

## Diamond Wire Saw - Coolant Recovery 金刚线切片机-冷却液回收

### Current Methods – Variable Kerf Content and Cost of Operation

- Single saw filtration using crude bag or cartridge filtration. In this application the wire saw is charged with coolant and circulated during the cut. At the end of the cut the Si kerf levels can be as high as 10% depending on the ingot size. The kerf is increasing during the cut which creates a “variable” cutting environment.
- Single saw filtration using a single saw recycling system that removes kerf effectively during the cut. In this application the wire saw is charged with coolant and circulated during the cut. The saw recycling system removes a majority of the kerf during the cut. When the cut is complete, virgin make up coolant is added back to the saw. Having a separate filter system is expensive and requires more labor and filter media cost per cut. In some cases the addition of virgin make up can be higher than a central processing system, thereby increasing “Your Cost of Operation.”

### 目前的方法-具有不一致性和高成本的特征

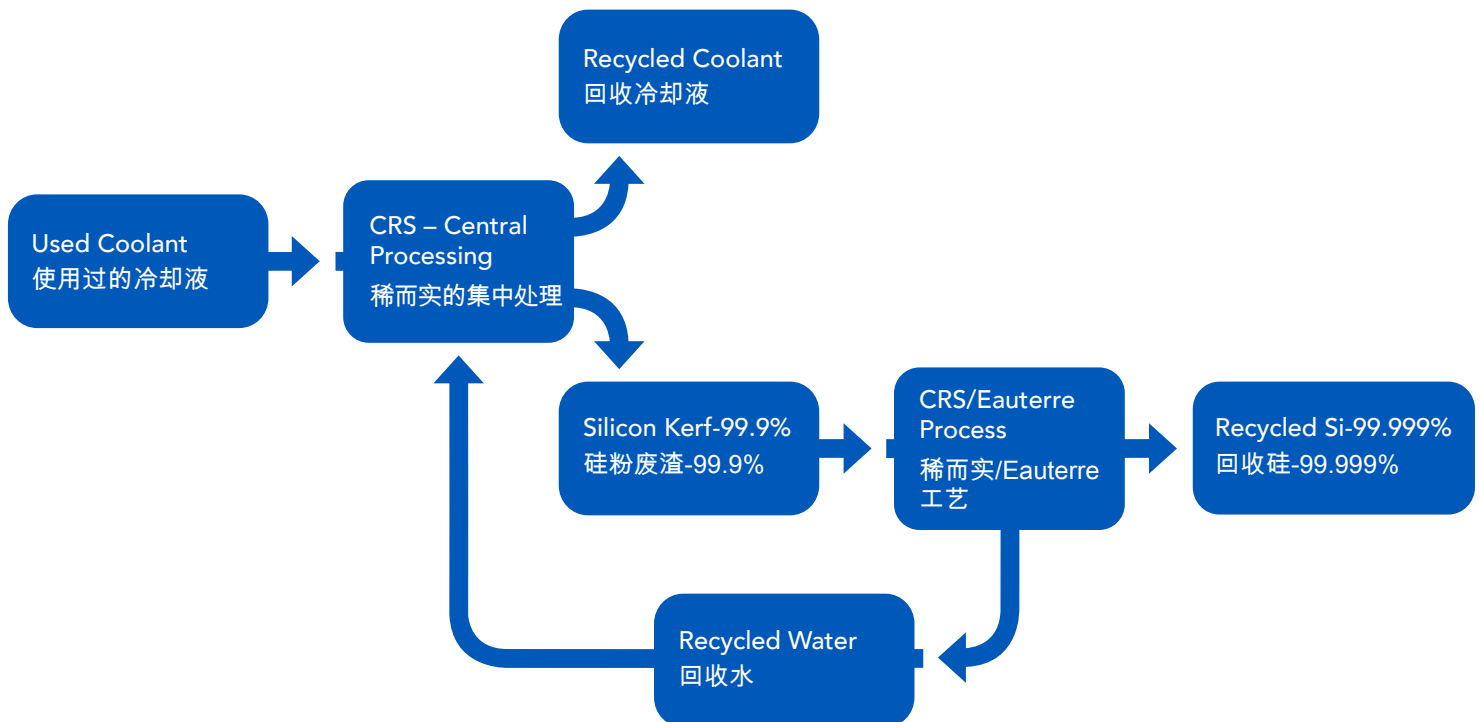
- 切片机单机过滤采用简陋的过滤袋或者滤芯过滤。用此方法，切片机内注入了冷却液，并在切片过程中进行循环。在切片结束时，硅粉的废渣量可高达10%（取决于硅块的尺寸）。废渣会在切片过程中不断增加，使得切片环境产生“可变因素”。
- 切片机单机过滤采用单独的切片机回收系统，在切片过程中有效地去除废渣。用此方法，切片机内注入了冷却液，并在切片过程中进行循环。在切片过程中，切片机回收系统去除大部分的废渣。在完成切片时，新的冷却液加回到切片机中。采用单独的过滤系统是昂贵的，并且在每刀切片时会要求更多的劳动力和产生更高的过滤介质成本。在某些情况下，额外添加新的冷却液会比采用集中处理系统更加昂贵，由此而增加“您的运营成本”。

### CRS Methods – Consistent and Reduced Cost

- The CRS Central Processing Methodology produces consistent high quality recycled coolant and water as well as 99.9% Silicon. This process has no CAPEX and reduces operating cost. The system can be configured as shown below:

