



3M Science.
Applied to Life.™

3M™ CMP Pad Conditioner Product Selection Guide

Redefining CMP

Redefining chemical mechanical planarization (CMP)

In the world of semiconductor fabrication, consistency, reliability and yield are critical at every part of the process. For over 25 years, 3M™ CMP Pad Conditioners have provided innovative pad conditioning solutions to some of the world's leading semiconductor fabricators.

From the exclusive sintered abrasive diamond technology behind 3M™ Diamond Pad Conditioners to the precisely microreplicated patterns in 3M™ Trizact™ Pad Conditioners, our global technical team is committed to continually redefining the cutting edge of pad conditioner technology. Multiple geographically independent research and manufacturing facilities around the world provide convenient product support and product supplies.

Selecting a pad conditioner for your application or process

Selecting a pad conditioner requires compatibility testing to ensure that your pad, wafer and slurry combination will perform optimally. Our technical team has data packages for many common processes — tungsten to copper, poly to STI, and many more — that have been proven compatible with our products over years of operation. We can also test custom combinations at our labs around the world.

Explore 3M CMP pad conditioning solutions



3M™ Trizact Pad Conditioner

Precisely engineered, microreplicated, diamond-coated ceramic CMP disks for some of the most demanding processes.



3M™ Diamond Pad Conditioner

Effective, reliable diamond pad conditioning for consistent long-term performance.



3M™ Pad Conditioner Brush

Durable, cost-effective pad conditioning for CMP buff and pad cleaning on soft pads.



3M™ Trizact Pad Conditioner T Series

Enhances the conventional 3M™ Trizact™ pad conditioner platform with a surface topography optimized for stronger pad activation, slower pad wear rate decay and even more consistent wafer-to-wafer performance.



3M™ Diamond Pad Conditioner C Series

Offers extra-precise diamond placement at the micrometer scale to further help control coplanarity and flatness for even more consistent performance in CMP pad conditioning.

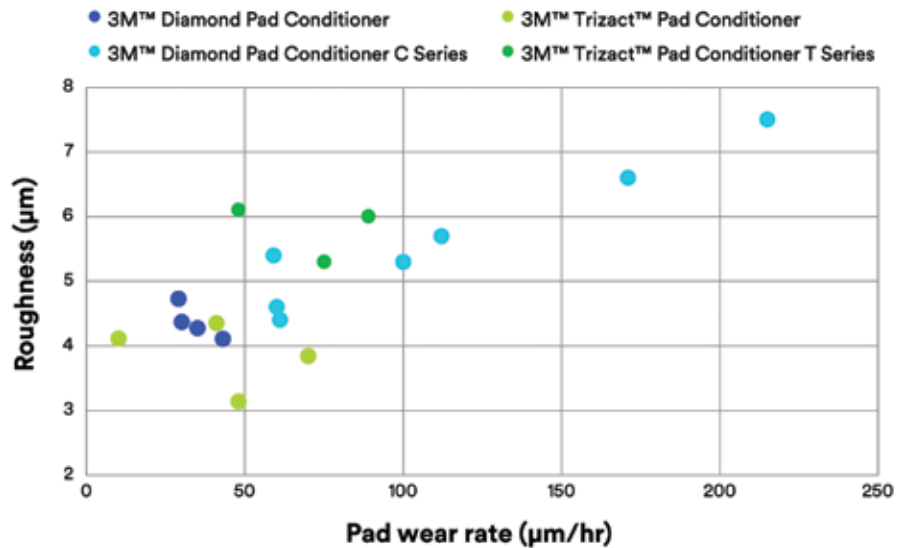
View conditioners



Matching your pad or slurry

3M offers a broad range of CMP pad conditioners tailored across key attributes such as pad wear rate and pad roughness.

Plus, our high-tech pad conditioners are designed to be compatible with CMP pads with industry-standard combinations of shore hardness and specific gravity. Data packages are available with additional product compatibility details.



