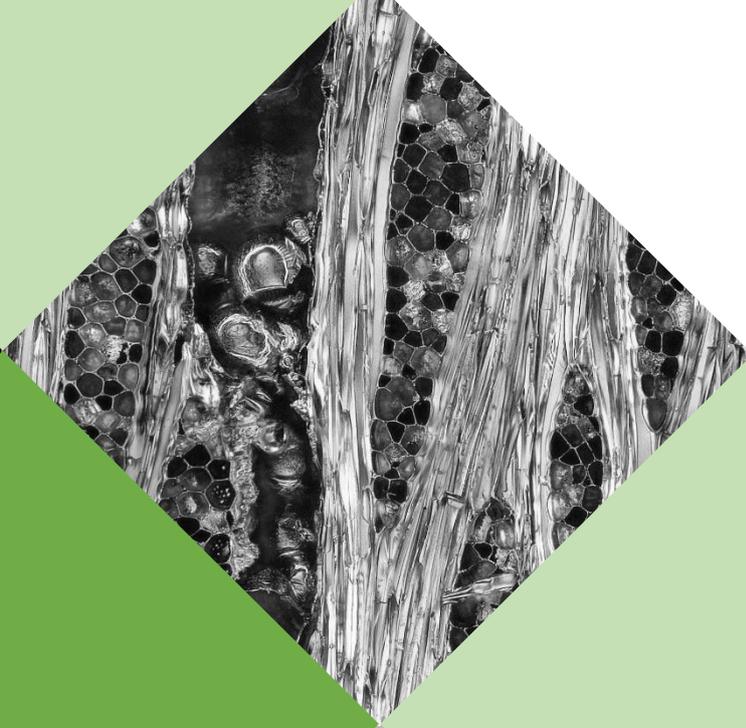




**GTTN**  
Global Timber  
Tracking Network



## Scientific methods for taxonomic and origin identification of timber

June 2020

[www.globaltimbertrackingnetwork.org](http://www.globaltimbertrackingnetwork.org)

### USERS OF THIS GUIDE:

Authorities, traders, importers and all others interested in the current capacity of timber tracking methods for the taxonomy and geographical origin of timber (products).

### AIM OF THIS GUIDE:

Inform about the scientific methods available for timber tracking (taxonomy and origin) and on the laboratories offering these identification services. This guide is a concise version of the scientifically more detailed [Timber Tracking Tool Infogram](#).

**Editor:** Nele Schmitz

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**Pictures:** Victor Deklerck, Volker Haag, Justyna A. Nowakowska, Charlie Watkinson.

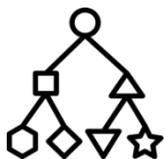
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Find out more at

 [gtn@efi.int](mailto:gtn@efi.int)  [www.globaltimbertrackingnetwork.org](http://www.globaltimbertrackingnetwork.org)  [@GTTNetwork](https://twitter.com/GTTNetwork)

## WHAT ARE TIMBER TRACKING TOOLS & WHAT CAN THEY DO FOR YOU?

**Scientific methods for the verification of the taxonomy and/or the origin** of the timber based on anatomical, chemical or genetic characteristics of the wood.



Taxonomic identification

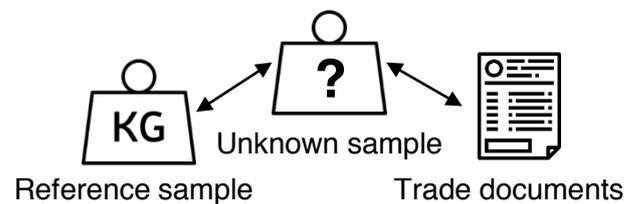


Origin identification

Both

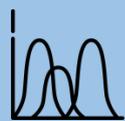
### Essentials for a timber identification:

**All timber identifications rely on having reference samples**, and these specimens are the basis of determining if the trade documents list the correct taxonomic name(s) and geographic origin(s).



Wood anatomy

**Anatomy:** The cellular structure of wood varies between families, genera and sometimes even species. It can be investigated at macroscopic or microscopic level using standard sets of anatomical features or by digital image analysis.



DART TOFMS



Stable isotopes



NIR Spectroscopy

**Chemistry:** The chemical contents of wood can be studied using Direct Analysis in Real Time (DART) Time-Of-Flight Mass Spectrometry (TOFMS), Near Infra-Red (NIR) Spectroscopy or stable isotopes. DART TOFMS looks at wood chemicals. NIR Spectroscopy looks at the surface of the wood, studying both wood chemicals and physical characteristics of the wood, which can vary both between species and origins. At this moment, however, DART TOFMS is only reliable for species identifications. Stable isotopes are linked to environmental conditions and hence only vary between origins of samples but not between species.



Genetics

**Genetics:** The DNA, present in the wood, can be investigated to identify the species, as well as the geographic origin and the individual.



Anatomy



DART TOFMS



Stable isotopes

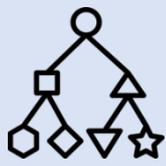


NIR Spectroscopy



Genetics

## WHICH METHODS CAN ANSWER WHICH IDENTIFICATION QUESTIONS?



Taxonomic identification

Both

Family/genus/  
species group  
identification



Species  
identification



Origin identification

Country/  
area of harvest  
identification



Individual tree  
identification



## WHAT WOOD PRODUCTS CAN BE IDENTIFIED BY WHAT METHOD?

Solid wood\*



Charcoal

Particle board



Pulp, paper,  
fibreboard



\* Including: raw wood, veneer, plywood, other manufactured solid wood

## WHICH TOOL SHOULD I USE?

The factors that determine which method is most suitable for your case are:

- The **question** that needs to be answered (taxonomic identification at the family, genus or species level, geographic origin at the level of region or individual tree).
- The **type of wood product** (raw wood, veneer, plywood, other manufactured solid wood, charcoal, particle board, pulp, paper or fibreboard).
- The **size of the sample** that can be taken (smaller or bigger than 1 cm<sup>3</sup>).

## PRACTICALITIES

The [online service provider directory](#) guides you through the above questions and offers you a **list of the possible laboratories** that can perform the analysis. You can contact the lab(s) of your choice and get an **estimate of the costs and time** that will be needed for your specific case.

To get a geographic overview of the laboratories offering authentication analyses for timber, you can consult [the service provider map](#).

Key resource

## Coordinating partners



## With support from



by decision of the  
German Bundestag

[www.globaltimbertrackingnetwork.org](http://www.globaltimbertrackingnetwork.org)

The objective of the Global Timber Tracking Network (GTTN) is to promote the operationalization of innovative tools for wood identification and origin determination, to assist the fight against illegal logging and related trade around the globe. GTTN is an open alliance that cooperates along a joint vision and the network activities are financed through an open multi-donor approach. GTTN phase 2 coordination (2017-2019) is financed by the German Federal Ministry of Food and Agriculture (BMEL). GTTN phase 2 (2017-2019) is coordinated by the European Forest Institute with the technical support from the Thünen Institute.