ENGINEERING CJW PROCESS SYSTEMS
C J Waterhouse Co Ltd
MATERIALS HANDLING ▼ WEIGHING SYSTEMS ▼ PROCESS SOLUTIONS
PLANT CONTROL ▼ BESPOKE MACHINERY ▼ AUTOMATION
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Bespoke Machine Solution for the Refractory Industry

The customer is a part of a global manufactures over 1.5 million tons of refractory products per year across their 30 worldwide manufacturing facilities.

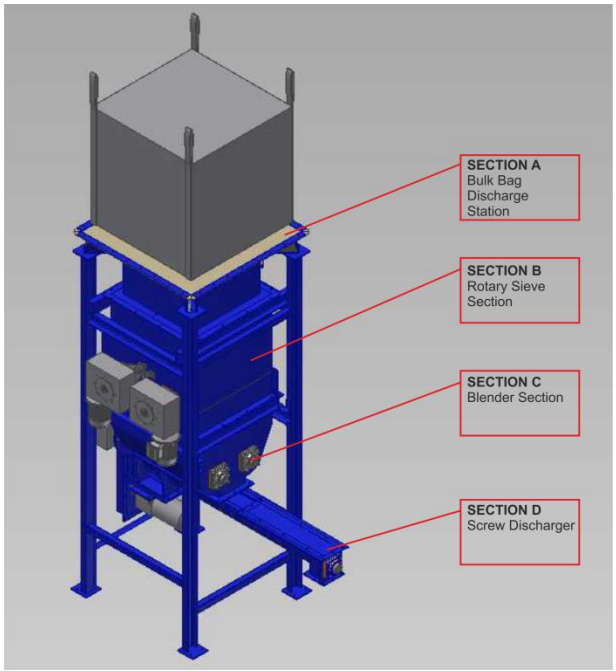
C J Waterhouse Company was initially approached to solve a specific materials handling problem that they have experienced for many years. The customers problem was related to the handling and dispersion of a Zirconia / Graphite blended material. This material has a very high bulk density of over 2500Kg/m3 and readily compacts under its own weight due to the blend consisting of a variety of particle sizes. The downstream process requires that this material be delivered to the mould station in small batches of approximately 2Kg as a fine, well blended material.

Previous methods for completing this process involved; FIBC discharging, sieving, re-blending and dosing. This process was carried out by a series of individual standard machines which is time consuming, costly and ineffective.
With their experience in bespoke machine design, C J Waterhouse co was commissioned to produce a machine to overcome and simplify the existing process.

The product design phase studied all the individual processes and sought to combine them into a single integrated machine.

FIBC Discharging
Material Sieving
Material Blending
Material Dosing

} BESPOKE MACHINE



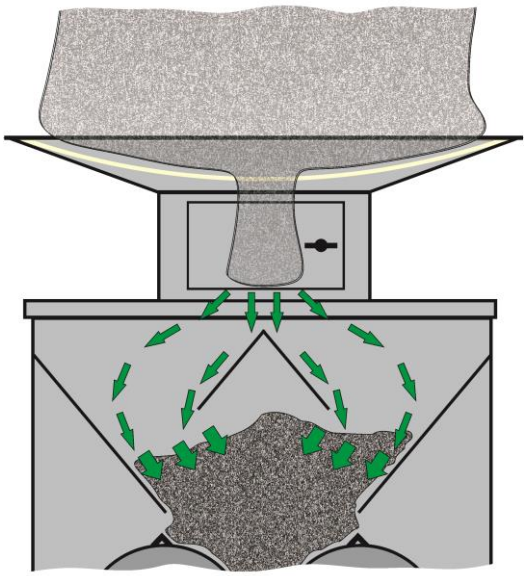
The resultant machine comprises of four elements and is designed to accept a bulk bag of material and dispense a sieved, blended product to the operator.

Section A - FIBC Discharge

This section is generally the same as our standard powder bulk bag discharge station with the addition of a number of internal deflector plates to provide a specific material flow pattern and reduce pressure loading on the machine section below.

A central inverted 'V' and two angled diverter plates on each side channel material towards the centre of the chamber and create two voids towards the outer edge.