This information is based on tests performed at 3M laboratory facilities, and may be based on a limited sample size or a subset of 3M CMP materials. Many factors beyond 3M's control and uniquely within the user's control can affect the use and performance of 3M CMP materials in a particular semiconductor manufacturing application. To learn more about the specific properties and benefits of a given 3M CMP pad or 3M CMP pad conditioner, or to arrange a technical evaluation of the product, contact 3M to speak with an expert.

Matching your technical needs

Across the industry, semiconductor manufacturers are facing a range of technical challenges depending on product, application and market position. Whatever your technical priority, 3M has a CMP pad conditioner for you.



Scratch and defect improvement

- 3M™ Trizact™ Pad Conditioners offer proven reductions in scratching and defectivity over legacy diamond pad conditioners, as well as providing a metal-free cutting surface for both advanced and mature nodes.
- 3M™ CMP Pad Conditioner Coatings technology enables metal leaching and defectivity improvements, and can be applied to most 3M pad conditioner products.



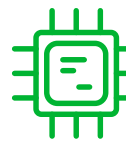
Disk-to-disk consistency

- 3M™ Diamond Pad Conditioner C Series features precision diamond placement technology and enables improved disk-to-disk consistency.
- 3M™ Trizact™ Pad Conditioners have highly controlled tip shape and height. They deliver consistency and reliability with a proven record in both advanced and mature node processes.



Cost of ownership

- 3M™ Trizact™ Pad Conditioner T Series include further improved pad wear rate decay compared with legacy pad conditioners, which helps enable cost-of-ownership improvement through longer disk life.
- 3M™ Diamond Pad Conditioner C Series features highly controlled co-planarity and flatness compared with legacy diamond pad conditioners, helping enable cost-of-ownership improvement through longer disk and pad life.



SiC and advanced packaging

- 3M pad conditioner products have been used for emerging CMP applications in SiC and advanced packaging, where large volumes of layer removal is required. 3M products help deliver long disk life with good performance to slurry corrosion, while also delivering a high removal rate through high aggressiveness.

3M™ Trizact™ Pad Conditioners

Pad conditioners for CMP processes where precision, reliability and consistency are vital. Using 3M proprietary microreplication technology, virtually every aspect from overall shape to tip shape to height dispersion can be specified at microscale and manufactured out of diamond-coated ceramic.

Get product details



Semiconductor manufacturers choose them for:



Tunable performance

Maintain tight control of your preferred height dispersion, tip shape and pattern throughout the lifespan of the pad conditioner.



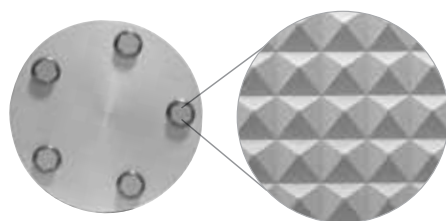
Yield improvement

Virtually eliminates scratching defects associated with some diamond grit conditioners. Controlled coefficient of variation provides optimized consistency.



Advanced node processes

No metals allowed? No problem. Ideal for processes sensitive to contamination.



Precise microreplicated patterns help give you complete process control

Frequently compatible slurry chemistries¹

- Copper
- ILD
- Poly silicon
- Self-aligned contact (SAC)
- SiGe
- STI

Explore our 3M™ Trizact™ Pad Conditioners range

View information on a few popular 3M™ Trizact™ Pad Conditioner products covering a range of roughness and pad wear rate combinations, or contact our team to explore our full library of high-performance pad conditioners.

| Product Number | Carrier | Carrier Size (in.) | Abrasive Material | Feature Size, Nominal (µm) | Active Tip (% of Total) and Normalized Pad Wear Rate |
|----------------|----------------------------|--------------------|--------------------|----------------------------|--|
| A5 | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 250 µm | Available upon request |
| B5 | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |
| B6 | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |
| B25 | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |
| B75 | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |

3M™ Trizact™ Pad Conditioner T Series

The epitome of our commitment to consistent, long-lifespan, metal-free pads. Launched in 2023, 3M™ Trizact™ Pad Conditioner T Series products optimize the surface topography for stronger pad activation, much slower wear and consistent performance throughout their lifetime.

