

Products

Software

Bing (Version 9.0) is a non-destructive testing device of wood mechanical quality, using the vibration method. It comes in several industrial applications meeting different purposes: classification of sawn wood, *in-situ* testing of logs or poles, manufacturing flaw detection (splitting, etc.).

WISIS is a non-destructive measuring system used for evaluating the mechanical condition of solid wood employed in a structure. This diagnostic tool is used to periodically evaluate the condition of the wood, in order to detect and determine the extent of any deterioration due to application of excessive loads, or to fungal or insect attacks.

Stratefi is an assistance package in strategic decision making and long-term management for logging and wood processing companies in the tropics. This tool is used for simulating industrial activity, from managing the forest concession to marketing the finished product. It is custom-configured for each company using it, and can adapt to all scenarios. The simulations can be run over time-frames of more than 25 years. They are used for evaluating, comparing and testing an infinite number of different industrial strategies.

> www.cirad.fr/innovation-expertise/produits-et-services/logiciels

Training

Knowing wood and how to use it properly

Improve knowledge of wood from tropical sources, its regulation, proper usage, the essential implementation precautions, the general framework for its trade with regard to international regulations (CITES, certification).

Anatomical recognition and classification rules for the tropical wood trade

Learn the main classification rules for tropical wood in the form of logs and lumber; recognising the main species on the market; making quantitative and qualitative estimates of timber batches; improving knowledge of the material to develop better arguments for its trade and regulation.

Advanced training in drying

Further training for personnel responsible for operating and monitoring dryers; suggesting improvements to companies in the field of work organisation, and enhancing the performance of existing tools on the production sites.

Wood durability and preservation

Understand the behaviour of wood and derived products, to cope better with deteriorations caused by biological agents. Providing recommendations for risk reduction through a smart choice of species to use, and through a preservation treatment suited to the environmental conditions.

Training in standardised preservation testing

Acquire the technical skills to implement standardised tests on wood preserver effectiveness against underground termites and basidiomycete fungi.

Advanced training in sawing and sharpening

Theoretical and practical training in the sawing and sharpening professions: the basics of sawing, the different types of machine, sharpening techniques, species posing sawing difficulties; practical tasks performed in the workshop.

Advanced training in finishing

Practical training in finishing and varnishing techniques: machining, surface preparation, staining, finishing and application, the various finishing products (waxes, oils, varnishes, etc.), compatibility of stains and varnishes, application systems and implements, safety – protection – prevention, circuit analysis and premises maintenance.

> www.cirad.fr/enseignement-formation/offre-de-formation
> florence.paulet@cirad.fr



Directeur de publication : Patrick Caron, Directeur Général Délégué à la Recherche et à la Stratégie
Coordination : Direction générale déléguée à la Recherche et à la Stratégie
Rédaction : Délégation à la valorisation – vip-cirad@cirad.fr

Avenue Agropolis, TA 181 / 04 - 34398 Montpellier Cedex 5, France
Tél : +33 4 67 61 44 61 - Fax : +33 4 67 61 56 57

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VIP

VALORISATION ET INNOVATION
EN PARTENARIAT

Tropical and Mediterranean wood

Demographic growth and socio-economic development in warm-region countries are being accompanied by a constantly increasing worldwide demand for timber. Adjusting forest production to future requirements is a challenge which entails promoting rational and sustainable use of tropical and Mediterranean wood.

Developing these natural resources creates direct and indirect jobs, contributes to local and regional economic development, promotes maintenance of public infrastructures and generates fiscal revenue for States. In most of these countries, the forests constitute an essential source of material, energy and financial resources, both for States and for populations, often with limited incomes.

The development of forest wood products is associated with primarily local processing facilities, run by artisans and small & medium enterprises (SMEs). However use of these materials remains subjected to a plethora of constraints, which result in them being perceived as complex to use, due to their biological origin; in particular, their mechanical and biological stability determine the durability of the structures built, and their implementation under satisfactory conditions.

Managing these parameters is a major challenge for forthcoming research, and for scientific and technological innovations to be developed.

FOCUS

400 to 450 million people derive significant income from forest products in tropical and Mediterranean countries.

