Fully Automated BVG – Glue – Kitchen at Prowell Schüttorf

BVG, Bauer-Verfahrenstechnik-GmbH out of Greifenberg/Ammersee, was selected to supply the glue kitchen for the new facility at Schüttorf, on a turn key basis.

This delivery was the first order Prowell placed at BVG. Nevertheless, BVG was not unknown to Prowell. Back in 2001, BVG got the order from Propapier for the complete chemical handling systems for their new paper mill at Burg, Sachsen Anhalt. BVG has also supplied "high tech" glue kitchens "BVG – Super – Glue" to several new corrugators in the past years in Germany and Austria.

The technology, as well as the technical standard of the new glue kitchen, is based essentially on the requirements of Prowell. It is of technical standard, which is already running at other plants of Prowell. On the other hand, the new plant features several innovations and is guideline for quality, clean design, efficiency, and automation.

The technology of the new glue kitchen is based on the classical Stein Hall Process. But there are two separate tanks, one for primary starch and one for secondary starch. This design gives several advantages, as follows:

- Separate Preparation of Carrier
Back in the 30's of the last century, this technology was invented by the two Americans, Stein and Hall. In their patent they also proposed the "two tank" design, because this allows for the best dwelling and retention time of the native starch. These chemical basics have been the same until now. The only difference is the know how of the technical transformation.

- **High Production Rate**
Both tanks are working simultaneously. When adhesive is processed in the second tank (secondary starch), the carrier can be prepared parallel in the first tank (primary starch), thus cutting the cycle time for preparation of adhesive from batch to batch by half the time. High production rate is very important, because the high speed corrugator, featuring 3,3 m (130") sheet width, consumes up to 7 m³/h (1842 gal/h) adhesive.

- **Small Size of Batches**
Due to simultaneous preparation of carrier and adhesive it is possible to keep the volumes of the preparation tanks to a small size. This increases the flexibility of the plant by far.

The engineering was carried out by use of most modern 3 d CAD programming.

Bild 1: 3D – CAD Plan

Functional Description of the plant:

Native starch is delivered by truck and will be blown into two silos, with a volume of 90 m³ each. Out of the silos, the starch is fed into three day-tanks by means of screw conveyors. The day-tanks feature a volume of 1.5 m³ each and are built on load cells.
From the day-tanks starch will be fed into two mix tanks, which are built on load cells, too. It is possible to feed starch out of each silo, into each day-tank, and each mix tank. That makes the plant very flexible.
Into the primary starch (carrier), caustic and another additive is metered and into the secondary starch (adhesive), Borax powder. All chemicals are added gravimetrically, based on load cells.

Starch silos **Day tanks and mix tanks**

Ready prepared adhesive is stored in two tanks, with a volume of v = 7 m³, each. From here the corrugator will be supplied.

Wash water is collected in a tank of v = 10 m³ and used again in the secondary starch.

Adhesive storage and wash water tanks

At the corrugator there are satellite tanks installed for the modulfacers and double backer. The satellite tanks are built on load cells to record the consumption of adhesive for the different applicators.

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Satellite tank at Modulfacer

The complete plant is controlled by a centralized electrical panel. The separate moduls of the plants are linked by a bus system (profibus dp) from Phoenix. It is operated by two work stations, one in the glue kitchen and one in the control room of the corrugator.

It is possible to be connected remote, via modem and pass word. This can be done by regular phone or cell phone from any place in the world – if there is a connection available. This service helps to give support to the operator at any time. All the relevant data are stored in a data base, to trace alarms and production status.

The new glue kitchen was commissioned on schedule and went on stream without problems. After three months of operation, the plants still looks neat and clean. The design and finish fits perfectly to the layout of the entire mill.

BVG would like to take this opportunity to express its thanks to the project management and all who are involved in this project for the confidence placed in BVG, as well as for the excellent cooperation.

It is very impressive, what has been done so far. We wish Prowell and the new facility at Schüttorf all the best and great success in pursuing the further goals to achieve together.

Greifenberg, 2006-02-02

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