Get product details

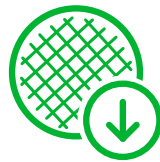


Semiconductor manufacturers choose them for:



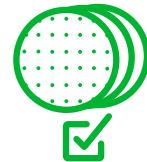
Strong, tunable pad activation

3M™ Trizact™ Pad Conditioner T Series maintains the tunable surface topography of 3M™ Trizact™ Pad Conditioners and combines it with increased diamond grain size to strengthen pad activation.



Reduced pad wear rate

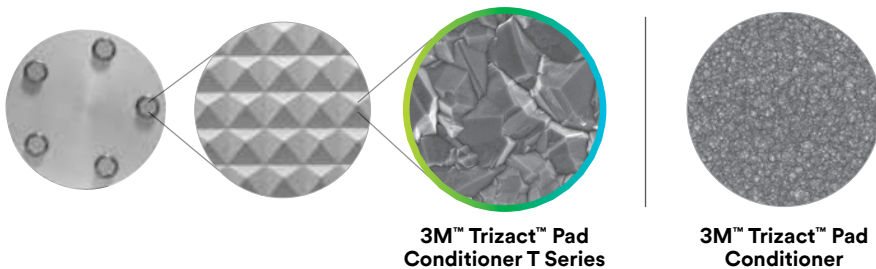
As pad conditioners wear down, the coefficient of friction (CoF) decreases, leading to pad wear rate decay. The rougher diamond coating on 3M™ Trizact™ Pad Conditioner T Series has a higher CoF that can reduce pad wear rate decay by up to 80%.



Optimized consistency

3M™ Trizact™ Pad Conditioner T Series demonstrates a coefficient of variation between pads of less than 2% — a more than 4X improvement over legacy sintered abrasive pad conditioners.

Optimized, rougher CVD diamond surface over microreplicated asperities



3M™ Trizact™ Pad Conditioner T Series

3M™ Trizact™ Pad Conditioner

Frequently compatible slurry chemistries¹

- Copper
- ILD
- Poly silicon
- Self-aligned contact (SAC)
- SiGe
- STI

Explore our 3M™ Trizact™ Pad Conditioner T Series range

View information on a few popular 3M™ Trizact™ Pad Conditioner T Series products covering a range of roughness and pad wear rate combinations or contact our team to explore our full library of high-performance pad conditioners.

| Product Number | Carrier | Carrier Size (in.) | Abrasive Material | Feature Size, Nominal (µm) | Active Tip (% of Total) and Normalized Pad Wear Rate |
|----------------|----------------------------|--------------------|--------------------|----------------------------|--|
| B5T | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |
| B6T | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |
| B25T | 304 or 410 Stainless Steel | 4 in. or 4.25 in. | CVD Coated Ceramic | 180 µm | Available upon request |

3M™ Diamond Pad Conditioners

3M™ Diamond Pad Conditioner products feature a diamond grid firmly attached through 3M proprietary sintered abrasive technology. These reliable pad conditioners can help refresh your CMP pad surfaces, minimize wear, and maintain consistent asperities and consistent pad performance, for wafer after wafer.

Get product details

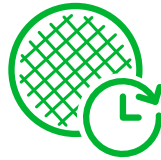


Semiconductor manufacturers choose them for:



Controlled performance

Diamond spacing and protrusion results in excellent pad planarity.



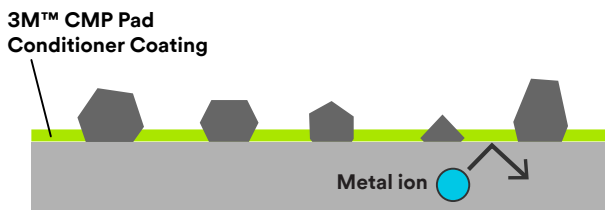
Increased life

Diamonds are firmly secured with 3M proprietary sintered abrasive technology and protected by an edge exclusion zone to minimize scratching and uneven wear.



