

Comparing stockpile versus containerization storage

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Traditional storage of bulk commodities usually consists of either stockpiling directly on the quayside or the use of special storage units to house the commodity before it is eventually loaded inside the bulk cargo ship.

While being simple in its formation, the stockpiling method requires careful consideration of the different types of commodities being handled and how it is managed and stored. Establishing the ground space needed to calculate the volume and weight of the stockpile requires some complex planning. The angle of repose, the width, and the stockpile height may not always be accurate, as this depends on the stockpile being conical or pyramid-shaped.

Having said that, it is commonly regarded as being the most effective way to hold and store commodities. However, stockpiling does not necessarily mean that it is the best possible practice for storing for export, some of which are listed below:

The conical or pyramid formation of the stockpile in terms of maximizing storage volume is inefficient. Empty space above the stockpile could be used



effectively in reducing the floor area and increase storage capacity.

Open stockpiles can lead to contamination including insect infestation, vermin and cross-contamination of different commodities stored nearby. The building of special storage units is an expensive solution and may not completely eradicate contamination issues.

Loss of commodity during the handling process can be said as “money blowing in the wind”. Considering the resources and efforts in extracting and processing the material is offset by the fact that some loss of commodity is inevitable with open wagons.

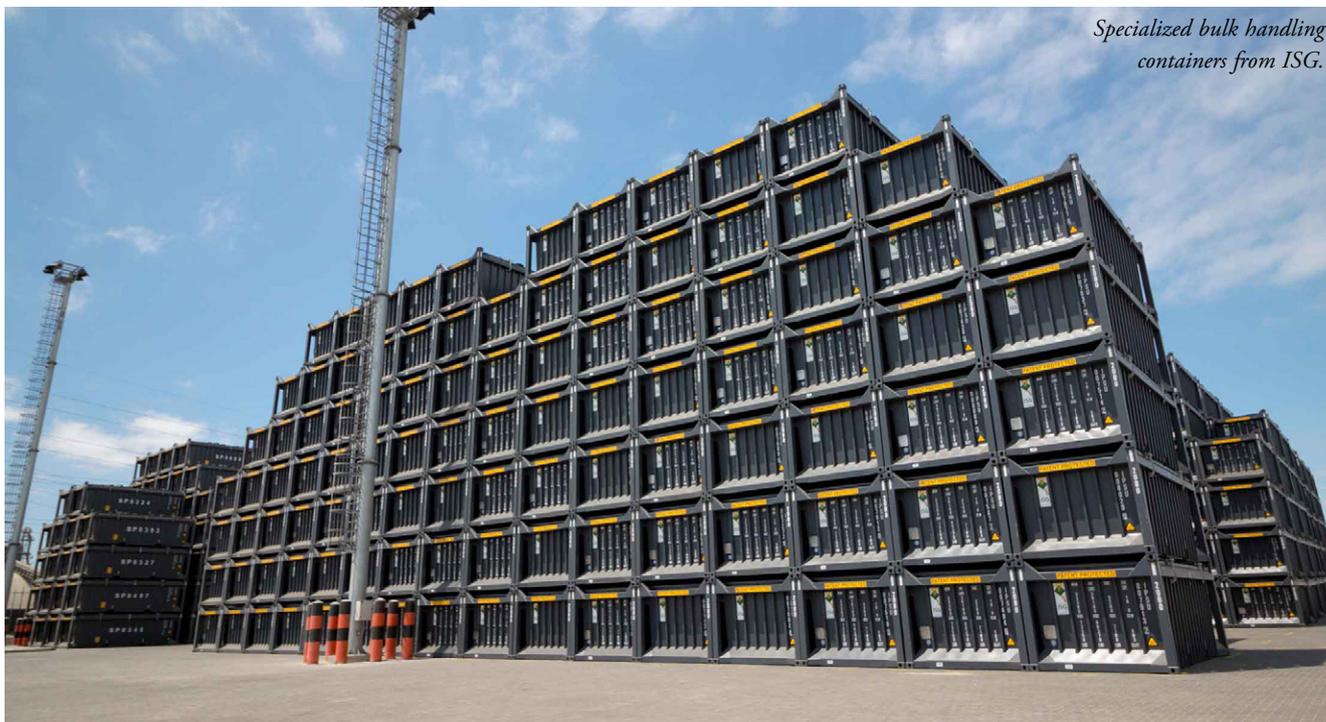
Environmental issues occur when ports and terminals located in close proximity to residential areas generate dust from handling bulk materials.

Due to the economic climate and that more governments around the globe are putting in place strict environmental policies, bulk ports and terminals are now looking into solutions to improve the storage and security of the commodity, and also reduce the amount of dust generated during the handling process, but with a system that is also a low cost solution.

