Bundled Deliverables Include:
- Process flow diagrams
- Proposed equipment layout
- Process equipment
- Silicon rod cropping saw with PLC control
- Two silicon filament cutting saw with PLC control
- Silicon bridge cutting saw
- CNC machine for bridge connection feature
- CNC machine for filament connection feature
- Annealing oven
- Other proprietary equipment
- Silicon Material Handling Equipment
- Customized work holdings
- Customized cutting tools for customer specific application
- Operations manual
- Safety and operational procedures
- On-site technical support and training

FILAMENT PRODUCTION SYSTEM

Configurable to Support Leading Polysilicon CVD Reactors

GT Advanced Technologies provides a complete suite of equipment designed for high throughput and precision fabrication of silicon seed filaments and bridges. The Filament Production System may be easily configured to support leading polysilicon chemical vapor deposition (CVD) reactor technologies. Equipment components are engineered with a focus on operational efficiency to help shorten cycle times and lower overall process costs which results in minimizing the total cost-per-filament produced.

Square cross-sectional shaped filaments are precisely cut from high purity polysilicon source rods and can be processed into customer specified lengths up to 3000 mm. The cross-sectional size of the filaments come in three standard sizes, 7 x 7 mm, 8 x 8 mm, and 10 x 10 mm but can be configured to accommodate other customer-specific filament sizes. As an example, a short 6.5-hour cycle can yield 85 7 x 7 mm seed filaments from a single Ø105 mm x 3000 mm silicon rod. With a holding capacity of four silicon rods, the Filament Saw can yield 340 seed filaments in a single machine cycle.

A multiple-step cutting process improves control and simplifies the workflow with three types of saw tools: a silicon rod cropping saw with PLC control, a silicon filament cutting saw with PLC control, and a silicon bridge cutting saw.

Silicon filament rods are essential to polysilicon production. Pairs of filaments are each connected by a silicon bridge to form a U-shape. When loaded into a reactor, these U-shaped rods become the surface material for the trichlorosilane decomposition process.

Growth Begins Here™
Filament Production System

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 Inc. (NASDAQ: GTAT) is a diversified technology company with innovative crystal growth equipment and solutions for the global solar, LED and electronics industries. Our products accelerate the adoption of new advanced materials that improve performance and lower the cost of manufacturing.

Short Cycle Throughput of Three Standard Filament Sizes
Filament and bridge seeds are produced with a square cross-sectional shape. Source rods can be CZ mono-crystal or as-grown polysilicon with a maximum size of Ø105 mm x 3000 mm (diameter x length). Process tolerances for critical mating surfaces are available upon request.

Filament Product System equipment can be configured to produce any size filament and bridge along with their corresponding connection. GT Advanced Technologies’ systems are fully integrated and will meet the quality requirements of a semiconductor or solar polysilicon facility.

<table>
<thead>
<tr>
<th>Filament Seed Size</th>
<th>Filament Throughput</th>
<th>Throughput Time</th>
<th>Source Rod (Max. Size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 x 7 mm</td>
<td>340 each</td>
<td>6.5 hours</td>
<td>Ø105 mm x 3000 mm</td>
</tr>
<tr>
<td>8 x 8 mm</td>
<td>260 each</td>
<td>6.5 hours</td>
<td>Ø105 mm x 3000 mm</td>
</tr>
<tr>
<td>10 x 10 mm</td>
<td>172 each</td>
<td>6.5 hours</td>
<td>Ø105 mm x 3000 mm</td>
</tr>
</tbody>
</table>

System Equipment Designed and Developed by GT
GT Advanced Technologies equipment is used in manufacturing the world’s most efficiently produced polysilicon. As one of the largest equipment suppliers for creating polysilicon, our industry-leading expertise focuses on the highest value process steps.

The Filament Production System is complete with seamless installation, start-up, on-site personnel training and technical support to ensure the highest level of performance. This contributes to lowering the implementation cost of GT technology and helps the customer effectively manage volume operations quickly.