Important Water Balance Parameter

determined by LithoTack II

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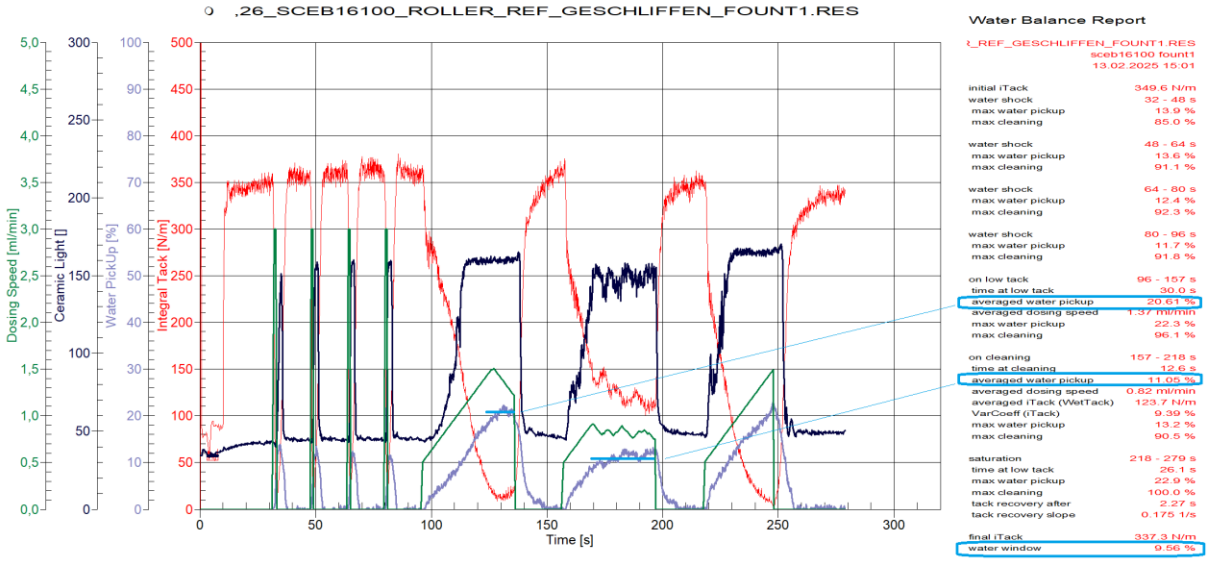
Content

1. Water Window



1. *diagram determination of water window*

The water window is the difference between the water levels required for zero tack and plate cleaning.

If too small, it can be critical to control the optimum water level on the press. Slightly more water can cause ink transfer problems due to low tack. Slightly less water may cause plate cleaning problems.

If it is too high, the printer may tend to add too much water, leading to potential drying problems and/or colour density issues.

Typical values are between 5% and 20%.

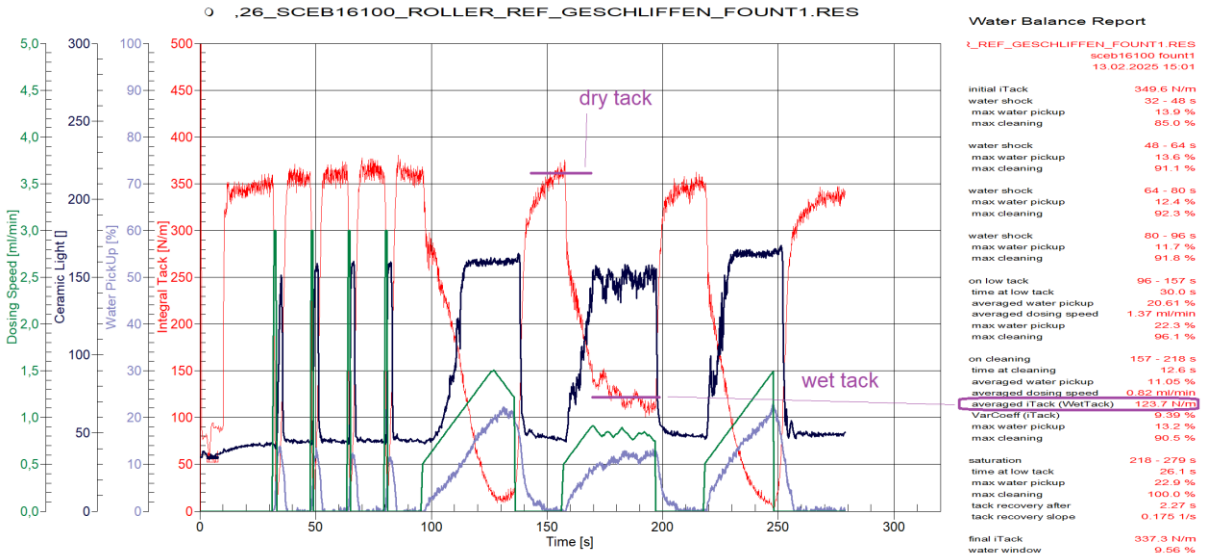
2. Wet Tack – relation to dry tack

Wet tack is the tack obtained during plate cleaning. In practice it is the efficient tack.

