



## Product Safety Assessment

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# DURAMAX™ Binders

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### Names

- DURAMAX™ binders
- DURAMAX B-1000 ceramic binder
- DURAMAX B-1022 ceramic binder
- DURAMAX HA-12 ceramic binder
- DURAMAX D-3005 ceramic dispersant

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### Product Overview

- DURAMAX™ binders are emulsion polymers manufactured by Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliates. This family of products ranges in color from milky white to pale yellow, depending on the formulation.<sup>1,2,3,4</sup> For further details, see [Product Description](#).
- DURAMAX binders are used to enhance properties when added to ceramic parts and powders.<sup>5,6,7,8</sup> For further details, see [Product Uses](#).
- DURAMAX binders are for commercial use. Worker exposure is possible during manufacture, transport, or applications. Because these products are not sold directly to consumers, and are manufactured for industrial applications, consumer contact is unlikely. For further details, see [Exposure Potential](#).
- Direct eye contact may cause slight irritation. Prolonged or repeated skin contact may cause slight irritation. Inhalation of product vapor or mist can cause headache, nausea, and irritation of the nose, throat, and lungs.<sup>9</sup> For further details, see [Health Information](#).
- The acrylic polymers in DURAMAX binders are expected to slowly degrade in the environment. Due to their high molecular weight, the acrylic polymers are not expected to accumulate in the food chain. Based on data from similar materials, acrylic polymers are expected to be practically nontoxic to aquatic organisms on an acute basis.<sup>10</sup> For further details, see [Environmental Information](#).
- These products are stable under recommended storage and normal use conditions.<sup>11</sup> For further details, see [Physical Hazard Information](#).

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## Product Safety Assessment: DURAMAX™ Binders

### Manufacture of Product

Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliates, manufacture DURAMAX™ binders in various global locations. They are prepared as emulsion polymers.

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### Product Description<sup>12,13,14,15</sup>

DURAMAX™ binders are acrylic emulsion polymers dispersed in water. They are milky white to yellow liquids with an acrylic (sweet) or ammonia odor. These products range from 34% to 56% solids.

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### Product Uses

DURAMAX™ binders and dispersants are specifically designed for use in INDUSTRIAL ceramic applications. DURAMAX binders and dispersants are expressly NOT recommended and NOT approved by Dow for Ceramic bone or dentifrice replacement or other Personal Care related applications. These products may be blended to achieve desired characteristics in the final ceramic product.

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### Exposure Potential<sup>16</sup>

DURAMAX™ binders are used in the production of industrial products. Based on the uses for this product, individuals could be exposed through:

- **Workplace exposure** – Exposure can occur either in a facility that manufactures DURAMAX binders or in the various industrial or manufacturing facilities that use these binders. They are produced, transported, stored, and consumed in closed systems until use. Those working with DURAMAX binders in manufacturing operations could be exposed during maintenance, sampling, testing, application 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 products containing DURAMAX binders** – Dow does not sell DURAMAX binders for direct consumer use. Consumer exposure is unlikely, as these products are used at low levels in industrial ceramic applications and most of the polymer is consumed in the firing process. See [Health Information](#).
- **Environmental releases** – Due to the use pattern for these products, releases to the environment are expected to be minimal. If released to surface waters, the acrylic polymers would initially remain dispersed in water, but eventually settle into the sediments. The acrylic polymers would likely be removed by biological wastewater-treatment facilities via adsorption to biosolids. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. Respiratory protection is necessary for cleaning up spills and leaks. For small spills, DURAMAX binders should be absorbed with materials such as sand. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the product should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. An approved positive-pressure, self-contained breathing apparatus (SCBA) with a full-face mask is recommended for emergency work. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **In case of fire** – These water-based formulations are noncombustible, but dried product residue can burn. Product can splatter above 100°C (212°F). To extinguish combustible residues of these products, use water spray, carbon-dioxide or dry-chemical extinguishers, or foam. Keep people away. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Keep fire water out of waterways and sewers to minimize the potential for environmental damage. Follow emergency procedures carefully. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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## **Product Safety Assessment: DURAMAX™ Binders**

### **Health Information<sup>17</sup>**

Health information for DURAMAX™ binders is summarized on the relevant [Safety Data Sheets](#). 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. These products may also contain minor components or additives that have additional health risks. An overview of health information for DURAMAX binders appears below.

**Eye contact** – Direct contact can cause slight irritation.

**Skin contact** – Prolonged or repeated skin contact can cause slight irritation.

**Inhalation** – Inhalation of vapor or mist can cause headache, nausea, and irritation of the nose, throat, and lungs.

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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### **Environmental Information<sup>18</sup>**

Environmental information for DURAMAX™ binders is summarized on the relevant [Safety Data Sheet](#). It is important to note that environmental risks associated with individual products may vary based on their formulation and/or intended use. The [Safety Data Sheet](#) is the preferred source for specific environmental information.

The acrylic polymers in DURAMAX binders have a high molecular weight, low water solubility and are nonvolatile. If introduced to soil, they are expected to remain in soil. If released to the water, the acrylic polymers would initially remain dispersed in water, but eventually settle into the sediments. The acrylic polymers are expected to be relatively inert in the environment and would not be considered biodegradable according to strict Organisation for Economic Co-operation and Development (OECD) guidelines. However, they are expected to slowly degrade in the environment, including degradation by physical action or by exposure to sunlight.

