

The Densifier™ Technology



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Densifier™ Profile:

The Densifier™ maximizes the space utilization of the storage compartments of ocean vessels, barges, railcars, and trucks to enhance transportation efficiencies. This is an ongoing problem for lightweight, “cubic” cargos such as woodchips.

Under conventional loading methods, woodchips are loaded in storage compartments in a forced product stream causing the random and uneven disbursement of the woodchips. As a result of these inherent inefficiencies, minimal tons of woodchips are loaded per cubic unit of space, increasing the overall operating costs for the storage and transportation of woodchips.

The Densifier™ revolutionizes the loading of woodchips by eliminating most of the unnecessary air space that occurs in conventional loading operations. As the woodchips are processed through the Densifier™ woodchip distribution device, the chips are uniformly dispersed in an outward direction in a pattern of concentric circles. Using the Densifier™ in loading operations causes woodchips to lie flat on top of one another as they enter a confined storage compartment, which results in less air space and maximum compaction. Therefore, space utilization in the storage compartment is maximized and transportation costs are reduced proportionately.

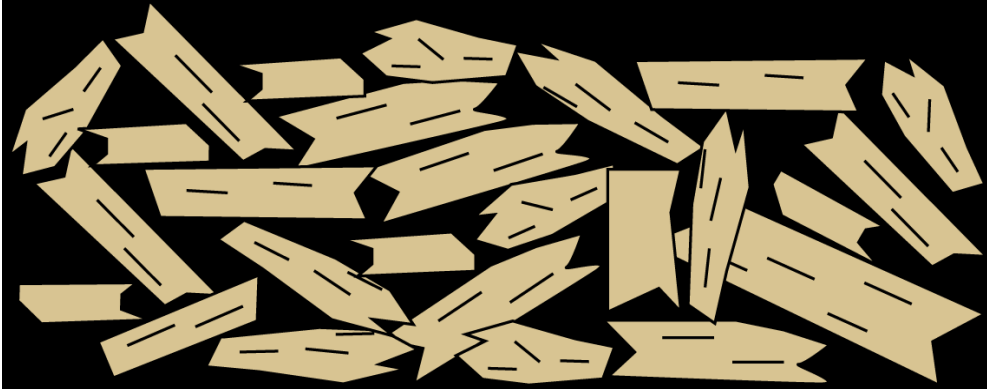


The Densifier™ technology is patented in the United States and 41 foreign countries.

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Visual Comparison of
Conventional Stowage with “Densified” Stowage Patterns

Woodchip Distribution Using Conventional Loading Methods



Densified Stowage Pattern (up to 30% increase in compaction)



The Densifier™ Compaction System

The Densifier™ can be used in railcar, barge, ocean vessel and trailer loading operations. The Densifier™ was designed to attach easily to conventional pneumatic or conveyor loading systems. The Densifier™ is designed to complement the current loading rate of the facility. By incorporating the Densifier™ in woodchip loading operations, the utilization of an open top hopper railcar can be improved up to 12%, which results in a lower freight cost.

The Densifier™ Compaction System has been in operation 14 years at East Coast Terminal Co., loading vessels, and in railcar loading operations in many major Chip mills throughout the U.S. and Canada. Our past stowage performance on vessels loaded at East Coast Terminal Company has produced an increase in cubic utilization in the range of 12.5% to 25.5% depending on the type of vessel. Using the Densifier, we have achieved stowage compaction as low as 76 cu ft per GMT loading southern yellow pine. This increased cubic utilization created freight savings of \$100,000 - \$200,000 per voyage on vessels employed in the U.S.E.C./Far East trade. The Densifier™ has created new markets for US woodchip merchants by reducing their equivalent CIF delivered costs. The same incremental transportation savings apply to the loading of barges, railcars, and trailers. The Densifier™ Model DX1000 was designed for loading ocean vessels; Model DX500 was designed for loading barges; and the Model DX400 for loading railcars and trucks.

Other Densifier™ Applications

Materials Handling & Engineering, Inc., (MHE), is actively marketing the application of the compaction system in storage pad and batch pulp digester loading operations. Materials Handling & Engineering, Inc. has successfully tested the loading of a storage pad and batch pulp digester using the Densifier™. Pad storage loading capacity was increased in the range of 25% to 30% and chip integrity was preserved more effectively than conventional methods of pad loading. Fiber yield in the batch digest was increased due to reduced liquor channeling and better chemical absorption. The ability of the Densifier™ to distribute fines more evenly throughout the block stow of woodchips, coupled with its ability to maintain physical integrity of the woodchips by reducing degradation enhances quality control dynamics of the raw material prior to being used in the manufacturing process.

Densifier Compaction System for Pure Woodchips Carriers

View of the ship loader swinging in the loading position of a pure woodchip carrier



Close up of the Densifier™ Compaction System for loading pure woodchip carriers



Densifier™ Compaction System for Rail Cars



Georgia



Virginia



North Carolina



Tennessee



Densifier™ Loading Railcar



Densifier™ Loading Railcar

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