

Effective Cross-Linking Agents for Improved Product Properties

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.

Diverse Applications

Dorf Ketal Tyzor® organic titanates and zirconates are excellent cross-linking agents for various polymers in numerous end-use applications. Some typical examples of these diverse applications include:

- Oil field fracturing fluids
- Silicone or silanol end-capped sealants, adhesives and coatings
- Nitrocellulose (NC) based printing inks
- Polyvinyl alcohol (PVA) based coating binders
- Sol-gel coatings and binders
- Thixotropic dispersion paints
- (Meth)acrylate-based aqueous coating binders

Multitude of Benefits

The effects which can be achieved by using Tyzor® organic titanates and zirconates as a cross-linking agent depend on the polymer, the end use and the type of reaction system (aqueous or non-aqueous). In general, curing rates can be accelerated and end-product properties can be improved.

Typical properties that can be enhanced include:

- Thermal stability
- Chemical/solvent resistance
- Water resistance
- Mechanical properties
- Gel strength

Broad Product Selection

A broad range of Dorf Ketal Tyzor[®] organic titanates and zirconates is available for use in solvent-based or water-based systems. The Tyzor[®] product line includes reactive alkoxides and stable chelates of titanium or zirconium.

Selection of the correct Tyzor[®] product depends on the system and end use. In general, the alkoxides are more reactive than the chelates. When high stability in a polymer or coating formulation is required, chelates are usually preferred.

Unique Mode of Action

Tyzor[®] organic titanates and zirconates are very well suited for cross-linking reactions due to their high reactivity and their tetra-valent functionality.

Organic titanates and zirconates will interact with functional groups (i.e., -OH, -COOH, SiOH, etc.) of various polymers (and substrates) to form stable covalent bonds or weaker hydrogen bonds. In addition, polymeric inorganic networks can be formed when Tyzor[®] products are reacted in the presence of other metal alkoxides, such as Si and Al, through hydrolysis and condensation.

The various ways that Tyzor[®] organic titanates and zirconates can be used as a cross-linking agent include:

- Catalysis of cross-linking reactions
- Forming covalent bonds with the -OH or -COOH groups of functional polymers
- Forming hydrogen bonds for aqueous binders with high gel strength
- Creating metal oxide networks in sol-gel coatings and binders

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.