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Research area: Process Aims

Paper and paperboard production // Papermaking

Key words:

deposits, causal research, chemical analysis, processes

Title:

Development of a service-module including structured causal research and avoidance of deposit-problems during the papermaking process by using analytical-chemical and process data.

Background/Problem area

More and more production and quality issues are caused by deposits and blots within papers. Resulting web breaks and cost intensive machine downtimes for cleaning reduce productivity and increase number of customer claims. This situation is presented by the amount of publications regarding this topic and finally the amount of orders for chemical analysis at testing institutes.

Production and quality issues can appear in many ways:

- Deposits on machine-parts
- blots within the paper
- Thin or thick parts within the paper
- transparent or dark parts within the paper
- Holes
- Corrosion
- Wettability issues by coating and bonding processes
- Coating rupture
- Printing issues like Missing Dots or Mottling
- Embedding, mainly on varnished papers

Deposits can appear in the whole paper machine, in the approach flow system, in the forming, press and dryer section, on wires and felts, and in form of blots or other missing dots. The causes for these issues are multifarious, for example variation of raw material and additive properties, eventually unwanted changes of production conditions or interactions between process and product additives. The above mentioned issues can appear, when a wrong combination of additives, which influences processes and products, is used.

Chemical additives are specifically used to influence the process and products. These can be grouped into additive categories according to their functional task. There are different active substances and a multiplicity of trade products to achieve these functions.

The knowledge about substances in deposits and where they come from is a prerequisite for an effective solution to prevent these issues. The results of chemical analysis must be available quick enough to reduce costs caused by machine downtimes or non optimal production conditions. Therefore modern analytical methods are necessary. Due to the composition of the deposits special preparations are needed for concentrating the testing components or removing disturbing components.

Objectives/Research results

The objective of this project is the development of a largely standardized method to analyze deposit and blot causes objectively and effectively. On the basis of chemical analysis incl. fingerprint analysis, process analysis, correlation analysis and process expertise a procedure is to be developed to derive lasting solutions.

The developed method combines available and innovative tools to an efficient procedure. In future this method should be offered as "module deposits" (Modul Ablagerungen) under the PTS brand "SystemCheck Wet-End".

Currently three deposit issues are analysed by the PTS standard deposit analysis and sent over to a service provider, who delivers the fingerprint analysis.

Application/Economic benefits

The economical benefits can be used by papermaking companies. Mainly small and medium sized enterprises will profit by this procedure as they can't develop methods like these themselves. In this case these companies can take up this service in the full extend without a long amortisation period.

The most important savings potential for papermaking companies is a reduction of web breaks, machine downtimes and an increased product quality. Against the additional proceeds of 166.000 Euro/a for a concerning paper plant there are just costs for consultancy and for change-over works. Sometimes special additives can be saved to avoid deposits as well.

Project period: 01.01.2007 – 31.12.2008

Remarks

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