



GREENChainSAW4Life

Project n° LIFE18 CCM/IT/001193

*“GREEN energy and smart forest supply CHAIN as drivers
for A mountain action plan toWards climate change”*

Deliverable number DL.C3.3

Potential local wood application and marketability of wooden products

Action Number and Title	C3 Resources Consumption Model and Carbon Fluxes Baseline
Task	Potential CO2 stocked in biomaterials
Starting Date	M1
Duration	M1-M28
Due Date of Delivery	31/12/2020
Actual Submission Date	30/09/2021
Author(s)	Simone Rasetto (GIUSIANO) Lucio Vaira

TABLE OF CONTENTS

TABLE OF CONTENTS	2
INTRODUCTION	3
2. THE GREENCHAINSAW4LIFE PROJECT AND THE CASCADE USE OF WOOD	4
2.1 WOODWORKING FOR PALLET AND PALLET	5
2.1.1 SPECIFICATIONS OF THE MATERIAL OF ORIGIN AND SUITABLE ESSENCES	5
2.1.2 SPECIFICATIONS OF THE PRODUCT / SEMI-FINISHED PRODUCT	6
2.1.3 COST / REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME	6
2.1.4 PROTOTYPING	7
2.2 ROOFING AND WOODEN BOARDS	7
2.2.1 SPECIFICATIONS OF THE SOURCE MATERIAL AND SUITABLE ESSENCES	7
2.2.2 SPECIFICATIONS OF THE PRODUCT / SEMI-FINISHED PRODUCT	8
2.2.3 COST/REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME	8
2.2.4 PROTOTYPING	8
URBAN FURNITURE - PUBLIC SECTOR	9
OUTDOOR FURNITURE - PRIVATE SECTOR (FURNITURE, GAZEBOS, DECKING)	10
2.3 FOLDERS FOR THE PRODUCTION OF MULTILAYER PARQUET AND LAMINATED PANELS	14
2.3.1 SPECIFICATIONS OF THE MATERIAL OF ORIGIN AND USABLE ESSENCES	14
2.3.2 SPECIFICATIONS OF THE PRODUCT/SEMI-FINISHED PRODUCT	14
2.3.4 COST/REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME	15
2.3.3 PROTOTYPING	15
PACKAGING	15
INTERIOR FURNITURE	16
SMART WORKING	17

INTRODUCTION

The wood market in recent years has been characterized by some extraordinary facts: the lack of raw materials, rising prices, and the risk of using illegal wood from uncontrolled supply chains.

To mitigate market instability, the recipe that may seem the most banal and the most at hand, lies precisely in the enhancement of the national forest. Let's not forget that Italian forests, in addition to representing the natural reservoir of carbon dioxide fixation and containing the negative effects of climate change, also represent an important driver of socio-economic development of marginal, rural and mountain areas of our country. And it is precisely thanks to their management, based on an interaction between public and private, that we could decrease timber imports by almost half: since the second post-war period, about 80 percent of the need for structural elements in wood comes from abroad, while globally Italy is fifth for importation of hardwood sawn and seventh for importation of conifer sawn. Despite the Italian forest area in the last 70 years has tripled, going from 5.6 million hectares in 1956 to 11.1 million in 2015, occupying in percentage terms 38 percent of the national surface, today the forestry sector brings only 0.08 percent to the national economy. For Assolegno - national association of first processing industries and wood builders - among these data there is a close correlation and, by virtue of this, careful management of the forest heritage could be the key to keeping price increases under control and safeguarding the forest heritage avoiding the use of illegal wood. Wood consumption will increase in many sectors also due to market upheavals caused by the Covid pandemic.

Here are some highlights of the 5th Wood Building Report - 2020 (Europe, progression, situation and future developments)¹. The report presented last December 10, 2020 by Silvia Melegari, general secretary EOS and CEI Bois, allows to analyze situation and prospects in the Wood Building sector in Europe. Covid-19 has caused an upheaval of social life and the economy without precedent, determining the affirmation of trends that could remain even after the end of the pandemic:

- Consumers spend more time at home and buy online => packaging sector on the rise (production of pallets and wooden crates increasing)
- Some will leave the big cities for the countryside => in construction the single-family prevails over the multi-family (greater use of wood in the construction of single-family houses)
- Lower propensity to risk => stronger renovation of the new construction (greater use of wood for roofs parquet etc)

The current supply is covered in a very small part by Italian wood.

