

3M™ Trizact™ Diamond Tile 677XAEL

3M™ Trizact™ Diamond Tile 677XAEL is a structured, fixed abrasive composite pad consisting of an inorganic abrasive (vitreous diamond agglomerates) in an organic binder (cross-linked polymer) capable of lapping a multitude of substrates on varied equipment and processes.

Trizact diamond tile abrasive pads not only remove material faster than some coarse slurries or fixed pellets, but they also do it with fine diamond grades that help limit damage to substrates. The result is dramatically reduced polishing time. 3M's in-plant studies have found that lapping processes using Trizact diamond tile can help reduce overall process time by up to 60% for improved throughput.

Without the messy residue of slurry lapping, the process, equipment, and manufacturing environment should be cleaner. Manufacturers can eliminate the hassle of slurry disposal, simplifying their waste management. 3M's proprietary abrasives can help make lapping less costly.

For use in either single or double-sided lapping, the pads mount to existing machine plates with a pressure-sensitive adhesive (PSA). Production of silicon wafers and fabrication of metal, electronic, and optical products are among the applications for electronic lapping.

Key Features

- Fast, consistent cut rates
- Finer finish for faster polishing in subsequent steps
- Helps manufacturers improve part flatness (TTV)
- Less edge roll-off compared to slurries
- Helps manufacturers reduce their total process time
- Formulated for long pad life
- Helps manufacturers reduce slurry waste
- Virtually eliminates lap plate replacement
- Fits on most lapping machines
- Includes pressure sensitive adhesive (PSA) backing for mounting

Applications

- A-, C- and R-plane sapphire rough lapping
- Rough lapping for silicon carbide (SiC), zirconia (ZrO₂), glass, silicon dioxide and silicon materials
- Trizact tiles can be used with either single- or dual-sided lapping tools and can be directly mounted onto most lapping plates, including flat/smooth, grooved and waffle patterns.

Grades and Sizes

- Available in 6, 9, 20 and 45 micron grades and includes pressure sensitive adhesive (PSA) backing.
- Manufactured to virtually any shape, with many hole sizes and hole configurations.
- For discs or sheets greater than 47 inches, the pads will be shipped in multiple pieces.

Directions for Use

Reference the following Technical Application Bulletins for detailed information on the use of Trizact diamond tile 677XAEL:

- Machine Prep and Pad Mounting Instructions, bulletin p/n 60-5002-0022-9
- Lubricant Use and Filtering Instructions, bulletin p/n 60-5002-0023-7
- Pad Conditioning Instructions, bulletin p/n 60-5002-0021-1
- Frequently Asked Questions, bulletin p/n 60-5002-0024-5

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Sapphire - Typical Performance Characteristics, Double-Sided Lapping

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ Trizact™ Diamond Tile Abrasive Pad 677XAEL, 45 Micron, Double-Sided Lapping

Grade	Sapphire Plane			Wafers per batch	Lubricant
	A-Plane	R-Plane	C-Plane		
6 micron	0.66 $\mu\text{m}/\text{min}$ <i>Ra = 0.01 μm</i>	0.41 $\mu\text{m}/\text{min}$ <i>Ra = 0.02 μm</i>	0.40 $\mu\text{m}/\text{min}$ <i>Ra = 0.01 μm</i>	15ea, 2" (51mm) diam sapphire	5% Challenge 543 HT and 0.5% 3 μm plated white aluminum oxide (PWA) in ethylene glycol, or 0.5% 3 μm PWA in triethylene glycol
9 micron	2.1 $\mu\text{m}/\text{min}$ <i>Ra = 0.02 μm</i>	2.7 $\mu\text{m}/\text{min}$ <i>Ra = 0.03 μm</i>	1.6 $\mu\text{m}/\text{min}$ <i>Ra = 0.02 μm</i>	15ea, 2" (51mm) diam sapphire	5% Challenge 543 HT and 0.5% 5 μm plated white aluminum oxide (PWA) in ethylene glycol, or 0.5% 5 μm PWA in triethylene glycol
20 micron	5.7 $\mu\text{m}/\text{min}$ <i>Ra = 0.21 μm</i>	21 $\mu\text{m}/\text{min}$ <i>Ra = 0.53 μm</i>	2.9 $\mu\text{m}/\text{min}$ <i>Ra = 0.23 μm</i>	15ea, 2" (51mm) diam sapphire	5% Challenge 543 HT; 0.5% 15 μm plated white aluminum oxide (PWA) in Deionized Water (DI)
45 micron	13.0 $\mu\text{m}/\text{min}$ <i>Ra = 0.47 μm</i>	23 $\mu\text{m}/\text{min}$ <i>Ra = 0.78 μm</i>	4.8 $\mu\text{m}/\text{min}$ <i>Ra = 0.42 μm</i>	20ea, 2" (51mm) diam sapphire	5% Challenge 543 HT; 2.0% 35 μm plated white aluminum oxide (PWA) in Deionized Water (DI)

Pad Diameter (OD x ID), 25" x 9" (635mm x 229mm)

Platten Speed: Upper, 26 rpm; Lower, 60 rpm; Sun Gear, 20 rpm

Downforce: 1.0 psi for 20 micron and 45 micron grade. 4.2psi for 6 micron and 9 micron grades

Pad Wear Rate: 0.3 μm per minute

Lubricant Flow Rate: 60 ml/min

Storage and Shelf Life

The shelf life of Trizact diamond tile 677XAEL is 12 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% relative humidity.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and is deemed commercially available from 3M. The COA contains the 3M specifications, test methods and test results for the products performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

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Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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