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 Apparatus for Shipboard Heat Treating



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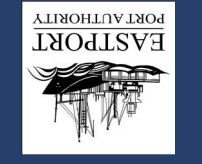
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Recognizing our vendors and partners for their role in collaborating with Phyto-Charter Inc. in designing, developing and implementing the Shipboard Heat-Treating System.

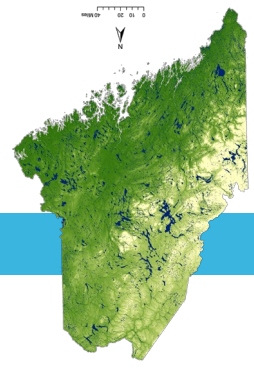
PHYTO-CHARTER SOLUTIONS

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Volumes as displayed above are oven-dry short tons)

Species	All Growing Stock	Total Sawtimber (Grades 1 & 2)	Pulpwood Quality Growing Stock	Rough Cull	Total Pulpwood % of Total	Pulpwood Quality	% of Total Production
Balsam Fir	5,051,348	1,109,237	3,942,111	142,240	4,084,351	18.8%	26%
Larch spp	182,456	62,153	120,303	1,868	122,171	0.6%	1.7%
Tamarack	793,682	479,721	313,961	45,236	359,197	1.7%	0.0%
Norway Spruce	6,076	6,076	997	997	7,073	0.0%	3.6%
White Spruce	2,118,453	1,433,494	684,959	108,031	792,990	3.6%	4.9%
Black Spruce	1,531,837	487,739	1,044,098	30,783	1,074,881	4.9%	18.5%
Red Spruce	10,615,770	6,762,658	3,853,112	160,845	4,013,957	18.5%	26%
Jack Pine	37,419	9,474	27,945	3,052	30,997	0.1%	0.0%
Red Pine	1,134,321	452,557	681,764	34,603	716,367	3.3%	20.9%
Eastern White Pine	7,769,127	4,107,223	3,661,904	884,690	4,546,594	20.9%	29%
Scotch Pine	2,557	2,557	2,557	2,557	2,557	0.0%	0.0%
Northern White Cedar	6,120,092	3,453,586	2,666,506	434,245	3,100,751	14.3%	19%
Eastern Hemlock	8,735,753	6,413,855	2,321,898	563,893	2,885,791	13.3%	100%
Total	44,096,334	24,771,697	19,324,637	2,413,040	21,737,677	100.0%	100%

Merchandise Softwood Volume (5.0" + DBH), By Species, By Quality in Hancock, Penobscot and Washington Counties
 Maine's Eastern Polygon



