HAMMER-IMS

Optimization of Paper Web Uniformity:
RWTH Aachen Utilizes Hammer–IMS Technology

The Institut für Textiltechnik (ITA) at RWTH Aachen University is one of the leading teaching and research institutes within the Faculty of Mechanical Engineering. With over 400 employees and a state-of-the-art technical center that encompasses the entire textile process chain - from fiber production to finished products - the ITA plays a central role in developing sustainable and innovative technologies. The institute focuses on transforming the textile and paper industries while advancing environmentally friendly materials.

As part of the Forschungscluster Modellfabrik Papier (FOMOP) funded by the German Federal Ministry of Education and Research (BMBF), the ITA is developing disruptive concepts to reduce energy and water consumption in paper manufacturing. The goal is to make a significant contribution to achieving climate neutrality in the paper industry through innovative methods, such as dry fiber processing. A key aspect of this research is validating the uniformity of paper webs, which are dry-laid using in-house developed airlaid processes. This uniformity is critical for optimizing the mechanical and optical properties of paper products. To precisely examine surface uniformity, the ITA opted for the Hammer-IMS laboratory measurement system, identified as the ideal solution at the Techtextil trade fair in Frankfurt.

The Hammer-IMS system offers several advantages: It enables precise measurements of areal weight fluctuations in DIN A4-sized samples, which is essential for analyzing surface homogeneity. Thanks to the non-radioactive M-Ray technology, the system is safe and straightforward to use, avoiding the legal and safety requirements associated with radioactive sources. This significantly simplifies its application within the institute. Additionally, the device is highly compact with integrated, user-friendly analysis capabilities. A standout feature is its scalability, allowing seamless application in pilot and industrial-scale settings. The technology has proven particularly effective for non-destructive measuring loose samples without altering their structure. It also facilitates the investigation of uniformity changes during processes such as pressing or calendering. Initial results indicate significant improvements in web uniformity, while further research aims to enhance the detection of defects, such as fiber neps. Future research will include the integration of the Edge-Vision optical measurement system from Hammer-IMS for more precise evaluations. Combining results from grammage measurements and optical detection will enable a more comprehensive analysis of the paper webs. This combination promises synergy effects to harness the strengths of both systems, driving progress in research further. The close collaboration between ITA and Hammer-IMS highlights the successful synergy of scientific expertise and technological innovation. This partnership not only advances modern measurement methods but also makes a significant contribution to the sustainable transformation of the paper industry. Both partners look forward to upcoming research milestones and continued successful collaboration. the paper industry. Both partners look forward to upcoming research milestones and continued successful collaboration.

Measurement of surface uniformity of dry-laid paper using the Hammer-IMS laboratory measurement system.