

# AESTHETIC PERFORMANCE

## Overview on mould research

Stig Bardage and Lone R. Gobakken

COST FP1303 meeting  
FCBA Paris  
27-28 January, 2014



SP Technical Research Institute of Sweden

## Introduction

### Aesthetics

- Many definitions

A set of principles concerned with the nature and appreciation of beauty

- The *aesthetic experience* is often experienced as a pleasurable and desirable experience.
- The *aesthetic performance* of a product could be defined as the experienced appearance throughout its service life.



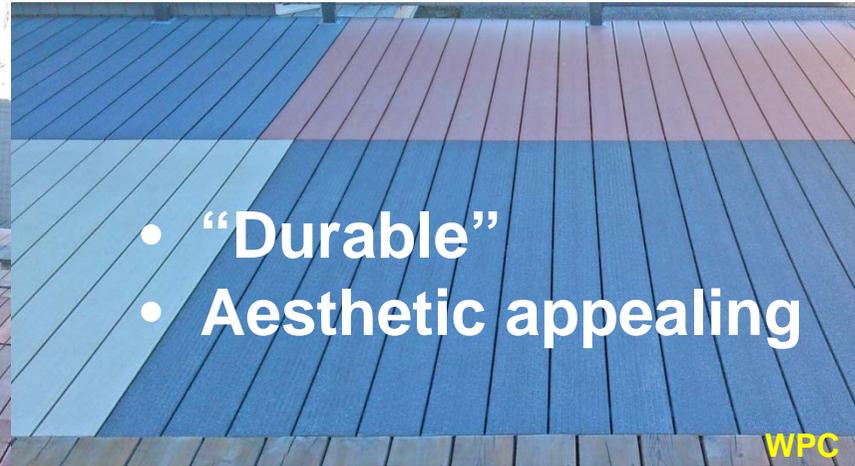
SP Technical Research Institute of Sweden

- Bio-based products are biodegradable by default
- Different technologies may delay biodegradation
- Bio-based materials are expected to be durable and perform well in service, and to be bio-degradable after end of service life.



SP Technical Research Institute of Sweden

## Examples of “high quality” bio-based products



SP Technical Research Institute of Sweden

- Without treatment, surfaces tend to become grey, **what sometimes is desirable!**



SP Technical Research Institute of Sweden

➤ Compromised aesthetic performance



- Surface disfigurement of bio-based materials may be caused by the action of moisture, UV light, mould and blue stain fungi development.
- Mould and staining fungi live on organic non-structural material components
- Structure, physical properties, environment and climate are factors that influence the establishment of fungi
- The occurrence of mould fungi leads often to concerns regarding the development of allergy and other related health problems



## Research on mould and blue stain

- **Laboratory studies** (standardised and non-standardised) to test susceptibility to and efficacy against fungi (fungicidal property)
- **Field tests**
  - Performed in different ways (standardised and non-standardised)
- **Modelling of mould and blue stain growth indoors and outdoors**
  - Different methodologies are used
  - Laboratory studies/tests (material properties)
  - Field tests (climate effect, impact of mode of exposure, and others)
  - Prediction models
  - Lack of clear *consensus*
- **Assessment of surface disfigurement**
  - Image analysis, subjective evaluation protocols, molecular methods ...
- **Protective treatments**
  - Surface coating, impregnation
  - Chemical modification



## Future research

- **Systematic evaluation of material properties influencing mould and blue stain attack such as:**
  - Composition
  - Water dynamics
  - Surface properties
  - Effectiveness of protective treatments
  - Effect of environment and climate
  
- **Evaluation of performance in different applications/exposure situations such as:**
  - Indoors, outdoors, sheltered or not
  - Architectural/constructional solutions
  
- **Development of prediction models based on climatic and environmental data to be applied to types of products (as a group) and/or specific products**
  
- **End-user preferences and expectations**



## Important for the successful use of bio-based building material

- **Not underestimate the importance of the aesthetical performance**
- **Learn more about end-user preferences and expectations**
- **Exchange of information between scientist allowing for coordinated research efforts**
- **Systematic build-up of information on performance in relation to material properties and end-use**
- **When ever possible, perform comparisons with other alternative non bio-based materials**

# THANK YOU!



SP Technical Research Institute of Sweden