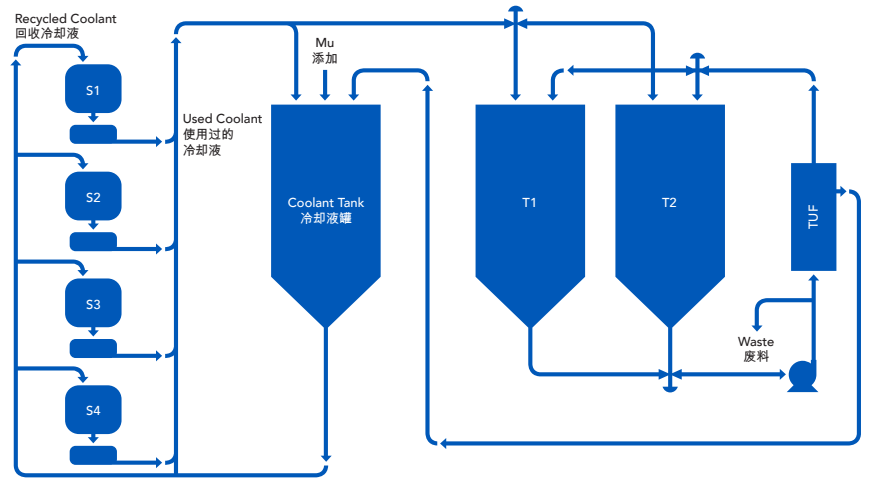
### 稀而实的方法- 具有一致性和低成本的特征

- 稀而实的集中处理方法可以生产出具有一致性的优质回收冷却液和水，以及纯度为99.9%的硅。采用此方法无需固定资产投资，并能降低运营成本。系统的配置模式如下：



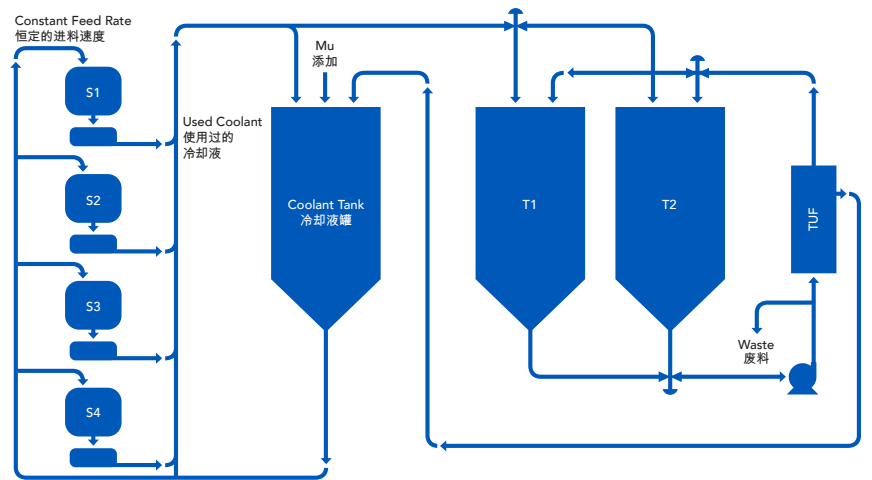
Configuration 1: Collect all the used coolant in single saw filtration process and put into a central recycling system. Recycled coolant with virgin make up is returned to the saws for recharging the saw after each cut. Totes or a piping transfer system can be used for this method.

配置一：从每台切片机的过滤工艺中收集所有使用过的冷却液，并输送至集中处理系统。回收冷却液混合了新料，返回切片机，在完成每次切片后注入。用此方法，可以使用装运桶或者管道输送系统。



Configuration 2: Collect all the used coolant on a continuous basis using piping to send the used coolant to a central system. Recycled coolant is continuously returned to the saws through a piping system.

配置二：使用管道连续收集所有使用过的冷却液，将使用过的冷却液输送至集中处理系统。回收冷却液会通过管道系统持续地返回至切片机。



## CRS Advantage 稀而实的优势

- Each CRS coolant reprocessing system is custom designed for each application therefore customer is ensured to reach guaranteed consistent results.
- The technology is a combination of proprietary cross-flow filters (TUF) and centrifuges custom built to CRS specifications and represents the newest technology on the market.
- The TUF filters yield high permeate rates from the membranes which keep the system cost low for continuous applications!
- The centrifuge portion of the process creates an extremely dry Si kerf waste that can be disposed of or recovered using another CRS/Eauterre process.
- CRS designs, builds, installs and operates the coolant recycling system as a turnkey system. CRS also provides a guarantee on the coolant quality and recovery rate being returned to the wire saws. These system are priced to give the customer maximum value and quality.
- Most importantly no CAPEX for the customer reducing your operation cost.
- 稀而实的每台冷却液回收系统都是量身定做的，因此可以保证客户能达到担保的结果。
- 结合了具有知识产权的交叉流过滤器(TUF)和定制离心机的技术，达到稀而实的标准，并且代表了市场上的最新技术。
- TUF过滤器经过膜可以达到很高的渗出率，保持系统的低成本，进行持续使用！
- 离心机工艺生产出非常干的硅粉废渣，可以使用稀而实/Eauterre的工艺进行处理或者回收。
- 稀而实采用交钥匙系统的方式设计、建造、安装和运行冷却液回收系统。稀而实还对返回至切片机的冷却液质量和回收率提供担保。这些系统的定价可以给予客户最大的价值和品质。
- 最重要的是客户无需固定资产投资