



## Technique for superficial heat treatment on wood product

### Introduction

Today, to increase the lifespan of wood products outdoors, it is necessary to add chemicals that are often polluting and make recycling difficult. The use of surface-burned wood is very old, dating back to prehistoric times when our ancestors burned the tips of stakes to make them harder and make tools and weapons for hunting. This technique has also been used by farmers in many countries to make the tips of stakes, fences or vine stakes rot-proof. This technique was used all over the world and particularly in Japan, for the construction of houses, under the name Shou-sugi-ban or Yakisugi.

Furthermore, in large markets such as construction, furniture, packaging and garden landscaping, regional woods have their strengths and limitations. Thus, secondary quality oaks, poplars but also other various species must find new outlets generating more added value for all stakeholders, producers and processors.

### Methodology and results

#### The Noir&Sens project aims to:

- develop an industrial tool for the surface heat treatment of wood that is efficient, reliable, flexible and with low energy consumption;
- make it possible to disseminate this technique to wood processing companies;
- identify the markets and products on which secondary quality surface-burned regional wood has sufficient added value to be competitive;
- create and design new ranges of products thus valued.

#### The results of the project are as follows:

- Pre-study of areas of interest in surface heat-treated wood;
- Study of potential markets and competitiveness of the process: a) Exterior fittings and furniture, cladding, street furniture, vegetable gardens, composters, garden centers, pots, fences, benches, etc., b) Interior fittings and furniture, decoration, design, interior architecture, kitchen, panels, etc.;

- Tests and optimization of surface heat treatment techniques for soft wood parts for oak, poplar and pine wood;
- Product qualification: not established for sustainability;
- Development of a flexible industrial tool for surface heat treatment of wood;
- Creation of a prototype;
- Estimation of the cost price of the treatment, of the added value brought to the products;
- Design of one or more competitive product ranges meeting market expectations;
- Choice of outdoor use where burning provides real added value in terms of natural protection;
- Diffusion of innovation during exhibitions, competitions, Paris Design Week, etc.

## Lessons learned

Noir & Sens has made it possible to develop an optimized industrial process for surface burning of wood, economical in cost and energy, making it possible to obtain a high-performance product in terms of durability, use and aesthetics for outdoor use.

Additional durability is provided by the heat treatment of the wood under the thin carbonized layer. Surface carbonization provides an interesting aesthetic but is difficult to stabilize over time, particularly on south-facing facades for cladding. Requires treatment on 2 opposite sides to prevent curling and 6 sides for complete protection.

The burning prototype is aimed at sawyers to promote less durable local wood and at secondary processing companies for finished products.

Finished burnt wood products are aimed at architects, planners, landscapers, gardeners, communities and individuals for outdoor use, interior designers, decorators and individuals for interior products.

It is now needed to find a machine tool manufacturing company to market the prototype.



*Figure 1. Example of wooden products.*

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## Further information

<https://www.fibois-cvl.fr/recherche-et-developpement/noir-sens/>



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