

# POLYSILICON PRODUCTION FACILITY



## TCS PROCESS VENT SCRUBBING

A major polysilicon production facility in China sought a solution to economically and reliably remove silane and acid wastes from their process vent gas system. The process gas stream contained large amounts of H<sub>2</sub> in addition to contaminants and nitrogen.

The production of trichlorosilane (TCS) is a critical step in the manufacture of polysilicon for the solar cell industry. TCS production creates a variety of waste gas streams, including TCS, Dichlorosilane (DCS), Silicon Tetrachloride (STC), and HCl. These waste gases must be removed at high efficiency prior to venting process gases to the environment. Specialized pollution control solutions must be designed to accommodate the high levels of hydrogen, heat release, and product handling issues that are associated with silicic acid by-products of the waste gases.

Verantis was able to provide three multi-train scrubber systems containing a combination of spray towers, eductor venturi and packed towers. Redundant components provide automatic changeover during maintenance periods. This arrangement allowed for 100% system availability and very high removal efficiencies of silane and HCl gases. Wastewater streams were minimized to reduce water consumption and treatment costs. Verantis can provide waste treatment solutions for silanes that are customized based on waste flow-rates, contaminant levels, and removal requirements.

Verantis engineers have provided solutions for treating general vent, emergency vent, process vent, and incinerator exhaust streams in the polysilicon industry in Asia, Europe, and North America. Our systems are specially designed to exceed most regulatory requirements and provide ideal results for complicated situations.

## OVERVIEW

This turnkey EPC project included a special solution designed to accommodate the high levels of hydrogen, heat release and product handling issues related to the by-products of waste gases.



## EQUIPMENT

The solution included three multi-train scrubbers with spray towers, Eductor venturi's and packed towers. Redundant components allowed for automatic changeovers during maintenance periods.



## AUXILIARY EQUIPMENT

In addition to the key equipment provided, Verantis designed and provided additional air pollution control equipment including, controls, pumps, chemical feed system, pipes and knock out drums with some components on mounted skids for quicker installation.



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## FEATURES

- Solutions provided for a major polysilicon production facility in China.
- Designed a solution to economically and reliably remove silane and acid wastes from their process vent gas stream which contain large amounts of H<sub>2</sub> in addition to contaminants and nitrogen.
- Verantis design/build services for this turnkey project included a special solution to accommodate high levels of hydrogen, heat release and product handling issues related to by-products of waste gases. System included six sets of process vent scrubbers and a separate Emergency Vent solution as well.
- Verantis has proven, successful installations in the polysilicon industry that meet and often exceed regulatory requirements.

For more information and resources,  
please visit [www.verantis.com](http://www.verantis.com).

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## TECHNICAL CAPABILITIES

All components of the three stage system were designed in house. Other components were sourced through a world-wide network of fabricators and suppliers.



## DESIGN CAPABILITIES

Systems can be designed to accommodate a variety of requirements including NFPA, API, ASME, and regulatory codes such as Chinese GB, European EN and US EPA standards.



## TURNKEY SOLUTIONS

Verantis is able to provide Turnkey Solutions globally for most of your incineration and pollution control needs. For more information on any of our products or solutions, please visit us at [www.verantis.com](http://www.verantis.com)