The main supplier countries are: France, Germany, Austria and Eastern Europe. Depending entirely on foreign countries involves some critical issues:

- The distance involves a large logistical cost and CO2 consumption, as transport is made exclusively by truck.
- Prices are fluctuating and often depend on external factors such as commercial agreements made by individual foreign countries with the large wood-consuming countries such as the USA and China.
- Difficulty in finding important quantities, competition in purchases is global.
- In some countries the traceability of the product is very difficult and you have to respect the rules of Due Diligence. Furthermore, it is often difficult to find PEFC and FSC certified material.

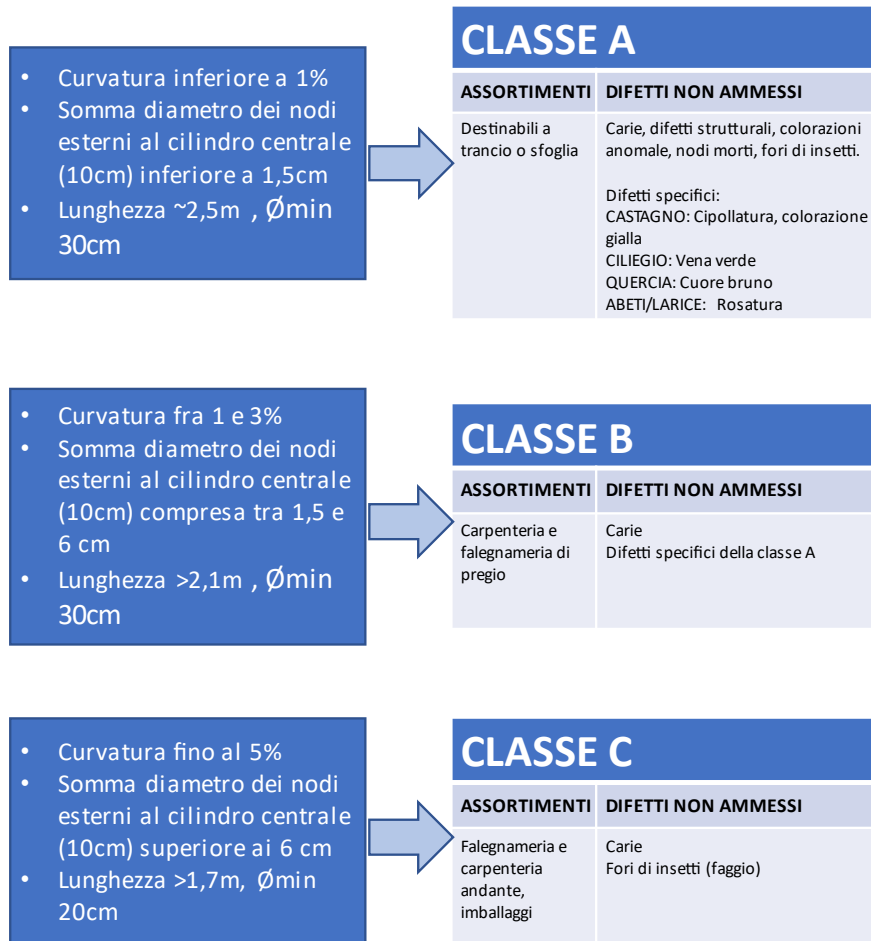
¹ 5°Rapporto Edilizia in Legno, tra Europa e Italia Silvia Melegari Segretario Generale CEI Bois

2. THE GREENCHAINSAW4LIFE PROJECT AND THE CASCADE USE OF WOOD

The project aims to use 100% of the woody biomass, using a cascade approach.

This goal can be achieved by classifying the material in the forest according to precise standards, and leading the different assortments extracted towards distinct production cycles for obtaining "standard" semi-finished products.

Through a comparison between the available bibliography and the practices implemented within the Giusiano Group and in the network of suppliers and customers, the raw wood was divided into three quality categories, as can be seen from the following scheme.