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 **cirad**
LA RECHERCHE AGRONOMIQUE
POUR LE DÉVELOPPEMENT

Expertise, projects and partnership

"Lignocellulosic resources, wood and other similar materials (bamboo, palm, etc.), are the only materials to store carbon during their development and to lock up it securely throughout the lifetime of products manufactured from them. To produce one cubic metre of wood, a tree converts on average one tonne of CO₂ and one tonne of wood securely stores 500 kg of carbon if it is used in construction, housing and, in general terms, in all long-term applications."

Jean Gérard,
Director of the Research Unit "Production and Processing of Tropical Woods"

RESEARCH issues

Improve our knowledge, processing methods and implementation methods, marketing and use of tropical and Mediterranean woods represents a priority area of action. Indeed, compared to other high-performance materials, wood has low energy consumption, and exhibits a very positive balance over its life cycle, from forest to final disposal.

The research works underway are contributing to:

- ensuring best matches between wood quality and uses
- managing the negative environmental impacts of treatment and preservation methods of wood and derived products
- ensuring that the timber industries have a supply of raw materials with controlled characteristics, which meet the performance requirements of the markets in the consumer and producer countries
- promote economic development, by improving local processing facilities



Tropix® (version 7.0)

This software presents the main characteristics of 245 tropical or temperate forest species: appearance of the log and wood, physical and mechanical properties, durability and preservation, drying behaviour of wood, implementation characteristics, product classification and actual or potential uses. TROPIX® can also be used to make multi-criteria species searches based on pre-selected characteristics.

> www.cirad.fr/innovation-expertise/produits-et-services/logiciels/tropix-r

TROPIX® is distributed by Cirad.

Anatomical identification of wood samples

At the request of socio-economic operators, Cirad can perform anatomical identification of wood samples and analyse the specific arrangement of their lignin structure (layout of tissues, shape and size of constituent cells of wood material). These analyses are based on the use of a reference wood bank comprising more than 34,000 specimens, corresponding to more than 8000 species, 2000 genera and nearly 250 botanical families. Cirad's wood bank is stocked in particular through exchanges with the biggest international wood banks (United States, Netherlands, United Kingdom and Germany).

Laboratory testing accredited by the French Accreditation Committee

The durability of woods and effectiveness of treatment products and/or methods are evaluated in standardised tests. These tests are conducted in the Cirad preservation laboratory, which has been committed to a quality approach for more than ten years, and accredited since 2006 by the French Accreditation Committee (Cofrac, accreditation no. 1-1686) as per standard NF EN ISO/IEC 17025. In 2010, this accreditation covered eight tests relating to preservation of woods and wood-based products, defined in the following standards:

EN 113: Wood preservatives. Test method for determining the protective effectiveness against wood destroying basidiomycetes. Determination of the toxic values.

EN 117: Wood preservatives. Determination of toxic values against *Reticulitermes* species (European termites) (laboratory method).

EN 118: Wood preservatives. Determination of preventive action against *Reticulitermes* species (European termites) (laboratory method).

EN 73: Accelerated ageing of treated wood prior to biological testing. Evaporative ageing procedure.

EN 84: Accelerated ageing of treated wood prior to biological testing. Leaching procedure.

ENV 12038: Wood-based panels. Method of test for determining the resistance against wood-destroying basidiomycetes.

XP X 41-542: Accelerated ageing test of treated materials prior to biological testing. Percolation test.

XP X 41-550: Determination of the protective effectiveness against termites of products and materials designed for use as soil and/or wall barriers.

> Research Unit: Production and Processing of Tropical Woods

Tropical wood traceability, regulations and trade

The rise to prominence of sustainable management of tropical forests and the constant changes to the regulations make traceability of forest products a necessity. In particular, establishing classification rules adapted to current practices in the international tropical timber trade has become essential.

Cirad works with the certifying bodies, and is among the leaders in establishing chains of controls of the various certification systems in force, and in monitoring and auditing companies applying for eco-certification.

Plant production control (PPC) procedures are developed and implemented at the request of processing companies, both in tropical producer countries and in consumer countries.

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Other areas of expertise...

- Assistance or technical support for project principals, prime contractors, architects, inspection bureaus, design & engineering offices and construction companies, for the implementation and use of tropical woods
- Physical and mechanical characterisation of solid wood, glued-laminated timber and reconstituted timber, wood-based panels and structural members
- Development of use of underutilised species
- Advice on timber economy and markets, wood procurement organisation, marketing and competitiveness of tropical forest products

> VIP contact: catherine.remond@cirad.fr