

HANDLING INFORMATION FOR HYDROSIZE® HP-1621 High Temperature Aqueous Sizing Solution

Product Handling

Hydrosize® HP 1621 is an aqueous solution of a high performance polymer. The solids level (nonvolatiles) of the solution is 15 percent (i.e. 15 grams of polymeric resin per 100 grams of solution). The level of solids (nonvolatiles) is limited by the solution viscosity. The viscosity of the solution may be reduced by:

1. Heating the solution.
 - *Heating to 25°C - 30°C significantly reduces viscosity.
 - *Heating to higher temperatures will further decrease viscosity but it is not recommended to hold at temperatures higher than 30°C for extended periods of time.
2. Diluting concentration of solution with deionized water (deionized water must be used).

Application To Substrate

Hydrosize® HP-1621 can be applied in a variety of ways. Examples include roll coating, curtain coating, dipping, spraying, etc. For most applications a target of 1 – 3 weight % on solids is desirable. The level of add on (loading or pick-up) is controlled by line speed, the concentration of HP-1621 solution, and temperature.

Processing

After application to the substrate, the solution must be dried to remove excess water (85% water). The recommended processing conditions for thin films (1-3 mils) are 130°C to 150°C for 10 to 30 seconds. The time and temperature is greatly effected by the thickness of film/coating.

The polymeric resin undergoes a “curing” stage between 150°C and 250°C. The by-product, water, is volatilized. Typically for thin films/coatings, 220°C and a residence time of a few seconds are used. Higher temperatures up to 260°C are acceptable. As expected, the time for curing decreases as the temperature increases and/or the film thickness decreases. The best method to minimize blistering of the film during drying and curing is to ramp temperatures along the length of heating system with a minimum final temperature of 220°C. It is imperative that Hydrosize® HP-1621 is completely cured to obtain maximum mechanical properties of final structure. In addition, all water must be removed to eliminate out-gassing and void formation from occurring during later processing stages.

Cleaning

Do not allow the solution to dry on equipment! Rinse apparatus immediately with water. If the solution dries, then it becomes more difficult to clean. If this is the case, use warm/hot water, a caustic solution, or 1-methyl-2-pyrrolidone (NMP).

Storage

Hydrosize[®] HP 1621 should be stored in tightly closed containers to prevent evaporation of water and contamination. It is recommended that storage temperatures be maintained 5°C to 20°C. Do not allow product to freeze. If a refrigerated storage area is not available, then store in a place as cool as possible and away from direct sunlight or heat source. The Hydrosize[®] HP 1621 solution may exhibit a drop in viscosity during storage.

Health and Safety Information

Appropriate literature has been assembled which provides information pertaining to the health and safety concerns that must be observed when handling Hydrosize[®] HP 1621. Before working with any product, you must read and become familiar with the available information concerning its hazards, proper use, and handling. This cannot be overemphasized. Further information may be obtained by contacting Hydrosize[®] Technologies.

The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis at least must include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done at Hydrosize[®] Technologies. All information is given without warranty or guarantee. It is expressly understood and agreed that customer assumes and hereby expressly releases Hydrosize[®] Technologies from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and information. Any statement or recommendation not contained herein is unauthorized and shall not bind Hydrosize[®] Technologies. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.