

Linton

SILICON CRUSHER

PSGW40930



一、破碎方案- (设备构成) : **WJ 微波加热硅料干燥自动线 + MP 破碎自动线**

Crushing solution - (equipment composition): WJ microwave heating silicon drying automatic line + MP crushing automatic line

在晶硅拉晶制程中，为了提高拉制效率，晶硅原料加入坩埚前，需要将多晶硅原料破碎成所需大小的块料，以便投炉便捷，晶块受热均匀，更容易熔化。为了更好的提升这种破碎生产技术，采用微波加热耦合冷水淬裂，并进一步微波加热干燥，最后再经机械破碎，实现连续生产，减少污染，提升效率的目的。微波热破碎较之单纯机械破碎，硅损占比降低0.3%-0.5%。

To improve the efficiency of the crystal pulling process, the raw material is crushed into blocks of the required size before it is added to the crucible, making them easier to feed into the furnace. This also enables the crystals to be heated evenly and melted more easily.

To better enhance this crushing production technology, microwave heating is coupled with cold water quenching and further microwave heating and drying, and finally by mechanical crushing. This achieves continuous production, reduces pollution and enhances the efficiency of the purpose.

When microwave thermal crushing was compared to simple mechanical crushing, silicon loss accounted for 0.3%-0.5% lower.

1、 **WJ 微波加热硅料干燥自动线 WJ microwave heating silicon material drying automatic line**



加热均一，能耗低

Uniform heating and low energy consumption

硅损降低 0.3%-0.5% 降低人力成本

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2、 MP 破碎自动线 MP crushing automatic line

Reduce manpower



costs

- 可实现全流程自动化，提高生产效率
 - Enables automation of the entire process to improve Silicon loss reduction of 0.3%-0.5%
 - 采取特殊设计，选择特种材料，有效避免硅料污染
 - Adopt special design and choose special materials to effectively avoid silicon contamination
 - 此设备破碎所得硅块料更均匀，避免破碎不均匀造成硅料损失
- production efficiency

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- This equipment crushes the silicon lumps more uniformly, avoiding the loss of silicon due to uneven crushing.
- 大幅度减少用工成本
- Significant reduction in labor costs

