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Superior Thermowood / ThermoForest

After nearly seven years in research and development, Superior Thermowood (STW) is pleased to announce the successful launch of their second-generation, thermal modification technology. In addition, the company revealed that for the first time it is offering a full line of deck building products to the local market.

The Superior Thermowood system is based upon 20 year old technology licenced internationally by VTT, however in recent years STW has re-engineered and evolved the process significantly. Tests conducted by the Wood Science department of Lakehead University (Thunder Bay) show that Superior Thermowood's products present substantial improvements and their process may lead the world in thermal modification.

STW's Thunder Bay operations have redeveloped the original Finnish thermowood technology used to thermally treat raw wood. The process substantially improves woods' physical properties, allowing it to resist, twisting, warping and moisture "up take" by changing the its internal structure. The process actually strengthens the microscopic cell walls as the moisture content is reduced, resulting in increased stability and enhanced aesthetic values.

Having successfully resolved basic engineering issues and a host of smaller refinements, STW is preparing for large-scale production and the roll out of their advanced thermowood technology to the North American market. They are now focused on seeing their industry changing, "value added" process widely accepted. The technological advances and product improvements it provides should allow it to make a major contribution to the North American lumber industry.

The company is particularly happy that, for the first time anywhere, a complete line of high quality Superior Thermowood SPF decking materials will be available for purchase, in limited distribution, at retail outlets this spring.

Company President Ed Rose said, "Our entry into commercialization for this year is limited in scale, however our commitment to growth and expansion into other areas across the country are underway with a number of opportunities currently being explored. "

Dr. Mat Leitch and the Wood Science department at Lakehead University has performed all testing of the mechanical properties for each of the species processed by Superior Thermowood (STW) since the company's inception.

"STW produces a superior product that displays high moisture and fungal resistance, enhanced colouring as a result of the process, as well as extremely shortened drying times from green to 5-8% MC. We feel there is great potential to create many value-adding industries utilizing the process and product", said Dr. Leitch.

The evolution, engineering and enhancements made to the process resulted in a system that is reliable, highly efficient and effective. Microscopic research conducted by Dr. Leitch and the students at Lakehead University confirm the thermal modification process actually enhances the cellular walls.

Dr. Leitch adds, "STW's thermowood process uniquely alters woods' cellular walls, increasing its strength and contributing directly to its structural integrity through a process called reinforcement and compression. This is a drastic departure from most competitive thermal processes, which typically produce structurally damaging, cellular collapse".

The many benefits provided by the products are as significant as the technology itself. No chemicals are added in the process, food sources for mold and insects are significantly reduced, the natural stresses of twist and warp are almost eliminated and the resilience to water penetration and absorption is substantially improved. The aesthetic qualities and appearance are greatly enhanced.

STW purchases raw fibre from local suppliers, directly benefiting the local economy. The material will then be processed in our plant, re-manufactured into a variety of lumber products. Once manufactured it arrives in the marketplace a true "value added" product. Thermowood will be available in an un-manufactured form to manufacturers who can mill, machine and finish it as required for their specific applications.

Physical Properties

The products' ability to resist uptake of moisture, as well as attack by mold, fungus and insects are principally due to the compression and fusing modifications within the hemi-cellulose fraction of the cell wall

and a reduction of the elements mold and insects feed on. This combination, along with its low moisture content (MC) of approximately 5-8%MC, is a product that is highly sought after.

Superior Thermowood is incredibly stable without the swelling and shrinkage that is typically found in standard lumber products. It is durable and versatile and presents clear advantages, particularly for outdoor applications such as decks, docks, outdoor furniture, window and door framing.

Its attractive, warm colour, fine grain, aesthetic appearance, are all qualities demanded by furniture, trim and flooring industries (hardwoods), as well as for use in outdoor applications such as decks and fences (softwoods). These factors are well illustrated by common "white woods" like Balsam Fir and Spruce that once processed, display characteristics similar to that found in Western Red Cedar.

Environmental Factors

The green factor will impress even the most ardent environmentalists. Great strides have been made in terms of reduced fuel consumption and waste recovery. Recent engineering efforts have seen the amount of energy used in the processing of each load significantly reduced. The process has been thoroughly reviewed by the Ministry of the Environment and given full clearance to operate.

Wood waste recovered from finishing has been studied extensively by Lakehead University, where it has been determined to be valuable as a resource for pelletized fuel with highly advantageous BTU value characteristics over standard wood waste products.

The beauty of the Superior Thermowood process is that it produces a high quality "standard" of SPF (spruce, pine, fir) species that is popular for many applications, but also shines for underutilized species. In particular, there are opportunities to utilize species such as; White Birch, Black Ash, Poplar and Tamarack. While generally available, these are species not currently utilized in production quantities and are often considered "nuisance" species - in the way of the sought after, main commercial species.

Global Advantage

A key element to the re-engineering was to create a "value added" process and product, one that can enter into the market place in mass

volumes at a highly competitive price point. All while meeting the requirements of the NAFTA agreement thereby avoiding tariffs upon entering the U.S. market.

Company officials state that the process will add significant value to widely available, underutilized species, thereby improving current forest management practices.

Today's economic climate, and the problems that were building in the lumber and forestry industry even before the current crisis, requires a new approach and better solutions. The STW process and product appears to be well situated to play a significant role in establishing the new foundation of Ontario's forest and lumber industry.

Each Superior Thermowood facility will create approximately 25 direct jobs, depending on the size and scope of the plant, with as many as 4 to 5 times that in indirect opportunities for each location.

Acknowledgements

The objectives Superior Thermowood has achieved were resolved through creativity, research, engineering and determination. The company has benefited from the strong encouragement and support from a variety of sources including local lumber mills and product suppliers who have been of major assistance over the years.

STW President Ed Rose said "One of the most significant factors in our success has been our partnership with Lakehead University, and in particular, the personal interest of Dr. Mat Leitch.

"The results we've seen from our process, the testing confirmation and the finished product, all serve to strengthen our resolve and our commitment to what we see as a truly significant, forward thinking industry. It's a development that can make a valuable contribution on a number of levels including the economic future of our forestry industry and the environment."

"STW has enjoyed substantial assistance from both the Federal and Provincial Governments, through the FEDNOR Program, the Northern Ontario Heritage Fund, and Living Legacy. The encouragement, guidance and support received from these groups is greatly appreciated.