KAESER report
A magazine for the production industry

KAESER COMPRESSORS®

Innovative, paper-based packaging solutions

Plastic is ubiquitous in our everyday lives and its disposal poses a huge environmental challenge. There is ever greater demand for alternative solutions to plastic for the purposes of packaging. The family-owned Koehler Paper Group is developing barrier papers with special functional coatings, that provide the paper with qualities which up until now were only associated with plastics and composites. The greatest advantage of innovative, paper-based packaging solutions such as these is that they can be recycled easily and environmentally responsibly via the established paper cycle.

Swapping plastic for paper

Family-owned for eight generations, this specialty paper manufacturer from Oberkirch in Baden-Württemberg produces over 550,000 tons of paper, cardboard and wood pulp board annually at four sites across Germany. Boasting a customer base that spans the globe, its product portfolio includes thermal paper, carbonless copy paper, decorative paper, fine paper, recycled paper, mechanical pulp board, sublimation paper, and flexible packaging paper.

For some time now, the Research and Development department at Koehler has been working in partnership with the Technical University of Darmstadt on developing, among other products, a functional surface coating for paper packaging, the application of which provides the material with barrier properties similar to those of plastic, and enabling packaging made from non-recyclable plastic to be replaced with recyclable paper.

Paper with the correct barrier properties can be used to make bags and packaging for products such as soup or custard powder, flour, tea, coffee, and dried pet food. The manufacturing process requires a specialized production line, in this case achieved with the installation of processing equipment dubbed Paper Machine 8 and Coating Machine 8. PM 8 alone is almost 500 ft long. At its heart sits a so-called Yankee dryer, the largest machine-glazing

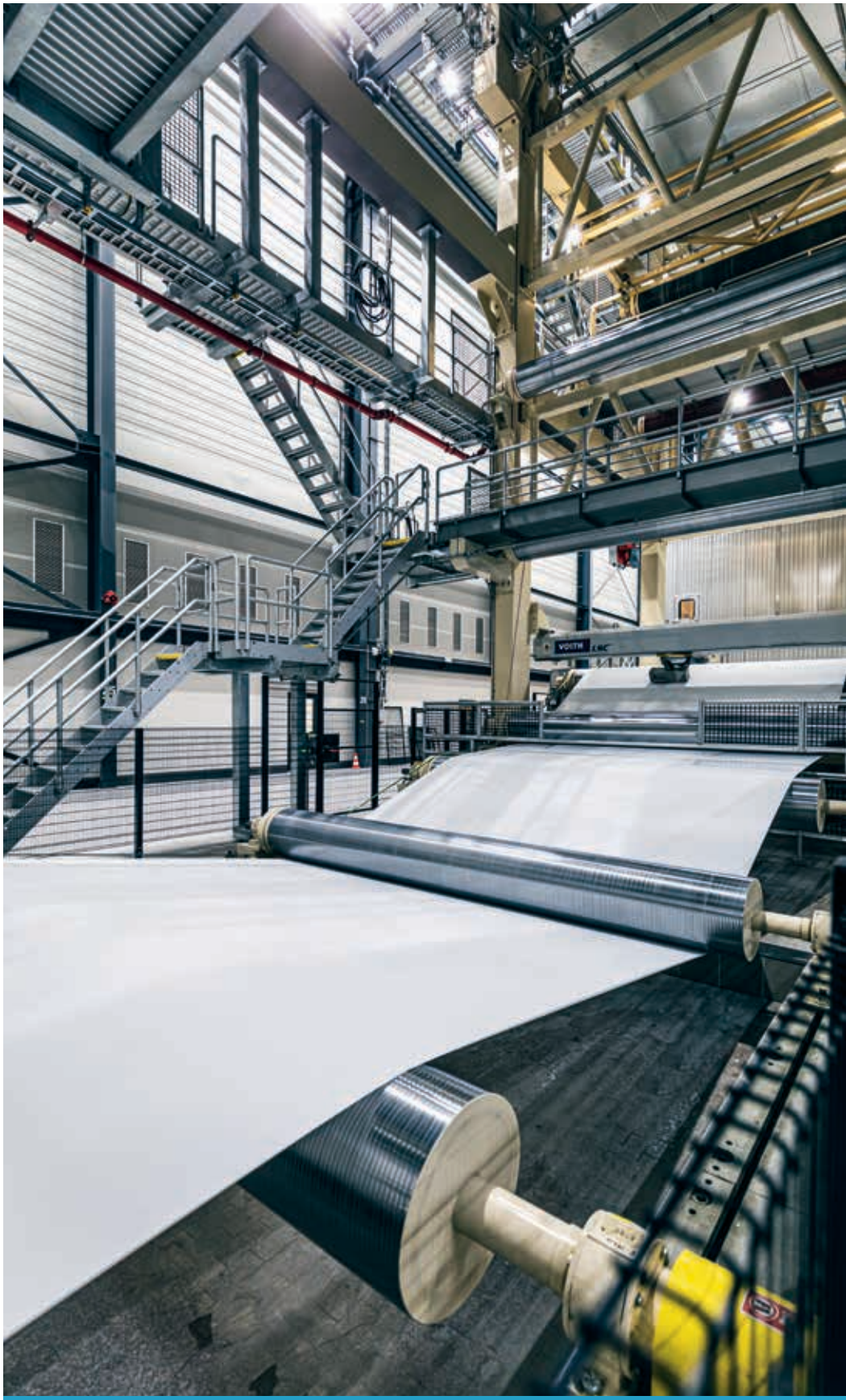
cylinder of its kind in the world. It is this machine that furnishes the paper with its unique smooth finish, an important factor for its subsequent processing.