The formats of the semi-finished products that will be produced can be divided into 3 different macro-categories:

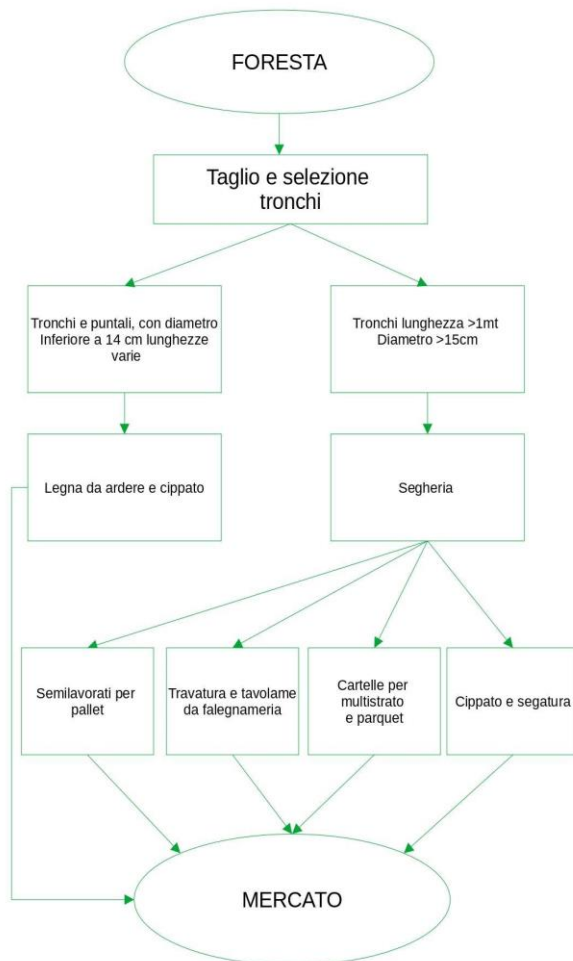
- Semi-finished products for pallets
- Beams and boards for carpentry
- Folders for the production of multilayer parquet and laminated panels

All the essences of the forest surfaces in question will be used:

- CHESTNUT: boards, beams, parquet folders, and chips
- BEECH: handles, boards, elements for pallets, firewood and chips

- OAK: parquet folders, boards, elements for pallets firewood and chips
- ASH and MAPLE: parquet folders, boards, firewood and chips
- LARCH: beams, boards parquet folders and chips
- FIR / PINE: elements for pallets, building boards and chips.
- ACACIA: decking boards

Below is a brief scheme of the model of use of the assortments:



2.1 WOODWORKING FOR PALLET AND PALLET

Woodworking for pallets are widely used in Italy. About 100 million pallets are produced each year, made by a complex of 1,500 companies that create about 1.7 billion euros and employ 13 thousand employees.

2.1.1 SPECIFICATIONS OF THE MATERIAL OF ORIGIN AND SUITABLE ESSENCES

Woodworking for pallets can be produced with different essences. Mainly coniferous (fir, pine, larch, etc.) but also with beech, oak and chestnut. With these woodworking products, pallets are produced. These pallets are divided into two large categories: standard and non-standard. The first group includes pallets for large-scale distribution EPAL, pallets for the chemical industry (CP) and those for the glassworks (TF). In the non-standard ones we find the

multitude of pallet sizes customized for the final customer. The dimensions of the trunk are very varied. You can think of using trunks with a diameter of 20 cm up to 100 cm. Lengths from 170 cm to 1000 cm. Regarding the presence of defects, reference can be made to class C of the scheme reported above. The commercial standards for this type of assortment are at the moment tops with a minimum diameter x, with a length of 2.1m or 2.5m approximately, so as to be able to head them after cutting. Adding the threshold of 1.7 you can optimize the production of boards from 80 cm.

2.1.2 SPECIFICATIONS OF THE PRODUCT / SEMI-FINISHED PRODUCT

The boards for the production of pallets must have the following characteristics: minimum thickness 15 mm, maximum thickness 25 mm, length from 800 to 1200mm and width from 70 to 145 mm. The tolerances are + - 1 mm because the pallets are used in fully automatic systems (palletizers) and must be very precise.