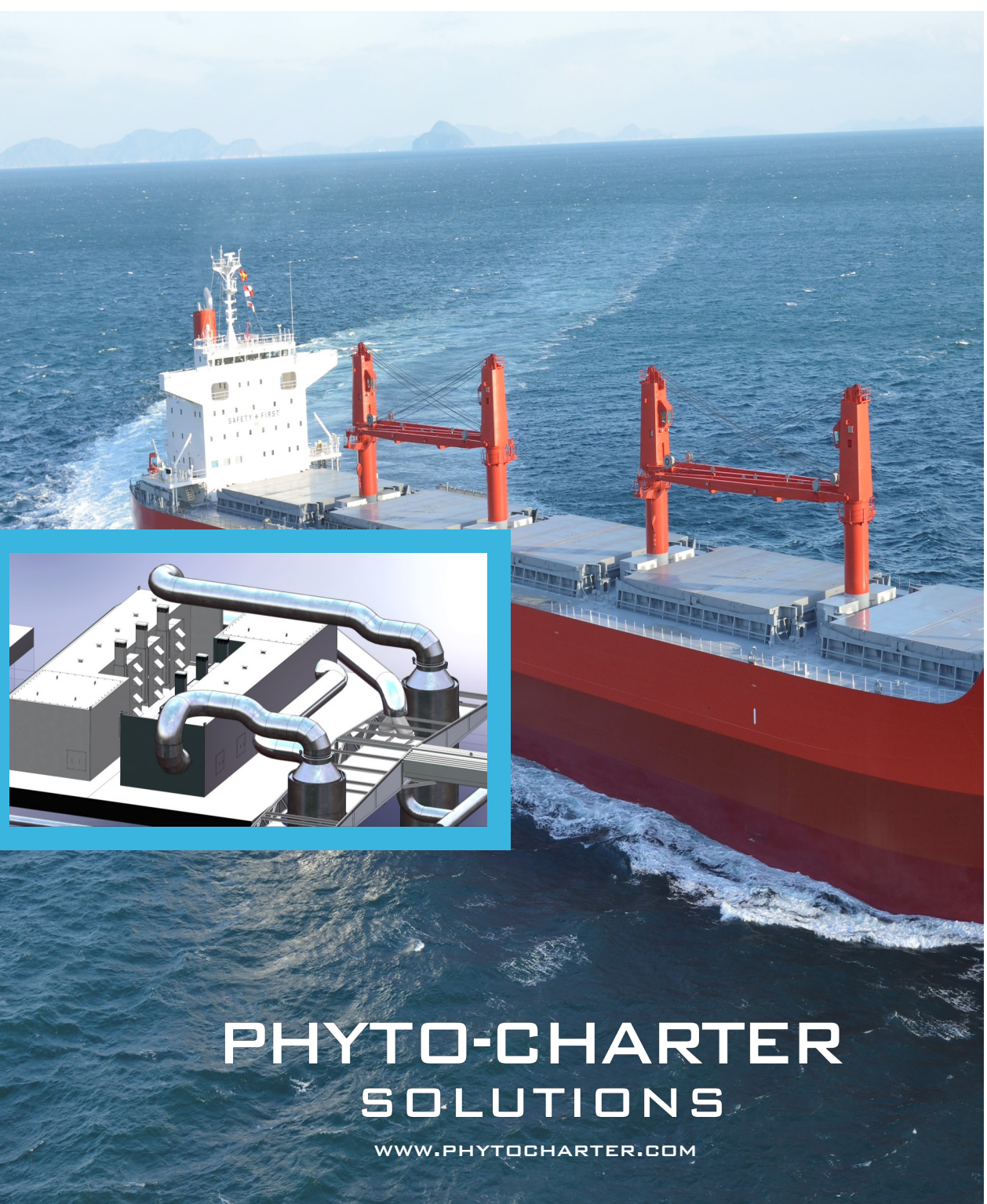
Over 90% of the State of Maine U.S.A is forested, including some 12+ million acres in the northern part of Maine. 39 percent of the forest is soft-woods and 61 percent is hardwoods. Maine has harvested for timber for well over two centuries, yet the state has more forest today than 100 years ago.

SUSTAINABLE FORESTRY

SHIPBOARD PHYTOSANITARY CONTROL SYSTEM

Meeting the Phytosanitary Requirements for Importing Wood Fiber into Europe

Phyto-Charter® Solutions
 Engineered and perfected a shipboard phytosanitary system which meets European Union Council Directive 2000/29/EC.



Portable and Modular Design for Shipboard Deployment

PHYTO-CHARTER SOLUTIONS

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Exporting wood fiber, woodchips and logs across the globe.

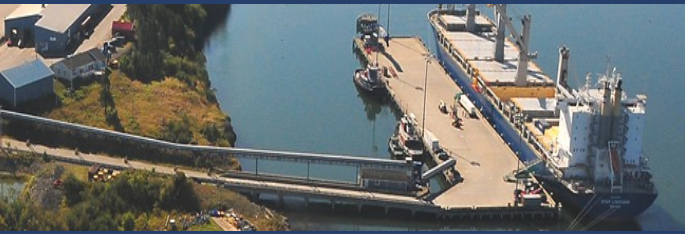
The Process

Wood Chips > Bulk Loading > Heat Treating > Certification > Shipping

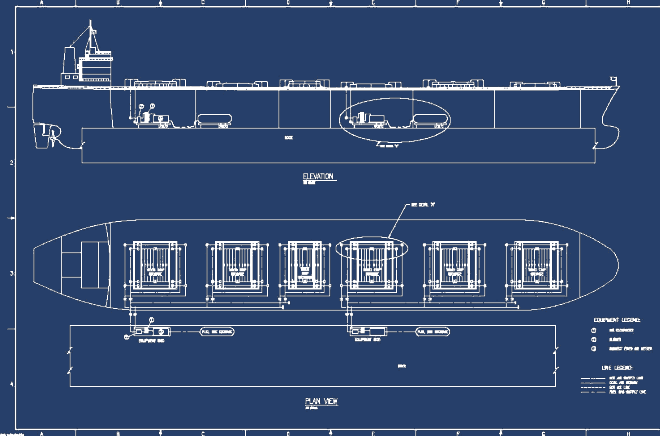
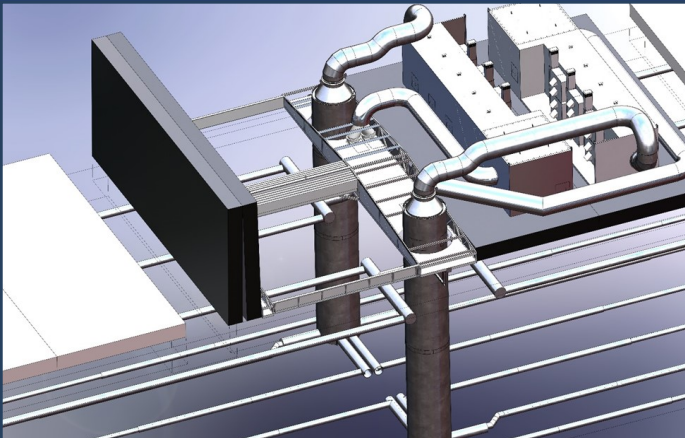
STABLE AND SUSTAINABLE SOURCES