Compressed air & paper manufacturing

Put simply, paper manufacturing initially involves the gradual removal of water from the pulp-water mixture, which forms the basis of all paper products, so that it becomes progressively more stable and compact. A second production area then applies a coating (either functional or visual) so that the paper receives its specific properties (as a barrier for food packaging, for example). Finally, at the end of the process, the finished product is rolled onto huge reels.

Numerous stages of the production processes described above rely on compressed air, such as water or vapor valve control, cleaning particulate filters, powering processing systems and even unloading trucks. At Koehler, these applications are grouped under the term “working air” and share a constant demand pressure of 94 psig. Due to the large number of small, simultaneously operating consumers involved, a very low fluctuation range is essential. In order to ensure a dependable and energy-efficient supply of working air for the new paper machine, the company invested in two DSD 240 KAESER rotary screw compressors with energy-saving 1:1 direct drive. These were complemented by two high-efficiency HYBRITEC combination dryers of types TI 418/602, which combine the exceptionally low pressure dew points normally associated with desiccant dryers with the energy-saving performance of latest-generation refrigerated dryers. KAESER’s rotary screw compressors and HYBRITEC dryers are a perfect fit for Koehler’s energy-saving concept.

There are, however, a number of stages in the paper production process that require compressed air at the higher pressure of 116 psig. These include all applications where compressed air comes into direct contact with the product itself, such as when feeding paper onto the individual rollers, diverting the direction of the paper (e.g... onto the next roller), or when changing full



The coating machine known as PM 8 applies coatings to the paper that provide it with properties up until now only associated with plastics and composites.

Two KAESER DSD 240 rotary screw compressors ensure a dependable supply of working air at 94 psig, while two energy-efficient HYBRITEC combination dryers take care of compressed air treatment.

reels: a targeted blast of compressed air causes precision tearing of the paper. Here, with so-called "blowing air" applications, the goal is to cover temporary consumption peaks that can only be handled by systems with a suitably large compressed air bandwidth: a role perfectly fulfilled in this case by a DSDX 305 rotary screw compressor (flow rate 870 scfm at 145 psig) from KAESER, also equipped with 1:1 direct drive. The internal SIGMA CONTROL 2 compressor controller ensures efficient control and monitoring of the compressor, while two energy-saving SECOTEC TF 340 refrigerated dryers provide stable pressure dew points with maximum reliability and exceptionally low life-cycle costs. Andreas Walter, Central Systems Project Engineer at Koehler, is thrilled with the results of the new compressed air system. "One of our key objectives for the new system was to achieve significant energy savings. Paper manufacturing is a highly energy-intensive business, which makes the efficiency of our systems and components an incredibly important factor. Our new air system from KAESER more than meets all of our requirements in this regard; we're absolutely delighted with it."

> The key advantages that convinced us were operational reliability, energy efficiency, service, and spare parts availability.
>
> *(Andreas Walter, Central Systems Project Engineer)*

A DSDX 305 rotary screw compressor from KAESER provides blowing air for temporary demand peaks.

These 14 foot wide reels hold approximately 50 miles of paper.