

ZINPLEX 15

TECHNICAL INFORMATION

Crosslinking agent for aqueous carboxylated polymers

Composition:	A complexed zinc oxide solution and water	
Appearance:	liquid	
Colour:	colorless	
Typical Properties:	Active Ingredients:	approx. 25.0%
	Density at 20°C:	approx. 10.1 lbs/gal

This information is intended as a guideline only and should not be used to issue specifications. Slight deviations do not affect application and capability of the product. For specifications please consult the Certificate of Analysis.

Properties/applications: ZINPLEX 15 contains 13.2% zinc metal ions that can be used to crosslink aqueous carboxylated polymers. This crosslinking or complexing takes place as the coating dries at either room temperature or under forced dry or higher baking conditions.

A zinc oxide solution designed to impart and improve:

- Non-blocking characteristics
- Heat & chemical resistance
- Hardness
- Water and solvent resistance
- Detergent resistance
- Mar and scuff resistance

Main applications:

- Floor polishes
- Overprint coatings for paper and paperboard
- Clear and pigmented industrial finishes
- Printing inks
- Adhesives
- Aqueous wood lacquers
- Architectural coatings

Recommended levels/use: The properties of a crosslinking agent are greatly dependent upon our customer's formulations and consequently, should always be tested (possibly at different treatment levels, temperatures, and/or time intervals) to verify performance prior to use. With certain polymer systems, pre-stabilization may be necessary prior to the addition of ZINPLEX 15. Nonionic surfactants such as METOLAT 388 or high ethoxylated substances (i.e. TRITON X405) offer good stabilizing properties.

*Please refer to Page 2 for further information on formation guidelines and stabilization procedures.

Storage/handling: Mix product and retest for quality after one year from the date of manufacture. The minimum shelf life in closed containers is 12 months from the date of manufacture. Refer to Material Safety Data Sheet for additional handling information.

Packaging: Drums holding 550 lbs/ 249 kg net or 5 gallon pail holding 50 lbs/ 23 kg net.

Our technical suggestions are based on data from many experiments and cannot represent a warranty of any kind as to their performance in other formulations. Customers must always verify our product's performance in their own systems. This technical data sheet replaces all previous issues.

EN

Revision: 1/15:

ZINPLEX 15

Formulation Guidelines:

1. The ZINPLEX 15 can be added directly to the resin solution and will remain stable over long periods of time without any increase in viscosity or gelation. This coating solution should have a minimum pH of 8.5 to prevent any of the zinc from precipitating out of solution. Additionally, ZINPLEX 15 can be diluted to 50% with water prior to addition to the resin solution for ease of incorporation. The addition should be added slowly into the vortex of the resin solution with good agitation.
2. Prestabilization of Polymer System Before Addition of ZINPLEX 15 – If the resin solution or formulation is unstable when the ZINPLEX 15 is added, it may be necessary to prestabilize the polymer system prior to the addition of the ZINPLEX 15. High ethylene oxide nonionic surfactants such as Triton X405 and Igepal CO-850 or CO-890 offer good stabilizing properties.

It is important to know the acid number of the aqueous polymers you are working with so you can determine the amount of ZINPLEX 15 to add to crosslink the COOH groups in the polymer. Generally only 30% to 50% of the acid groups need to be cross-linked to obtain the desired improvement in properties.

For every gram of acrylic acid you need 1.14 grams of ZINPLEX 15 to crosslink 30% of the acid groups. 1.91 grams of ZINPLEX 15 will crosslink 50% of the acid groups in 1 gram of acrylic acid.

There may be times when you want to double or triple the amount of ZINPLEX 15 recommended above in order to maximize the hardness or block resistance with some sacrifice in flexibility and gloss.

If you do not know the acid number of the aqueous polymer or the type of acid used, you will have to determine the amount of ZINPLEX 15 to be added empirically. This can be done by running a ladder of 2%, 4%, 6%, 8%, or 10% ZINPLEX 15 being added to the aqueous polymer or coating and checking the resultant properties.

Generally, the carboxylate polymers contain from 1% to 5% acid by weight so this ladder should give you a good indication of the level of the ZINPLEX 15 vs. the improved performance in properties you want to achieve.

Additions and Stabilization Recommendations:

1. All Polymer Systems should be adjusted to a minimum pH of 8.5 prior to the addition of ZINPLEX 15
2. Add ZINPLEX 15 to the polymer system very slowly with good agitation to minimize the formation of small gel particles. If such particles do form, they will dissolve if mixing is continued.
3. When gelling is severe, the polymer systems require prestabilization prior to the addition of ZINPLEX 15

Triton X405 contains about 40 moles of ethylene oxide. This surfactant is based on an octylphenol ethylene oxide backbone. Any non-ionic surfactant of similar composition, such as Igepal CO-850 or CO-890 nonylphenoethyleneoxy ethanol would be an acceptable stabilizing agent.

4. The amount of ZINPLEX 15 to be added to effectively crosslink a polymer system, without causing stability problems will have to be determined empirically, i.e., through a series of experiments to evaluate the efficiency and stability of the ZINPLEX 15 modified composition. Typically, the manufacturers of such polymers, as a rule, do not disclose either the amount or type of acid contained in their polymers.

Our starting recommendation is 1.14 grams of ZINPLEX 15 for each gram of acrylic acid. ZINPLEX 15 contains about 29.3% of a zinc complexing agent, having a functionality of 2 and molecular weight of 161.38.

Approximately 1.14 grams of ZINPLEX 15 will crosslink 30% of 1.0 gram of acrylic acid, having a functionality of 1 and molecular weight of 72.06. Using the same basis, 1.91 grams of ZINPLEX 15 will crosslink 50% of 1.0 gram of acrylic acid.

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