

For enhanced Performance of Paints and Coatings

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 Paints and Coatings

Dorf Ketal Tyzor® organic titanates and zirconates are important multifunctional reagents used in the preparation of binders and formulations of paints and coatings. They can be used as catalysts, cross-linking agents, adhesion promoters, rheology modifiers, and as key ingredients for oxide formation.

The unique properties and reactivity of Tyzor® help to enhance the performance of paints and coatings in a broad range of applications, including:

- Binders (polyester, polyurethane, acrylates, inorganic binders, etc.)
- Industrial paints
- Corrosion coatings
- Paint dispersions
- Printing inks
- Water-based paints and inks
- Coating ingredients (pigments, nano-sized particles, etc.)

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 both titanium and zirconium.

Selection of the correct Tyzor® product depends on the system type, process and end-use application. Selection of the proper grade of Tyzor® allows the best combination of reactivity and compatibility, depending on the coating system, to optimize performance.

Unique Functionality

Dorf Ketal Tyzor® organic titanates and zirconates perform a multitude of functions when used in paint and coating applications, including: catalyst, cross-linking agent, adhesion promoter and surface modifier.

Catalyst

Tyzor® organic titanates and zirconates can act as Lewis acid catalysts in a number of reactions.

Examples of use:

Esterification, transesterification, condensation and addition reactions; binder production; and curing of binders

Benefits:

- Mild reaction conditions
- High yield
- Elimination of undesirable side reactions
- Low catalyst concentrations
- Replacement of toxic materials, such as tin, antimony and chromium VI compounds
- Increased cure rate

Cross-linking agent

Tyzor® organic titanates and zirconates can be used to cross-link polymers by forming stable bonds with the functional groups (e.g., -OH, -COOH groups) of polymeric resins and binders.

Examples of use:

Industrial paints, wire coatings, printing inks and dispersion paints

Benefits:

- Accelerated curing
- Improved resistance to water, chemicals, and heat
- Improved scratch resistance
- Thixotropy in dispersion paints

Adhesion promoter

Tyzor® organic titanates and zirconates act as adhesion promoters between various, even unreactive substrates (plastic, metal, glass, wood, etc.) and functional coatings. They can be applied as a primer in a pre-treatment step, or as an additive to the coating formulation.

Examples of use:

Paints, wire coatings and printing inks

Benefits:

- Improved adhesion of coating to the substrate
- Improved resistance to water and chemicals
- Enhanced mechanical properties

Surface modifier

Tyzor® organic titanates and zirconates can be used as surface modifiers. Through controlled hydrolysis (sol-gel process) or pyrolysis, they form a stable metal oxide layer for use as a binder or coating on various substrates for property changes or for the preparation of nano-sized particles.

Examples of use:

Metal coating, plastic coating, pigment coating, paint binder and TiO₂ or ZrO₂ nano-sized particles

Benefits:

- Formation of stable TiO₂ or ZrO₂ layers
- Corrosion protection
- Scratch resistance
- Thermal stability
- Optical effects (pearlescent effects)

Diverse Applications

Dorf Ketal Tyzor® organic titanates and zirconates can be used in a wide variety of paint and coating applications to augment the performance and properties to a level far exceeding that of paints and coatings formulated without Tyzor®. Some typical applications are described here.

Binder Production

When used as Lewis acid catalysts, Tyzor® organic titanates and zirconates enable the synthesis of various ester binders under mild reaction conditions, offering high yield; low waste; easy work-up; controlled reaction conditions; and the minimization of by-products.

Pigment binder

Polymeric metal oxide layers formed by hydrolysis and condensation of Tyzor® organic titanates and zirconates are good binders for metallic and mineral pigments (e.g., for high-temperature-resistant paints).

Industrial paint

Reaction of Tyzor® organic titanates and zirconates with functional groups of industrial paint binders can achieve cross-linking and improved adhesion.

Wire coating

Electrical insulation varnishes are cross-linked by titanium esters to improve cure rate, heat resistance, adhesion and insulation properties.

Corrosion-resistant coatings

The controlled hydrolysis and condensation of Tyzor® organic titanates and zirconates are often used in combination with other metal organic esters to produce thin, inert oxide layers. This can provide corrosion protection for metals and scratch resistance for metals and plastics.

Dispersion paints

Water-stable Tyzor® organic titanates and zirconates allow reversible cross-linking of special binders, such as vinyl acetate dispersions, resulting in thixotropic or “drop-less” paints.

Printing inks

Tyzor® organic titanates and zirconates are used as cross-linking agents in both rotogravure and flexographic printing inks, which are applied to flexible packaging, to improve the adhesion of the inks to various substrates. Benefits include improved printability (particularly on non-absorbing substrates such as plastic or metal foils); enhanced curing; and improved chemical, solvent, water and heat resistance.

Sol-gel, nano-technology

Tyzor® organic titanates and zirconates are an excellent source for nano-sized TiO₂ and ZrO₂ particles via hydrolytic processes. Nano-sized particles can provide many outstanding properties in coatings without changing the basic formulation. These improvements include: scratch resistance; corrosion resistance; easy cleanability; and repellency.

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.