



BULLETIN

MADISON CHEMICAL INDUSTRIES INC.

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Reducers

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Madison Chemical Industries Inc.

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Introduction

Madison Chemical offers several Reducers for its polyurethane and epoxy coatings. This bulletin defines the difference between Reducers and other viscosity-reducing substances, describes Madison's three formats, explains why Reducers are used in two of those three formats, describes the available Reducers and details which Reducers to use with which product groups.

Solvents, Diluents, Thinners, Reducers: What's The Difference?

Solvents are liquids, usually volatile, that are used in the manufacture of paints or coatings to dissolve or disperse the film-forming constituents. Solvents evaporate during curing and therefore do not become part of the dried film.

Diluents are also liquids used in a paint or coating formulation. They are usually, but not always, volatile in nature and are used to lower the viscosity. A diluent must be compatible with the other ingredients, but does not dissolve (i.e., act as a solvent for) the film forming constituents. Some diluents (e.g. the so-called "reactive diluents") are intended to remain part of the final paint or coating film.

Thinners are volatile organic liquids (both solvents and diluents or a blend thereof) added to paints or coatings at the time of use, to facilitate application by lowering the viscosity.

Reducers are also compatible liquids added to a coating at the time of use, which lower the viscosity but are not necessarily solvents for the particular film forming ingredients.

In most cases, the terms Thinner and Reducer are used to mean the same thing. Whether the product is a paint (which forms its film through a drying process) or a coating (which forms its film through a chemically curing reaction of some sort), Reducers perform the same function at the time of use.

In the Madison Chemical context, Reducers are high purity solvent blends particularly designed for the intended product and added at time of use to lower coating viscosity and enhance product appearance and performance. Madison products are incompatible with many off-the-shelf paint thinners such as mineral spirits and lacquer thinners. It is critical to use only the recommended Reducer.

Madison's Three Formats

Madison manufactures over 200 products. Fortunately, they all fall into one of three distinct formats, as set out on the next page.

Plural Component products within the Madison context are mostly solvent-free products, intended to be applied with plural component spray equipment. These products do not need the addition of Reducers prior to application.

Mix-and-Apply products are products which involve mixing together two different constituents and then applying them in a paint-like fashion. Products under this category contain solvents and may require a Reducer at the time of use for best application results.

The designation “**PreCatalyzed**” denotes products which contain solvents and are very paint-like to use. Madison PreCatalyzed products can be applied by brush, roller or spray. The addition of Reducers may be required, depending on the method of application and the ambient temperature.

Why Use Reducers?

Reducers can play a significant role in the quality of the applied film of a Mix-and-Apply or PreCatalyzed product. As soon as the application process is complete, and the applied coating has become tack-free, in general the Reducer's job is finished. Although Reducers typically do not remain in the coating, they can affect it in many different ways, e.g. poor gloss, pigment floating, lack of adhesion, foaming, sagging, too fast or too slow drying time. All of these things can happen if the proper Reducer is not used. The appropriate choice and use of Reducer will create a smooth film and the film will achieve its full potential strength and properties.

Today, no single compound is capable of achieving the desired result. A blend of several high purity ingredients must be used. The combination must be efficient at dispersing the binder system of the coating. The choice of Reducer influences viscosity, flow properties, drying time, spraying or brushing characteristics, and gloss.

Madison Reducers

Madison's Reducers have been blended specifically to meet compatibility and coatings requirements. Madison's stringent quality control procedures measure properties such as specific gravity, flash point, clarity, purity and odor. In addition, performance modifiers such as moisture scavengers are used in the blend to ensure the best results.

TABLE 1 PRODUCT NAMES AND ATTRIBUTES OF REDUCERS

PRODUCT NAME	CODE NUMBER	ATTRIBUTES
VR-1 Spray Grade	Z201	Fast evaporating. Use when spraying at moderate or cool temperatures or for brush/roller application during cool weather. Use with polyurethane-based products.
VR-2 Brush Grade	Z202	Slower evaporating. Use when applying by brush or roller at moderate or high temperatures or when spraying at hot to very hot temperatures. Use with polyurethane-based products.
VR-4 Spray Grade	Z204	Specifically formulated for use with epoxies. Medium to fast evaporation rate.

TABLE 2 TYPICAL APPLICATIONS FOR MADISON REDUCERS

TYPICAL APPLICATION	RECOMMENDED REDUCERS
All Mix-and-Apply and PreCatalyzed solvent-dispersible polyurethanes	VR-1 Reducer for spraying at moderate to cool temperatures and for brushing or rolling at cool temperatures. VR-2 Reducer for spraying at hot to very hot temperatures and for brushing or rolling at moderate to hot temperatures.
All MG series epoxies	VR-4 Reducer for both spray or brush application.
Gemthane AquaTech STC	Water for this and other water-dispersible polyurethanes.
Clean-up and flushing equipment	VR-1 Reducer for all polyurethane formats. VR-4 Reducer for epoxies. Water for AquaTech.