Technical Data Sheet

FASTRACK™ E-2706 ER Binder

Polymer Emulsion for Water-Based Traffic Marking Paints

Regional Product Availability

EMEAI

Product Description

FASTRACK™ E-2706 ER Binder is an all-acrylic binder designed specifically for use in water-based traffic marking paints, especially when application occurs under marginal conditions of temperature, humidity and air flow. Actual road trials have proven that traffic marking paints formulated with FASTRACK™ E-2706 ER Binder are significantly faster drying in high humidity, low temperature and poor air flow conditions compared to conventional water-based traffic paints. This fast dry capability dramatically improves the resistance of markings to early rain showers.

The advantages of traffic marking paints based on FASTRACK™ E-2706 ER Binder compared with conventional solvent-based traffic paints include:

- Better glass bead retention giving extended retroreflectivity/night-time visibility
- Acrylic durability giving extended whiteness and daytime visibility
- Environmentally acceptable - can be formulated to VOCs < 100g/l
- Increased worker safety - exposure to volatile organic solvents is greatly reduced
- Easier, safer cleanup using water and mild solvents or detergents
- Significantly reduced disposal costs - can be solidified and disposed of as non-hazardous waste

Typical Properties

These are typical properties, not to be construed as specifications

Property	Typical Values
Appearance	Milky white liquid
Solids Content	49.5 – 50.5 %
pH	10 – 10.6
Brookfield LV Viscosity (Spindle 3, 60 rpm)	< 500 mPa.s
Minimum Film Formation Temperature	~16°C
Specific gravity (wet polymer)	1.06 g/cm^3
Specific gravity (dry polymer)	1.14 g/cm^3

Traffic marking paints based on FASTRACK™ E-2706 Binder dry much faster than conventional waterborne traffic paints, even at high humidity with no air flow.

Early Washout Resistance

Paints based on FASTRACK™ E-2706 ER Binder become more resistant to “laboratory rain” much faster than conventional waterborne traffic paints.

Formulation Guidelines

Below are some guidelines to help formulators:

Formulating waterborne traffic paints based on FASTRACK™ E-2706 ER Binder is similar to formulating other common types of latex paints. No unusual techniques or equipment are required. However, as a result of the very fast drying characteristics of FASTRACK™ E-2706 ER Binder, traffic paint manufacturers must adopt the following guidelines when formulating paints:

pH
Maintain a pH of 10.0 or above at all times during the manufacture and storage of paints based on FASTRACK™ E-2706 ER Binder.

Neutralizing Agent
Use only ammonia to adjust the pH of the paint. Do not use less volatile amines or nonvolatile base.

Grinding
Avoid excessive heating of the paint during manufacture. It is strongly recommended not to "grind" (disperse) at high speed (<1000 min_{-1} is recommended) to adequately incorporate the pigment into FASTRACK™ E-2706 ER Binder. Over-grinding will only aggravate skin and gel formation and foaming in the dispersing process.

Volume Solids
It is vital to formulate at maximum volume solids, with the constraints of viscosity and paint stability in order to minimize "dry-to-no-pick-up" times.
Our starting point formulations are formulated between 57–60 % volume solids and can be applied without heating the paint.

Pigment Volume Concentration
High pigment/extender loads are necessary in traffic marking paints in order to achieve high solids and high durability on the road. Our road tests demonstrate that paints based on FASTRACK™ E-2706 ER Binder formulated at 54–60% PVC provide a good balance of cost and dry speed, road adhesion and glass bead retention.

Pigment
All pigments used for traffic paints based on FASTRACK™ E-2706 ER Binder must be suitable to disperse easily in waterborne paints. We suggest Tioxide TR-92 as an easy-to-disperse titanium dioxide.

Pigment Extenders
The accelerated drying mechanism of FASTRACK™ E-2706 ER Binder is initiated by the drop of pH, caused by the evaporation of ammonia. Therefore it is important that pigment extenders do not contain high levels of alkaline impurities, preventing the required pH-drop after application. Calcitec V40S or Durcal 5 are suggested.

Dispersants
Dispersants based on ammonium salt of a polyelectrolyte like OROTAN™ 963 are suitable to give good paint stability, without affecting the early water resistance. The optimum level of dispersant depends on the choice of pigments and extenders.

Phosphonate dispersants, such as AS-238, might also be used.

Wetting Agent
A surfactant is needed to facilitate wetting of the pigment particle surfaces. TERGITOL™ 15S40 or Surfynol CT-136 have been found to be especially effective in reducing “puffiness” and high viscosity.

Defoamer
Excessive foam in the paint will increase the apparent viscosity and lead to problems with gel formation. Both Tego 825 and Foamaster MO 2134 are examples of effective defoamers. Alternatives should be evaluated for specific paint applications. It is important to avoid silicone based defoamers, since they may adversely affect the adhesion of the paint to the reflective glass beads.

Rheology Modifiers
Although traffic marking paints based on FASTRACK™ E-2706 ER Binder are less prone to pigment settling than conventional latex paints, a low level of rheology modifier can help to reduce pigment settling. ACRYSOL™ RM-12W Thickener, a highly pseudoplastic nonionic urethane rheology modifier, is suggested as it gives some structure to the paint, without negative effect on sprayability.

Alcohol
Ethanol is added to paints based on FASTRACK™ E-2706 ER Binder to impart freeze thaw stability, but also to optimize “dry-to-no-pick-up” times.

Coalescents
Waterborne traffic marking paints based on FASTRACK™ E-2706 ER Binder require the addition of coalescing solvents to obtain good film formation, particularly at lower application temperatures.
We recommend 10% UCAR™ Filmer IBT or Texanol, calculated on polymer solids, to coalesce traffic marking paints based on FASTRACK™ E-2706 ER Binder down to 5°C. Lower levels may compromise performance and durability, especially if the paints are applied at low road surface temperatures. Higher levels may compromise paint stability.
The use of more water miscible solvents (like Butyl carbitol) as a sole coalescent is not recommended.

Discussion of Test Procedures

One difference between water and solvent borne traffic paints is the greater influence of relative humidity, air flow and temperature on the development of “dry-through” of waterborne paints. In order to identify a traffic paint that gives the best degree of satisfactory drying behavior, it is important to study drying under marginal conditions of high relative humidity and low air flow.

Studying the drying characteristics of waterborne traffic paints under optimum drying conditions can lead to the wrong conclusion, that one paint performs essentially the same as another paint, while in practice under marginal drying conditions the drying of one paint is much slower than of another one. To enable a more “real life” evaluation of waterborne traffic paints in the laboratory, Dow developed a specific laboratory drying chamber, in which relative humidity, temperature and airflow can be controlled while testing drying characteristics, such as early washout resistance and dry-through. Blueprints for the construction of the drying chamber and details of our test methods can be obtained through our representatives.

Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all, local or national regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local or national regulations. Contact your Dow Coating Materials Technical Representative for more information.

Chemical Registration

Many countries within EMEAI require the registration of chemicals, either imported or produced locally, prior to their commercial use. Violation of these regulations may lead to substantial penalties imposed upon the user, the importer or manufacturer, and/or cessation of supply. It is in your interests to ensure that all chemicals used by you are registered. Dow does not supply unregistered products unless permitted under limited sampling procedures as a precursor to registration.

Note on EMEAI Product Line

Product availability and grades vary throughout the countries in the EMEAI area. Please contact your local Dow Coating Materials representative for further information and samples.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

For more information visit us on Dow.com

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