Product Safety Assessment

Chemical Mechanical Planarization (CMP) Polishing Pads


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Names
• Chemical Mechanical Planarization (CMP) Polishing Pads
• IC1000™ CMP Polishing Pad family
• VISIONPAD™ Polishing Pad family
• POLITEX™ Polishing Pad family
• SUBA™ Polishing Pad family
• MH™ Polishing Pad family
• IKONIC™ Polishing Pad family
• OPTIVISION™ Polishing Pad family

Product Overview
• CMP (Chemical Mechanical Planarization) Polishing Pads are typically thin (e.g., \(\frac{1}{16}\) inch thick), polymeric discs with grooved surfaces. They are typically 20-30 inches in diameter. The pads are marketed under the trade names IC1000™, VISIONPAD™, SUBA™, MH™ and IKONIC™ pads.\(^1\) For further details, see Product Description
• CMP Polishing Pads are used for ultra-fine (micrometer to nanometer range), precision polishing applications. These pads are designed to be used with CMP polishing slurries, liquid products that contain etching chemicals and abrasives. CMP Polishing Pads are used throughout the microprocessor manufacturing process for polishing silicon wafers and their metal circuitry (e.g. copper, tungsten) and for polishing glass, ceramics, lenses, and aluminum disks.\(^2\) For further details, see Product Uses.
• CMP Polishing Pads are intended for industrial use only. Exposure can occur either in facilities that manufacture CMP Polishing Pads or in the various industrial or manufacturing facilities that use these products. For further details, see Exposure Potential.
• CMP Polishing Pads are solid, pancake-shaped discs. No health hazards are anticipated from handling these products. For further details, see Health Information and request the relevant Safety Data Sheet from the Dow Customer Information Group.
• CMP Polishing Pads are not biodegradable or toxic to wildlife. For further details, see Environmental Information.
• CMP Polishing Pads are stable under recommended storage and use conditions. For further details, see Physical Hazard Information.

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Manufacture of Product

- **Locations** – The Dow Chemical Company and its global affiliates produce CMP Polishing Pads in Newark, Delaware in the United States and in Hsinchu, Taiwan. Dow also distributes CMP pads manufactured by Nitta Haas, Inc.

- **Process** – CMP Polishing Pads are produced using proprietary methods that involve pouring liquid polymer into pad-shaped casts. Once solidified, the pads are further machined to desired thicknesses and grooving patterns are applied to their surfaces. Other pads are manufactured by coating liquid polymer onto felt substrates, then cutting the dried product to desired dimensions.

Product Description

CMP pads are typically thin (e.g., 1/16 inch thick), polymeric discs with grooved surfaces. They are 20-30 inches in diameter, depending on polishing machine size requirements. CMP Polishing Pads can be porous or solid, hard or soft, depending on application. CMP pads contain pressure-sensitive adhesive on one side for adhesion to the platen (pad holder). Dow Electronic Materials manufactures the following families of CMP Polishing Pads, each with unique polishing characteristics: IC1000™, VISIONPAD™, SUBA™, and MH™ pads.

Product Uses

The semiconductor industry uses Chemical Mechanical Planarization (CMP) to planarize (flatten) and polish surfaces onto which circuitry will be deposited. CMP Polishing Pads are designed for polishing and finishing a wide variety of surfaces where flatness and ultra-precision surface finish is critical. DOW™ CMP Polishing Pads are designed to be used with NANOPURE™, KLEBOSOL™, CELEXIS™, ACUPLANE™ polishing slurries, as well as Reactive Liquid bulk copper removal slurries. The combined action of CMP Polishing Pad and slurry produces the planar (flat) surface. CMP Polishing Pads are used on the following surfaces:

- Silicon (semiconductor wafers) – stock, intermediate, and final wafer polish
- Interlayer dielectric devices (ILD), low-k dielectric devices
- Nickel-plated memory discs
- Glass and optics
- Ceramics
- Metals (aluminum, tungsten, copper)
- Copper barrier
- Plastics

Exposure Potential

CMP Polishing Pads are used in the semiconductor industry and for other industrial precision polishing applications. Based on the uses for these products, individuals could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture CMP Polishing Pads or in the various industrial or manufacturing facilities that use these products. Those working with CMP Polishing Pads in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit exposure. See Health Information.

- **Consumer exposure to CMP Polishing Pads** – These specialty products are for industrial use only. Dow does not sell CMP Polishing Pads for consumer use, so direct consumer contact with this product is unlikely. See Health Information.

- **Environmental releases** – Environmental releases in the sense of discharges to water, air or soil are not anticipated, given the physical form of the pads. Used pads are disposed of as regular (municipal) solid waste. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area. Appropriate extinguishing measures should be used. Firefighters should wear a positive-pressure, self-contained breathing apparatus and protective clothing. See Environmental, Health, and Physical Hazard Information.
For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Health Information**

Health information for CMP Polishing Pads is summarized on the relevant Safety Data Sheets. These materials may also contain minor components or additives that have additional health risks. It is important to note that health risks associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific health information. An overview of health information for CMP Polishing Pads appears below.

*Eye or skin contact* – Mechanical irritation is possible from skin or eye contact with polymeric dusts during pad fabrication and machining operations.

*Inhalation* – Inhalation of polymeric dusts during pad fabrication and machining operations can cause mechanical irritation to nose, throat, and lungs.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Environmental Information**

Environmental information for CMP Polishing Pads is summarized on the relevant Safety Data Sheets. These materials may also contain solvents or additives that have additional environmental impact. It is important to note that environmental impact associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific environmental information. An overview of environmental information for CMP Polishing Pads appears below.

CMP Polishing Pads are not expected to be biodegradable. They are not expected to be acutely toxic to fish or wildlife.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Physical Hazard Information**

CMP Polishing Pads are stable under recommended storage and use conditions. These products should be stored flat in their original packaging at temperatures between 10°C to 24°C (50°F to 75°F).

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Regulatory Information**

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of CMP Polishing Pads. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

**Additional Information**

- Safety Data Sheet – request from the Dow Customer Information Group
- Contact Us at [www.dowelectronicmaterials.com/products/led/cmp.htm](http://www.dowelectronicmaterials.com/products/led/cmp.htm)
VISIONPAD™ pad family webpage

POLITEX™ pad family webpage

SUBA™ pad family webpage

Product Lines for Electronics & Entertainment: Polishing Pads
(www.dow.com/products/product_lister.page?industry=1000004&application=1011343)

For additional information about CMP Polishing Pads, visit the Dow CMP Products webpage at www.dowelectronicmaterials.com/products/semiconductors/cmp/.

References

4. Product Lines for Electronics & Entertainment: Polishing Pads webpage:
NOTICES

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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