

For Protection and Enhanced Properties of Glass

Dorf Ketal is the industry pioneer and a global leader in producing and supplying organic titanates and zirconates. For more than 50 years, Dorf Ketal has been delivering innovative, high-quality Tyzor® compounds to meet the evolving needs of a wide range of industrial markets. Dorf Ketal offers more than 40 grades of Tyzor®, including several specialty compounds.

Ideal for Glass Treatment

Dorf Ketal Tyzor® organic titanates and zirconates play an important role in the surface modification of glass. They can be used for the treatment and protection of glass surfaces, as well as for achieving aesthetic effects. They can be used as adhesion promoters, surface modifiers, and catalysts.

The unique properties of the Tyzor® products can be used to enhance the properties on various forms of glass, including:

- Glass fibers • Glassware
- Flat glass • Glass beads
- Hollow glass (e.g., glass bottles)

Tyzor® titanates and zirconates are used in glass treatment to provide the following benefits:

- Increased adhesion between glass and a polymer matrix or coating
- Improved mechanical (scratch) and chemical resistance
- Functional effects such as self-cleaning properties, heat, and light reflection
- Optical effects (iridization, pearlescence)
- Easy-to-clean glass surfaces

Broad Product Selection

A broad range of Tyzor® organic titanates and zirconates is available for solvent, solvent-free and water-based applications. The Tyzor® product line includes reactive alkoxides and stable chelates of titanium or zirconium.

Selection of the correct Tyzor® product depends on the system type, process and end-use requirements. The various grades of Tyzor® provide variation in the reactivity and product properties allowing for optimized performance in each application.

Unique Functionality

Tyzor® organic titanates and zirconates perform a multitude of functions when used in glass treatment applications, including: adhesion promoter, surface modifier, and catalyst.

Adhesion Promoter

Dorf Ketal Tyzor® organic titanates and zirconates act as adhesion promoters between a glass substrate and a polymer matrix or coating by improving the bond strength. They can be applied as a primer in a pre-treatment step, or as an additive to the coating formulation.

Benefits:

- Improved adhesion of coating to the glass
- Increased resistance to water and chemicals
- Enhanced scratch resistance

Catalyst

Metal oxide coatings produced using Tyzor® titanates can act as a catalyst in the presence of UV light to decompose organic soil on the glass. This allows the dirt to be easily removed with just water, resulting in easy-to-clean glass.

Surface Modifier

Tyzor® organic titanates and zirconates can be used as surface modifiers. Through controlled hydrolysis (sol-gel process) or pyrolysis, they form stable metal oxide layers which can change the functional and aesthetic properties of the glass. These properties are often dependent on the thickness and morphology of the oxide layer, which can be controlled to range from nano-scale microstructures to macro-scale coatings.

Benefits:

- Heat and light reflection
- Chemical and scratch resistance
- Optical effects (iridization, pearlescence)

Diverse Applications

Tyzor® organic titanates and zirconates can be used in a wide variety of glass treatment applications to improve the properties to a level far exceeding that of untreated glass. Some typical applications are:

Glass Fibers

Glass fibers are used as reinforcing fibers in many plastic composite materials. The use of water soluble Tyzor® titanates or zirconates as ingredients of glass fiber dispersions increase the adhesion promotion and provide better fiber stability.

Flat Glass

Tyzor® organic titanates and zirconates may be applied to flat glass using thermal/pyrolytic or hydrolytic processes to form a thin, continuous layer of metal oxide. The metal oxide layer can provide a number of properties including: light and heat reflection, improved surface hardness, chemical resistance, photo catalytic functions (i.e., easy-to-clean), improved adhesion, and optical effects.

Hollow Glass

When applied to the hot surface (ca. >500°C) of hollow glass, organic titanates produce a thin continuous TiO₂ film. This film improves the strength of the glass surface and promotes adhesion of the final coating with aqueous wax emulsions at the cold end.

Glassware, Glass Beads

Tyzor® organic titanates and zirconates are used to form thin metal oxide layers via pyrolytic or hydrolytic processes on glassware and glass beads. These thin layers create various optical effects, such as decorative iridization, or colored glass.

Put Tyzor® to Work for You

The broad range of Tyzor® organic titanates and zirconates allows you to select the optimum grade to meet your specific needs, enabling you to produce superior quality products for a wide variety of applications and market segments.

And, with warehouses in every region and an integrated global network of highly trained sales and technical service professionals available to assist you, it is easy and convenient to put Tyzor® to work in your application anywhere in the world.