Responsive support and supply

Four geographically independent 3M manufacturing and research facilities around the world provide prompt, local technical support and supply.



3M™ CMP Pad Conditioner Coatings reduce metal leaching

3M™ CMP Pad Conditioner Coatings put a durable layer over the pad conditioner, helping substantially reduce metal leaching. Plus, they further minimize micro and macro scratching defects. 3M coatings can be factory-applied to any 3M™ Diamond Pad Conditioner.

Explore our 3M™ Diamond Pad Conditioners range

[See next page for details.](#)

View details on selected 3M™ Diamond Pad Conditioners covering a range of roughness and pad wear rate combinations or contact our team to explore our full library of more than 70 high-performance pad conditioners.

Frequently compatible slurry chemistries¹

- BPSG
- Cobalt
- Copper
- ILD
- Metal gate
- Poly silicon
- STI
- Tungsten

Explore our 3M™ Diamond Pad Conditioners range

| Product Number | Carrier | Carrier Size (in.) | Diamond Size (µm) | Diamond Type* | Flatness (µm) | Aggressiveness Value (BL) |
|--------------------|---------------------|--------------------|-------------------|---------------|-----------------------------|---------------------------|
| A63 | 304 Stainless Steel | 4.25 in. | 63 µm | 2 | 0-35.5 µm | 1-3 |
| A82 | 304 Stainless Steel | 4.25 in. | 74 µm | 2 | 0-60 µm | 6-14 |
| A98 | 304 Stainless Steel | 4.25 in. | 90 µm | 3 | 1-70 µm | 8-14 |
| A122 | 304 Stainless Steel | 4.25 in. | 150 µm | 3 | 43-96 µm | 9-16 |
| A153L | 304 Stainless Steel | 4.25 in. | 150 µm | 4 | 1-100 µm | 6-9 |
| A160 | 304 Stainless Steel | 4.25 in. | 250 µm | 4 | 1-100 µm | 15-19 |
| A165 | 304 Stainless Steel | 4.25 in. | 250 µm | 4 | 1-100 µm | 15-19 |
| A188 | Polycarbonate | 4.25 in. | 250 µm | 4 | 1-100 µm | 15-19 |
| A188H | Polycarbonate | 4.25 in. | 250 µm | 4 | 10-90 µm | 20-26 |
| A188J | Polycarbonate | 4.25 in. | 250 µm | 4 | 1-100 µm | 15-19 |
| A189H | 304 Stainless Steel | 4.25 in. | 250 µm | 3 | 0-75 µm | 22-28 |
| A189L | 304 Stainless Steel | 4.25 in. | 250 µm | 3 | 0-75 µm | 14-16 |
| A2813 | 304 Stainless Steel | 4.25 in. | 180 µm | 3 | 0-75 µm | 20-27 |
| A3700 | Polycarbonate | 4.25 in. | 150 µm | 9 | 1-100 µm | 25-35 |
| B138L | 410 Stainless Steel | 4 in. | 180 µm | 1 | 25-60 µm | 18-25 |
| H70 (Double sided) | 304 Stainless Steel | 3.74 in. | 63 µm | 2 | 1-100 µm (on both sides) | N/A |
| L130 | 410 Stainless Steel | 4 in. | 150 µm | 3 | 20-57 µm | 9-12 |
| S60 | 410 Stainless Steel | 4 in. | 250 µm | 4 | 50-100 µm | 15-19 |
| S82 | 410 Stainless Steel | 4 in. | 74 µm | 2 | 20-71 µm | 9-10 |
| S122 | 410 Stainless Steel | 4 in. | 150 µm | 3 | 21-69 µm | 9-16 |
| S122H | 410 Stainless Steel | 4 in. | 150 µm | 3 | 21-69 µm | 13-16 |
| S122L | 410 Stainless Steel | 4 in. | 150 µm | 3 | 21-69 µm | 9-12 |
| S188J | 410 Stainless Steel | 4 in. | 250 µm | 4 | 20-60 µm | 15-19 |