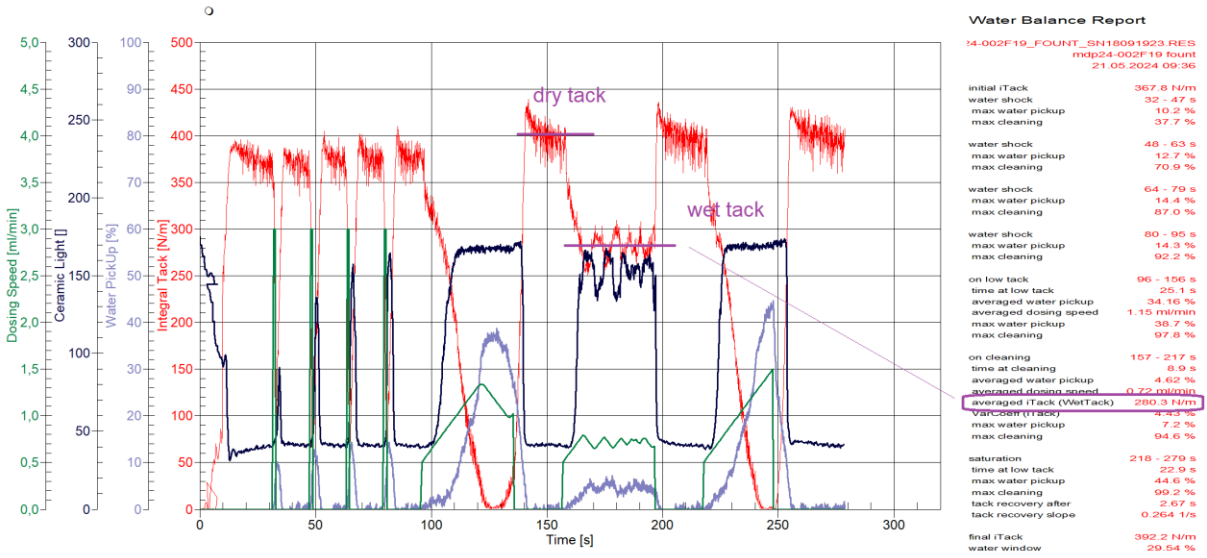
Generally, the tack of offset inks is measured under dry conditions. However, in contact with water the tack can vary considerably.

Wet tack can be between 20% and 80% of dry tack.

If it is too high, the substrate may also be too stressed, resulting in fibre picking or similar problems. When too low ink transfer problems may occur.



