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INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output from the project titled “Thermovacuum: New Processes for New Generation of Thermally Modified Wood” co-funded by the European Commission within the framework of the Competitive and Innovation Program. This solution has been developed by a team coordinated by WDE Maspell SRL (IT), in partnership with Consiglio nazionale delle ricerche (IT), Ecolwood sarl (F), Consorzio nazionale servizi legno-sughero (IT), SLU Swedish University of Agricultural Sciences (SW) and Arredomare (IT).

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

Thermovacuum combines an energy-efficient vacuum drying process with a thermal treatment of wood. This new process generates thermally modified wood that has special strength and durability properties. The timber product is created without adding chemicals and with considerable energy savings. This is possible through a technology that operates “under vacuum”. The process produces wood with the durability and aesthetic characteristics of resistance similar to those of tropical woods. In addition, production costs will be reduced by 40%-60%.

INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

39 Miscellaneous Manufacturing Industries

INDUSTRIAL CLASSIFICATION - NACE CODE;

16 Manufacture of wood and of products of wood and cork, except furniture;

1. DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

Thermovacuum is a process for the thermal modification of wood where oxygen inside the reactor is substituted by partial vacuum and heating is provided by forced convection. The Thermovacuum system has been designed to combine an efficient vacuum drying process with a thermal treatment process. The equipment consists of an autoclave and power cabinet that will be provided by the solution owner. The equipment is pre-installed and supplied to the customer, who is only required to install it on a flat concrete base. The process can dry and process any kind of wood

Economic and environmental benefits of the eco-innovative solution

Costs are depending on equipment size. The plant is designed on demand, and production net capacity currently varies from 5m³ x cycle (about 900 m³/year) to up to 26m³ x cycle (about 3,900 m³/year). Consequently, the costs of equipment and related installation vary between 250,000€ and 410,000€.

Payback depends on several factors: number of working days/ treatments per year and treatment market sale price. Existing plants are working 300 days/year with minimal manual labour for operating the machinery. With these assumptions, the payback period depends on machine production capacity and varies between 1.75 years for the biggest to up to 2.5 years for the smallest plant.

Thanks to the vacuum technology, the heating system transfers the heat directly from the source to the wood without any “medium” (like water, oil, air). Moreover the Thermovacuum technology does not use water for cooling the process.

Compared to current alternative solutions this enables the:

- Reduction in electricity consumption (30% to 70%)
- Reduction in thermal energy consumption (30%)
- Reduction in air emissions (90%)
- Elimination of water consumption or – when additional device for hygroscopic conditioning is required (as optional) – 70 litres saved per m³ compared to BAT

Thermovacuum technology:

- Does not use any oil (reduction of about 200 lt/m³ compared to other alternatives)
- Uses less than < 5 ppm of nitrogen gas (NO₂) compared to existing solutions
- Does not use or add chemicals during the process of treatment
- Decreases waste generation (reduction of about 80% compared to BAT)

2. AVAILABILITY OF THE ECO-INNOVATIVE SOLUTION AND BUSINESS PARTNERSHIP

Market readiness, Trade mark, existing market coverage, commercialization strategy

Trade marks exist for Thermovacuum Solution (Technology) and for VacWood (final product manufactured by Thermovacuum process). Thermovacuum solution is currently available in Italy, France, Portugal, Poland, Norway, Belgium, Chile, the USA and Brazil.

Requirements to adapt the solution to the local market and potential applications/market size

No adaption requirements. Electricity is the only supply needed to run the heating process and the vacuum pumps.

On-site after-sales services support and the technical assistance requirements

All Thermovacuum plants are remotely monitored 24 hours/day via PLC. In case of breakdowns or malfunctions, causes and solutions are promptly analysed and implemented by the technical engineers at WDE Maspell. A team of engineers is available for process support and technical assistance.

Targeted local business partners

Targeted sectors include joiners, wood traders and distributors, wood treatment companies, furnishers and all enterprises working with wood for the above mentioned uses.

Market segment: outdoor coverings, flooring, indoor and outdoor furniture for the luxury marine sector.

Type of local business partnership sought

Joint venture & Sales representatives (distributors)