

Measurement of Total Stickies (Macro, Micro and Potential Secondary Stickies)

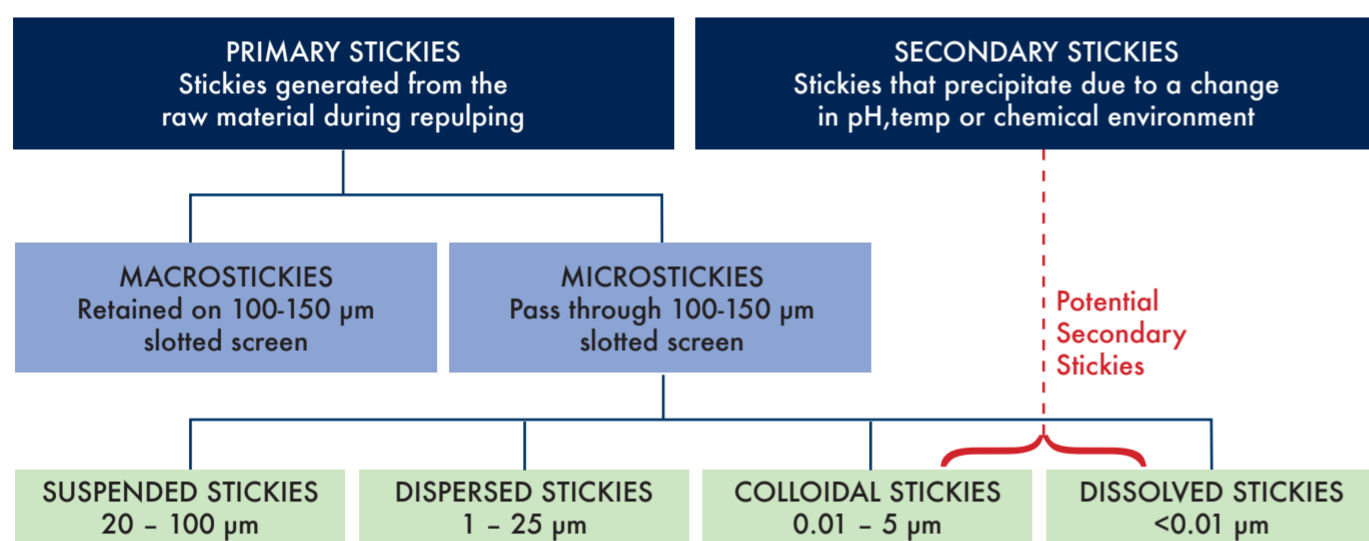
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INTRODUCTION

Contaminants from adhesives and waxes remain one of the biggest challenges for papermakers using recovered fibre. These contaminants are called “stickies” because they stick to papermachine felts and wires leading to operating problems, reduced productivity and defects such as holes and dark spots in the paper. Through a survey administered by the CSIR, the South African paper recycling industry identified several shortcomings of existing methods for measurement of stickies, and have expressed the need for quick and simple methods that could be easily implemented in a mill environment. The consequence of “inadequate methods” has been poor process monitoring and the inability to pick-up stickies related problems before it occurred. This resulted in a rather reactive approach to dealing with these problems. As with all testing procedures, the criteria for any measurement must include a high degree of precision and repeatability. However, in a mill environment, operator time and ease of implementation must also be considered, and more often than not, a compromise is required. In response to this need, the CSIR developed quick and simple methods for routine measurement of all stickies types (macro, micro, and potential secondary stickies). The applicability of the methods was demonstrated during a stickies audit carried out at a newsprint and packaging mill. In addition, the new methods were compared to existing methods.

STICKIES CLASSIFICATION



METHODOLOGY

Macrostickies measurement

Methods described by Houtman & Tan (2002) and Aquan-Yuen *et al.* (1999) were modified to measure macrostickies. The modified method was verified using the Tappi standard method T277.

Microstickies measurement

Methods described by Allen (1997) and Huo *et al.* (2001) were modified to measure microstickies. The modified method was verified with turbidity readings of the process waters.

Potential secondary stickies measurement

Dissolved and colloidal substances were precipitated after a pH shock and measured using the method described for microstickies. The method was verified using the procedure described by Sarja *et al.* (2004).

Sampling

Pulp samples were obtained at several points in a newsprint mill recycling old newspapers (ONP) and sorted books and magazines (SBM), and a packaging mill recycling old corrugated cardboard (OCC). Samples were collected over a four week period and average results were reported. Where applicable, samples were taken at the Repulper (RP); Dump Chest (DC); Primary Coarse Screen Feed (PCSF); Primary Coarse Screen Accept (PCSA); Secondary Coarse Screen Feed (SCSF); Secondary Coarse Screen Accept (SCSA); Intermediate Chest (IC); Long Fibre stream After Fractionation (LFAF); Primary Fine Screen Accept (PFSA); Secondary Fine Screen Accept (SFSA); Long Fibre Storage Tank (LFST); Out of Flotation (OF); Accepts after Centri-Cleaners (ACC); Before Wire Press (BWP); Medium Consistency (MC) Pump; and Storage Tower (ST).

RESULTS AND DISCUSSION

The actual cause of stickies problems is often unknown. Is it due to macrostickies? Agglomeration of microstickies? Precipitation and agglomeration of dissolved and colloidal stickies (secondary stickies)? It is important that this information is known, as the size classification influences the strategies for removing each size class, and also influences the approach taken for minimising their impacts on papermaking.

