

# Screening of Super Absorbent Polymers with GKM Tumbler Screeners

**Super Absorbent Polymers (SAP)** are polymers that can absorb and retain extremely large amounts of a liquid relative to their own mass.

Water absorbing polymers, classified as hydrogels, absorb aqueous solutions through hydrogen bonding with the water molecule. So a SAP's ability to absorb water is a factor of the ionic concentration of an aqueous solution. In deionized and distilled water, SAP may absorb 500 times its weight (from 30–60 times its own volume).

The total absorbency and swelling capacity are controlled by the type and degree of cross-linking to the polymer. Low density cross-linked SAP generally has a higher absorbent capacity and swells to a larger degree. These types of SAP also have a softer and more cohesive gel formation. High cross-link density polymers exhibit lower absorbent capacity and swell. The gel strength is firmer and can maintain particle shape even under modest pressure.



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The largest use of SAP is found in personal disposable hygiene products, such as baby diapers, adult protective underwear, and sanitary napkins. SAP is also used for blocking water penetration in underground power or communications cable, horticultural water retention agents, control of spill and waste aqueous fluid, artificial snow for motion picture and stage production. The first commercial use was in 1978 for use in feminine napkins in Japan and disposable bed liners for nursing home patients in the USA.

During the manufacturing process, the Polymer is dried, ground and screened. The granules used inside the napkins or diapers are usually between 0.85 mm and 90  $\mu$ . This fraction has to be virtually dust-free, which normally means less than 0.3% below 60  $\mu$  in the end product. The reason for this is the protection of personal health during the manufacturing and application processes.

Several Polymer manufacturers have been conducting numerous test runs with various types of screening machines. One outperformed them all. The GKM Tumbler Screening Machine KTS was found to yield superior results. By means of a mechanical belt drive arrangement; this machine simulates typical hand screening motion, resulting in the meeting of the stringent separation requirements.

The equipment for this application mainly consists of the GKM KTS Screening Machines with several relief decks. Typical screen sizes are 0.85 mm as top deck, 0.60, 0.40 and 0.25 mm serving as relief deck and 150  $\mu$ .



Typically, the following production rates can be expected from the GKM Tumbler Screening Machines:

- KTS 2600                    ~ 8,200 kg/hr
- KTS 2400                    ~ 7,000 kg/hr
- KTS 2000                    ~ 6,000 kg/hr
- KTS 1600                    ~ 3.500 kg/hr

Please feel free to contact us at any time if you need further information.

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- GKM Tumbler Screeners
- Gardner Mixers and Blenders
- Mucon Valves
- Mucon Discharge Aids