



Standard Test Method for Apparent Tack of Printing Inks and Vehicles by a Three- Roller Tackmeter¹

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1. Scope

1.1 This test method covers the procedure for determining the apparent tack of printing inks using a mechanical or electronic model of a three-roller tackmeter.

1.2 This test method is applicable to paste-type printing inks and vehicles that are essentially nonvolatile under ordinary room conditions.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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 of Terms Specific to This Standard:

2.1.1 *tack, n*—a function of the force required to split a thin fluid film of a printing ink or vehicle between two rapidly separating surfaces; it is a rheological parameter indicative of internal cohesion of the fluid.

2.1.1.1 *Discussion*—Tack of a printing ink or vehicle is not a fixed number but varies with operating conditions, primarily separation velocity, splitting area, and film thickness. Tack also varies with changes in the rheological properties of the ink or vehicle due to time, temperature, and interactions with the separating surfaces. In practice, one or more of these surfaces usually consist of rubber-like rollers that differ in composition and geometry and whose properties tend to change with age, nature of previously run fluids, type of wash-up solvent, and mechanical flaws. On laboratory instruments, tack readings are also sensitive to the calibration and zero accuracy of the tackmeter employed.

2.1.2 *apparent tack, n*—a tack reading obtained at a specific set of conditions.

2.1.3 *flying, n*—the tendency of a printing ink or vehicle to be ejected as large globules from a roller distribution system.

2.1.3.1 *Discussion*—Flying is generally most severe during rapid roller acceleration such as occurs when switching immediately from zero or a slow speed to a high operating speed.

2.1.4 *misting, n*—the tendency of a printing ink or vehicle to be ejected as a fine aerosol from a roller distribution system.

2.1.4.1 *Discussion*—Misting is generally most severe at high operating speeds and with fluids that produce long filaments.

3. Summary of Test Method

3.1 A thin film of the test printing ink or vehicle is applied to the three-roller distribution system of the tackmeter, which operates at speeds comparable to those on production printing presses. Measurement of the frictional torque induced by drag forces in the splitting film provides an arbitrary value for apparent tack. On mechanical models, the torque is determined with a manually balanced lever arm, a direct-reading attachment, or a recorder; on electronic models, with a digital readout, recorder, or printer. Readings are in units of gram-meters (g-m).

3.2 The procedure in this test method is designed to give a single value for apparent tack at a specific set of instrument conditions. Typical conditions are as follows: a cooling water temperature of 90°F (32.2°C); a volume of 1.32 mL (film thickness 12.3 μ m) of the test printing ink or vehicle applied to the rollers; an operating speed of 400 r/min for vehicles, 800 r/min for sheet-fed offset inks, and 1200 r/min for web-fed inks; and a reading after 1 min of operation. Alternative conditions may be used by agreement between the supplier and the customer.

3.3 Instructions are also given for calibration of the Inkometer and for minimizing effects of interactions among the rollers, test fluids, and wash-up solvents.

4. Significance and Use

4.1 Tack of printing inks controls their high-speed transfer properties, as manifested by throughput in roll milling, picking of paper during printing, and wet trapping in multicolor printing. Although an apparent tack measurement does not completely predict the transfer performance of an ink or a vehicle, it provides a meaningful parameter for quality control,

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