Product Safety Assessment

*AQUASET™ Thermo-setting Resins (Water-soluble)*


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**Names**

- *AQUASET™* Thermosetting Resins (Water-soluble)
- *AQUASET* acrylic binders

**Product Overview**

- *AQUASET™* thermo-setting resins are a family of water-based, acrylic polymers designed to replace conventional melamine-formaldehyde, urea-formaldehyde, and phenol-formaldehyde resins in a wide array of products. *AQUASET* resins are formulated as clear to hazy amber-colored liquids. For further details, see [Product Description](#).

- *AQUASET* thermosetting resins are sold for industrial use only and used for binding various fibers in the production of industrial non-woven materials such as fiberglass webs and wool (batt) used in roofing, flooring, insulation, and HVAC filters. For further details, see [Product Uses](#).

- Worker exposure to *AQUASET* thermosetting resins is possible during manufacture, transport, or use. Consumers may use building products – such as insulation, roofing, or flooring – that may contain these fully cured binders. For further details, see [Exposure Potential](#).

- Health information provided is for uncured products, which are intended for industrial use only. Eye or skin contact with liquid product or mist can cause slight irritation. Inhalation of product vapor or mist during processing can cause irritation of the nose, throat, and lungs. Headache and nausea are also possible. For further details, see [Health Information](#).

- *AQUASET* acrylic polymer resins are completely soluble in water. The cured polymers are expected to be inert in the environment. For further details, see [Environmental Information](#).

- *AQUASET* thermosetting resins are stable under recommended storage and use conditions. For further details, see [Physical Hazard Information](#).

**Manufacture of Product**

- **Locations** – Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, manufactures AQUASET™ thermosetting resins at facilities in Knoxville,
Tennessee and tolling companies in the U.S. Foreign affiliated companies and tolling companies manufacture AQUASET™ thermosetting resins in Villers Saint Paul, and other locations in France.

- **Process** – AQUASET thermosetting resins are produced and formulated in batch operations using proprietary materials and technology.

### Product Description

AQUASET™ thermosetting resins are clear to hazy amber-colored liquid formulations (precise mixtures of various components). AQUASET thermosetting resins are formaldehyde-free† binders developed to replace conventional melamine-formaldehyde, urea-formaldehyde, and phenol-formaldehyde resins. These products are water-based solutions of organic polyacids that incorporate a cross-linker and catalyst. When heated to greater than 175°C (350°F), the water is driven off and the organic polyacids react with the cross-linker to form a polyester “network” polymer. The resulting polymer is a strong, durable, and flame-resistant thermoplastic solid. When cured (exposed to heat and reacted to solidify and harden), AQUASET™ binders become a solid thermoplastic material, meaning it softens when exposed to heat.

### Product Uses

AQUASET™ thermosetting resins are sold for industrial use only and used as binders for a wide variety of non-woven materials. They can bond glass, high-temperature-resistant polyester, cellulose, carbon, and ceramic fibers. Possible end-use applications for AQUASET binders include:

- **Glass fiber webs (fiberglass) for roofing applications (shingles and built-up roofing)**
- **Specialty-glass mats used as facer sheets in composites, flooring, and insulation applications (residential, commercial, specialty)**
- **Fiberglass wool (batt) for insulation, insulating component, and other applications.**

### Exposure Potential

AQUASET™ thermosetting resins are used as binders for fiberglass webs and specialty-glass mats. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Worker exposure is possible during the manufacture of AQUASET thermosetting resins or during their use as a binder. Those working with AQUASET binders in manufacturing or fabricating 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 and safety equipment in place to limit exposure. Builders, roofers, and others in the construction industry could be exposed to cured (dried and hardened) resin in shingles, flooring, insulation, or other materials. Contact with cured product is not expected to present a health risk. See Health Information.

- **Consumer exposure to AQUASET thermosetting resins** – AQUASET binders are not sold directly to consumers, but they can be used to produce shingles, insulation, flooring, and other building products consumers may purchase or use. Because these resins are formaldehyde-free†, they do not produce formaldehyde emissions during cure. Contact with cured product is not expected to present a health risk. See Health Information.

- **Environmental releases** – Based on the use patterns for these products, the potential for an environmental release is low. If released to water the polymer component would initially disperse in water, and would be expected to become a part of the sediment. These polymers will likely be removed by biological wastewater-treatment facilities as sludge. These polymers

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† Formaldehyde-free: Product made without formaldehyde or formaldehyde-generating materials
are expected to be practically nontoxic to fish or other aquatic organisms. 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 focus is on immediate containment to prevent contamination of soil and surface or ground water. Evacuate personnel upwind and away from any spill or leak. Use appropriate personal protective equipment. Dike the spill with inert solids such as sand or earth. Transfer liquids and solid diking material into separate suitable containers for recovery or disposal. Spilled material can create slippery conditions. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – AQUASET™ thermosetting resin formulations are noncombustible. Dried product can burn. These products can splatter above 100°C (212°F). Use extinguishing measures appropriate for the surrounding fire. Firefighters should wear positive-pressure, self-contained breathing apparatus and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**

Health information for AQUASET™ thermosetting resins 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. An overview of health information for uncured AQUASET thermosetting resins appears below. Uncured MOR-AD solvent-borne adhesive products are intended for industrial use only. Cured (hardened) AQUASET™ resins are solid thermoplastic materials that are not expected to present a health risk.

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

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

**Inhalation** – Inhalation of product vapor or mist during processing can cause irritation of the nose, throat, and lungs.

**Chronic exposure** – Prolonged or repeated overexposure to product dusts or mists can cause lung irritation. Maintaining airborne concentrations within the recommended exposure limit is not expected to produce adverse effects within the lung.

For more information, see the relevant Safety Data Sheet.

**Environmental Information**

Once cured the polymers in AQUASET™ thermosetting resins would be expected to be inert in the environment. If released to surface waters, the polymers would initially remain dispersed in water, and eventually become part of the sediment. These polymers will likely be removed by biological wastewater-treatment facilities as part of sludge biosolids.

Although polymers are generally considered nonbiodegradable, they are likely to degrade slowly in the environment, including degradation by physical action or upon exposure to sunlight.
Because of their high molecular weight, these polymers would not be expected to accumulate in the food chain (low bioconcentration potential). Based on information for similar products, AQUASET™ thermosetting resins are practically non-toxic to fish and other aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

AQUASET™ thermosetting resins are stable under recommended storage and use conditions. Product decomposition can occur at temperatures greater than 230°C (446°F). Keep these products from freezing.

Monomer vapors can be evolved when products are heated during processing operations.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of AQUASET™ thermosetting resins. 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.

Additional Information

- Safety Data Sheet (www.dow.com/products/product_line_detail.page?product-line=1120042) or request from the Dow Customer Information Group
- Contact Us (www.dowconstructionchemicals.com/na/en/contact/)
- Dow Construction Chemicals website – Products (Technological Building Blocks) webpage (www.dowconstructionchemicals.com/na/en/products/)

For more business information about AQUASET thermosetting resins, visit the Dow Construction Chemicals website at www.dowconstructionchemicals.com/na/en/.

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References

3. Dow Construction Chemicals website – Products (Technological Building Blocks) webpage
   (www.dowconstructionchemicals.com/na/en/products/)
8. Dow Construction Chemicals website – Products (Technological Building Blocks) webpage
   (www.dowconstructionchemicals.com/na/en/products/)

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