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RUBBER INDUSTRY TO BENEFIT FROM HEPKO RING TRACK TECHNOLOGY

Newark-based CJ Waterhouse, a specialist in the design and manufacture of bespoke, automated materials handling and weighing machinery, is using the HepcoMotion[®] Precision Ring Track (PRT2) in an enhanced version of an established system. The third generation of Smart Cart (G3) is designed to provide fully automated weighing of minor ingredients using intelligent mobile weigh carriages, or Smart Cart's, which travel upon the track and collect the required materials, in accordance with the pre-specified recipe. This particular version of the Smart Cart is aimed at high end compounders in the rubber industry, and the PRT2 used on the system provides unlimited variation for both curved and linear movement.

"The third generation Smart Cart, or G3 now features wireless communications and the addition of a radio frequency tag (RFT) positioning system," says company director, Chris Waterhouse explaining some of the G3's enhancements. "The application is the same, however, and we are using the identical track system as in previous generation machines – the PRT2 – as it has always performed very well."

A typical system featuring automated bag manufacture, handling and accumulation with 20 dedicated feed stations will require an investment of around £500,000, the Smart Cart G3 automated ingredients system is aimed at those in the rubber industry with multiple mixing lines processing many tonnes of rubber. Smart Cart was first developed around 10 years ago to overcome the negative constraints associated with more traditional systems where feeders are positioned around a static central weigh vessel. Such systems can suffer from lower accuracy, contamination, slow throughput and limited or no expansion possibilities.



For larger compounding facilities the payback period for the Smart Cart G3 can be as low as 24 months. This is because the system has the ability to replace previously manual operations – the system, depending upon layout and configuration can produce up to four bags per minute, and with no operator intervention, other than to refill the material storage.

Performance of this nature relies on the system's integral components. With regard to the PRT2, the system needs to stop accurately at feeder stations and bag load/unload stations to ensure operational success. Friction-free linear movement is an important element in this regard too. To ensure smooth running all PRT elements are manufactured from high quality steel, zone hardened on the vee-edges and precision ground all over with datum register faces provided both internally and externally for ease of location.

The Smart Carts are fixed to HepcoMotion® carriage plates mounted on the PRT2 circuit. Low melt bags or other receptacles are loaded automatically or manually to the carriage which proceeds around the track collecting specific quantities of material. On completion of the batch, the bag is printed, sealed and ejected on to an accumulation system.

“The PRT2 from HepcoMotion® offers a complete solution,” says Mr Waterhouse. “It's a cost effective precision track system that is long lasting and durable.”

One of the principal benefits of Smart Cart G3 is its ability to handle as many weighing carriages as the application needs, while an extension to the circuit allows for the inclusion of additional material feed stations. This benefit is facilitated by the PRT2.

“The ring track is both adaptable and flexible, and also provides the high load carrying capacity that we need – direct loads up to 3800N and moment loads of 210Nm,” explains Mr Waterhouse.

Force motion platform scales ensure the Smart Carts provide a weighing accuracy of $\pm 2-3$ grams, while the system is powered by variable speed drives that ensure smooth speed changes and good carriage stability.

“The ability to maintain a stable orientation at the increased travelling speeds is another reason why we retained the PRT2 system in our Smart Cart G3,” says Mr Waterhouse.

Another important point is the ability of PRT2 to withstand the dusty and slightly aggressive working environment encountered by Smart Cart G3. HepcoMotion® bearing assemblies are greased for life and supplied dust- and debris-shielded as standard. PRT2 also uses the HepcoMotion® lubricating system to prevent the ingress of dirt and to provide positive lubrication – lubrication increases the load carrying capability of the system by a factor of four and extends its life typically by a factor of 25.

The HepcoMotion® PRT2 comprises individual elements of ring slides, ring segments and tracks that can be mixed and matched to provide total flexibility. Straight slides can be specified up to 4m in length and if necessary butted for unlimited movement.

CJ Waterhouse has already sold three of its Automated Smart Cart minor ingredients systems, two to the same UK customer. Furthermore, the company currently has numerous live quotes worldwide for further potential systems. Each Smart Cart G3 is designed specifically to match customer requirements.

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About HepcoMotion

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