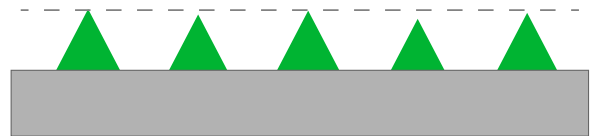
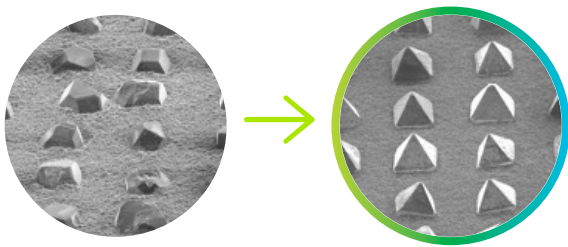
*Higher numbered diamond types are sharper (e.g. Type 2: Blocky, Type 3: Semi-Blocky, Type 4: Semi-Sharp)

3M™ Diamond Pad Conditioner C Series

Get product details



3M™ Diamond Pad Conditioner C Series products take the next step in consistency and control for diamond pad conditioners. Building on our tested and reliable sintered abrasive technology for diamond attachment, 3M™ Diamond Pad Conditioner C Series positions each diamond in a grid pattern at the micrometer scale. Plus, we've further controlled co-planarity and flatness so that you can have confidence in your activated pad roughness over dozens or hundreds of wafers.



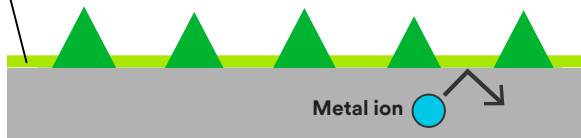
Exceptionally controlled performance

3M manufacturing processes emphasize consistency and precision. We can orient the diamonds on 3M™ Diamond Pad Conditioner C Series with a more than 80% tip-up ratio.

Highly controlled co-planarity

Choose your grid density. Precision diamond placement improves your control of pad wear rate and enables improved disk-to-disk consistency.

3M™ CMP Pad Conditioner Coating



3M™ CMP Pad Conditioner Coatings reduce metal leaching

Frequently compatible slurry chemistries¹

- BPSG
- Cobalt
- Copper
- ILD
- Metal gate
- Poly silicon
- STI
- Tungsten

Explore our 3M™ Diamond Pad Conditioner C Series range

View details on select 3M™ Diamond Pad Conditioner C Series products, or contact our team to explore our full library of products.

| Product Number | Carrier Type and Size (in.) | Diamond Size (µm) | Pitch (µm) |
|----------------|--|-------------------|------------|
| C250 | 304 Stainless Steel 4.25 in., 410 Stainless Steel 4 in. | 250 µm | 510 µm |
| C260 | 304 Stainless Steel 4.25 in., 410 Stainless Steel 4 in. | 250 µm | 625 µm |
| C280 | 304 Stainless Steel 4.25 in., 410 Stainless Steel 4 in. | 250 µm | 884 µm |
| C2120 | 304 Stainless Steel 4.25 in., 410 Stainless Steel 4 in. | 250 µm | 1250 µm |
| C2160 | 304 Stainless Steel 4.25 in., 410 Stainless Steel 4 in. | 250 µm | 1667 µm |

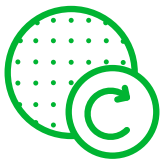
3M™ CMP Pad Conditioner Brush

Featuring a metal-free construction and low cost of ownership, 3M™ CMP Pad Conditioner Brush products are used for CMP buff and pad cleaning applications.

Get product details



Semiconductor manufacturers choose them for:



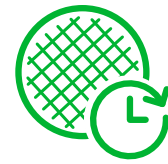
Great for soft CMP pads

Strong bristles to remove pad debris from porometric and felt-based pads.



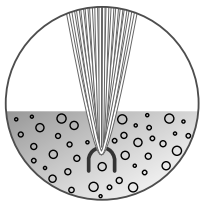
Metal-free durability

Bristles are independently anchored and evenly distributed across the brush surface using 3M proprietary brush-making technology.