2. diagram wet tack is approx. 30 % of the dry tack

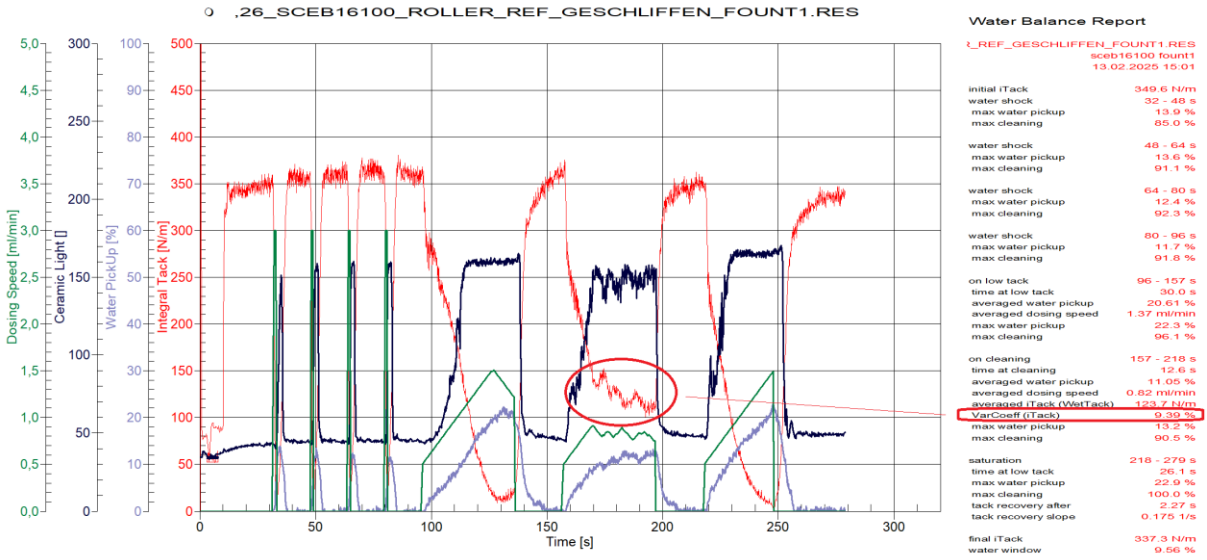


3. diagram wet tack is approx. 70 % of the dry tack

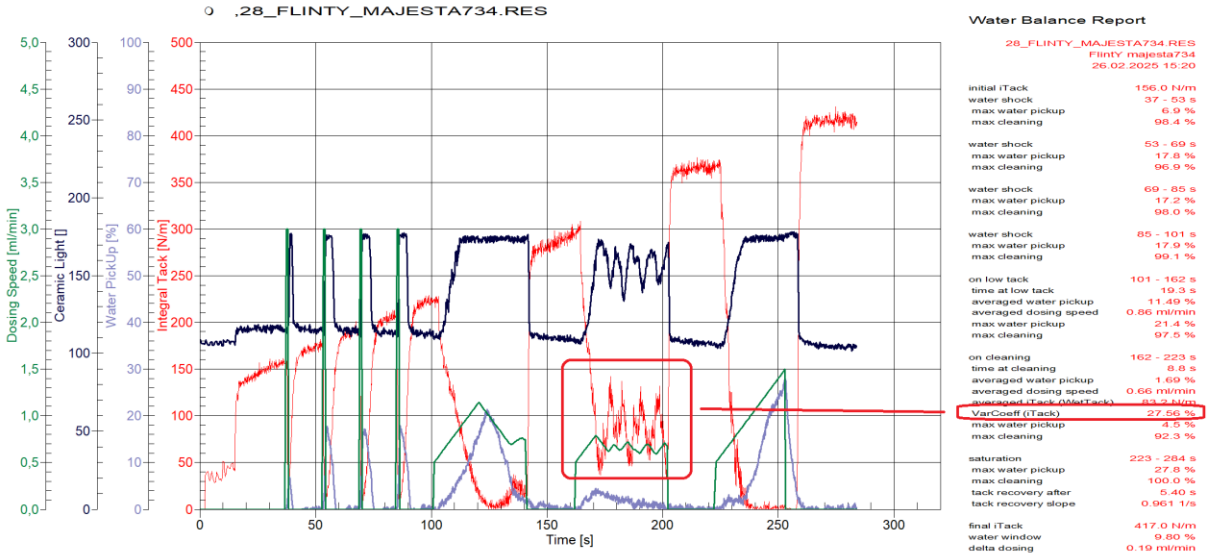
3. Wet Tack Stability

Wet tack stability is the tack stability of the ink-water emulsion required for plate cleaning. Instability can cause problems with ink perception on plate and ink density. Also, the time lag between controlling the water supply and the actual effect on the plate may be too long.

Wet tack stability is expressed by the parameter VarCoeff [%]. Values below 10% are good, below 20% are acceptable, but higher values can cause print quality problems.



4. *diagram VarCoeff of 9,4 % is well*

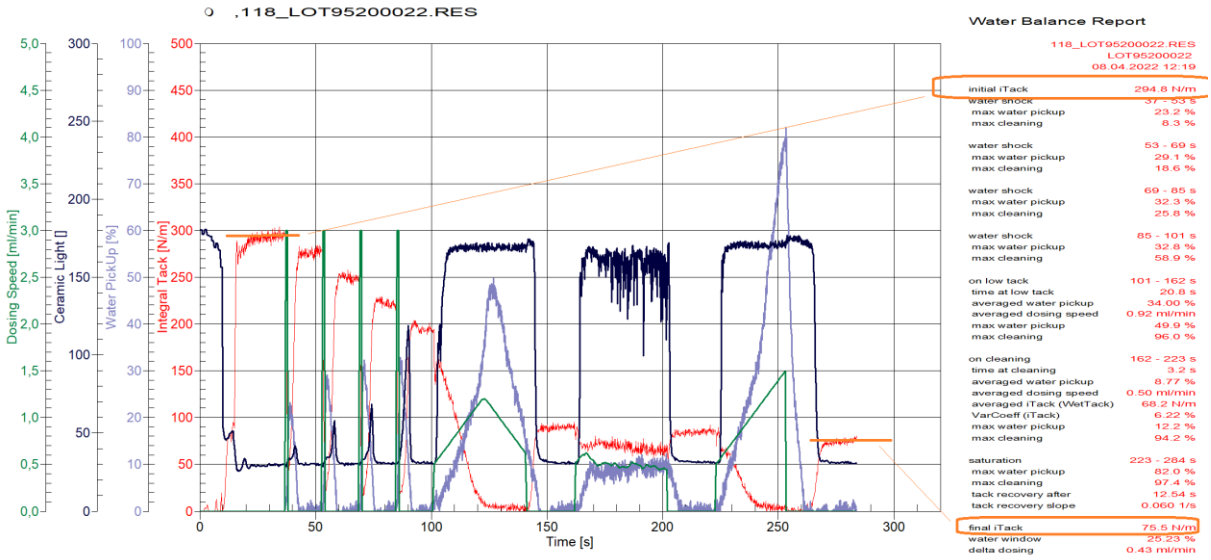


5. *diagram VarCoeff of 27,5 % may cause printing problems*

4. Delta Tack

Delta tack is the difference in tack between the initial dry tack and the final dry tack. If the delta tack is too high, the ink may be affected by fast drying, oxidation or structural degradation.

