OraTec P, details of the portable solution.

TECHNOLOGY IN THE CLOUD: ONSITE AND REMOTE MONITORING OF TISSUE CREPING PROCESS

Tissue creping process and the Yankee cylinder characteristics can make a huge difference in terms of production, quality and profitability in paper manufacturing.

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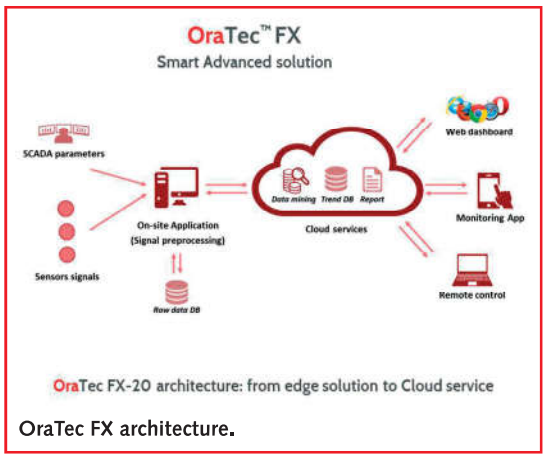
Tissue market is rapidly changing and as paper production demand increases, modern paper machines are asked to perform at maximum levels while running at very high production speed, often changing size and paper weight in a wide range that goes approx. from 16 to 36 gr/sqm. This of course challenges reliability, makes it more difficult to comply with requested production efficiency and could even turn into tons of paper wasted every year. That's exactly why, today more than ever before, in a highly competitive market tissue papermakers need to be supported in choosing the right approach to sort production issues out and make the correct decision in the shortest possible time, to avoid product losses or - even worse - unexpected shutdown. In this context, tissue creping process and the Yankee cylinder characteristics play a critical role in paper manufacturing and they can make a huge difference in terms of production, quality and profitability.

TISSUE CREPING PROCESS

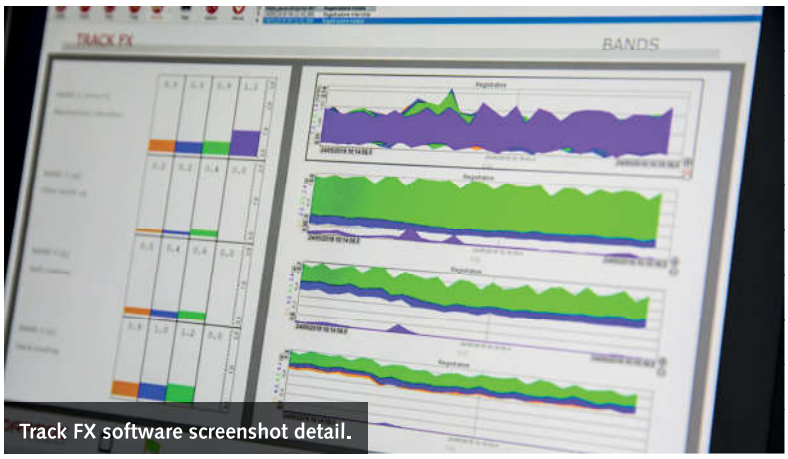
Creping is a very complex topic and the process parameters are very often obtained through production operator knowledge using a trial-and-error approach that may often induce lack of performance. As far as the Yankee cylinder conditions and the characteristics of its surface are concerned, it is important to underline that often those issues are related to paper production quality problems; the Yankee surface issues - including for example chatter marks, out of roundness and other problems - develop gradually over time, often causing paper production and quality losses. In all those cases it is very important to be able to take advantage of specific tools and technologies to keep under control the failure evolution, in order to plan the right actions on time. On the other side, doctoring design, creping parameters, coating, blade type and other variables represent a full bunch of aspects that influence the production process and each of them deserves the utmost attention if running into performance losses and problems are to be avoided.

ORATEC MONITORING SYSTEMS

After having developed the first vibration monitoring system more than 20 years ago and after years of in-depth research in the field of tissue creping process, **Oradoc** has developed OraTec™, a family of monitoring systems conceived to measure Yankee doctors behavior. OraTec™ offers a real support to the papermakers through the analysis of objective data detected on the tissue machine, thus allowing to foresee and quickly counter the possible occurrence of chatter marks.
OraTec™ P is the portable version of the measuring system dedicated to monitoring the creping process in tissue paper production and it mainly addresses coating producers, as it is particularly useful to help assess the friction between the Yankee cylinder and the creping blade in order to optimize coating employment and find the most suitable coating mix to guarantee



OraTec FX architecture.



