

# 不銹鋼過濾金屬砂

## STAINLESS STEEL FILTER METAL SAND



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台灣電能股份有限公司  
TAIWAN ENERGY CORP.

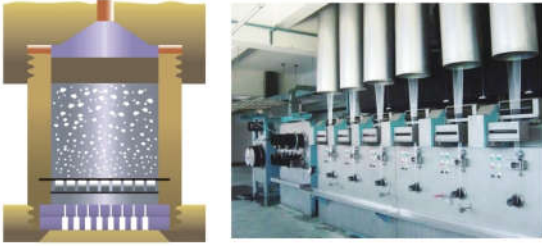
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## 製絲過濾用

融紡之過濾材以往採用矽砂、氧化鋁砂、等。目前為提高效率及生產更高品質纖維，均改用形狀極不規則之不銹鋼金屬砂。



### ●不銹鋼金屬砂的特性：

- 1.對高分子聚合物具耐蝕性**  
高鉻系金屬砂表面披覆氧化鉻膜，對於熱熔融之高分子聚合物具有良好之耐蝕性。
- 2.孔隙度高**  
極不規則的金屬砂孔隙度可達70~80%，遠高於矽砂，過濾雜質能力強，濾壓低、壓升速率慢(約矽砂的1/3~1/5)，pack使用壽命長。
- 3.剪切能力高**  
金屬砂有極不規則之銳角，對熱熔高分子聚合物具有過濾、剪切及除去微細凝膠(micro gels)的能力，(圓滑的矽砂、金屬網等無剪切能力)，因此產出之原絲強度高、品質好，可防止channeling現象發生。
- 4.熱傳導性佳**  
聚合物通過濾材剪切時會產生熱，剪切熱會在局部停留累積，金屬砂具有良好的熱傳導性(約矽砂4倍餘)，可掌控聚合物溫度，適用於高速紡絲。
- 5.具高抗壓性**  
金屬砂與矽砂同具有良好的抗壓性，但矽砂不可壓縮，金屬砂具有良好壓縮性，平均使用壽命可達矽砂2~3倍，為化纖紡絲最佳之濾材。
- 6.精確粒度分佈**  
金屬砂以水噴霧法製作，製程再現性高，可得到穩定的粒度分佈。

## 燒結過濾器用

本公司生產的不銹鋼粉末為極不規則形，成型性高，可搭配各類型的壓機，壓製成平板，圓盤或圓筒……等各種形狀的生胚。經高溫燒結後，具有能高抗壓力、密度低、孔隙率高的特性，極適合作為過濾效果佳，使用壽命長的粉末燒結過濾器。材質選用TE-316L鎳鉻鉬系的不銹鋼粉，更兼具優異的耐蝕性。我們亦可篩出分多種不同細微性規格的粉末，來滿足各種過濾精度的需求。

## For Sintering Filters

TE-316L is high Chromium-Nickel alloy steel and that is very strong and good at corrosion resistance. As sintered filters require high porosity and high corrosion resistance, TE-316L powder with irregular shape will be the most suitable choice to produce high porosity filter by sintering after compacting into shapes as sheet, disc, or cylinder. In order to meet various filtration precision requirements, we have various particle size of filter powder for your selections.

## For Polymer Filtration

In order to increase the production efficiency and better fiber quality, chemical fiber mills nowadays are using irregular shaped metal sand as filter medium in the fiber making process (to replace with silica sand and aluminum oxide.)



### ● Characteristics of Stainless Steel Filter Metal Sand:

#### 1. Inert to Polymers

High-chromium alloy stainless steel powder is inert to all polymers due to the protective chromium oxide coated on the particle surface.

#### 2. High Porosity Rate

The porosity rate of our metal sand is as high as 70-80%, which can easily capture more foreign bodies, decrease the pressure rising rate, and increase the pack life of spinneret.

#### 3. High Shearing Ability

Our metal sand powder has very sharp, strong, and irregular edges, which is very good for filtering, shearing, and stripping fine micro gels from melt polymer. As silica sand doesn't come with such edges, fiber produced with our metal sand is stronger, and better in quality.