Below are some examples:

		
beams for pallets	Planks for pallet	Pallet

2.1.3 COST / REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME

The reference market for semi-finished products are the producers and repairers of pallets and wooden crates. The market is very large. In Italy, more than 100,000,000 pallets are produced every year. The only partner subject uses annually 30,000 m3 of raw material to produce the pallets. This material today is for more than 80% purchased abroad, in Europe and outside Europe. Also interesting is the market for wooden boxes where more specific materials are used but with a better added value.

The reference market for wooden pallets are the manufacturing and logistics companies that use this packaging to transport their goods. Just think that 90% of the goods that each of us consumes every day is transported on a pallet: it is the central pivot of the logistics of goods destined for consumption. The currently most widespread essence for producing pallets are fir and pine, while this project intends to carry out tests with other essences such as chestnut, cherry, maple and ash to demonstrate their quality and possibility of use.

Below is a brief economic description, assuming the estimated production of a standard sawmill of 30m3 per day on 1 shift of work, for a total of about 7000m3 / year of finished product in semi-finished products (14,000m3 of raw material).

COSTS	k/€ 2.140	REVENUES	k/€ 2.250
Raw material	1.575	Plank sales	1000
Staff	340	Beams sales	1000

General expenses	225	Residues sales	100
		Chipped wood and sawdust revenues	150

Below is a brief economic description, assuming instead the estimated production of 1500/2000 pallets per day.

COSTS	k/€ 7.600	RICAVI	k/€ 8.000
Raw material	6.400	Pallet sales	8000
Staff	800		
General expenses	400		

2.1.4 PROTOTYPING

Within the project, the elements to produce the following pallets will be realized:

- 1 pallet model of size 1200x800x145
- 1 pallet model of size 1200x1000x145
- 1 pallet model of size 800x600x145
- 1 wooden box of size 800 x 400 x 400

Depending on the local wood species available, the production of the following pallets will be evaluated:

- 1 ash or maple pallet 1200x1000
- 1 mixed hardwood pallet 1200x1200
- 1 chestnut pallet 1200x800
- 1 larch pallet 1216x1013

2.2 ROOFING AND WOODEN BOARDS

The reference market for these products is the house. In Italy, the renovation market, especially for single-family houses, is constantly evolving. Wood is used both in construction (e.g. the roof) and in finishes. The market is huge and very lively, also due to the recent laws that favor energy efficiency. The partner company, Giusiano Legnami, uses about 1000m³ per year, mainly conifers.

2.2.1 SPECIFICATIONS OF THE SOURCE MATERIAL AND SUITABLE ESSENCES

The essences used for woodworking products are multiple: for the boards, all the available qualities can be used, chestnut, larch, ash, oak, beech, fir and maple. The uses are varied, from beams and boards to build roofs to various

semi-finished products to be transformed into wooden products for the home and for urban and outdoor furniture. The usable logs have a diameter from 20 cm to 100 cm and a variable length from 200 cm to 1200 cm. The categories of material reported above are therefore A and B

2.2.2 SPECIFICATIONS OF THE PRODUCT / SEMI-FINISHED PRODUCT

The beams and boards for carpentry have a multitude of sizes depending on the use and the essence, however the range goes from a minimum thickness of 23 mm to a maximum of 300, length from 120 cm to 1200 cm and width from 30 mm to a maximum of 300mm.

Below are some examples:

		
Small beams	Roofs	Planks

2.2.3 COST/REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME

The possible buyers will be directly individuals or companies that manage the construction site or professionals in the sector who would buy planks for subsequent processing. Giusiano Legnami, partner of the project, uses about 1000m³ per year of this material. In the last decade, the construction sector has mainly focused on extraordinary maintenance, which grew in value by 44%, against the reduction of new residential constructions. After years of constant declines, the Italian construction market has returned to growth, thanks mainly to private investments.

COSTS	k/€ 880	REVENUES	k/€ 1000
Raw material	600	Planks	200
Staff	150	Beams	700
General expenses	130	Residues	30
		Chipped wood and sawdust	70

2.2.4 PROTOTYPING

It will be possible to produce boards suitable for production and garden furniture and public furniture.

These elements of various sizes will also be produced in various essences to understand which ones, among those available, are better suited to the production of furniture. For example, chestnut could lend itself well to the realization of outdoor baskets as it hardly rots and resists better to bad weather.

Below are the categories that will be evaluated for prototyping during the project.