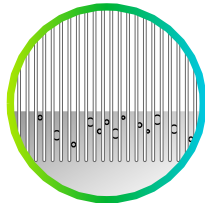


Low cost of ownership

Efficient pad cleaning and slurry distribution.



Conventional tufted bristle brush



3M™ CMP Pad Conditioner Brush

Pad cleaning and gentle conditioning of soft CMP pads

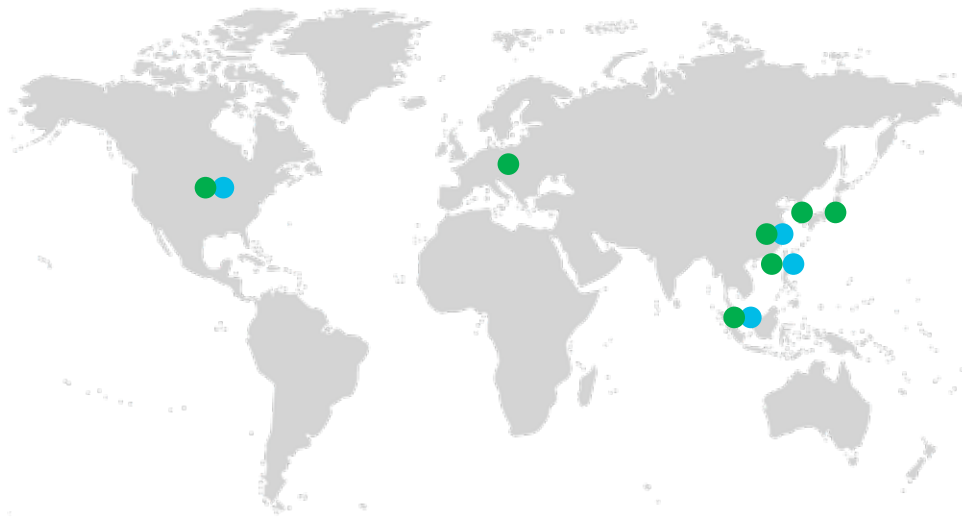
Frequently compatible pads¹

- Felt-based pads
- Porometric pads

Explore our 3M™ CMP Pad Conditioner Brush range

View information on select popular 3M™ CMP Pad Conditioner Brush products covering a range of fiber lengths, densities and diameters, or contact our team to explore our full library of products.

| Product Number | Carrier | Brush Material | Carrier Size (in.) | Fiber Length (in.) | Nominal Fiber Density (mg/cm ²) | Fiber Diameter (in.) |
|----------------|---------------|----------------|--------------------|--------------------|---|----------------------|
| PB32A | Polycarbonate | Nylon | 4.25 in. | 0.21 in. | 82 | 0.005 in. |
| PB33A | Polycarbonate | Nylon | 4.25 in. | 0.21 in. | 82 | 0.005 in. |
| PB33R | Polycarbonate | Nylon | 3.15 in. | 0.21 in. | 82 | 0.005 in. |
| PB42A | Polycarbonate | Nylon | 4.25 in. | 0.15 in. | 68 | 0.005 in. |
| PB52A | Polycarbonate | Nylon | 4.25 in. | 0.34 in. | 200 | 0.012 in. |



● Technical Support

● Manufacturing

Global supply and support

As of 2023, 3M is the only known supplier of CMP materials with sources of supply and labs in multiple countries around the world.

Our global laboratory and manufacturing capabilities provide you with access to local sampling, product iterations and 3M technical expertise to support your global business goals.

Choose a chemical mechanical planarization partner to help you create what's next in semiconductor manufacturing.

Get in touch with us at: [3M.com/CMP](https://www.3m.com/CMP)

1-800-251-8634



¹These selected chemistries are commonly compatible, but many others are compatible as well. The 3M CMP technical team has data packages for a broad range of common chemistries, and can test custom combinations for you as well.

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.

Product Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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