GLOBAL REACH



EMERGING TECHNOLOGY



PHYTOSANITARY CERTIFICATION



USDA United States Department of Agriculture
Animal and Plant Health Inspection Service

SHIPPING AND TRADING



PROCUREMENT BIOMASS FUEL CHIPS

Biomass production will be produced from mixed conifer borewood to meet the specific requirements of the European Union - Standing Committee on Plant Health. Borewood production is processed from the delimbed, bark-on, whole tree stem. The resulting biomass chips are of a high quality, relatively uniform and with a white appearance. Procurement from the Eastern Maine U.S.A. and Southwestern New Brunswick, CA. with in-woods and port production facilities.

RECEIVING & BULK LOADING OPERATIONS

The Port of Eastport USA is deepest draft marine terminal in North America and is the closest bulk-loading facility in the United States to European markets. The forest products bulkyard was engineered to receive and pile down in excess of 60,000 tons of woodchips on a 7-acre paved pad. The new bulk loading system operates at a nominal rate of 1000 tons per hour and will accommodate chip class vessels stowing bulk in excess of 40,000 gmt within its holds.

SHIPBOARD PHYTOSANITARY CONTROL SYSTEM

Export of wood fiber into the European Union has not been possible until the development by Phyto-Charter and verification by the US Department of Agriculture (APHIS) of a viable heat treating system which comports with the phytosanitary controls of the European Union. Phyto-Charter developed the Shipboard Heat Treating System under a commission with the Forest Biomass Research Institute (University of Maine, Orono) together with its retained engineers at Nyle Systems of Brewer, Maine and design builder Player Design, of Presque Isle, Maine.

The Method

The Phyto-Charter shipboard Heat Treating System utilizes the moisture contained within the wood fiber to infuse the air to 100 percent moisture saturation as the medium to bring the woodchip cargo temperature to above 56°C which is maintained for a period of 30 minutes.

The heating units are set on the deck with ship's gear. Fuel tankers and power generators remain on the quay and connect to the heating apparatus with flex pipe and cables.

Flexduct connects the heating apparatus to "duct towers" which pass through to the holds through "hatch panel" penetrations. Air infusers are arrayed on the tank tops of the hold and are supplied with saturated air by the multiple ducts passing through the duct towers. The air infusers are controlled by electric actuated dampers at duct tower air splitter. Temperature and air velocity sensors feed data back to a PLC which control the dampers to adjust the air velocity and temperature. The infusion controls ensure the efficient distribution of heat throughout the chamber.

After the entire cargo has been heat treated, the heating apparatus and duct towers are removed back to the quay. The cargo holds will be aspirated, dissipating the moisture.

PHYTOSANITARY CERTIFICATION PROTOCOL

Protocols entered into with USDA, APHIS, PPQ will ensure that the wood fiber has been fully heat treated and rendered sanitized.

USDA, APHIS, PPQ will monitor the system and have access to all equipment and to the vessel being treated and receive process data in real time. USDA, APHIS, PPQ will provide inspection and third party certification of the borewood chipping process to certify that the process eliminates all green, live, plant material from the bole prior to chipping. USDA, APHIS, PPQ will certify that the consignment complies with Annex IV.1 A, point 1.2 option (a) of EC Plant Health Directive 2000/29/EC.

SHIPPING TO PORTS AROUND THE WORLD

Phyto-Charter will serve the growing biomass energy markets, mdf panel board mills and the pulp and paper industry through our shipping and trading partners.

PHYTO-CHARTER INC.® - SECTORS SERVED: BIOMASS, BIOCHEMICAL, WOOD CHIPS & LOGS