Refer to diagram 6 below. Not all fount solution components evaporate. The remainder, such as surfactants or salts, will accumulate and cause a sharp reduction in tack. Here to an undesirable extent.



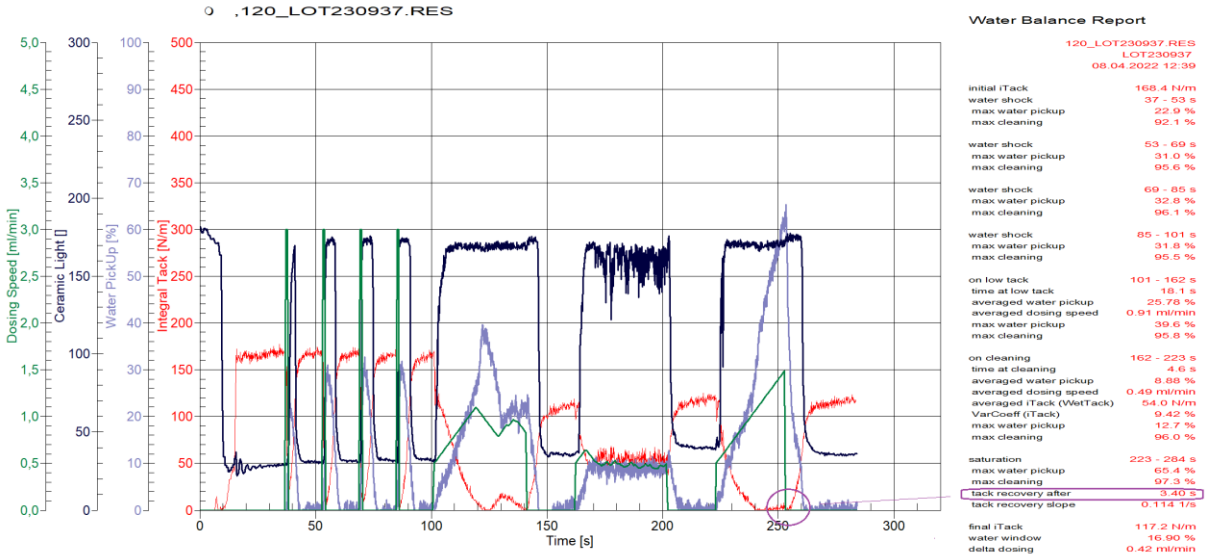
6. diagram fount solution remainder cause structural degradation

5. Recovery Time

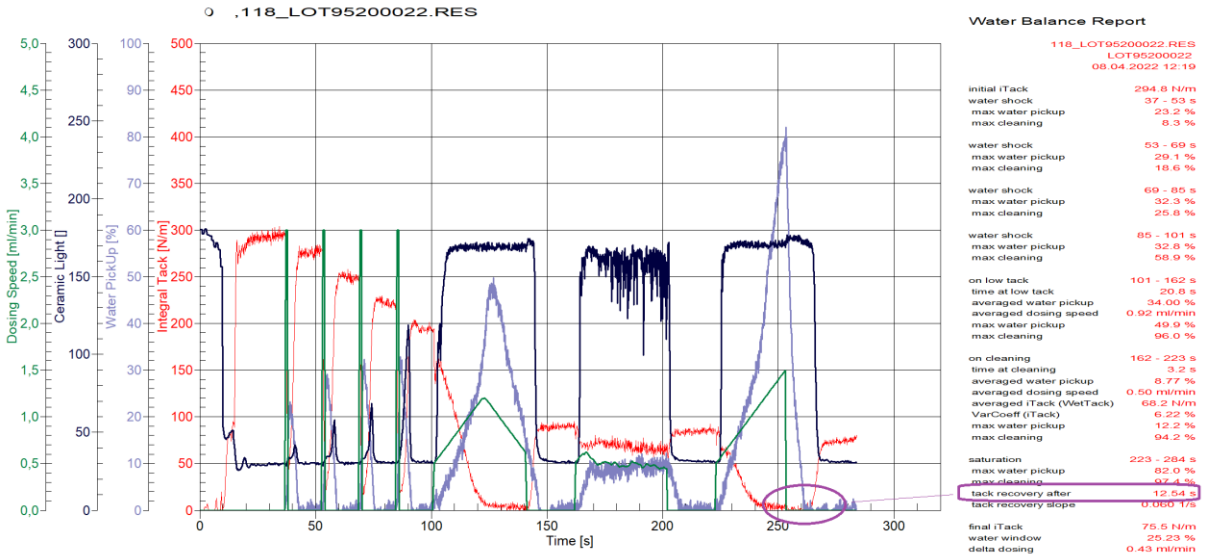
The recovery time is the time between shutdown of water transfer in saturation step and tack recovery.

