Product Safety Assessment

Ultra-Low Formaldehyde Acrylic Emulsions

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Names

- Ultra-low formaldehyde acrylic emulsions
- RHOPLEX™ ECO-100 emulsion
- RHOPLEX ECO-3482 emulsion
- RHOPLEX NW-1715K emulsion
- RHOPLEX NW-1845K emulsion
- RHOPLEX P-376 emulsion
- RHOPLEX ECONEXT™ 110 emulsion
- RHOPLEX ECONEXT 210 emulsion
- RHOPLEX ECONEXT 230 emulsion
- RHOPLEX ECONEXT 240 emulsion
- POLYCO™ 2149A emulsion
- Select PRIMAL™ emulsions

Product Overview

- Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliates, manufacture and market a series of water-based, ultra-low formaldehyde acrylic emulsions. They are marketed in the United States primarily under the trademark RHOPLEX™ emulsions and in Europe primarily under the tradename PRIMAL™ emulsions, although not all PRIMAL emulsions have ultra-low formaldehyde levels. For further details, see Product Description.

- Ultra-low formaldehyde acrylic emulsions are used primarily as binders and coatings for textiles and nonwoven fabrics. For further details, see Product Uses.

- Ultra-low formaldehyde acrylic emulsions are for commercial use. Worker exposure is possible during manufacture, transport, or application. These products are not sold directly to consumers; however, textiles and fabrics used by consumers may incorporate these products in dried and cured form. Dried and cured product would not be expected to represent a significant risk. For further details, see Exposure Potential.

- Eye contact with the emulsion can cause irritation. Skin contact can cause slight irritation. Inhalation of vapor or mist can cause irritation of the nose, throat, and lungs. These products may be harmful if swallowed. For further details, see Health Information.

- The acrylic resin components of ultra-low formaldehyde acrylic emulsions would be expected to be inert in the environment. Due to their high molecular weight, the acrylic resins are not expected to accumulate in the food chain. Based on data from similar materials, acrylic resins are not considered harmful to fish and other aquatic organisms. For further details, see Environmental Information.

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- These ultra-low formaldehyde acrylic emulsions are noncombustible, although the dried residue can burn. These products are stable under recommended storage and normal use conditions.\textsuperscript{10,11} For further details, see Physical Hazard Information.

**Manufacture of Product**

- **Capacity** – Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliates, manufacture and formulate ultra-low formaldehyde acrylic emulsions at various global facilities.
- **Process** – Ultra-low formaldehyde acrylic emulsions are produced in batch operations using proprietary Rohm and Haas methods, chemistries, and formulations.

**Product Description**\textsuperscript{12,13}

Ultra-low formaldehyde acrylic emulsions are water-based acrylic emulsions formulated as white to milky-white liquids with an acrylic or ammonia odor. They range from 30\% to 60\% solids. They are self-crosslinking. They are marketed in the United States primarily under the trade name RHOPLEX\textsuperscript{\textregistered} emulsions and in Europe primarily under the trade name PRIMAL\textsuperscript{TM} emulsions, although not all PRIMAL emulsions have ultra-low formaldehyde levels. The RHOPLEX ECONEXT\textsuperscript{TM} emulsion products (PRIMAL ECONEXT in Europe) were recently introduced as breakthrough products in this category.

**Product Uses**\textsuperscript{14}

Ultra-low formaldehyde acrylic emulsions are used in fabric-finishing processes, primarily as binders to back-coat commercial textiles and nonwoven fabrics. They can also be used to bind fibers together to make nonwoven fabrics. Specific acrylic emulsion products are selected to provide the balance of properties required for each application. Depending on the product used, they can impart the following characteristics to finished fabric:

- Touch characteristics varying from soft to stiff
- Excellent solvent resistance
- Wash and dry-clean durability
- Color and formulation stability

Once dried and cured, the resins produce strong coatings that remain permanently bonded to the fabric. Fabrics produced with these emulsions are used in applications such as:

- Hospital wear
- Personal hygiene
- Industrial clothing
- Filters
- Wet wipes
- Interlinings

**Exposure Potential**\textsuperscript{15,16}

These ultra-low formaldehyde acrylic emulsions are used in the production of textiles and nonwoven fabrics. Based on the uses for this product, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture or formulate ultra-low formaldehyde acrylic emulsions or in the various industrial or manufacturing facilities that use these products. Those working with these products in manufacturing operations could be exposed during application, maintenance, sampling, testing, or other procedures.
Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to ensure that exposure guideline limits are not exceeded. See Health Information.

