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Viscosity reading procedure for flexographic corrugated inks

Scope

This technical information paper is intended to provide basic instructions for conducting ink viscosity checks at the plant's presses. Quality demands are ever increasing; thus, greater emphasis must be placed upon every phase of manufacturing.

Safety precautions

Eye protection should be worn during viscosity reading.

Definitions

Viscosity: resistance to flow of a liquid

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The following check list should be followed before taking any viscosity checks:

- A) Make sure that the viscosity cup (or viscometer) is *clean* and free from any old dried ink.
- B) Make sure that the viscosity cup has not been damaged with dents or bent in any way. Check the cup calibration periodically with calibration fluid available from your cup manufacturer.
- C) Check the opening of the bottom of the cup and make sure that the orifice is uniformly round.
- D) Make sure that the ink to be checked is free from any paper dust or debris that may clog the viscosity cup.

The checklist below has been provided to help obtain a proper reading from the viscosity cup. Any deviation of these checks will alter the reading.

Instructions

- 1) To test the initial viscosity of a flexographic ink, it must be well mixed. If the ink is on press, circulate it through the fountain and back to the sump for approximately 5 minutes. If the ink is in a pail, it needs to be mixed well with an air mixer (approximately 2 to 3 minutes) or by hand, stirring with a paddle thoroughly until it is uniform in consistencey (normally from 2 to 5 minutes, longer if the ink is older and significantly settled).
- 2) Submerge the No. 2 Zahn viscometer test cup until the rim of the cup is below the surface.

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- 3) Lift the test cup rapidly, but smoothly. As the top of the cup breaks the surface of the ink, immediately start the stopwatch.
- 4) Immediately stop the watch when the steady stream of ink breaks 0.5 in. (12.7 mm) from the bottom of the test cup.
- 5) Record the time in seconds. This number is what is referred to as the ink's viscosity.
- 6) If the viscosity in the pail was measured first, put the ink into the press fountain and circulated for 4-6 min, recheck the viscosity using the above procedure. (The viscosity may drop from its initial reading after press circulation, due to the ink temperature rising and any press wash water remaining in the system getting mixed into the ink.)
- 7) If viscosity is high with ink temperature at approximately 22.5°C (72°F), check pH and adjust accordingly. Recheck once sufficient time has been allowed for the recirculation of the ink.
- 8) If ink viscosity remains high, add pH adjusted (neutral pH) water in a measured amount. Recheck once sufficient time has been allowed in the recirculation of the ink.
- 9) Continue as needed, until the viscosity reaches the desired level at the correct pH to meet the customer's requirements. Experience has shown that this viscosity should be in a range of 20-25 s using a No. 2 Zahn cup.

Keywords

Ink, Viscosity, Flexography

Additional information

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