

THE POWER OF POLYSILICON

From the Earth's Crust to Today's Technology

We transform people's lives by energizing and connecting our world through silicon technology. As the largest producer of high-purity polysilicon in the United States, Hemlock Semiconductor Operations (HSC) draws on the talents of more than 1,000 employees to provide the material critical to two high-tech, high-growth industries: electronics and solar energy.



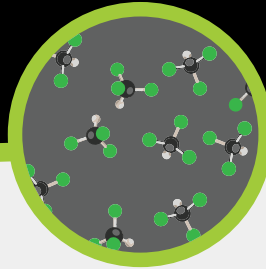
Quartz

Polysilicon is a hyper-pure form of the element silicon, which is harvested from the Earth's crust as quartz, a mineral made of elements silicon and oxygen.



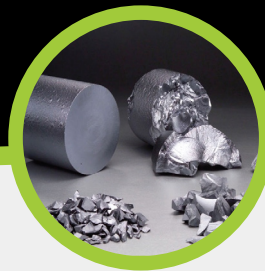
Metallurgical Grade Silicon

Quartz is turned into metallurgical grade silicon by removing the oxygen from the mineral. At this point, the silicon is at least 98% pure.



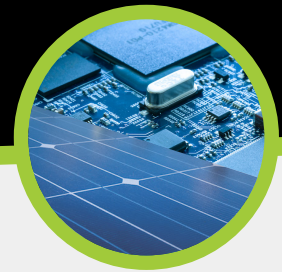
Trichlorosilane

The metallurgical grade silicon is used to make trichlorosilane, a gas molecule made of silicon and other elements, before the final step of purification.



Polysilicon

Here at HSC, we make hyper-pure polysilicon, which is 99.999999999% pure. Trichlorosilane is used in our high-tech process to produce the rods of polysilicon.



Computer Chips and Solar Panels

Our polysilicon is sent across the globe and becomes the building blocks of computer chips and solar panels, transforming our world.

Our High-Tech Process

To make polysilicon, we pump trichlorosilane gas into a reactor fitted with thin silicon starter rods. When we activate our reactors with electricity, the silicon in the gas molecules sticks to the rods, creating thicker rods of polysilicon.

Afterwards, we break the rods into smaller chunks that are sent to manufacturers around the world and serve as the key building blocks to computer chips and solar panels.

Recycling Raw Materials

You may be wondering what happens to the rest of the trichlorosilane molecule. As the molecules react in polysilicon rod production, other gas molecules form. The leftover molecules can be converted back to trichlorosilane gas to make more polysilicon!

By recycling, we have almost zero raw material waste, helping protect our environment.