URBAN FURNITURE - PUBLIC SECTOR

Some of the essences available on the territory can be used to create various design urban furniture, as reported below.

- **BENCHES** Benches are an element that gives a sense of order and care to every place, they promote socialization allowing you to relax and enjoy the open space. In addition to being robust, they are resistant to humidity, frost, and smog. They can be built with larch boards and the measurements will be defined based on customer requests.



- **GAZEBOS, WOODEN COVERS** The most suitable structures to enjoy open spaces while protecting yourself from the sun. They create comfortable and welcoming areas in which to socialize and relax. Gazebos and covers can be made in larch, fir, oak, and chestnut. There are several wooden elements that make up a structure of this kind with very varied lengths and widths.



● **BASKETS AND BIKE RACKS** Baskets play a fundamental role in maintaining the order and cleanliness of an environment. Bike racks with their respective covers are essential to promote the use of the bicycle even in the city. The essences that can be used for this realization are larch, fir, oak, and chestnut.



● **FENCES** The most common element to delimit an area, capable of integrating harmoniously with the surrounding environment. They will be built in larch, and chestnut.



OUTDOOR FURNITURE - PRIVATE SECTOR (FURNITURE, GAZEBOS, DECKING)

We would produce solid wood outdoor furniture that is comfortable and of modern design. The usable essences are chestnut, oak, larch, and ash. All materials used for the production of these furnishings must be dried, varnished or oiled. For some essences like ash, it must also be heat treated to better resist the weather. There will be different types of products including:

● **PERGOLAS AND GAZEBOS** They will be designed and produced in solid wood, ready to be assembled, of different sizes and shapes, rectangular, square etc in expandable modules. The usable essences are: larch, fir, oak, and

chestnut. There are several wooden elements that make up a structure of this kind with very varied lengths and widths.



- LIVING ROOMS AND GARDEN SEATS Exposed wood structures combined with quality cushions, available in various colors to adapt to the style of different gardens. They will be built in larch, fir, oak, and chestnut.



- **PLANTERS AND OTHER GARDEN OBJECTS:** The planters will be of different shapes and sizes, in solid wood on display. Wooden doghouse, colored and designed in the same style as garden furniture. The usable essences are larch, fir, oak, and chestnut.



- **DECKING** The outdoor decking will be available in various colors and essences and supplied in boards of various lengths and thicknesses or in pre-assembled tiles to be laid on the ground. The finish will be smooth or ribbed according to uses. The decking will be mainly produced in heat-treated ash. In case of possible exposure to saline and higher temperatures, they will instead be produced in acacia, chestnut or larch, essences more resistant in such conditions.



● **CABIN-HOUSE - TOURISM SECTOR** Cabin-houses are temporary structures increasingly used in sustainable tourism services and are designed to allow users to enjoy open spaces with the addition of comforts typical of domestic environments. Local timber could also be used for the creation of a modular and dismantlable structure mainly made with waste from the production of other processes, thus allowing the transformation of waste into secondary raw materials. Wood waste of various essences can also be used for the creation of furniture and accessories to be used inside the cabin house and in the surrounding spaces. Combined with the cabin house is a proposed toilet-cabin, equipped with a composting bathroom or a water-less toilet that can be used in various natural or urban contexts. The modular structures will be equipped with solar panels on the roof to provide electricity to the structures. Thanks to the collaboration with Dimora Design Farm, these modules will be prototyped and used for sustainable/experiential tourism activities in rural and mountain areas, positively impacting the processes of economic, social and natural regeneration of the territories.





Render project by Dimora Design Farm (dimoradesignfarm.com)

2.3 FOLDERS FOR THE PRODUCTION OF MULTILAYER PARQUET AND LAMINATED PANELS

Folders are the basic semi-finished product for producing multilayer parquet. The European parquet market is about 82 million m². Of this, 83% is multilayer. Italy is third in Europe in terms of use with about 10%. Italian production is around 5 million m². The same semi-finished product will be used to produce the elements that make up the laminated panels. The parquet market is constantly evolving and is widely used in home renovations. With laminated panels, various objects can be produced, including quality packaging and interior finishes such as exposed walls, worktops, and shelves.