Mills have in place screening systems to remove macrostickies – but what are the efficiencies of the screens? Are they measured in the first place? How can they be optimised? Does screening need to be re-configured?

Very few mills, if any, measure microstickies on a routine basis. After screening and “removal” of macrostickies, is agglomeration of microstickies into macrostickies occurring? What is the baseline concentration of microstickies in process waters? At what concentration level does microstickies become a problem? What triggers agglomeration of microstickies or precipitation of secondary stickies? What is the current approach to dealing with microstickies – Talc? Dispersants? Polymers? Enzymes? Are the dosages at optimal levels? Is it added at the right place in the process? Are the process conditions conducive for optimal functioning of the additives?

The CSIR have developed and tested methods for routine measurement of macro, micro, and potential secondary stickies in a mill environment. The methods developed compared favourably with existing methods during trials carried out at a packaging and newsprint mill. Through regular monitoring, it is anticipated that these methods will help answer some of the questions above, and in doing so, assist mills in developing robust and proactive strategies for removal and control of stickies in their paper recycling operations.

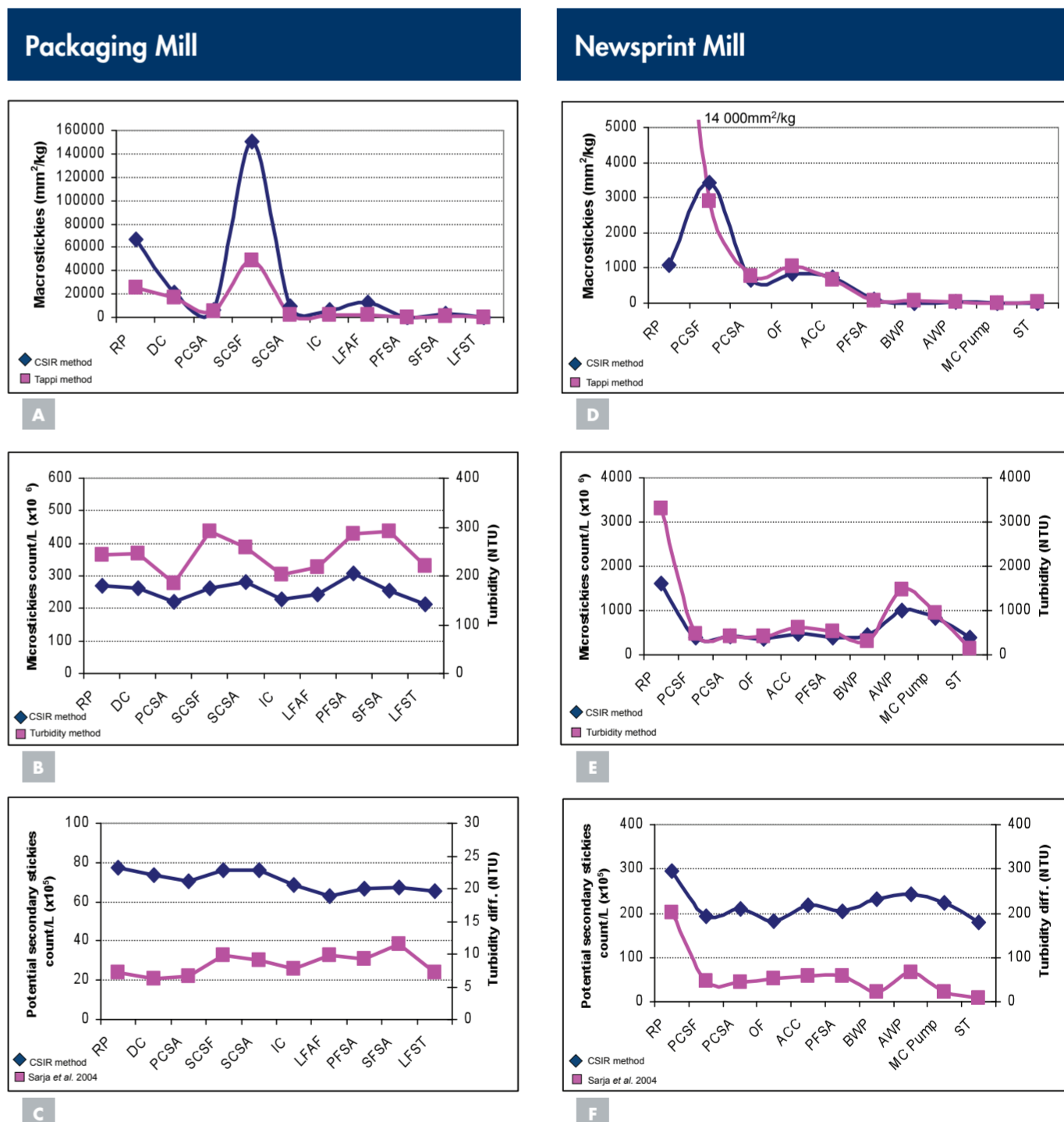


Figure A-F: Macro, micro, and potential secondary stickies measurement at various sampling points in a Packaging (left) and Newsprint (right) mill. Comparison between CSIR (◆) and existing (■) methods.

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