

DION® 382E
(Outside US – BIVIRTEX 421-22)
Powdered Bisphenol-A Fumarate Resin**DESCRIPTION**

DION® 382E is a powdered, monomer-free, bisphenol-A fumarate polyester.

APPLICATION

- DION 382E is typically used as a styrene soluble binder for fiberglass reinforcement products.

FEATURES

- Propoxylated bisphenol-A fumarate without solvents, crosslinking monomer, or external flow additives.
- High molecular weight.
- Soluble in styrene and most organic solvents.
- Uncrosslinked, behaves as an amorphous low melting point thermoplastic before curing.
- Laminates made from styrenated versions feature excellent corrosion resistance.
- Manufactured using statistical process control in ISO 9002 certified plants.

BENEFITS

- High tensile properties of chopped strand mat.
- Compatibility and good solution rate properties with styrene, leading to good appearance, workability, and air release upon preparation of FRP laminates.
- No use of solvents or water which present environmental and other problems.
- Welds together adjacent glass filaments without wicking or icing associated with solvent or water-based binder systems, thereby leading to minimal binder usage to achieve necessary mat tensile strength.
- High molecular weight, coupled with melting and rheological properties, permits production of thermoformable mat with good properties.
- Consistent batch-to-batch performance.

The information herein is general information designed to assist customers in determining whether our products are suitable for their applications. Our products are intended for sale to industrial and commercial customers. We require customers to inspect and test our products before use and to satisfy themselves as to contents and suitability for their specific applications. We warrant that our products will meet our written specifications. **Nothing herein shall constitute any other warranty express or implied, including any warranty of merchantability or fitness for a particular purpose**, nor is any protection from any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is limited to replacement of our materials and in no event shall we be liable for special, incidental or consequential damages.

PROPERTIES

| | |
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| Acid Number | 16 maximum |
| Ring & Ball Softening Point, °C | 96 - 106 |
| Mesh Size: | |
| % on U.S. #35 | 0.5 max |
| % thru U.S. #100 | 30.0 max |
| % thru U.S. #200 | 10.0 max |
| Average particle size, microns | 220 - 240 |
| Viscosity @ 25 °C, 50% in styrene, poise | 45 |
| Bulk density, lb/cu. ft. | 35 |
| Melt index, 2,160 gm, gm/10 min.: | |
| @ 115 °C | 7 - 14 |
| Tg, by DSC, midpoint, 10 °C/min ramp, °C: | |
| first heat | 63 |
| second heat | 56 |
| Melt viscosity, poise: | |
| @ 150 °C | 180 |
| @ 170 °C | 40 |

APPLICATION PROPERTIES

DION® 382E is widely used as a binder for chopped strand mat where good transparency or compatibility is desired for various reinforced plastics. Upon dissolution in styrene it will co-react with polyester laminating resins. The chemical structure of DION 382E affords excellent corrosion resistance and the mat products are universally suitable for premium as well as general purpose resin applications.

An outstanding property of DION 382E is that high mat tensile strengths are possible, while still affording a binder which dissolves styrene at a rate sufficient to permit good appearance, de-aeration, and workability during laminate construction. The binding strength is made possible by the high molecular weight and structure of DION 382E.

Apart from chemical composition, binding efficiency is affected by particle size distribution, and alternate particle size versions can be offered. The choice of particle size depends on the weight of the glass mat produced, on the tex of the glass strand, and the effectiveness of mechanical distribution. Generally, lighter mats require finer particle size versions. Particle size distribution of DION 382E is carefully controlled once the proper distribution is specified. Excessively large, particles do not detract from binding strength, but result in wasted material. Likewise, too small particles, can afford insufficient mass to bridge and weld together adjacent glass filaments. Moreover, small particles may preferentially fall through the mat before they are fused. DION 382E particles are irregularly shaped so they have a tendency to cling to the mat before fusion.

Processes for applying and fusing the binder vary widely. Typical usage is 2.5 - 4% by weight of the glass mat, depending on the desired degree of rigidity. Competitive solvent or water based emulsions tend to require more usage on a solids basis, because much of the binder tends to coat individual filaments without affording a weld to adjacent filaments. Moreover, the dry application system afforded by DION 382E greatly reduces energy requirements and eliminates many environmental problems.

Stoving conditions will vary, but typically involve about 1.5 minutes at 160 - 220 °C, depending on the furnace and mat thickness. The operation is designed to melt the binder to weld together the fibers at contact points. Overheating must be avoided to prevent the binder from homopolymerizing (yielding a stiff mat) to prevent discoloration. Generally, each operation must be individually optimized in accordance with heat transfer to the mat to assure the binder is optimally fluidized without overheating.

PREFORM APPLICATIONS

Because of its high molecular weight and melting characteristics, DION® 382E is finding growing use in various preform applications involved in RTM and SRIM. Preforms made from DION 382E can exhibit good shape retention without the need for crosslinking or curing agents which yield stiffness which can be hard on mold surfaces. Furthermore, DION 382E can afford shorter thermoforming cycles and lower temperatures to minimize discoloration problems with glass sizings.

Since DION 382E represents a dry system, the need for evaporation of carrier fluids is avoided. This is especially advantageous in thick, multi-ply preforms since fiberglass is a good thermal insulator. The absence of water is an extra advantage whenever the preform is intended for urethane applications. Furthermore, preforms made from DION 382E tend to be relatively resilient, which accelerates the cooling rate by allowing air to enter the preform whenever pressure is relaxed after the mat is thermoformed. DION 382E may be limited in practicality for preform applications involving intricate shapes or where high fluid velocities are involved during RTM or SRIM injection. Individual testing is required, and Reichhold should be consulted on the possible supply of specialized versions of the binder.

STORAGE

DION® 382E is chemically quite stable, but should be stored under cool, dry conditions, away from heat. Temperature must never exceed 100°F to minimize chances of fusion or agglomeration of the particles. Like most solid powders the material can compact slightly upon excessive handling or vibration. During summer months, it is recommended that air conditioned or refrigerated transport be considered to minimize chances of overheating upon shipment. DION 382E is not hygroscopic, but elevated humidity has a slight tendency to form weakly bound lumps. These lumps are easily broken, but storage under low humidity is always advantageous.

PACKAGING FORM

DION® 382E is normally supplied in 250 lb. net fibre drums or 1000 lb. net gaylord boxes. Both containers are equipped with polyethylene liners.

SAFETY

READ AND UNDERSTAND THE MATERIAL SAFETY DATA SHEET BEFORE WORKING WITH THIS PRODUCT

Obtain a copy of the material safety data sheet on this product prior to use. Material safety data sheets are available from your Reichhold sales representative. Such information should be requested from suppliers of all products and understood prior to working with their materials.