

Pre-Mixing System



High Performance Mixing Technology

Mixing Process Innovation that Maximizes Performance

The Reichel & Drews modular Pre-Mixing Unit optimizes the blending of SBS, APP-granule and filler by reducing the mixing times, energy requirements and maintenance requirements while reducing environmental contamination.

SBS is typically difficult to mix with bitumen because its specific gravity will tend to make the SBS pallets float on the bitumen surface. In traditional mixing processes using augers or impellers, the SBS granules heat up and become elastic before homogenization. Once passed through the homogenizer, the SBS granules do not shear as they likely would if they were at a lower temperature. Thus, regaining much of their original size after passing the homogenizer. This results in having to make multiple passes through the homogenizer in order to assure a homogeneous mix of bitumen and SBS.

System Overview

With the pre-mixing system, bitumen (pure or modified bitumen), plastic granules, or fillers are added to a previously selected mixer in a single pass via the mixing nozzle (centrifuge).

Because the modified granules are passed through the homogenizer at a lower temperature there is a greater shearing effect on the modifier granules. Also, the Pre-Mixing Unit assures that 100% of the bitumen and modifier pass through the homogenizer. As a result, usually a single pass is all that is needed to achieve a homogeneous mix. Additional passes through the homogenizer are possible if needed or desired.

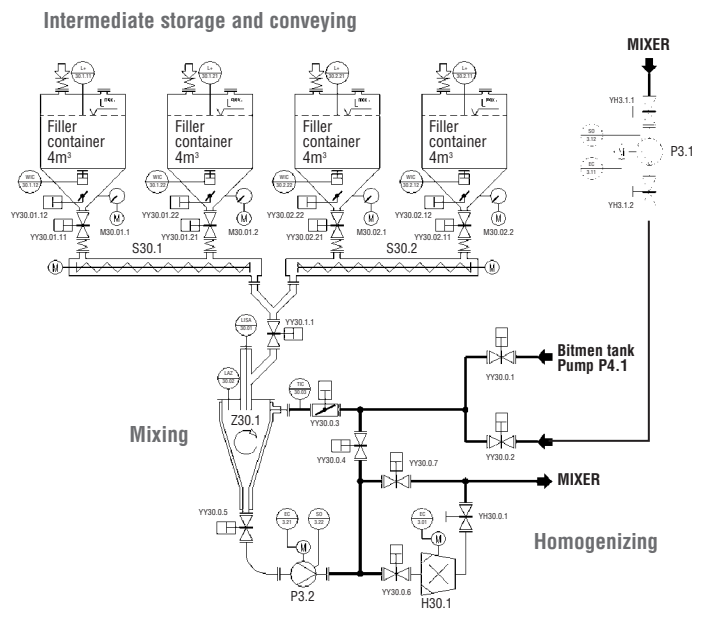
In case a recipe needs modification later, there is always the possibility to add single components (bitumen, plastic, and filler).

When mixing, the plastic granules are always added first, and afterwards the filler. It is therefore not possible to add additional plastic granules to a compound with filler.

All plastic granules like SBS, APP, IPP etc can be used as long as they are capable of freely flowing in the weighing container and may be conveyed without problems via the transport system (screw conveyor).

The concept of the Pre-Mixing System can be divided into three key areas that are inter-related to each other and together work as a whole.

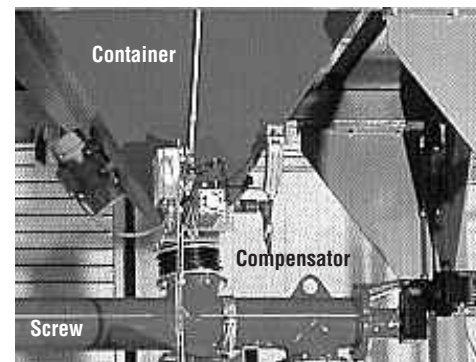
- Intermediate storage and conveying
- Mixing
- Homogenizing



Intermediate storage and conveying

The premixing system is equipped with storage containers for plastics and filler. They have approximately 4m³ of content and are encapsulated to avoid dust. The containers are fixed to the frame unilateral on two moveable hinge bearings and rest on a load cell.

The load cell is electronically adjusted and weighs the content of the container to enable a controlled extraction of additives.



The content of each container can be read on the operation panel as weight specification (kg).

