Mixing and applying of plastic wear layers on the spot.

Two solids and two fluids mixed on weight.

DOSING
Vincent van der Wel

The strength of Bolidt is the development, production and application of thermosetting plastics. The plastic systems find their way into seamless and leakproof industrial floors, ship decks, wear layers in road- and commercial constructions, sport floors and wall finishing. For the application the company developped a machine which weights and mixes the solid and fluid components on the spot.

The systems of Bolidt fullfill the specific mechanical, chemical, sustainability and esthetical requirements of the market. A good example of Bolidt's specialisation are the antimicrobial floor and wall finishes for by example the food processing industry. Per year Bolidt provides two million square meters of floors, decks and wear layers. With own application teams a variety of projects world wide is performed.

Applying in one move
Each Bolidt floor is a unique one, composed in one out of 250 types, in a colour to customer needs. Each project has as a matter of course its own surface and application takes place on site. Especially the top layer has to be applied in one go because the plastic hardens, so an interruption causes a clearly visible seam. Not only an esthetical problem but moreover a risk for by example leakages.

That means on the spot sufficient finished product has to be available. A shortage causes an interruption and 'just the right size' is risky. So Bolidt always produced in its work in Hendrik Ido Ambacht (NL) some percentages extra. The remainder returned into the ware house but the turnaround time of these products is long. It should be quite a coincidence when a similar floor in the same colour occurs again. Secondly the different components have a limited shelf life. Altogether a procedure causing unnecessary costs. The components and the preparation have a price and disposal as waist is far from free.

In situ
Bolidt invented an apparently simple solution. The plastic mixtures should not be prepared in the factory but, in exactly the right quantities, in situ.

Batching was discarded; a batch frequently is too big or too small, and Bolidt decided for continuously. The machine, applying the plastic system, had to be mobile. Ideally he moves ahead of the job. Bolidt decided to develop and produce a Bolimixmachine. A continuous process requires a continuous mixer, fed continuously. Bolidt had good experiences with mohnopumps, since they supply a constant flow. The plastic system does not match with flow and volumes meters and when weighing the sensors are outside the material flows and weighing is chemically spoken correct. Differences in temperature, density and so on don't have to be compensated. Apart of that you can weigh solids as well as fluids.

The weight of mass flows
For the problem of the mass flow regulation Bolidt contacted Bert van de Weerd of their home supplier PENKO. "There we use the LIW (Loss in Wight) technique for. For each raw material a feeder is necessary. The measured loss in weight per unit ($\Delta m/\Delta t$) we compare continuously with the required mass flow. By means of a PID characteristic we match the control of the feeder continuously so a constant compound enters the mixer. During refill we adjust the dosing speed empiric".

the Bolimixmachine in action.

aapplying the wear layer on the Erasmusbridge.

With this information Bolidt dared to take up the challenge. At first in 2004 a machine was build who produced continuously a compound out of two fluids and one paste with a capacity of 2 to 5 tons/h. Each raw material has its own weighing construction with a mohnopump and an own weight controller. The control is done by means of an operator's terminal. With two years of experience Bolidt decided in 2006 to design and build a bigger Bolimixmachine, especially for the application of wear layers on roads and bridges. This machine prepares ready mixtures out of two solids and two fluids. For the combination of a sufficient high weighing and controlling accuracy the stock of raw materials and the feeders are separated. That's why this machine possesses two feeders for the solids and two dosing tanks for the fluids. Each of them is made weighing with a controlled dosing device, a screw feeder or a pump. The stock of solids is located in t provided.

Experience
In the meantime the Bolimixmachine has been used for the application of adhesive and wear-resistant layers on theMoerdijk, Hollandse, Hagesteinse, Muider and Boogbeek bridge. All of them on or under high strength concrete. Per hour 1000 m2 is produced and applied. Thanks to an exchange system of dosing tanks the machine can apply on concrete or steel.
The comments of Boldit: "Remainders fortunately don't occur anymore. Apart of that the machine applies directly after start up a useful mixture. That is thanks to the special characteristics of the PENKO controllers. speed of the Bolimixmache to the speed we apply the wear layer in".

the control panel

Calculated settings are stored per formula and the instruments measure rapidly with a high resolution. Out of this information an alarm is generated when the mixture even slightly deviates from the setpoint. Practical is we can easily adapt the speed of the Bolimixmache to the speed we apply the wear layer in". ■

applying the layer on the Moerdijkbridge.

the Moerdijkbridge with the new wear layer.