Dc leakage (nA/ μ FV)	Dissipation Factor{ % }	Breakdown Voltage { V }
HRMR50-50	5000	≤ 0.6	≤ 6	≥ 255
HRMR50-40	4000	≤ 0.6	≤ 6	≥ 260
HRMR50-35	3500	≤ 0.6	≤ 6	≥ 270
HRMR63-40	4000	≤ 0.7	≤ 6	≥ 300
HRMR63-35	3500	≤ 0.7	≤ 6	≥ 300
HRMR63-30	3000	≤ 0.7	≤ 5	≥ 300
HRMR63-28	2800	≤ 0.7	≤ 5	≥ 300
HRMR63-25	2500	≤ 0.7	≤ 4	≥ 300
HRMR63-23	2300	≤ 0.7	≤ 4	≥ 300
HRMR63-20	2000	≤ 0.7	≤ 3	≥ 300
HRMR63-15	1500	≤ 0.7	≤ 3	≥ 300
HRMR63-10	1000	≤ 0.7	≤ 3	≥ 300

Chemical Compositions (Maximum values,ppm)

Grade	O	C	N	H	Fe	Ni	Cr	Si	Ti	Nb	Na	K	W	Mo
HRMR50-50	1700	60	50	40	15	30	30	10	30	10	15	5	5	5
HRMR50-40	1600	60	50	30	10	30	30	10	30	10	15	5	5	5
HRMR50-35	1600	60	50	30	15	30	30	10	30	10	15	5	5	5
HRMR63-40	1500	60	50	35	15	30	30	10	30	10	15	5	5	5
HRMR63-35	1500	60	50	30	15	30	30	10	30	10	15	5	5	5
HRMR63-30	1500	40	50	20	10	20	20	10	30	10	15	5	5	5
HRMR63-28	1400	40	40	20	10	20	20	10	30	10	15	5	5	5
HRMR63-25	1400	40	35	20	10	20	20	10	30	10	15	5	5	5
HRMR63-23	1300	40	35	15	10	20	20	5	30	10	15	5	5	5
HRMR63-20	1200	40	30	15	10	20	20	5	30	10	15	5	5	5
HRMR63-15	1000	40	25	15	10	20	20	5	30	10	15	5	5	5
HRMR63-10	1000	40	25	15	10	20	20	5	30	10	15	5	5	5

Physical Properties

Grade	Bulk Density(g/cm ³)	Average Fisher Size(μ m)
HRMR50-50	2.0~2.8	5.0~8.0
HRMR50-40	3.5~4.5	7.5~11.0
HRMR50-35	3.5~4.5	7.5~11.0
HRMR63-40	3.5~4.5	6.0~10.0
HRMR63-35	3.5~4.5	6.5~12.0
HRMR63-30	3.5~5.0	6.5~11.0
HRMR63-28	4.0~5.0	7.0~11.0
HRMR63-25	4.0~6.0	7.0~12.0
HRMR63-23	4.0~6.0	7.0~12.0
HRMR63-20	4.0~6.5	8.0~13,0
HRMR63-15	4.0~6.5	9.0~14.0
HRMR63-10	4.0~8.5	10.0~20.0

Material list

*Tantalum Products

Purity: 99%,99.9%,99.95%,99.99%,99.995%

*Niobium Products

purity: 99%,99.9%,99.95%

*Tantalum and Tungsten Alloy Products

Ta-2.5%W Alloy,Ta-7.5%W Alloy,Ta-10%W Alloy

*Tantalum and Niobium Alloy Products

TaNb3%,TaNb20%,TaNb30%,TaNb40%,TaNb50%

*Niobium and 1%Zirconium Alloy Products

Manufacturing Standard

- 1.ASTM Standard (newest version)
- 2.GB/T Chinese Standard

Others

Any other technical parameters and detailed requirement of products,
Please email us or call us.

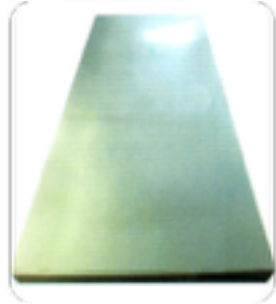
Special requirements to agreed on by the supplier and buyer of negotiations.





Ingots

Tantalum and Tantalum Alloy Ingot: Dia<=190mm, Weight<=700Kgs
Niobium and Niobium Alloy: Dia.<=240mm, Weight<=580Kgs
Length<=1500mm



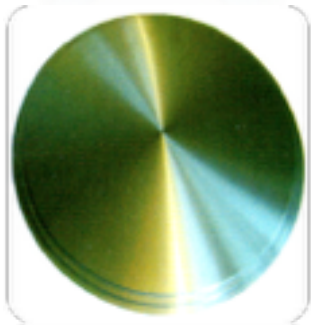
Foil, Sheet and Plate

Size	Thickness (mm)	Width (mm)	Length (mm)
Foil	0.03-0.07	5-300	≥50
Sheet	0.07-0.5	30-700	30-2000
Plate	0.5-1.5	50-1000	50-3000
Board	≤1.5	50-1500	50-3000



Strip and Coil

Thickness ≥0.03mm *Width 5-300mm x L



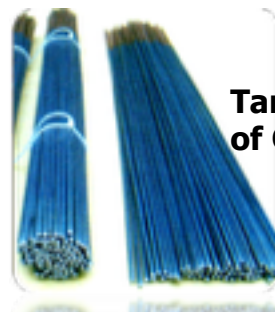
Target

Circular targets: Diameter 25-600mm *Thickness 3-28mm
Rectangular targets :
Thickness 1-20mm *Width 10-1000mm *Length 200-2000mm

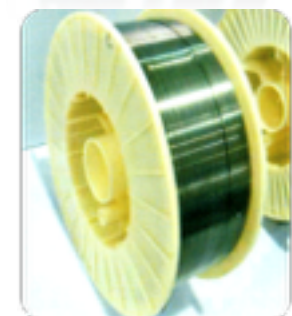


Rod and Bar

Diameter: $\varnothing 3-120\text{mm}$



Tantalum Electrode of Copper Core



Wire

Diameter: $\varnothing \geq 0.25\text{mm}$
in coil or in straight



Abnormal Shape Products

Screw, Nut, Bolt: $\geq M3$
Crucible, Flanged tube, Circle
Other products according to the drawing



Tube

Diameter: $\varnothing 2.0-100\text{mm}$
Thickness: $0.2-10\text{mm}$
Length: $5-12000\text{mm}$



Spinneret Tantalum sheet



- **Ta2O5 Ore Ta2O5 鉍物**
Ta2O5 : minimum 30%
Nb2O5: minimum 15%
U3O8% + ThO2%: 0. 5% maximum
- **Nb2O5 Ore Nb2O5 鉍物**
Nb2O5 +Ta2O5 : minimum 60%
- **Tungsten Ore Tungsten鉍物**
WO3: minimum 55%
- **Tin Ore Tin 鉍物**
Sn: minimum 55%

원산지: East Africa

납 기: 80일

포 장: 드럼통

기 타: EICC 증빙서류 Full set 제공

原產地: East Africa

納 期: 80日

包 裝: ドラム缶

その他: EICC의 證據書類를 Full set提供

Country of Origin: East Africa

Delivery Dates: Within Business 80 days

Packaging: Drums

Full documentation issued by EICC to be provided

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