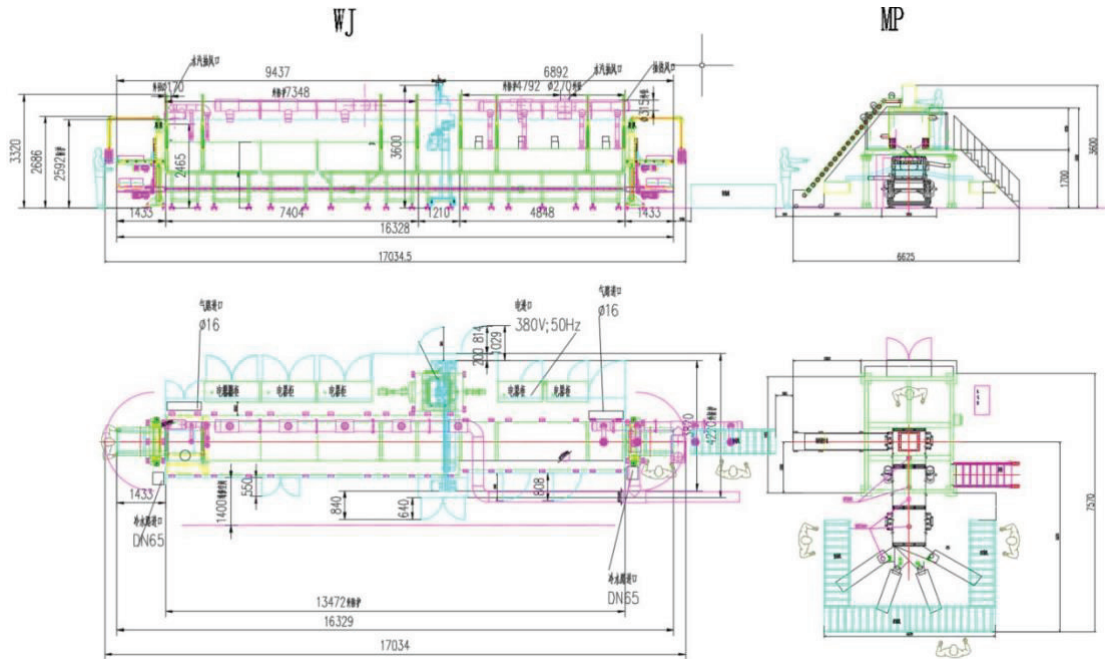
二、设备基本参数 Equipment basic parameters

序号 No.	项目 Projects	设备参数 Equipment parameters
1	产能 (T/天) Production capacity (T/day)	30-50
2	硅料加热温度 (°C) Heating temperature of silicon material (°C)	250~400
3	设备总功率 (kW) Total power of equipment (kW)	450
4	设备尺寸 (m, L×W×H) Equipment size (m, L×W×H)	30×9×3.5m (详见设备布置图) 30×9×3.5m (see equipment layout diagram for details)
5	设备总重 (满载), 吨 Gross weight of equipment (full load), tons	约 55 About 55
6	进料规格 Feed specifications	直径≤305mm, 长度≤400mm Diameter ≤ 305mm, length ≤ 400mm
7	传输速度 Transmission speed	0-4m/min 可调 0-4m/min adjustable
8	微波功率 (MHZ) Microwave Power (MHZ)	2450
9	温度检测 Temperature detection	实时检测, 超标报警 Real-time detection, exceedance alarm
10	设备故障率 Equipment failure rate	≤1.5%

三、设备布局图 Equipment layout diagram

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四、成套方案主要技术指标 **Main technical specifications of the package**

1. 筛分后规格: <3 mm; 3-60 mm; >60 mm 也可依据要求定做;
2. 设备故障率: $\leq 1.5\%$
3. 称重要求: 筛分后出料口合格料称重的精度 $\pm 0.5\text{kg}$;
4. 破碎筛分后尺寸占比: (以一周满载实测数据之和为最终计算得来)
 - 3-60 占总重为 $\gg 98.3\%$
 - <3 占总重为 $\ll 1.7\%$
 - >60 返
 - 回设备二次破碎
5. 破碎后总体金属物质增加量: $\leq 2\text{ppbw}$
 1. Specification after sieving: <3 mm; 3-60 mm; >60 mm Also can be customized according to requirements.
 2. Equipment failure rate: $\leq 1.5\%$
 3. Weighing requirements: the accuracy of weighing qualified material at the outlet after sieving $\pm 0.5\text{kg}$.
 4. Crushing and screening after the size of the ratio: (the sum of a week of full load measured data for the final calculation)
 - 3-60 accounts for 98.3% of the total weight
 - <3 1.7% of total weight
 - >60 Return to equipment secondary crushing
6. Overall metal increase after crushing: $\leq 2\text{ppbw}$

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五、设备工程参数需求 Equipment engineering parameters requirements

序号 No.	项目 Projects	说明 Description	参数/要求 Parameters / Requirements
1	电 Electricity		总功率：450KW Total power: 450KW
2	超纯水 Ultrapure water	用于加热硅棒水爆 For heating silicon rod water explosion	DN50, 7-12 摄氏度.; 进水压力：0.4-0.6Mpa DN50, 7-12 degrees C. Inlet water pressure: 0.4-0.6Mpa
3	冷却水 Cooling water	磁控管微波电源冷却水 Magnetron microwave power supply cooling water	20 吨/h, 温度 20-25℃; 进水压力：0.4-0.6Mpa, 给水/回水压力差：>0.2Mpa; 水硬度≤50PPM 20 tons/h, temperature 20-25℃; inlet water pressure: 0.4-0.6Mpa, feed water/return water pressure difference: >0.2Mpa; water hardness ≤50PPM
4	排风系统 Exhaust system	设备排风、排湿 Equipment air and moisture exhaust	含水汽，自然排空至室外；10000m3/h, Ø350 mm Containing water vapor, natural evacuation to outdoor; 10000m3/h, Ø350 mm
5	破碎机破碎口除尘 Crusher crushing mouth dust removal		排风总量 5500 立方/h Total exhaust air 5500 cubic meters/h
6	压缩空气 Compressed air		0.6-0.7MPa, 5m3/h; 平均 100L/min 0.6-0.7MPa, 5m3/h; average 100L/min
7	承重 Load-bearing	满载约 55 吨 Full load of about 55 tons	地板承重静载荷为 2 吨/㎡ Floor load-bearing static load of 2 tons/㎡
8	使用环境要求 Environmental requirements for use	温度、湿度、酸雾、洁净度 Temperature, humidity, acid mist, cleanliness	环境温度：18-25 度；相对湿度：45%-65%；酸雾：PH 值 6.5-7.5；洁净度：一万级和十万级之间,GB/T16292-1996。(国际标准 ISO 4--ISO 5) Ambient temperature: 18-25 degrees; relative humidity: 45%-65%; acid mist: PH 6.5-7.5; cleanliness: between 10,000 and 100,000 levels,

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			GB/T16292-1996.(International standard ISO 4--ISO 5)
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