HYDROCHLORINATION TECHNOLOGY SOLUTION FOR PRODUCING TRICHLOROSILANE (TCS)

High Volume Gains from Single FBR System Substantially Reduces Capital Investment Costs

GT Advanced Technologies offers a high volume hydrochlorination solution capable of producing enough trichlorosilane (TCS) from a single hydrochlorination fluid bed reactor (FBR) system to support a 12,500 MTA polysilicon facility. This hydrochlorination solution lowers the cost of ownership for a high-volume polysilicon production facility by millions of dollars because of lower capital costs when compared to facilities utilizing a multiple FBR approach. The Capex reduction eliminates the cost of the second FBR as well as other equipment, piping, structure, valves, and instruments. The single hydrochlorination FBR system also minimizes the complexity of construction management and ultimately operations as fewer resources are required to construct and operate a single hydrochlorination FBR process.

GT’s TCS Purification Process (sold separately as a basic engineering package) purifies the TCS produced in hydrochlorination to levels that support polysilicon production of 10-11 nines quality. This facility incorporates thermal heat produced via the chemical vapor deposition reactors, thus lowering the cash cost of the polysilicon production process.

Hydrochlorination Performance Metrics:

- Conversion: >25%
- On-line time: >90%
- Electricity usage: <0.3 kW-hr/kg TCS produced
- Total net energy usage: ~0.6 kW-hr/kg TCS produced
- Annual capacity: up to 12,500 MTA polysilicon equivalent from a single FBR
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Key Equipment Supplier
GT supplies its customers with the key equipment to create an operationally stable and robust hydrochlorination production process. This provides our customers with the peace of mind and assurance that the key equipment has been constructed to the most stringent fabrication standards by a GT qualified fabricator with significant oversight from GT personnel. The equipment supplied by GT is designed and fabricated to meet the local fabrication requirements as well as ASME standards.

Facility Design Services Promote Shorter Schedules
GT provides complete services to assist in building and safely operating a polysilicon manufacturing plant. GT’s global support team of polysilicon experts is committed to meeting customer requirements for polysilicon and TCS production anywhere in the world.

Polysilicon producers that choose GT benefit from our project execution experience, advanced knowledge base and relationships with various FEED, integration and EPC(M) service providers. Through these relationships, we’ve created a proven workflow to accelerate your custom plant completion. All of which helps reduce capital costs so you can maximize return early.

GT Advanced Technologies’ personnel work with engineering design firms to merge our process technologies with stage-gated project execution – from feasibility studies to process commissioning and start-up.

Service Commitment
GT Advanced Technologies is dedicated to delivering the highest levels of satisfaction in the implementation of our processes and equipment. We respond to the needs of our customers with proven solutions, comprehensive training and support.

About GT Advanced Technologies
GT Advanced Technologies is a diversified technology company producing innovative crystal growth equipment for the solar PV and power electronics industries, and sapphire material for precision optics and other specialty industries. The company’s technical innovations accelerate the use of advanced materials, enabling a new generation of products across this diversified set of global markets.

Learn more at www.GTAT.com

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