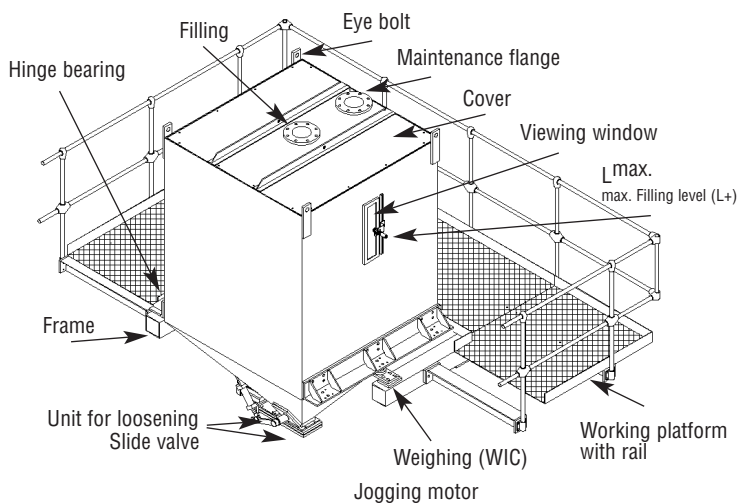
A mixing process can only be started when a sufficient quantity of additives exists. Otherwise the corresponding container has to be filled before production can begin.

The release of material is controlled by the corresponding slide valve on the exit of each container. If it is open, a jogging motor and a mechanical unit for loosening provide a continuous material flow to the transporting screw.

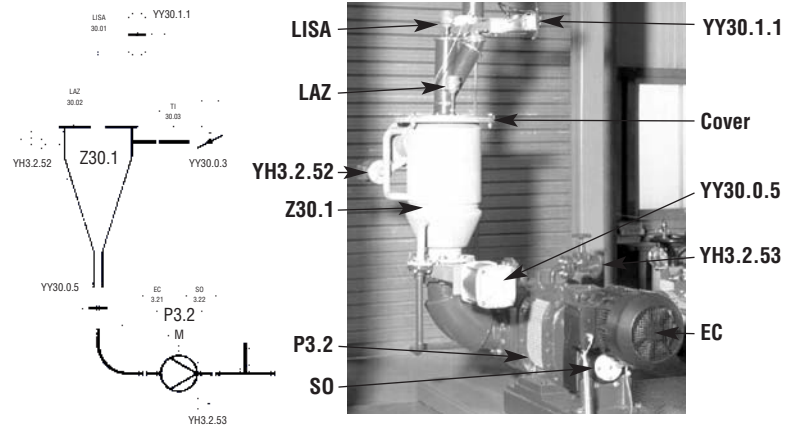
An expansion joint is mounted between the container exit and the screw entrance to ensure that the container is freely suspended.

The transport of the material from the containers to the entrance pipe of the mixing nozzle is realized via a screw conveyor with frequency-controlled drive. It is provided with a draw down to manually empty the container if necessary.

Container

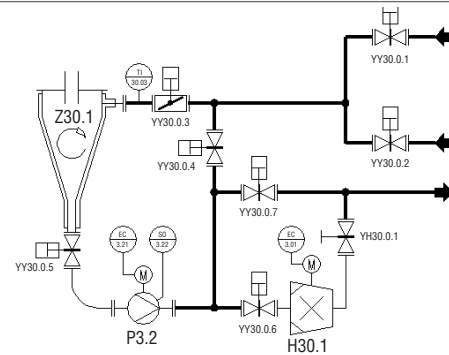


Mixing

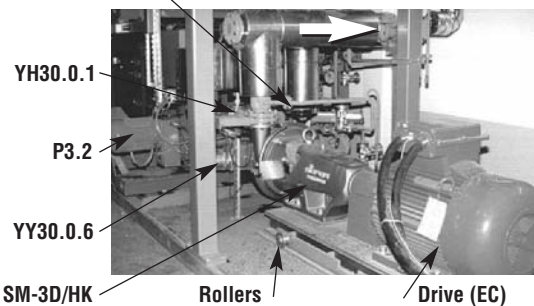


- LISA = Tester
- LAZ = Manometric switch (Over fill protection)
- YY30.1.1 = Flat slide valve (SBS/Filler feed)
- Z30.1 = Mixing nozzle
- YH3.2.52 = Gate valve HTO
- YH3.2.53 = Gate valve HTO
- YY30.0.3 = Gate valve DN125
- YY30.0.5 = Flat slide valve DN150
- P3.2 = Bitumen pump KKP125
- EC = Frequency controlled drive
- SO = Revolution control of the pump

