The Life Cycle Impact of Utility Timber Treated with Tanasote

A success story for wood and wood treatment
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New preservatives for utility timbers
The Lonza (Arch Timber) offering: **Tanasote**

Life Cycle Impact Assessment:
- ISO standards
- Type
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- Sleepers

Overview of results
The positive story for wood and wood treatment
New Preservatives for Utility timbers

A success story for wood and wood treatment

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The potential loss of creosote

- Case to retain made strongly
- Threat to a major wood and treated wood market
- Opportunity for alternatives

Development of replacement products

- Support the continued use of wood
- Support the continued success of wood treatment
- A Challenge for the preservative manufacturers and wood treaters
- Opportunity for a BPR approved product
The Lonza Offering: Tanasote

Tanasote

- Oil based preservative
- Oil established in wood utility timber applications
- Applied warm
- Unique and novel combination of actives
- Optimised for long-term efficacy
- Optimised for technical features
- Utility timbers are a demanding and visible end-use!

Public Procurement Markets

- Demand for LCAs
- Lonza fully market ready
Tanasote: Optimised Technical Features

Tanasote

- Robust product stability
- Good penetration with established processes
- Good mobility in wood with no product bleeding from wood
- Good water repellency with visible beading, brown colour
- Low odour
- Fixing compatibility
- Low conductivity
- Good climability
Tanasote Pilot Plant in Operation
Tanasote Life Cycle Impact Assessment

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Life cycle assessment:

■ Holistic decision support tool that compares the environmental impacts of different products or systems

■ Study has been modelled in accordance with international standards ISO 14040:2006 and ISO 14044:2006

■ These standards underpin all detailed work on LCA

Goal of the studies:

■ To generate quantitative environmental profiles of Tanasote-treated wood utility timbers in order to understand the associated life cycle environmental impacts in comparison to other types of utility product materials
If the LCA is to be used to make public claims to third parties

- Critical review by three independent LCA experts
  - Documented in the report

LCA = complicated accounting process

- All the inputs and outputs (effects) within a defined scope
Alternative Materials

- Cast concrete poles
- Fibreglass (composite – polyester) poles
- Fibreglass (composite – epoxy resin) poles
- Spun concrete poles
- Steel poles

- Cast concrete railway sleepers
- Steel railway sleepers
Functional unit Pole Study:

“A 10 metre utility pole designed for a mean pole top load of 4.52 kN (excluding the factor of safety) and suitable for direct embed installation with a lifetime of 60 years”

Estimated lifetime Tanasote treated wood poles = 40 years and that for all other pole types = 60 years.

One and a half Tanasote treated wooden poles were modelled and compared against one of each of the other pole types.
Functional unit Sleeper study:

“Railway sleepers and other track components required for 1 km of railway track over 40 years”

Lifetime of the sleepers: 23, 28.5 and 34.5 years for wood, steel and concrete, respectively
Geographical area covered: Europe
Variation in distances etc in sensitivity analyses

System boundary: ‘cradle to grave’ LCA

- includes the impacts of:
- Raw material extraction;
- Manufacturing and fabrication activities at all stages
- Transportation at all stages in the supply chain
- In use
- End of life management
Three results categories:

**Damage to ecosystems**
- Assesses the loss of species as a result of the products being produced and used
- Considers issues such as climate change, eutrophication and acidification

**Damage to human health**
- Considers damage to human life, impacts such as climate change, human toxicity, and fine particulates.

**Damage to resources**
- Considers the indicators fossil fuel depletion and metal depletion.
Results presented in people emission equivalents

A people emission equivalent in a European context is defined with the equation below:

$$1 \text{ people emission equivalent} = \frac{\text{Impact in Europe in 1 year}}{\text{Population in Europe}}$$

Allows environmental indicators across categories to be compared against each other
Utility Poles

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Utility Poles LCA - Normalised Impacts

- Cast concrete pole
- Fibreglass epoxy pole
- Fibreglass polyester pole
- Spun concrete pole
- Steel pole
- Wooden pole - with Tanasote S-40

Normalized impacts (per European person emission equivalents)
Damage to Human Health

- Cast concrete pole
- Fibreglass epoxy pole
- Fibreglass polyester pole
- Spun concrete pole
- Steel pole
- Wooden pole - with Tanasote S-40

Normalised impacts (per European person emission equivalents)
The Good News
Sensitivity Analysis

- Cast concrete
- Fibreglass epoxy
- Fibreglass polyester
- Spun concrete
- Steel
- Tanasote-treated
- Tanasote-treated +10% retention
- Tanasote-treated -10% retention
Study modelled the effect of variation in Tanasote treatment

Good Life Cycle advantage comes from using wood

- Wood is good!
- But not the end of the story - without treatment it needs replacing too often

Tanasote treatment of wood is the winning combination

- Minimise the number of inputs
- Longer lifetime to discount inputs over – wood is good *because* of the service life achievable
- Optimised treatment and in-service features
A Success Story for Wood and Wood Treatment

- Tanasote Replacement for Creosote
  - Will prevent the loss of market to alternative materials
  - Tanasote treated pole and sleepers are lowest impact alternatives

- Tanasote
  - Provides technical features required by Utility Companies
  - Good fit for treaters
  - BPR ready
  - Regulatory support in place
  - Market ready
  - Impact data for Specifiers in place
  - Critical review enables public claims to be made

- A modern twist on an old classic

Tanasote
If you have been……

thanks for listening!

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Questions?