High Impact Packing at Rohm & Haas Scotland

Three Big Bag Filling Systems for Acrylic Resin Powder

Webster Griffin were selected to manufacture a turn-key FIBC filling and packaging system for acrylic resin powder - an impact modifier used in the manufacture of high quality extruded plastic profiles.

This project presented Webster Griffin with several problems - in particular the product, although being non corrosive was combustible and deemed to be capable of a dust explosion. This fine white powder is free flowing and becomes aerated when handled or poured into bags, therefore, powder densification and special bag handling techniques were required.

The throughput of the plant is fast: 24 x 500kg half ton or 12 x one ton bags/hour and must be achieved with one operator plus a part time fork lift truck driver.

The bag is a heavy duty woven polypropylene bag with a 6:1 safety ratio and four top lifting loops, bottom discharge spout and top filling spout, the bag is manufactured from flat woven polypropylene extrusion coated bags and has a static conductivity strip.

Scope of Supply:

Webster Griffin supply includes integrated product settling hopper and two stage product dosing valve above the filling machine, an automatic empty pallet infeed system, with pallet magazine, automatic slip sheet applicator, bag filling and product consolidation station, check weighing station, accumulating conveyors for filled bags and operators platform.

Solutions:

To minimise the risk of combustion the powder is nitrogen purged in the silo and surge hopper above the filling equipment.

To prevent dust escaping during filling the filling spout on the machine has an inflatable collar to provide a dust tight seal between the bag neck and the spout, the spout has an inner and outer tube, while the acrylic resin powder flows into the bag through the central tube, displaced dust laden air escapes via the outer tube or plenum and is ducted directly to the clients dust extraction system.

The Webster Griffin control panel and wiring are intrinsically safe and owing to the low melting temperature of the powder, overheating of any component or motor is monitored automatically, the motors are also explosion proof.

For ease of changeover the machine is self-adjusting for different sizes of bags and has a stainless steel telescopic filling spout, the weigh system is digitally programmed for alternative bag weights ad stores 100 coded weighing programmes in its memory.

At the end of the weighing - filling - vibrating cycle the bag is lowered and vented before the telescopic filling spout is retracted and the automatic bag hooks are released.

To give one man operation the filling station has bag loop hooks which facilitate fast empty bag loading and allow for immediate release of the filled bag

In order to avoid floppy unmanageable filled bags they are suspended during filling and intermittently vibrated to de-aerate and consolidate the powder in the bag - care is taken to ensure that vibration is not transmitted to the precision loadcells which account for the fine weight accuracy achieved on the system.

Consistent weight accuracy is ensured by control of the product feed valve at the base of the surge hopper which responds instantly to feed back from the loadcell weighing system, the bag is filled in two stages, 'coarse feed' - during which the bag is vibrated to compact the contents - followed by 'fine feed' for accuracy, after filling the bag is check weighed and the weighment logged.

Tower outside Rohm and Haas

Project Specification

Specification	High Speed Big Bag Filling System
Client:	Rohm & Haas Scotland
Product Packed:	Acrylic Resin Powder
Bag Type:	Heavy Duty Woven Polypropylene bags with a 6:1 safety ration and four top lifting loops
Bagging Rate:	24 x 500kg bags/hour 12 x 1000kg bags/hour
System Comprising:	• Product settling hopper • Two stage product dosing valve • Automatic empty pallet infeed system with pallet magazine • Automatic slip sheet applicator • Check weighing station • Accumulation conveyors for filled bags • Operators platform
Special Feature:	Non-interference product compaction. Webster Griffin specially developed product consolidation system, low amplitude, high frequency. Vibration is applied during weigh-fill cycle without effecting weighing process or accuracy.