Measuring Ink Density to Determine Water Content and Ink Loss During Colour Change

By Technology Coaching

Equipment

- Pipette;
- 50ml Tip (5 Peaces);
- Adaptor for 50ml tip;
- Hand unster 20 kg accuracy 20 g;
- Scale 65 g accuracy 0.01 g;
- Excel spreadsheet for Calculation.

Procedure Measuring Density

1. Switch on scale;
2. Place plastic cup on scale;
3. Zero Scale;
4. Place the 50 ml tip on the pipette;
5. Set the dispense volume dial on 10. The display will indicate “10 ml”
6. Fill the pipette and checking if liquid is not containing air, the display will flash “10 ml”;
7. Operate the pipette once by putting the liquid back in the original container the display will stop flashing;
8. Dispense 50 ml liquid in plastic cup on scale by operating the pipette 5 times;
9. Take reading from scale;
10. Dived reading by 50 to get the density in kg/dm^3.

Measuring Ink Loss during Colour Change

1. Measure density water (procedure slide 3);
2. Measure empty bucket weight (using 20 kg unster);
3. Measure ink density at Start (procedure slide 3);
4. Measure total ink bucket weight at Start (using 20 kg unster);
5. Put ink in machine and ink up machine as normal;
6. Circulate ink for 5 min;
7. Retrieve ink from machine following the normal procedure by starting wash-up cycle;
8. Measure total ink bucket weight at End (using 20 kg unster);
9. Measure ink density at End (procedure slide 3);
10. Enter data in spreadsheet the results for residual water content and ink loss will be calculated

Equation for Calculation Water Content Ink

$$m_{water} = m_{ink+water} * \frac{\left(1 - \frac{\delta_{ink+water}}{\delta_{ink}}\right)}{\left(\frac{\delta_{ink+water}}{\delta_{water}} - \frac{\delta_{ink+water}}{\delta_{ink}}\right)}$$

m := weight in kg

V := volume in dm^3

ρ := density in kg/dm^3

Calculation Ink Loss During Colour Change

Ink Loss in kg =

Ink Weight Start - Ink Weight End*(1-Water Addition/Ink Weight Start);

Ink Loss in dm^3=

Ink Loss in kg / Ink density Start in kg/dm^3

Thank you for your attention

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