- **Consumer exposure to products containing ultra-low formaldehyde acrylic emulsions**
  - Dow does not sell ultra-low formaldehyde acrylic emulsions for direct consumer use, but they are used to make or coat textiles and nonwoven fabrics, such as wet wipes and personal-hygiene products. Contact with the dried and cured product is not considered to present a significant risk to consumers. See Health Information.

- **Environmental releases** – Ultra-low formaldehyde acrylic emulsions are maintained and used under strictly controlled conditions, and as a result environmental releases are expected to be minimal. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. If released to water or soil, the acrylic resin components would be inert in the environment. If released to surface waters, the acrylic resin components would initially remain dispersed in water, but eventually settle into the sediments. Based on data from similar materials, these products are not expected to be biodegradable, but would likely be removed by biological wastewater-treatment facilities via adsorption to biosolids. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, these products should be captured, collected, and reprocessed or disposed of according to applicable governmental regulations. An approved respirator is recommended for emergency work. Spill products can cause slippery conditions. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area. These products are noncombustible, although dried residue can burn. Use extinguishing techniques that are appropriate for the surrounding materials. Products may splash above 100°C (212°F). 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 Safety Data Sheet from the Dow Customer Information Group.

**Health Information**

Health information for ultra-low formaldehyde acrylic emulsions is summarized on the relevant Safety Data Sheet. It is important to note that health risks associated with individual products may vary based on their formulation and/or intended use. These products may contain minor components or additives that have additional health risks. An overview of health information for these products appears below, but the product Safety Data Sheet is the preferred source for specific health information.

- **Eye contact** – Direct contact can result in slight eye irritation.

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

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

- **Ingestion** – These products are expected to have low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.
Environmental Information\textsuperscript{19,20}
It is important to note that environmental risks associated with individual products may vary based on their formulation and/or intended use. The relevant product \textit{Safety Data Sheet} is the preferred source for specific environmental information.

The acrylic resin components of these ultra-low formaldehyde acrylic emulsions have high molecular weights, low water solubility, and are nonvolatile. If introduced to soil, they are expected to remain in soil. If released to the water, the acrylic resin components would initially remain dispersed in water, but will eventually settle into the sediments.

The acrylic resin components are expected to be relatively inert in the environment. Although polymers are considered essentially nonbiodegradable, they are expected to slowly degrade in the environment, including degradation by physical action or exposure to sunlight.

Due to their high molecular weight, acrylic resins are not expected to accumulate in the food chain. Based on data from similar materials, these products are not considered harmful to fish or other aquatic organisms on an acute basis.

For more information, request the Safety Data Sheet from the \textit{Dow Customer Information Group}.

Physical Hazard Information\textsuperscript{21,22}
These ultra-low formaldehyde acrylic emulsions are stable under recommended storage and normal use conditions. Avoid freezing as product stability may be affected.

These products are noncombustible. However the dried residue can burn. There are no known materials that are incompatible with these products.

For more information, request the Safety Data Sheet from the \textit{Dow Customer Information Group}.

Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of ultra-low formaldehyde acrylic emulsions. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant \textit{Safety Data Sheet}, \textit{Technical Data Sheet}, or \textit{Contact Us}.

Additional Information
\begin{itemize}
\item Request the Safety Data Sheet from the \textit{Dow Customer Information Group} (\url{www.dow.com/assistance/dowcig.htm})
\item Contact Us (\url{www.dow.com/assistance/thoughts.htm})
\item \textit{RHOPLEX}™ \textit{ECO-100 [Emulsion] Technical Data Sheet}, The Dow Chemical Company, Form No. DW09N029, Rev. 0, September 2009 (\url{www.dow.com/assets/attachments/business/pcm/rhoplex_eco/rhoplex_eco-100/tds/rhoplex_eco-100.pdf})
\end{itemize}

For more information about RHOPLEX™ or PRIMAL™ ultra-low formaldehyde acrylic emulsions, visit the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm).

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References

6 RHOPLEX™ SP-100 Emulsion Material Safety Data Sheet, The Dow Chemical Company, August 31, 2010, Hazards Identification and Toxicological Information.
8 RHOPLEX™ SP-100 Emulsion Material Safety Data Sheet, The Dow Chemical Company, August 31, 2010, Ecological Information.
17 RHOPLEX™ SP-100 Emulsion Material Safety Data Sheet, The Dow Chemical Company, August 31, 2010, Hazards Identification and Toxicological Information.

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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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