



## Materials in Motion

Most products at some stage of their life during production or manufacture, utilise materials in powder or granulated form. This is where the challenge can be for the designers of equipment and processes to move these types of materials from place to place, horizontally, vertically or somewhere in between. The conveyor or elevator designer must consider a multitude of parameters, probably more than twenty in their pursuit of the most effective solution. Materials in bulk will almost certainly give rise to dust, additionally the material may be fragile, it may have sharp edges and wage a war of attrition against the machinery and itself. The route may involve gradients upwards or downwards, sharp turns and exposure to the elements. For mixtures of different sizes of granules sizes, segregation may be a problem, again needing special thought. The list goes on and on and as research and technology move the industry forward the number of parameters to consider is increasing.

However, with the benefit of more than a century of innovation and development, a huge range of efficient material movement possibilities now exists. For long distances, lorries may be the obvious choice, but not always. The World's Longest Conveyor Belt is 61 Miles long in Morocco and conveys phosphate from Bou Craa, a mining town in the interior to ships at the coast. At the other end of the scale, for medical, pharmaceutical or scientific laboratory applications belt conveyors about 250mm long and with a width of less than 50mm will fit the bill perfectly. The Archimedes screw or screw conveyor had its origins in the middle east and is reputed to have been used to transport water to the hanging gardens of Babylon. Since then the screw conveyor has been used for many applications of powders and granules. Most powder handling systems including some form of screw conveyor to transport material from one point to another. More recently the screws have been adapted to provide hydro electric power from the waters of the UK.



Most of the earliest conveyors were of the belt type, adapted to serve as elevators by the addition of simple slats or buckets, typically for use in agriculture. Safety, environmental, efficiency and crucially production considerations have given rise to the variety of approaches seen today. A brief visit to the SHAPA website Equipment Finder will demonstrate the extent of innovation that has taken place, where several member companies specialise in providing solutions to meet particular needs, great and small.

Many conveyor types are capable of negotiating turns and gradients efficiently whilst protecting fragile, hazardous, hygienically demanding or otherwise difficult to handle materials. This equipment includes lean and dense phase pneumatic conveyors, either pressurised or vacuum operated, aeromechanical types and flexible screw conveyors amongst others. There are robust chain conveyors for lightweight, bulky abrasive materials such as





woodchips, or high capacity screw conveyors for short straight runs, ideal for hopper and silo discharge duties moving materials to suitable transfer points. Depending upon the intended throughput, continuous or batch weighing systems may be incorporated. For example, load-cell based weighing equipment can continuously monitor delivery rates and be linked to master controls.

This is a mere snapshot of the science, technology and careful thought that encompasses conveying and elevating as an industry and development is continuous as materials to be moved also increase in sophistication. For further information please visit [www.shapa.co.uk](http://www.shapa.co.uk) or email your enquiry to [info@shapa.co.uk](mailto:info@shapa.co.uk)