Designation: D6989 – 03 (Reapproved 2013)

Standard Practices for Preparation of Solvent and Water Based Ink Resin Solutions[1]

This standard is issued under the fixed designation D6989; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These practices describe laboratory procedures for preparing a solvent or water based ink resin solution in low boiling solvent or alkaline water using two types of lab equipment; (*1*) an industrial blender (Sections 3-7), and (*2*) a laboratory roller mill (Sections 8-12).

NOTE 1—ASTM Subcommittee D01.37 recommends using the industrial blender where possible.

1.2 These practices use laboratory equipment generally available in a normal, well-equipped laboratory.

1.3 These procedures are for use with ink resins intended mainly for liquid (for example, flexographic and rotogravure) inks. The type of resins is typically, but not limited to, acrylic and styrene/acrylic copolymers, polyamides, polyesters, polyvinylbutyral, and maleated/fumarated rosin esters.

1.4 The typical low boiling solvents to be used include ethanol, isopropanol, *n*-propanol, ethyl acetate, isopropyl acetate, and *n*-propyl acetate. For water based ink resin solutions, water is used in combination with ammonium hydroxide or amines such as dimethylethanolamine, monoethanolamine, and triethylamine.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 *Definitions:*

2.1.1 *cold cut, n*—dispersion of resin into solvent using high shear dispersion without external heating.

2.1.2 *compatibility, n*—the ability of two or more differing substances to be mixed together without resultant kick-out or haziness.

2.1.3 *dissolution, n*—the point at which all resin completely dissolves in the solvent.

2.1.4 *incompatibility, n*—when a mixture of two or more differing substances results in precipitation, kick-out, or haziness.

2.1.5 *solution, n*—resin and solvent form a clear, compatible, and homogeneous mixture.

2.1.5.1 *Discussion*—Industrial practice may use the term "solution" loosely to describe what may actually be a clear "dispersion." For the sake of simplification, the terms solution and dispersion have been used interchangeably in this practice.

BLENDER

3. Summary of Blender Practice

3.1 Place required amount of resin and solvent in a blender jar.

3.2 Mix the resin-solvent mixture at high speed in a blender until heat is developed by the high shear and the resin is dissolved into solution.

3.3 The resulting resin solution can be used to measure parameters such as viscosity and solubility or compatibility of a printing ink resin.

4. Significance and Use of Blender Practice

4.1 This practice provides a means of preparing resin solutions by the "cold cut" method, modeling high-shear production dispersion techniques.

5. Apparatus

5.1 *Balance or Scale,* weighing to ±0.1 g accuracy.

5.2 *Blender,* with one quart vessel and cover, 115 alternating current volts (VAC), 60 Hz, 840 W (preferably explosion proof).

5.3 *Filter Media,* (such as organdy cloth).

5.4 *Auxiliary Equipment,* (that is, aluminum foil, paper towels, lab filter stand, etc.).

[1] These practices are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.37 on Ink Vehicles.

Current edition approved June 1, 2013. Published June 2013. Originally approved in 2003. Last previous edition approved in 2008 as D6989 – 03 (2008). DOI: 10.1520/D6989-03R13.