Application Details

Super Absorbent Polymer (SAP) consists of small gel-like beads that have all the water removed. When water is reintroduced, the crystals absorb the water and grow into a gel. SAP is an essential component in baby diapers, feminine hygiene products as well as incontinence products. Personal hygiene products which involve SAP are a steadily growing market.

In the 1980’s the worldwide annual production of SAP was about 400,000 metric tons. In 2000 the worldwide consumption reached 3 million metric tons. The huge increase is due largely to the use of SAP in the personal hygiene products industry.

Typical Process

The production of these personal hygiene products is a continuous process and one of the most critical tasks is the accurate, uniform and even distribution of SAP onto the fast-moving band of cellulose or bicomponent fiber. The short term accuracy and uniformity of the SAP-feeding device are key to the quality of the end product. Traditionally diaper manufacturers use gravimetric single or twin screw feeders.

Product Characteristics

SAP is a free flowing, very hygroscopic polymer based bulk material with a typical particle range of 50-500 µ. When SAP comes in contact with liquid it forms into a gel that traps moisture and will not release it, even under pressure.

Typical Rates

Depending on the size and throughput rates of the coating machine the typical flow range is 10 to 1,500 dm³/hr (0.35 - 53 ft³/hr) or approx. 5 to 750 kg/hr (11 - 1,650 lb/hr) at bulk densities of 0.5 to 0.75 kg/dm³ (31 - 47 lb/ft³). Typically, an accuracy of ± 0.5 - 1% 2 Sigma standard deviation is required, with a 1-5 second sample time and a turn-down of 1:5 from the maximum setpoint.

Feeding accuracy determines end product quality. The level of short term accuracy required for this application can only be achieved when the refill systems are optimally configured to suit the feeding systems. K-Tron’s PCS vacuum conveying systems offer a wide range of solutions for this purpose.

Feeder Details

Traditionally, typical feeders for such an application would include K-ML-T35 twin screw or K-ML-S60 single screw feeders with a 50-110 liter hopper, stainless steel construction and standard 2B finish. In some cases K-ML-KV2 vibratory feeders with 60 or 120 mm trays have also been used.

Now there is a new solution available: the revolutionary new Bulk Solids Pump (BSP) with its outstanding feeding performance, is a real alternative for this application. Test results as well as positive experience at customer sites have clearly shown that the BSP is the ideal feeder for SAP thanks to the uniform, pulse-free flow of material.

K-Tron Advantage

- High performance SFT digital weighing technology, which gives outstanding results in short term accuracy
- BSP technology provides superior gentle & uniform SAP-feeding into the coating machine.
- SmartConnex control system ensures long term stability and consistent feeding quality.

SAP Feeding System

This diagram illustrates some of the components K-Tron might supply in a SAP feeding system.

The BSP-150-S is ideal for SAP feeding applications.