2.3.1 SPECIFICATIONS OF THE MATERIAL OF ORIGIN AND USABLE ESSENCES

To produce the wooden folders, all the previously listed essences can be used, therefore both the resinous fir, pine larch and the broad-leaved ones such as beech, oak, chestnut etc. Parquet can be produced with folders. With the panels, on the other hand, valuable packaging and all interior furnishings and finishes can be produced.

2.3.2 SPECIFICATIONS OF THE PRODUCT/SEMI-FINISHED PRODUCT

The folders for the parquet have the characteristic of being very thin - about 5-6 mm - but they can have lengths and widths of any size. This allows the use of quality tops even of short length otherwise unusable. These folders have the following dimensions: width from 12 to 20 cm, length from 60 to 220 cm and thickness of 4 - 6 mm. The trunks to produce the parquet folders must have the following characteristics: diameter from 18 to 100 cm and length from 120 to 300 cm. However, for this type of material, no reference is made to the initial classification of the round but unusable or disposable elements from other processes can also be recovered. Different are the boards for the production of panels. These elements are coupled together with a finger joint joint. The elements to produce these panels will have the following characteristics: thickness from 10 to 150 mm, width from 5 to 12 cm and length from 20 to 250 cm. all the material must be adequately dried. This processing will allow the recovery of small trimmings from other productions. (for example boards for pallets and crates) The trunks for this production must have the following characteristics: diameter from 18 cm to 100 cm and length from 150 to 300 cm. The panels will have the following format: width from 60 cm to 200 cm, length from 125 cm to 400 cm, thickness from 10 to 50 mm.

Below are some examples:

		
Laminated panel	Parquet	Wood folders

2.3.4 COST/REVENUE ANALYSIS AND POTENTIAL MARKET VOLUME

The potential market is that of parquet and timber retailers for the home, or carpentries that use panels to build various objects and furnishings. To these traditional channels, the online sales channel could be added, using marketplace platforms like Ebay especially for finished products like parquet.

COSTS	k/€ 470	REVENUES	k/€ 500
Raw material costs	350	Wood folders and parquet	400
Staff costs	70	Panels	50
General expenses	50	Resissues	20
		Wood chips and saw dust	30

2.3.3 PROTOTYPING

PACKAGING

The produced packaging will serve to contain quality products such as wine, food, etc. They are designed and absolutely recyclable. Once used for the transport and packaging of the product, they can be used as containers for any object from home. For the prototyping phase, the objects listed below will be evaluated. N.12 different formats of packaging (boxes) including:

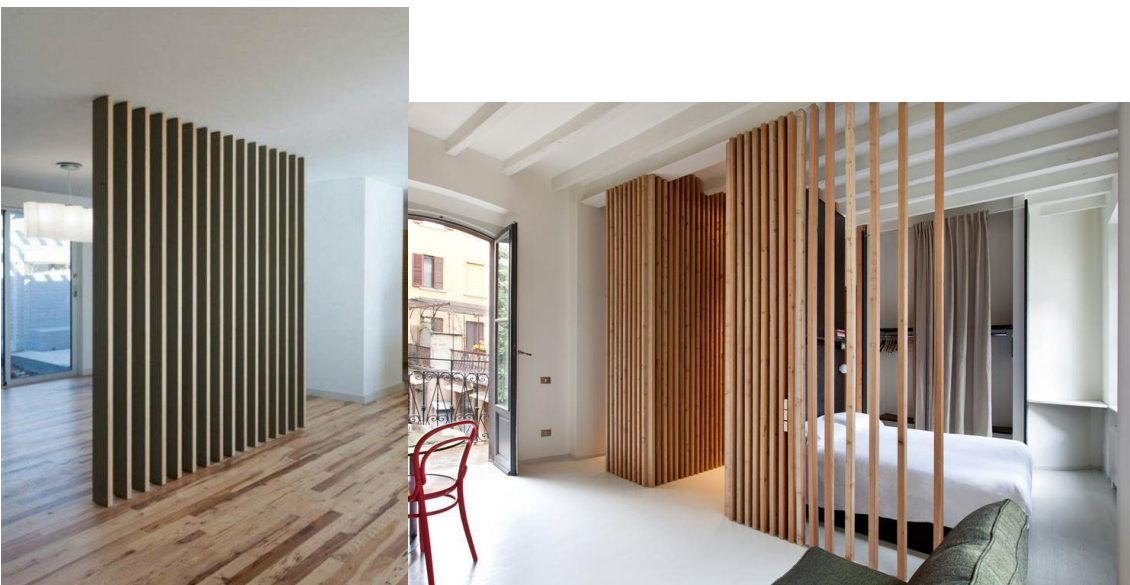
- box for 1 bottle: Measurements: cm.33.5x9x9
- box for 2 bottles Measurements cm 33.5x19.5x10
- box for 3 bottles Measurements cm 35.2x28.5x9
- box for 6 bottles Measurements: cm.36x24.5x17
- box for 12 bottles Measurements: cm33.5x50.5x17
- box for magnum Measurements cm.37.5x10x10
- box for Jéroboam Measurements cm 46.7x13.5x14

