C J Waterhouse Co Ltd

E N G I N E E R I N G

CJW

P R O C E S S   S Y S T E M S

MATERIALS HANDLING ▼ WEIGHING SYSTEMS ▼ PROCESS SOLUTIONS
PLANT CONTROL ▼ BESPOKE MACHINERY ▼ AUTOMATION
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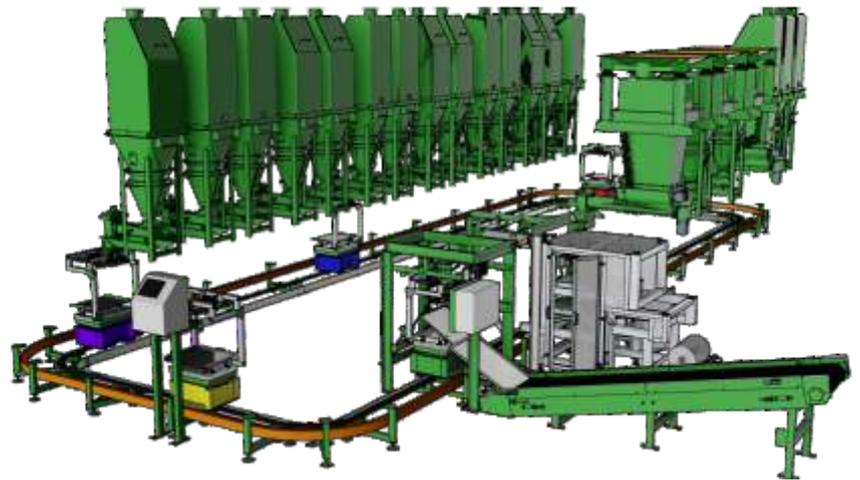# *SMART CART* Minor Ingredients System

Traditional Minor Ingredients Systems

Traditional minor ingredient systems were generally based around static central batch weighers with a number of material feed stations positioned around its perimeter. Such systems would either weigh directly into a bag or first into the weigh vessel then discharge into the bag. Such systems can suffer from lower accuracy, contamination, slow throughput and limited or no expansion possibilities. C J Waterhouse company developed the Smart Cart system to overcome the negative constraints.
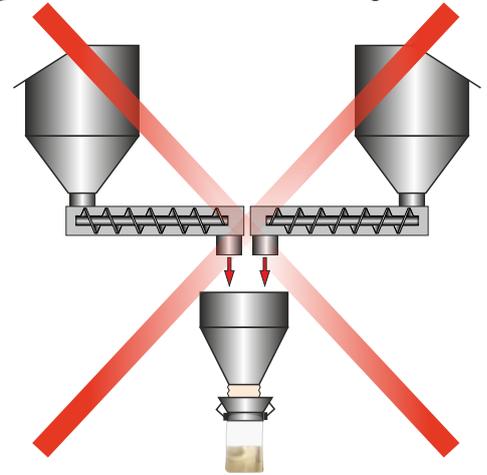
Smart Cart Philosophy

The Smart Cart overcomes these issues by moving individual weigh carriages with pre-loaded receptacles (bag, bucket etc.) to the feeder stations around a monorail track. In this way the raw ingredients are weighed directly into the container on the carriage from the feed station therefore eliminating cross contamination.

Each carriage incorporates a high accuracy force motion platform scale to give typical weighing accuracies on minor ingredients of +/- 3g or better. As the smart cart carriages run upon a continuous monorail track numerous carriages can be added to increase overall throughput.

 This system can also reduce / eliminate costly downtime due to weigher malfunctions as each weigh carriage can be simply removed from the track for maintenance or repairs. The remaining carriages will then continue the weighing operations or an additional spare carriage can be added to maintain the same throughput.

 automatic systems for bucket, container and bulk IBC can also be supplied although the latter would normally be located upon a linear track.

Due to the unique philosophy of the Smart cart it is possible to incorporate additional feed stations and track extensions at a later date if expansion should be required.

Bag Manufacture & Handling System

The fully automatic version of the Smart Cart manufactures bags on-line before loading them onto the carriage clamp system. The weigh carriage then proceeds around the track system collecting the required ingredients in accordance with the pre-specified recipe. On completion of the batch the bag is printed with a barcode or batch information before being sealed and ejected onto the downstream accumulation system. Semi & fully automatic systems for bucket, container and bulk IBC can also be supplied although the latter would normally be located upon a linear track.

Material Storage & Dosing

The system is designed to incorporate bulk material delivery in FIBC's or sacks. These delivery methods are catered for using either sack tip stations or bulk bag discharge stations. In both cases the materials are discharged into surge / feed hoppers located beneath. Numerous material storage facilities with integrated feeders are positioned around the track perimeter. These feeders can be either vibratory or screw type dependent upon the specific material being handled and all are fitted with pneumaticall operated catch gated to improve weighing accuracy and eliminate over-run or spillage. In addition to the standard material feed stations manual addition stations and 'bag-in-bag' stations can be incorporated as required.

Control & Automation

The control philosophy is based around a central control panel housing the master PLC and associated hardware for the off-track functionality of the system. Each Smart Cart weigh carriage incorporates a small PLC unit providing independent speed control, anti-collission control, weight signal conditioning and positioning control. Communications from the master PLC panel are sent using a wireless bluetooth system while power to the carriage drive is received via an enclosed copper Bus system which runs around the perimeter of the track. The central control panel incorporates a PC based recipe handling and production scheduling system which sends individual recipe requirements to each carriage as a new bag is loaded. The carriage will then commence its cycle and feed weighment data back to the central panel for batch logging and data reporting.

A PC based SCADA system provides system and carriage monitoring together with a user friendly human machine interface.