If it is too long, it is an indication that the emulsion is not splitting evenly. The emulsion will then move to the metal or rubber roller at a higher water content, resulting in transfer problems.

Values below 8 seconds are usually fine, higher values may indicate ink transfer problems.



7. diagram tack recovery after 3,4 s is perfect



8. diagram tack recovery after 12,5 s may indicate ink transfer problems

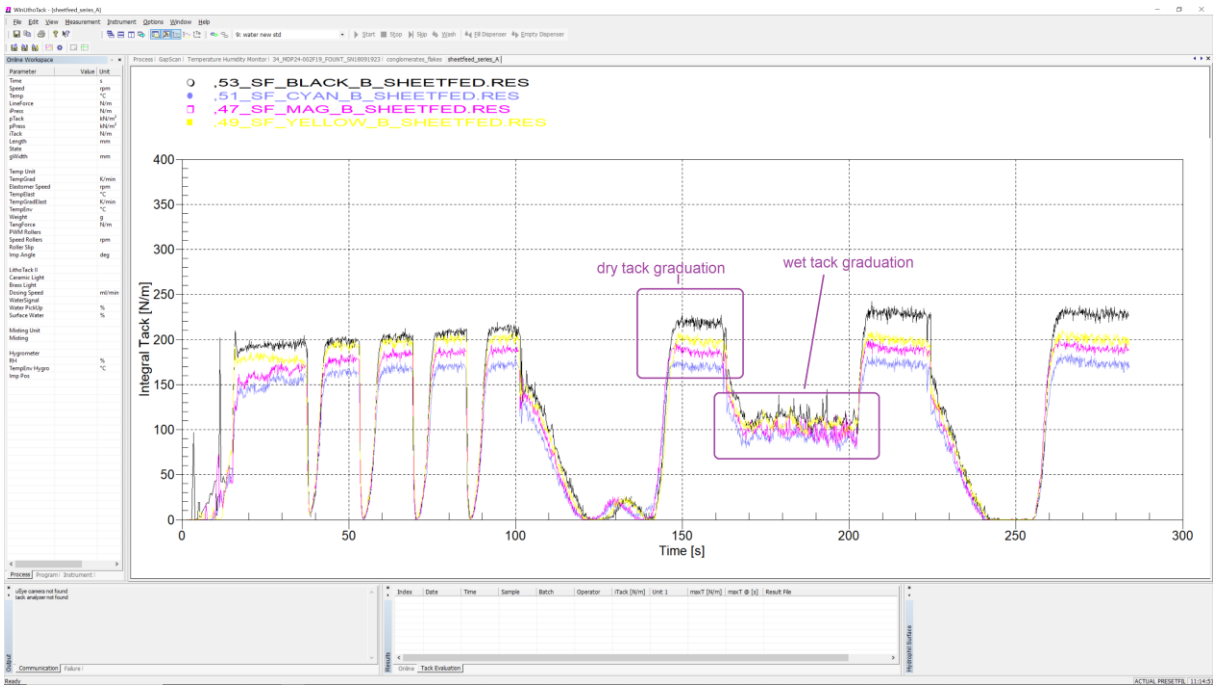
6. Wet Tack Order

In multi-colour offset printing, the most tacky ink is printed first, followed by the next least tacky ink, and so on. The inks are designed for a graded tack sequence.