Due to their high molecular weight, acrylic polymers are not expected to accumulate in the food chain. Based on data from similar products, DURAMAX binders are expected to be practically nontoxic to aquatic organisms on an acute basis (LC<sub>50</sub>/EC<sub>50</sub> greater than 100 mg/L).

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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### **Physical Hazard Information<sup>19</sup>**

DURAMAX™ binders are stable under recommended storage and normal use conditions. Avoid freezing as product stability may be affected. Monomer vapors can be released when these products are heated during processing operations.

These products are noncombustible, but dried product residue can burn. There are no known materials that are incompatible with these products.

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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### **Regulatory Information**

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DURAMAX™ binders. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant [Safety Data Sheet](#), [Technical Data Sheet](#), or [Contact Us](#).

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## Product Safety Assessment: DURAMAX™ Binders

### Additional Information

- Request the Safety Data Sheet from the [Dow Customer Information Group \(www.dow.com/assistance/dowcig.htm\)](http://www.dow.com/assistance/dowcig.htm)
- Contact Us ([www.dow.com/assistance/thoughts.htm](http://www.dow.com/assistance/thoughts.htm))
- DURAMAX™ B-1000 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FCC-339, December 1996 (revised 2008) ([www.dow.com/assets/attachments/business/pmat/duramax/duramax\\_b-1000/tds/duramax\\_b-1000.pdf](http://www.dow.com/assets/attachments/business/pmat/duramax/duramax_b-1000/tds/duramax_b-1000.pdf))
- DURAMAX™ B-1022 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-422, January 1999 (revised 2008) ([www.dow.com/assets/attachments/business/pmat/duramax/duramax\\_b-1022/tds/duramax\\_b-1022.pdf](http://www.dow.com/assets/attachments/business/pmat/duramax/duramax_b-1022/tds/duramax_b-1022.pdf))
- DURAMAX™ HA-12 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008) ([www.dow.com/assets/attachments/business/pmat/duramax/duramax\\_ha-12/tds/duramax\\_ha-12.pdf](http://www.dow.com/assets/attachments/business/pmat/duramax/duramax_ha-12/tds/duramax_ha-12.pdf))
- DURAMAX™ D-3005 Dispersant Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008) ([www.dow.com/assets/attachments/business/pmat/duramax/duramax\\_d-3005/tds/duramax\\_d-3005.pdf](http://www.dow.com/assets/attachments/business/pmat/duramax/duramax_d-3005/tds/duramax_d-3005.pdf))

For more business information about DURAMAX™ binders, visit the [DURAMAX products](http://www.dow.com/products/product-line/duramax) web site at [www.dow.com/products/product-line/duramax](http://www.dow.com/products/product-line/duramax).

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### References

- <sup>1</sup> DURAMAX™ B-1000 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FCC-339, December 1996 (revised 2008), page 1.
- <sup>2</sup> DURAMAX™ B-1022 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-422, January 1999 (revised 2008), page 1.
- <sup>3</sup> DURAMAX™ HA-12 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008), page 1.
- <sup>4</sup> DURAMAX™ D-3005 Dispersant Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008), page 1.
- <sup>5</sup> DURAMAX™ B-1000 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FCC-339, December 1996 (revised 2008), page 1.
- <sup>6</sup> DURAMAX™ B-1022 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-422, January 1999 (revised 2008), page 1.
- <sup>7</sup> DURAMAX™ HA-12 Ceramic Binder Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008), page 1.
- <sup>8</sup> DURAMAX™ D-3005 Dispersant Technical Data Sheet, Rohm and Haas Company, FC-333, April 1997 (revised 2008), page 1.
- <sup>9</sup> DURAMAX™ B-1000 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, September 11, 2012, Hazards Identification.
- <sup>10</sup> DURAMAX™ HA-12 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 9, 2005, Ecological Information.
- <sup>11</sup> DURAMAX™ HA-12 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 9, 2005, Stability and Reactivity.
- <sup>12</sup> DURAMAX™ HA-12 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 9, 2005, Composition/Information on Ingredients.
- <sup>13</sup> DURAMAX™ B-1022 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 24, 2011, Composition/Information on Ingredients.
- <sup>14</sup> DURAMAX™ D-3005 [dispersant] Safety Data Sheet, Rohm and Haas Company, June 24, 2011, Composition/Information on Ingredients.
- <sup>15</sup> DURAMAX™ B-1000 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, September 11, 2012, Composition/Information on Ingredients.
- <sup>16</sup> DURAMAX™ HA-12 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 9, 2005, Firefighting Measures, Accidental Release Measures, Exposure Controls/Personal Protection, and Ecological Information.
- <sup>17</sup> DURAMAX™ B-1000 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, September 11, 2012, Hazards Identification.
- <sup>18</sup> DURAMAX™ HA-12 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, June 9, 2005, Ecological Information.
- <sup>19</sup> DURAMAX™ B-1000 [ceramic binder] Safety Data Sheet, Rohm and Haas Company, September 11, 2012, Firefighting Measures, Handling and Storage, and Stability and Reactivity.

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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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