Track FX software screenshot detail.

the best possible runnability. This exclusive technical solution, with its hard case and semi rugged portable computer, is tough and easy to be carried along, and it makes it easier for onsite team service technicians to employ it on the tissue machine.
OraTec™ P provides a series of alarms and indications useful to identify particular working conditions of the machine that can lead to possible damage of the Yankee cylinder. The unit is made up of 2 vibration sensors with installation supports and cables, an acquisition unit, a rugged trolley and a notebook equipped with the new Track P software, available in Base and Pro licenses, each characterized by different functionalities and plug-ins.
The OraTec™ FX, instead, is the fixed measuring system specifically conceived for paper mills, to help production teams monitoring the creping process in tissue paper production. Thanks to a new and advanced technology for signal acquisition, OraTec™ FX is able to measure and evaluate process conditions such as coating characteristics, fiber accumulations, behavior of the cleaning blade, extractor efficiency, hood functionality and other process-related topics. This unique technology also allows to assess mechanical issues such as doctor back resonance and oscillating problems, Yankee roundness, external-induced vibrations and many others.
OraTec™ FX is also able to collect process data for a complete evaluation of working conditions, so as to optimize creping performance and perform a more accurate predictive analysis. It can be appropriately configured according to the customer's needs and/or the specificities of the machine to be monitored, thus to obtain some important objective data and results, both for creping process monitoring as well as Yankee reliability and conditions.
As far as creping process monitoring is concerned, OraTec™ FX can help improve blade lifetime optimization, understand different behavior of steel and ceramic blade, identify the right coating in order to reduce friction, better use the creping doctor (load, blade angle, stick out, etc.) and the cleaning doctor (optimizing load, run time, etc.), prevent and monitor

Remote monitoring service control room.

Yankee edge deposits. When it comes to the Yankee, OraTec™ FX can increase reliability and performance by early detecting and monitoring the possible onset of chatter marks, preventing surface spot damage, analyzing the partial shell deformation and understanding tissue machine hood contribution, identifying external surface of vibrations dangerous for creping process and Yankee surface. The proposed standard configuration consists of vibration sensors on the creping and cleaning doctors that come along with all installation supports, cables and protective covers, an acquisition panel with an appropriately configured workstation and the new Track FX software. The latest release of the Track FX software - version 3.5 - can boast a newly designed time domain and trend screens, a specific algorithm to enhance friction phenomena between Yankee and coating and a new cloud interface that allows to share data in real-time with Oradoc control room, where specialized technicians daily monitor collected data and support papermakers. Once installed, a training program specifically addressed to the paper production team proves fundamental to get the most out of this technology: the training will deal with topics such as basic understanding of mechanical vibration analysis, mechanical characteristics of the doctor back structure, as well as mechanical characteristics of the blade holder, blade configuration, vibrations coming from the machine, friction between blade and coating, understanding of software functionalities and data reading.

REMOTE MONITORING SERVICE

To obtain maximum benefits from this technology, Oradoc also offers a Remote Monitoring Service support: a skilled, specialized team of technicians carries out twice a day a remote analysis, the technician in charge connects to the system installed by the customer to check and verify working conditions.
The Remote Monitoring Service is finalized to carry out two different types of activities: some of them concern the measuring system itself - to check proper working of all components, like cables and sensors, data acquisition unit, control alarms, parameters set up, files and back-up data maintenance - while some others broaden the view to consider the whole paper machine Yankee section, taking into account for example not only the acquired data but also other variables pertaining to the machine, exchanging info with reference person at paper mill and identifying possible problems. Sometimes a troubleshooting plan is agreed with the plant staff - i.e. other advanced tests - to get a comprehensive picture and be able to issue a report on what has been done to increase the background knowledge concerning the tissue machine and solve the issues. What makes OraTec™ a really reliable monitoring system, besides its core characteristics, is what lies behind it: the in-depth knowledge of the paper production process, an inner point of view that makes it easier to highlight possible issue arising during the creping process.
Oradoc has a holistic approach to creping, as it engineers and manufactures both the doctoring system and the vibration measuring device, thanks to its deep knowledge of the process and the full understanding of all possible critical aspects that may arise during the creping stage. As case histories have brilliantly shown over time, the OraTec™ FX system - along with the Remote Monitoring Service - allows to detect and solve a wide range of different possible issues concerning either the paper machine or the creping process. On one case, for example, the system was able to detect an unstable vibration that lead to a failure in the basis weight control system and that was due to uneven hoods temperature regulation. In another situation, thanks to its high sensibility to vibrational roots near the creping doctor and by monitoring in particular the time trend analysis, the OraTec™ FX managed to highlight a press vibrational interference that was easily settled by replacing the press.
Blades could also badly influence the creping process, as the system sensed on a paper machine where blades had been replaced after being faulty re-sharpened.
The OraTec™ family of measuring instruments has proven to be the ideal tool to further improve the best tissue production performances. ●

Sensor installed on doctor back with protection cover.