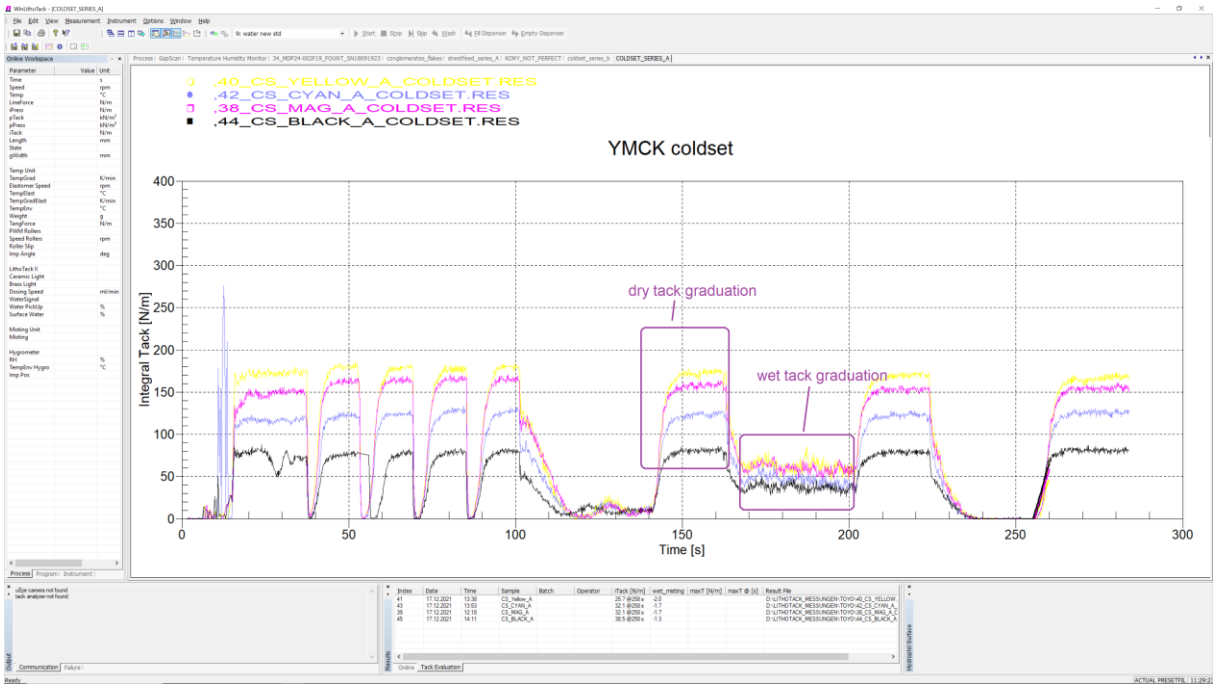
If the order is disturbed, printing problems such as poor ink perception or back trapping can occur.

Typically, the ink sequence is determined in dry conditions with the assumption that the same sequence will be obtained in wet proofing conditions.

The LithoTack II method allows the wet tack to be determined and thus the tack gradation for multi-colour printing to be determined in practice.