- object holder box: Measurements: 38.5x27.5x17.3
- chest: Measurements: cm.68x34x33.7
- favors of various sizes
- watch box of various sizes
- gift gadgets



INTERIOR FURNITURE

With the laminated panel, you can create shelves and worktops or desks. Being very water-resistant, it can also be used in bathroom furniture. This product can also be used to create exposed walls or to buffer a ceiling. It can be colored in any way you want to make it suitable for any type of decor. The idea is to create design products that are easy to assemble. The product will be shipped to the customer in a convenient kit and he himself with clear instructions will assemble the furniture. This product is ideal for being sold online through marketplace platforms like Ebay also because it can be completely customized according to the needs of the final customer. The laminated panel could also be used to produce, for example, partition walls that are very fashionable at this moment:



Bathroom countertops:

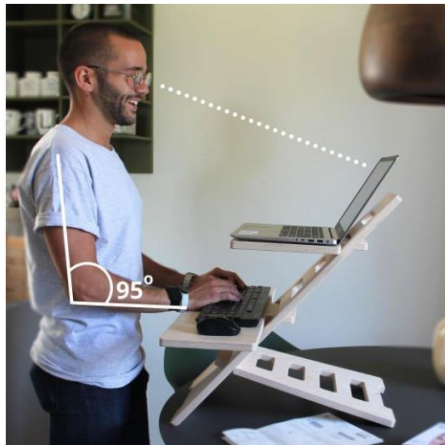


Bookcases



SMART WORKING

Standing desk



Standing Desk Umaréll

€189,00 €169,00



1



AGGIUNGI AL CARRELLO

Checkout sicuro con:



La Standing Desk Umaréll è progettata e prodotta completamente in Italia da artigiani italiani, con legno di betulla da foreste certificate FSC.

È facile da montare e smontare, per convertire la tua scrivania e lavorare in piedi quando vuoi.

Grazie alle diverse regolazioni, si adatta facilmente a qualsiasi altezza.

Il materiale e il sistema di montaggio garantiscono una **robustezza unica** nel suo genere che garantisce la possibilità di **sostenere qualsiasi tipo di monitor e/o computer** fino a 15kg.

La standing desk viene trattata con **cera d'api** completamente naturale e...

https://garisendalab.com/products/standing-desk-umarell?variant=32480193314898¤cy=EUR&utm_medium=product_sync&utm_source=google&utm_content=sag_organic&utm_campaign=sag_organic&utm_campaign=gs-2021-04-02&utm_source=google&utm_medium=smart_campaign&gclid=Cj0KCQjwzYGGbCTARIsAHdMTQz6jKgpBd6Y5g8aRVVS8PUw8J J2sLLea9NSawLK2QcbgWjUMGXqYaAu4 EALw wcb

Harmoni Standing Desk



Standard Birch

€199

SHOP



Premium Beech

€329

SHOP



Premium Oak

€359

SHOP



Premium Walnut

€389

SHOP

https://harmonidesk.com/collections?utm_source=facebook&utm_medium=cpc&utm_campaign=HA_EU_FB_CON-PRO-INT_0&utm_content=HA_EU_FB_CON_PRO_INT_0_Sustainability&utm_term=HA_EU_FB_CON-PRO-INT_0_Sustainability_Image_Setup_Research_Q2&fbclid=PAAaYkzHLCOWXruKD90Q6gH2ITk4zg8EjU1fyMncrv13fxNlqDXEympAJA2w0