Homogenizing



Manual wheel Pumping direction bitumen to the mixers



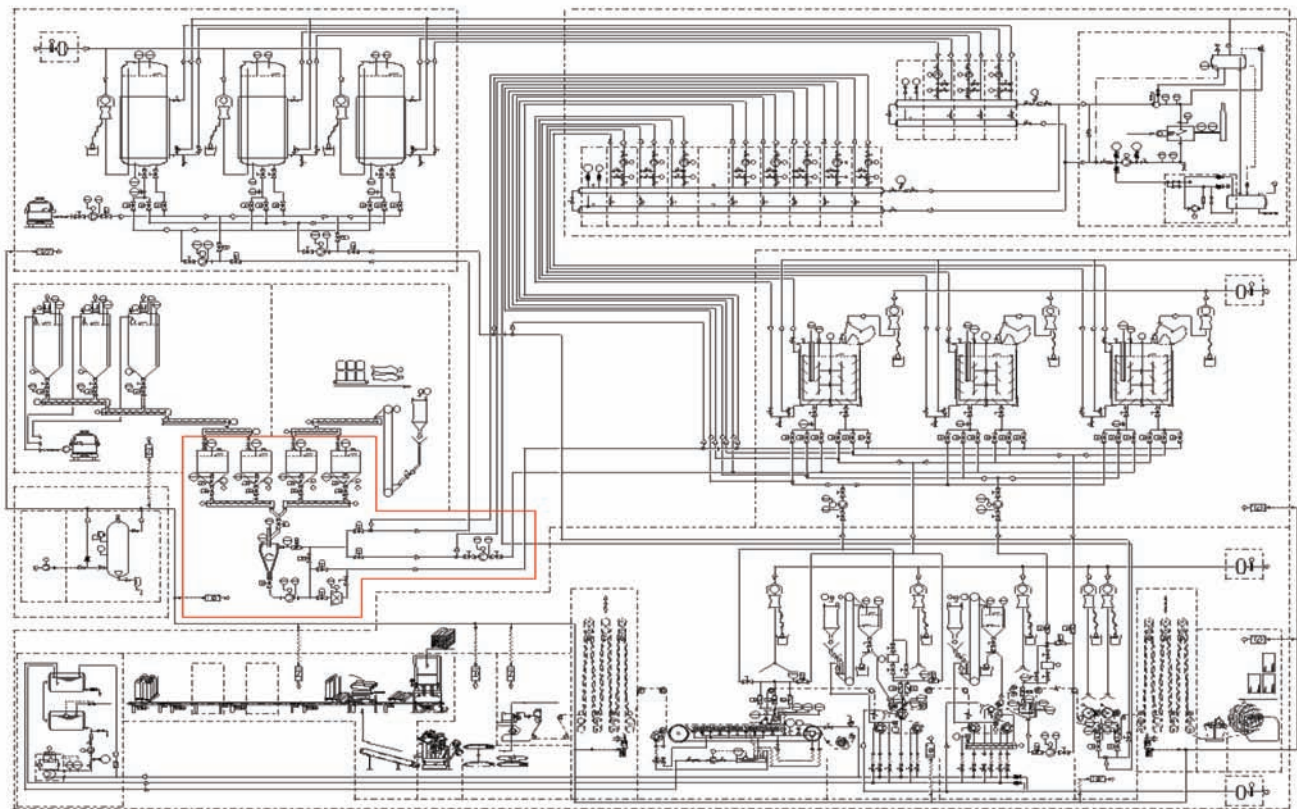
- P3.2 = Bitumen pump KKP125 (see Mixing)
- YH30.0.1 = Manual gate valve for maintenance work on the homogenizer
- YY30.0.6 = Pneumatic gate valve
- SM-3D/HK = Homogenizer (TRIGONAL – Machine)
- Drive = Drive Homogenizer (Electricla motor 160KW)
- Rollers = to move the homogenizer for maintenance and repair
- Manual wheel = to adjust the gap between the knife heads

Modular Construction

The Pre-Mixing Unit is a prefabricated, pre-piped and tested module that can be quickly and easily installed with three connections being made at the installation site, one for the supply of pure bitumen, one for the transportation of the bitumen compound to the mixers and the other for transportation of modified bitumen back to the centrifugal of the Pre-Mixing Unit.

The Pre-Mixing Unit can be used for new production lines or as a retrofit for exiting mixing systems. It can be located up to 50 meters away from existing mixers.

Mixing Process Schematic



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