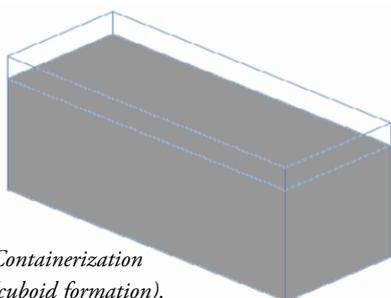
One solution which is currently experiencing an increase in demand is RAM Revolver “containerized bulk handling” from world renowned spreader manufacturer RAM Spreaders. This clever and simple system of handling the commodity involves special open top containers that also have lids that seal the commodity. This is particularly useful for protecting the commodity from the environment, reduces the amount of dust generated during the handling process and also secures the commodity. The use of



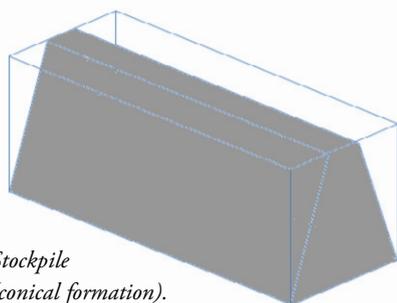
Specialized bulk handling containers from ISG.



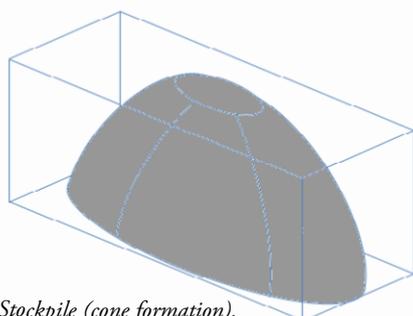
containerizing the commodity also allows storage at the quayside without it being exposed to the elements and reduces the floor space on the quayside by stacking the containers in the conventional way. An increase in storage capacity is achieved as the containers are filled with the commodity in cuboid formation. An illustration to compare each type of formation is shown below:



Containerization (cuboid formation).

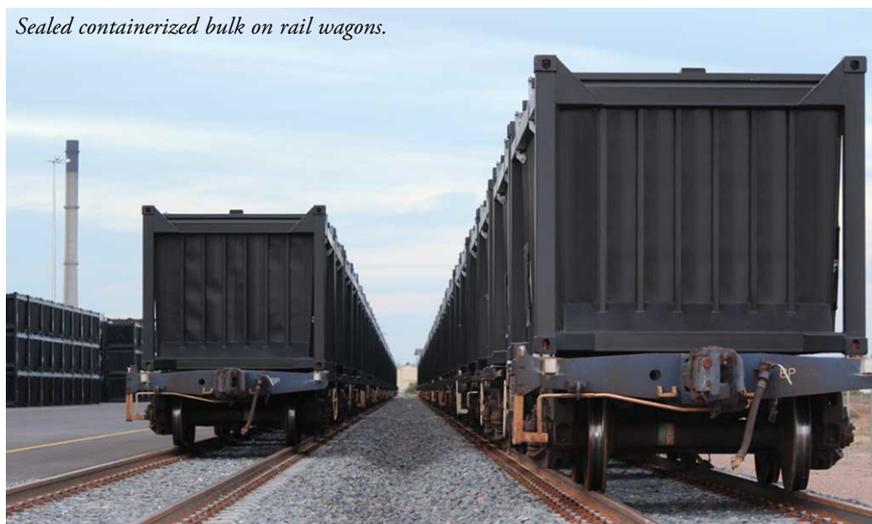


Stockpile (conical formation).



Stockpile (cone formation).

Sealed containerized bulk on rail wagons.



The containerization of bulk enables ports to quantify the amount of commodity stored for export quickly and is safe and securely stored, whilst conical, and cone formation stockpiles vary in size and depth, making it difficult to quantify and control during the export process.

The containerization of bulk is becoming very popular, with RAM Spreaders reporting a number of ports and mines having now adopted the low-cost, easy setup solution. The 4 stage process of containerization comprises of the following elements:

1. Filling the container at the facility (which can be either the container on a railcar or container on a truck). The lid is placed on top to provide a hermetically sealed container.
2. Transport the container to the Port Terminal.
3. Store the container in the traditional

way using existing port equipment.

4. Load the Ship using the RAM Revolver rotating spreader which can be attached to all types of port and ship crane.

The RAM Revolver removes the container's lid immediately before the commodity is gently tipped into the ships hold. This means the commodity is not exposed to the elements from the filling process only until it is loaded into the ships hold.

The containerized bulk handling system eliminates the need for storage units, allows standard ports to export bulk and avoids the need for conveyors systems and reduces maintenance and clean up time. It also uses traditional transport methods from transferring the commodity from the facility to the port using either road or rail networks, so there is no need to factor into the export process the need for a separate transport infrastructure.