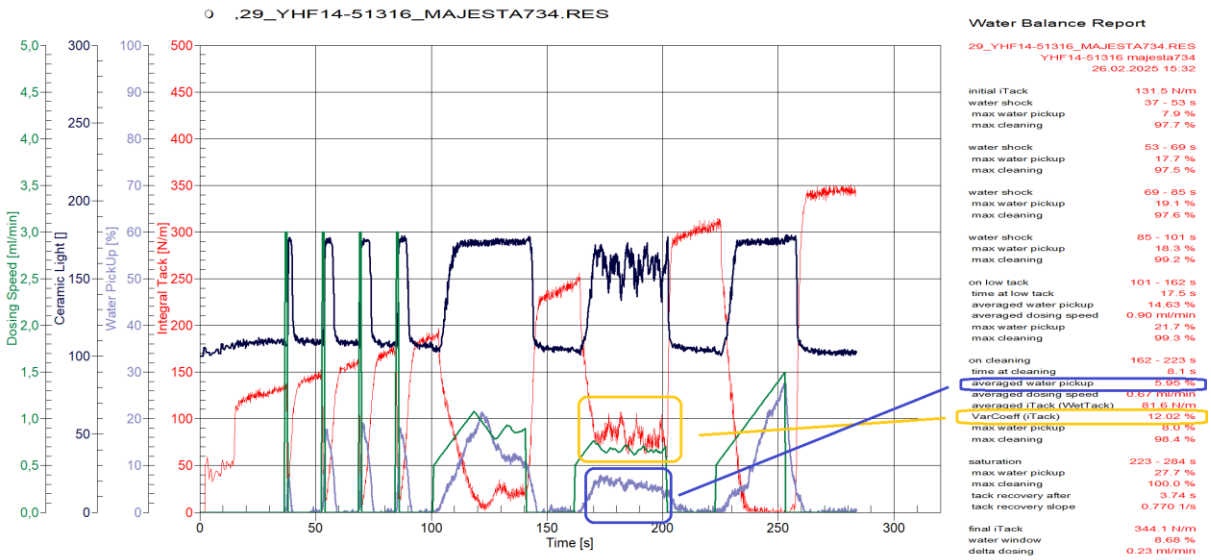


9. diagram tack graduation is also valid under wetting

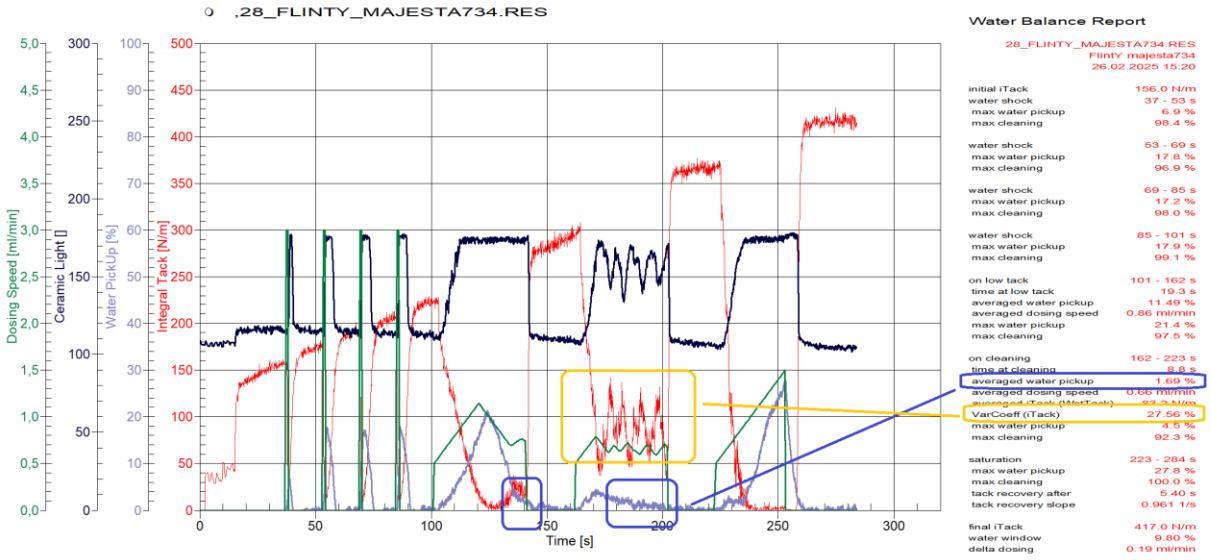


10. *diagram wet tack graduation might be critical for yellow and magenta*

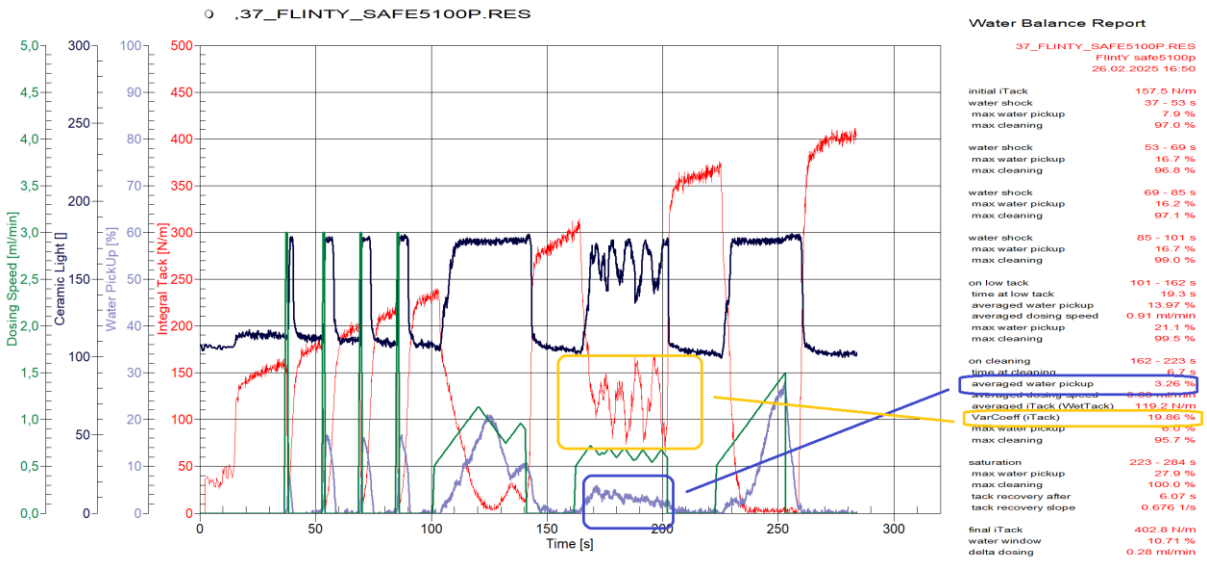
7. Result discussion example



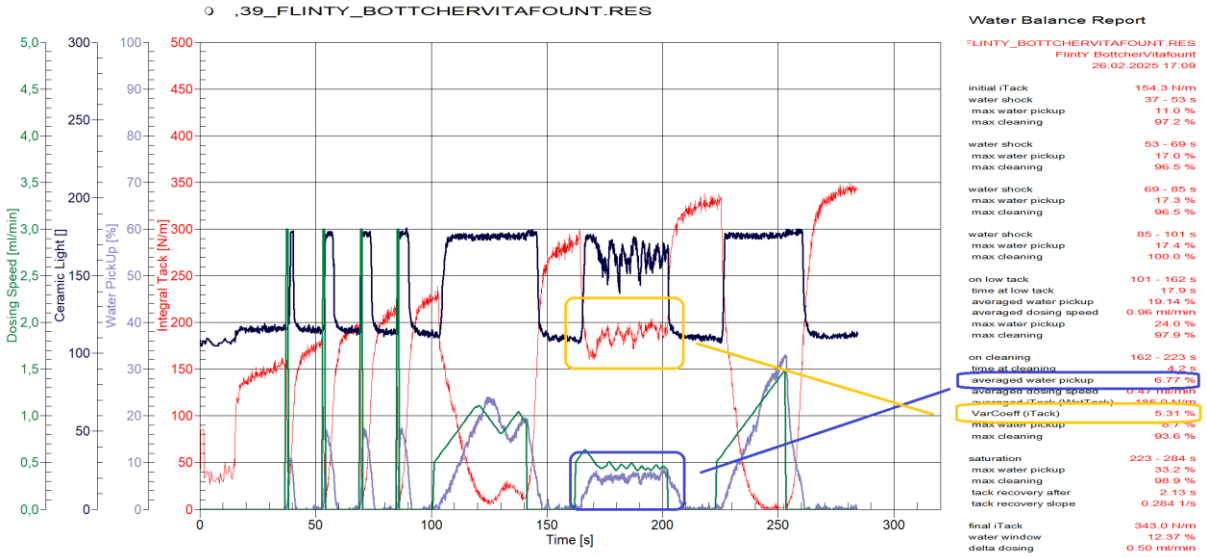
11. diagram ink 1 and fount 1 combination provides a well printing example



12. diagram ink 2 and fount 1 combination has issues in water pick up and tack stability



13. diagram ink 2 and fount 2 combination shows improvements mainly in water pick up, tack stability is still poor



14. diagram ink 2 and fount 3 combination shows stable water pickup and tack stability

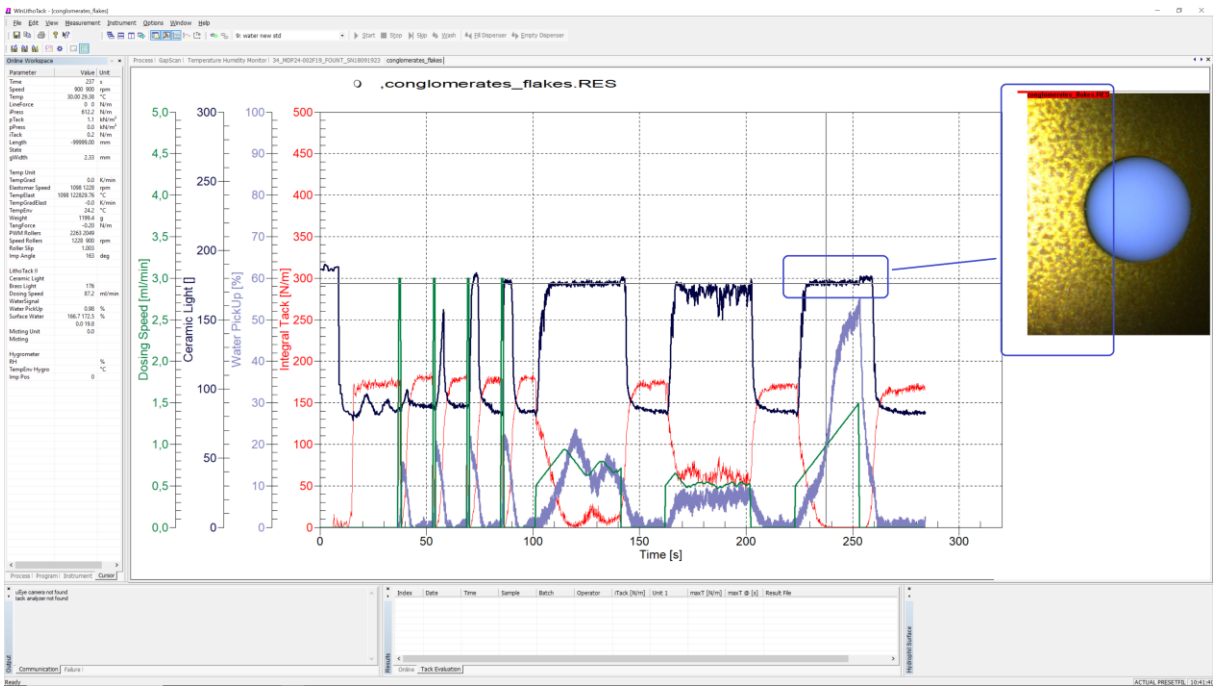
After changing the fount solution, the combination of ink 2 and fount solution 3 (Diagram 14) shows similar results to the combination of ink 1 and fount solution 1 (Diagram 11).

Note that the wet tack in Diagram 14 is much higher. So it depends on the application whether it is acceptable or not.

8. Parameter not covered by numerical report

Not all emulsion properties are expressed by a numerical parameter. To get the full picture, it is useful to follow the corresponding video sequences in the diagram.

In the example below, yellow pigments agglomerate, resulting in areas of higher colour levels. This is certainly an undesirable behaviour - and yellow pigment may have this property in particular.



15. *diagram Move the cursor to see special features - here areas of ink agglomeration.*