Abrasive Products for Slicing, Wafering, Cutting, Cropping, and Bricking

- Diamond Wire
- Coolant
- Mounting Beams
- Wafer Grinding Wheels
- Edge Grinding Wheels

Key Components/Materials
- Wafers, Ingots, Plates
- Sapphire
- Mono/Poly Silicon
- Silicon Carbide
- Glass
- Ceramics
- Other Materials
FIXED DIAMOND WIRE AND ACCESSORIES

Diamond Wire for Slicing Sapphire and Silicon Carbide Wafers
Precision diamond wire to slice 2", 4", and 6" C, M, R, and A-plane sapphire and silicon carbide.

Norton | Saint-Gobain Advantages: Uniformity throughout the entire spool yields more, better quality wafers, with low cost of ownership. Our standards are set higher than the industry norm – meeting and exceeding TTV, Bow and Warp requirements of the LED market.

Diamond Wire for Slicing Photo Voltaic Silicon
Used to uniformly slice 125 mm and 156 mm mono/poly silicon ingots. Multi-wire sawing with Norton wire simultaneously produces many wafers at a lower cost and higher throughput.

Norton | Saint-Gobain Advantages: specifically designed to meet the difficult demands of thinner kerf, long life, and low cost of ownership.

Diamond Wire for Slicing Applications in Additional Emerging and Conventional Markets
Whether slicing A-plane sapphire for smart phones in today's competitive telecommunication market or competing in a more conventional market, such as slicing watch crystals, Norton-diamond wire can provide a highly productive, cost-effective alternative for new slicing applications or precisely replace an older operation.

Norton | Saint-Gobain Advantages: using custom-made Norton diamond wire will meet all your goals: minimizing kerf loss, ensuring faster cut-rate, and generating longer life.

Beams for Workpiece Mounting
Beams solidly support 2", 4", and 6" square and round wafers during slicing operations. Glued to the workpiece prior to slicing, beams are de-glued after slicing.

Norton | Saint-Gobain Advantages: beams are designed with strength and stability to minimize impact on the wire and workpiece. Ingots and wafers do not chip, fall, or break.

www.electronics.saint-gobain.com
Wafer Grinding and edge Grinding Wheels for sapphire substrate and Wafer thinning
The market leader in engineering wafer grinding wheels for sapphire substrates and other hard materials.
Winter edge grinding wheels grind and polish wafer edges to precise tolerances.
Saint-Gobain Advantages: from stock removal to fine finishing, our engineers can design wafer grinding wheels for many different applications and machine platforms, as well as provide electroplated and metal-bonded edge grinding wheels.

Biodegradable Coolants for Critical Finishing Diamond Wire Applications
Saint-Gobain offers all types of coolants with an emphasis on water-based, biodegradable chemistries – specifically formulated to extend diamond wire life and improve sapphire, glass, and silicon wafer quality.
Norton | Saint-Gobain Advantages: wherever the surfaces of solid materials have to be machined to fine, defect-free and clean conditions, we have the perfect product for the application.

Fixed Diamond Wire and Accessories

Norton Fixed Diamond Wire - Repeatable Consistent Quality
Key Product Attributes
- Consistent slicing performance
- Uniform diamond counts
- Uniform wire diameter
- Uniform diamond distribution; no diamond clustering
- Made in state-of-the-art ISO 9001/14001 certified facility in USA

Additional Services Provided
- Onsite application support
- Process fine tuning

Case Study - 4” C-Plane Sapphire Slicing
6 hours process time; 35N tension and 25 m/s; all wafers are <20 μm Warp; <10 μm Bow; < 15 μm TTV

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Norton Fixed Diamond Wire Availability Material/Application Recommendations

<table>
<thead>
<tr>
<th>FDW CORE DIAMETER (MICRONS)</th>
<th>DIAMOND (MICRONS)</th>
<th>FDW OUTER DIAMETER (MICRONS)</th>
<th>MATERIAL/APPLICATION</th>
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<tbody>
<tr>
<td>100</td>
<td>8 / 12</td>
<td>120</td>
<td>PV silicon slicing/wafering</td>
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<td>8 / 16</td>
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<td>150</td>
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<td>180</td>
<td>Hard material slicing/wafering (e.g. silicon carbide, aluminum nitride, ceramics, etc.)</td>
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<td>Sapphire slicing/wafering</td>
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<td>30 / 45</td>
<td>320</td>
<td>Cropping and bricking</td>
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To expedite your diamond wire order, please provide the following application information:

- Machine manufacturer and model number
- Diamond wire length
- Wire outer diameter or kerf
- Type of spool
- Wire winding pitch and winding tension on the spool

If known,

- Wire core diameter
- Wire speed
- Wire tension at slicing
- Diamond grit size
- Process time

Please contact offices below with your diamond wire, wafer grinding, and edge grinding wheel application questions and requests for quotation.