#### 4. High Thermal Conductivity

Lots of heat will be generated when polymer is passing through the spin pack, and will be accumulated at the area. As metal sand has better heat conductivity (than silica sand for 4 times more), it can effectively remove the heat for better temperature control, and it is a perfect solution for high-speed spinning.

#### 5. Resistance to Compaction

Although both of metal sand and silica sand have good resistance to compaction, metal sand is good at compressibility while silica sand is not compressible. Using our metal sand can extend the pack life for 2-3 times than silica sand, and that makes our metal sand the best filter media for the spinneret.

#### 6. Precise Size Distribution

Metal sand is made by water atomization, which can produce stable quality with precise size distribution.



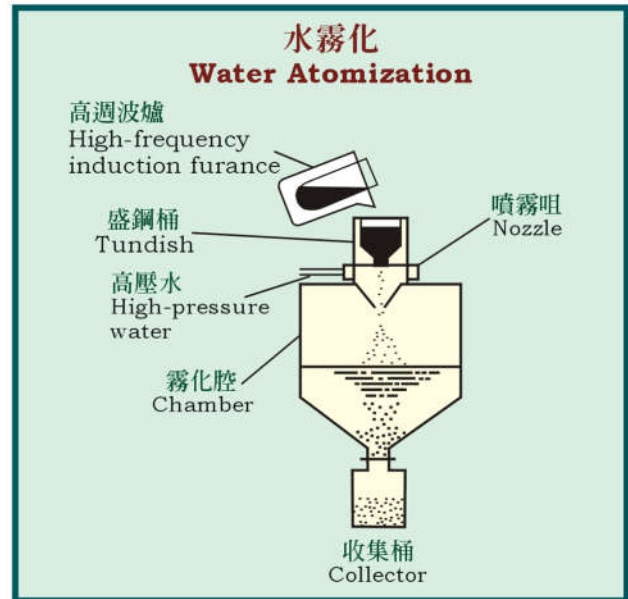


## 製程

本公司之金屬砂係以水霧化法製造，原物料經過嚴格成份挑選，精算各原料配比，以高週波感應爐熔煉，出爐前經德國 Spectro 分光儀之成份分析，以確保合金成份的規格要求，同時控制鋼水溫度 $\pm 10^{\circ}\text{C}$ 以內，傾倒入盛鋼桶，經精心設計的噴霧盤，以高壓RO水在 $\text{N}_2$ 環境下霧化，製造出形狀極不規則的金屬砂，再經脫水，真空乾燥，三次元振動篩選機分級，雙錐混合機混合，物性檢測、包裝，提供高穩定，高品質的不銹鋼金屬砂。

## Manufacturing Process

Our stainless steel filter metal sand is produced by water atomization. All of raw material is strictly selected and each of its weight percentage is precisely calculated when melted by induction furnace. After melting, we will analyze and ensure the alloy composition has been complied to the specification. Then the molten metal will go through a well-designed atomizing die, with controlled temperature and atomized into very irregular-shape powder with high pressure RO water in a  $\text{N}_2$  environment. After that, the metal sand will be collected, dewatered, dried, sieved, mixed, inspected, and then packed. Each of process is well operated and monitored, so we can always supply high quality and stable stainless steel filter metal sand to our customers.



## 品質

## Quality Assurance



分光儀  
Arc-Spark Spectrometer



氮氧分析儀  
Oxygen/Nitrogen Analyzer



實體顯微鏡  
Stereo Microscope



視密度計  
Apparent Density Tester



標準篩網 Test Sieves  
(ISO/ASTM/ANSI Standard)

