Optimizing Printing On Pharmaceutical Packaging

The pharmaceutical industry depends on attractive, durable packaging for its products, just like any consumer oriented business. The appearance and legibility of the information on the package can influence the customer to favor one brand over another, especially for products like skin ointments and medicinal syrups where the customer has many choices to consider. The success of the printing process used on the packaging materials ultimately depends on the viscosity control used to monitor the inks. In the case of water-based inks, pH can also be a factor.

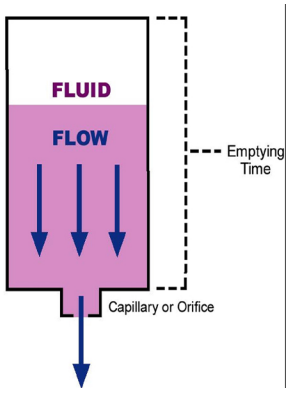

Figure 1/ Flow Cup

Traditional methods have employed "flow cups" such as the Zahn cup. (See *Figure 1*.) These devices are easy to use, provide a quick indication of "flowability", and cost only a few hundred dollars. The shortcoming is that operators are not always careful in using the cups correctly; therefore, results can vary widely.

Over the past several years, many businesses have transitioned to using benchtop rotational viscometers (see *Figure 2*) which give a more complete picture of how the ink or coating changes

Figure 2 / Brookfield DV-II+ Pro Rotational Viscometer

with variable shear rate (i.e. how fast the ink flows during the transfer process and the recovery after application to the substrate). This type of behavior is characterized in a "flow curve", which is simply an analytical picture of how the ink decreases in viscosity as the shear rate increases (see *Figure 3*). With this type of data, operators can quickly determine when an ink may be out of spec.

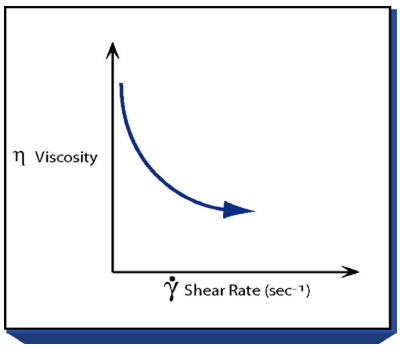

Figure 3 / Flow Curve - Decreasing Viscosity With Increasing Shear Rate

The most recent development to improve printing processes in pharmaceutical packaging is the use of on-line viscosity measurement and control. (See *Figure 4*). The technology has been around for many years, but its application contin-

Figure 4/ On-Line Process Viscometer - Brookfield AST-100

ues to advance with the increased complexity of both solvent and water-borne inks and coatings. Evaporation on the production floor naturally causes inks and coating materials to increase in viscosity with time. On-line control automatically provides the make-up fluid required to maintain viscosity, thereby guaranteeing acceptability of the printed image on the packaging. (See *Figure 5a* and *Figure 5b*)

Data Output for Viscosity Control On-Line Viscometer

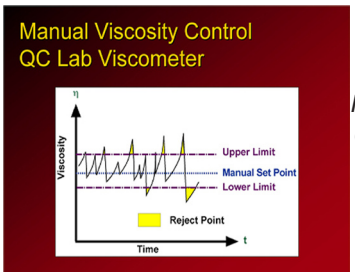

Figure / 5a Manual Viscosity Control QC Lab Viscometer

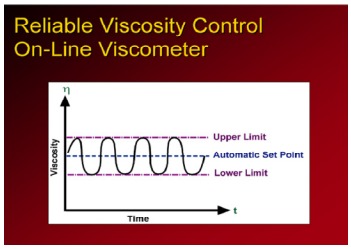

Figure / 5b Manual Viscosity Control On-Line Viscometer

When looking for an advantage over the competition, always consider the customer's first impression when viewing the packaging of your pharmaceutical product. If you've made the investment to design an attractive package with high image visibility, ensure optimal results with the best printing process available today - one that uses on-line viscosity control.

By Robert G. McGregor, Sales & Marketing Manager Brookfield Engineering Laboratories, Inc., Middleboro, MA 02346
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