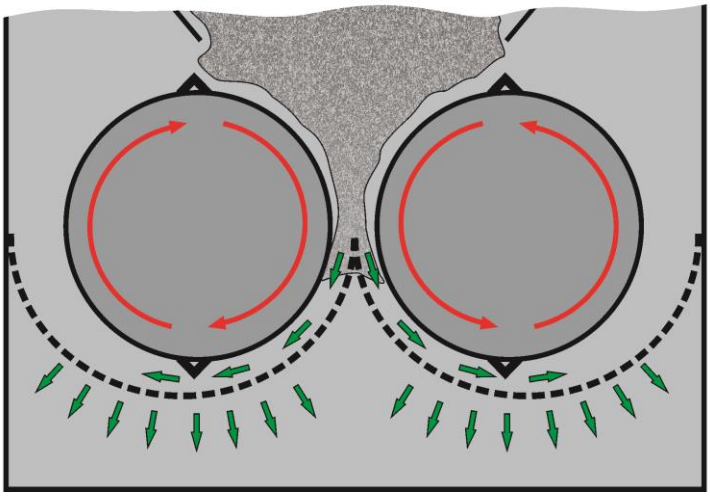
This material flow pattern is created to deliver material to the required point of the downstream machine component whilst alleviating pressure and therefore reducing potential material compaction.



Section B - Material Sieving

As vibratory sieving can separate particle sizes and cause blockages, especially with compacted materials, C J Waterhouse company looked to design an integrated solution incorporating a mechanical sieving operation.

The process is performed using two counter rotating drums with scraper paddles and a pair or removable curved sieve plates. These drums occupy the majority of the chamber and therefore only allow a small amount of material to the screen plates. As the drums rotate the scrappers collect material from the centre of the chamber and sweep it over the face of the screen plate.



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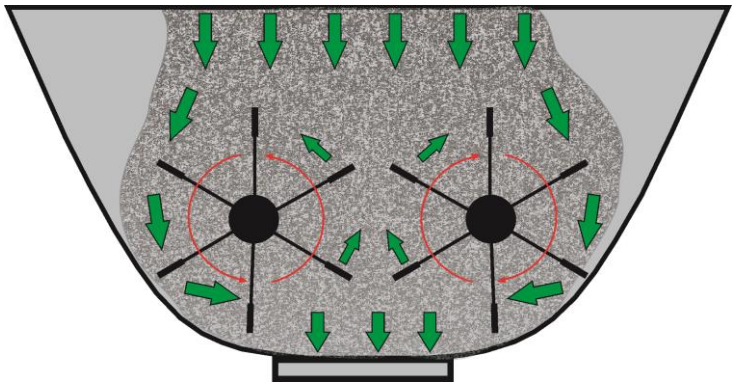
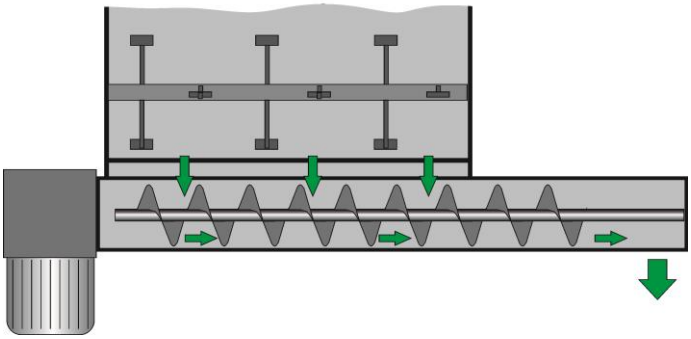
Section C - Material Blending

This section resides beneath the sieve plates and acts to re-homogenise the material to eliminate any potential particle separation that may occur during the sieving process.
Two counter rotating shafts with blending fingers gently mix the material continuously. In addition to this blending action the fingers also promote the flow of material to the downstream feeder and eliminate bridging within the compartment cavity.



Section D - Material Dosing

The final section of the machine is a 'U' trough screw feeder which delivers the sieved and blended material to the downstream process at a continuous rate via push button operation.



Trials of the machine at the clients manufacturing site in Scotland have proved extremely successful with the resultant material falling well within the required tolerance for particle size distribution.




For more information on the products and service offered by C J Waterhouse Company please visit our website or contact us directly.

www.cjwaterhouse.co.uk