The paperboard machine

The basic features of a typical paperboard machines is shown below.

1. Multi-ply forming
   In contrast to paper, Iggesund paperboards are built up in several layers, or plies. Fibres are supplied via inlets ("headboxes") at the wet end of the paperboard machine. Concentration at the wet end is approximately 0.3 % fibres and 99.7 % water. A low fibre concentration is essential in order to obtain as uniform a distribution of fibres as possible in each layer. The first layer is formed on a plastic wire and the water drains downwards. The subsequent layers are stabilised on two upper wires and water drainage is done both upwards and downwards depending on wire and position. In the wet state, the layers of fibre consolidate easily.

   Precision in the distribution of fibres and the consolidation of the fibre layers is a basic condition for qualities such as flatness, smoothness, strength and good creasing properties.

2. Pressing
   When the paperboard web reaches the press section, water content has dropped to 80–85 %. The press section is important for achieving the correct consolidation of the fibre layers. Sandwiched between two fabrics (felts), the paperboard web is pressed between hard rolls. The water is effectively removed so that moisture content in the paperboard at the end of the press section is 60–65 %.

   Here, qualities such as flexibility, stiffness and runnability are ensured.

3. Drying
   The drying section allows optimal control over the drying process. The paperboard web passes over steam-heated, polished cylinders which gradually reduce the moisture. A sophisticated system controls the temperature of the cylinders to ensure that the web tension is under control during the drying process.

   The drying section establishes a uniform moisture profile, flatness and stability.

4. Surface sizing
   Here a starch solution is applied to one or both sides to prepare the paperboard for coating. Surface sizing binds the fibres to the surface, making the paperboard more uniform and dense.

5. Calendering
   The paperboard is passed between rotating steel rolls to further increase surface smoothness. This process also controls the paperboard’s thickness and density.
6. Surface coating
The liquid, white-pigmented coating is applied and smoothed out over the surface with a blade on either one or both sides depending on the product. Each layer is dried independently by infra-red and hot air dryers. The surface coating section allows paperboard to be coated twice on both sides to provide a high degree of whiteness, smoothness and gloss. Coating also determines the surface’s ink and varnish receptivity.

7. Calendering and polishing
The final gloss of the surface is achieved by gloss calendering in a gloss calender or brush polisher. In the gloss calender the paperboard web passes between a heated hard steel roll and a soft polymer roll. In the brush polisher the paperboard is polished by rotating brushes. These processes give a uniform, smooth surface – which is essential for good printing and varnishing.

8. Reel-up
The paperboard web is reeled onto a large steel core, together weighing 30–40 tonnes depending on the product. Each finished reel of paperboard is given a unique identification code which allows the product to be traced all the way back to the raw materials.

9. Online measurement and control
The web passes thousands of measuring points from which data is transmitted to the central control system. Optical on-line measurement is carried out on the moving web to check thickness, grammage, coating weight, moisture content, whiteness and gloss. The resulting regulation and control capabilities are a prerequisite for uniform, high quality.