In partnership with Agroisolab GmbH, accredited testing laboratory in accordance with DIN EN ISO/IEC 17025:2005

Authenticating the origin of timber using stable isotopes

NEPCon Sourcing Legal Timber 2.0. March 15th 2018

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What is stable isotope analysis?

Stable isotope analysis is a tool you can use to verify the geographic origin of once-living products.

**Isotopes:** variation of elements
- Same number of protons
- Different number of neutrons
- All elements have one or more isotopic forms
- Elemental isotopes have identical chemistry

**Stable isotopes are:**
- Naturally occurring
- Non-radioactive
- Chemically identical
- Differ only in mass

Regions in the Amur region with consistent $^{18}\text{O}/^{16}\text{O}$, $\text{D}/\text{H}$, $^{13}\text{C}/^{12}\text{C}$ and $^{34}\text{S}/^{32}\text{S}$ isotope ratios to an analysed sample (BLUE).
Developing stable isotopes in timber since 2007
EUTR advises the use of laboratory analysis

The higher the risk of corruption in a specific case, the more it is necessary to get additional evidence to mitigate the risk of illegal timber entering the EU market. Examples of such additional evidence may include third-party-verified schemes (see section 6 of this guidance document), independent or self-conducted audits, or timber tracking technologies (e.g. with genetic markers or stable isotopes).

Good due-diligence processes are central to EUTR:

• **Know** the true origin of your timber

• **Know** the true species of your timber

Use confirmation methods, such as laboratory analysis and audits, to back up what your paperwork says.
Good due-care practices are central to Lacey compliance too:

• *Know* the true origin of your timber

• *Know* the true species of your timber

• Third-party certification (e.g. FSC, PEFC) are only **PART** of Lacey compliance as they *help* demonstrate due-care

Use confirmation methods, such as laboratory analysis and audits, to back up what your paperwork says.
Do your suppliers care as much about your brand’s reputation as you do?

A CAUTIONARY TALE...

• Publicly accused of a non-compliance to do with traceability and due-diligence

• High-profile customers stopped buying from the company

• Russell Hume recently entered administration

Designer furniture retailer Lombok becomes first UK company to be fined under illegal logging laws

Authorities twice warned upmarket furniture firm after it failed to carry out required due diligence

Ben Chapman | @b_c_chapman | Wednesday 1 November 2017 18:14 GMT | 15 comments

Article source:
https://ind.pn/2A70R9w
Lumber Liquidators pleads guilty to environmental crimes, agrees to pay more than $13M

Everett Rosenfeld  |  @Ev_Rosenfeld  
Thursday, 22 Oct 2015 | 4:40 PM ET

Lumber Liquidators pleaded guilty on Thursday in federal court to environmental crimes related to illegal importation of hardwood flooring, the Department of Justice announced.

The settlement is unrelated to the controversy over some of its laminate flooring from China, which CBS' "60 Minutes" has reported contains high levels of the carcinogen formaldehyde.

In total, Lumber Liquidators agreed to pay $13.13 million — including a $5.8 million criminal penalty, a $6.3 million civil penalty and $1.0 million in restitution to customers and $1.0 million to the state of Illinois.
By our powers combined…

There are lots of timber tracking technologies worth adding to your QA/due-care processes:

- **Stable isotopes** (origin)
- **DNA** (origin & species)
- **Chemical profiling** (origin and species)
- **NIR** (origin & species)
- **Wood anatomy** (species)
There are multiple origin tracking tools: DNA & Stable Isotopes

- Investigates genetic lineage of a tree/once-living object (population genetics)
- Associated with geographical origin
- Differentiation by DNA markers
- Investigates the origin of the elements in the timber
- Directly related to geographical origin
- Differentiation by isotope values

Maps are used to represent and evaluate DNA and stable isotope technologies – they are not specific to the topic of timber, and strong inferences shouldn’t be made out of these two maps alone.
What kinds of products can we work with?

Solid wood
- Minimum recommended weight is: 100g or 0.22lbs
- Roughly matchbox size

Plywood & Engineered flooring
- Need to obtain ~10 to 20g of sample per layer
- Minimum dimensions: 25x25cm (625cm$^2$) or 10x10 inches (100”$^2$)
- Min. thickness: ¼ mm

Furniture, musical instruments
- Need to obtain ~ 10 to 20g of sample
- Separate pieces treated as separate samples
Sample information needed before analysis can start

**Mandatory**
- Declared species
- Sample reference number
- Declared origin
  - Continent = weak
  - Country = better
  - Region = best possible

**Recommended/useful**
- Product identifier codes
  - SKU
  - Barcode
  - Batch
  - Date and location obtained
- Supplier codes/registration numbers
Existing stable isotope databases for timber

<table>
<thead>
<tr>
<th>Mahogany (Inc. African Mahogany)</th>
<th>Teak (<em>Tectona grandis</em>)</th>
<th>Spruce</th>
<th>Iroko</th>
<th>Oak</th>
</tr>
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<tbody>
<tr>
<td>Congo</td>
<td>Brazil</td>
<td>Austria</td>
<td>Cameroon</td>
<td>Amur region (China/Russia)</td>
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<tr>
<td>Costa Rica</td>
<td>Costa Rica</td>
<td>Belarus</td>
<td>Congo</td>
<td>USA (new - updated)</td>
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<tr>
<td>Democratic republic of the Congo</td>
<td>Ghana</td>
<td>Finland</td>
<td>Democratic Republic</td>
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<td>Ecuador</td>
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<td>India</td>
<td>Java</td>
<td>Russia</td>
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<td>Sweden</td>
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<td>Papua New Guinea</td>
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Note: Stable isotope analysis is genus/family-specific. Please check the lab has data before sending samples.
Sampling is hard work – WWF/Agroisolab Amur project 2011-2012

Locations of sampling sites in the Amur region
The next steps for agroisolab

- Databases are the biggest challenge
- This year – library of physical samples from Latin America (5 species)
- Store samples at Kew
- Samples will be available to researchers

Forecast carbon stable isotope ratios ($^{13}\text{C}/^{12}\text{C}$ or $d^{13}\text{C}$) of teak (Tectona Spp) within Central and South America
Nigerian rosewood entering China with retrospective permits
Illegal rosewood from Nigeria has long been exported to China, following revelations that the UN’s World Wildlife Fund (WWF) and the UK’s Department for Environment, Food and Rural Affairs (DEFRA) have signed agreements with Chinese officials to encourage trade in rosewood.

Sign-up at:
www.agroisolab.com/timber
Contact details

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