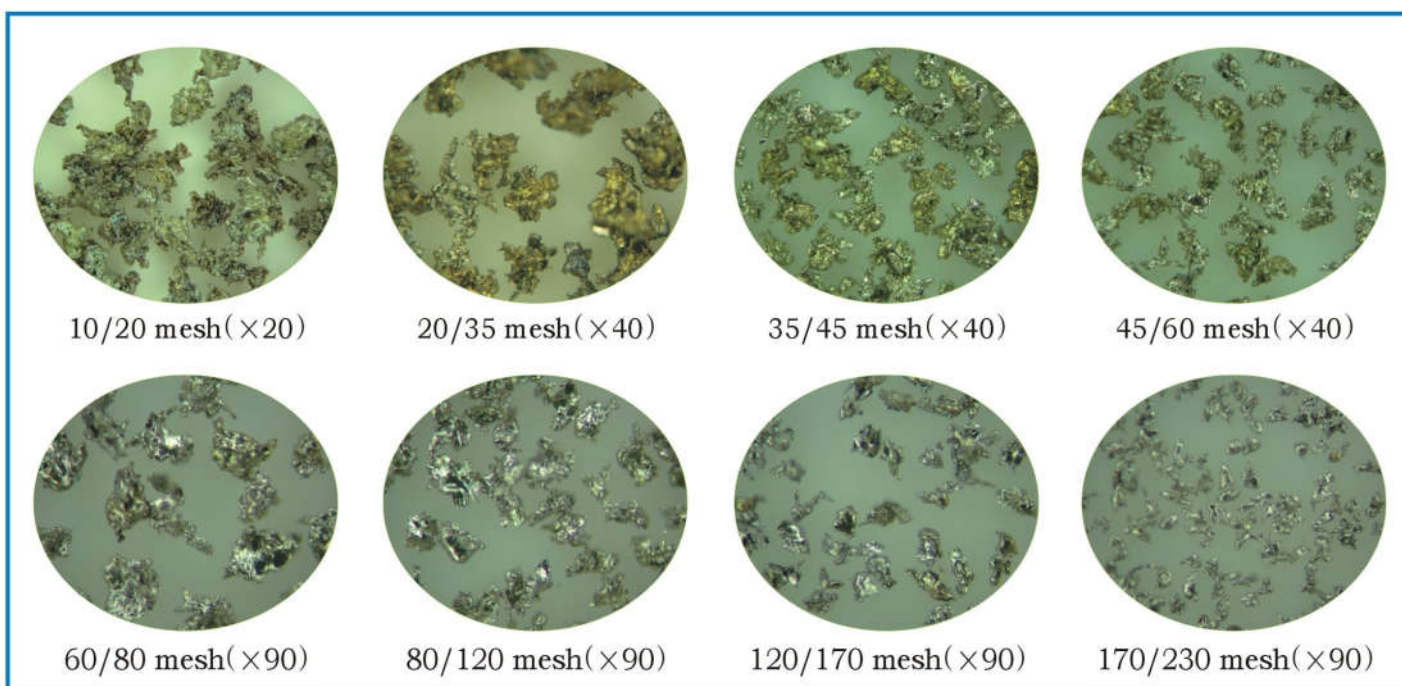
化學成份 Chemical Composition (%)

Type	C	Si	Mn	P	S	Cr	Ni	Mo	Fe
TE-1	≤0.04	2.0-4.0	<0.5	≤0.045	≤0.03	33-37	<0.9	<0.3	Bal
TE-3	≤0.1	1.0-2.0	<0.5	≤0.045	≤0.03	21-25	<0.5	<0.1	Bal
TE-316L	≤0.03	0.5-1.5	<0.55	≤0.045	≤0.03	16-18	12-15	2.0-3.0	Bal
TE-316M	≤0.2	2.5-3.5	<0.7	≤0.045	≤0.03	18-22	11-13	2.0-3.0	Bal

尺寸 Size			視密度	粒徑分佈 Size Distribution		
ASTM		Tyler	Apparent Density (g/cm <sup>3</sup> )	較粗	規格內	較細
目 Mesh	Microns	目 Mesh		Larger	WithinSpec.	Smaller
10/20	850-2000	9/20	1.45	≤10%	≥80%	≤10%
20/35	500-850	20/32	1.50			
35/45	355-500	32/42	1.55			
45/60	250-355	42/60	1.65			
60/80	180-250	60/80	1.70			
80/120	125-180	80/120	2.00			
120/170	90-125	115/170	2.30			

\*其它粒徑規格需求，請與我們連繫。

If other size is required, please contact us.



台灣電能股份有限公司  
TAIWAN ENERGY CORP.

高雄市大寮區(萬大工業區)農場路222號  
No. 222, Nong-Chang Rd, Da-Liao Dist. Kaohsiung Taiwan 831  
Tel: +886 7 7876722 Fax: +886 7 7888581  
E-mail: info@plasma.com.tw  
Web-site: www.plasma.com.tw

經銷商 Agent

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