



HENNING **LARSEN** ARCHITECTS

Sundere og grønnere materialer i arkitektens praksis
Martha Lewis, 4 september 2014

Bæredygtighedsafdeling :

Design med viden

Energidesign

Optisk indeklima

Indeklima

Materialer

Facadedesign

Space planning

Mikroklima

Certificeringer

Fælles udfordringer:



Politiken, 2011

Klimæændringer

Materialer:

Energi i udvinding /
fremstilling?
Drivhuseffekt?
Stratosfærisk
ozonnedbrydning?
Fotokemisk ozondannelse?
Forsuring?

VOC indhold g/l

Levetider?
Indeholder
genbrugsmaterialer?
Kan materialet genbruges?

Fælles udfordringer:



Ressourceknaphed

Materialer:

Er udvinding / host
kontrolleret?

Er det forsvarligt at udnytte?

Kan materialet genbruges?

Levetider?

Vandforbrug?

Energiforbrug?

Fælles udfordringer:



Farlige stoffer

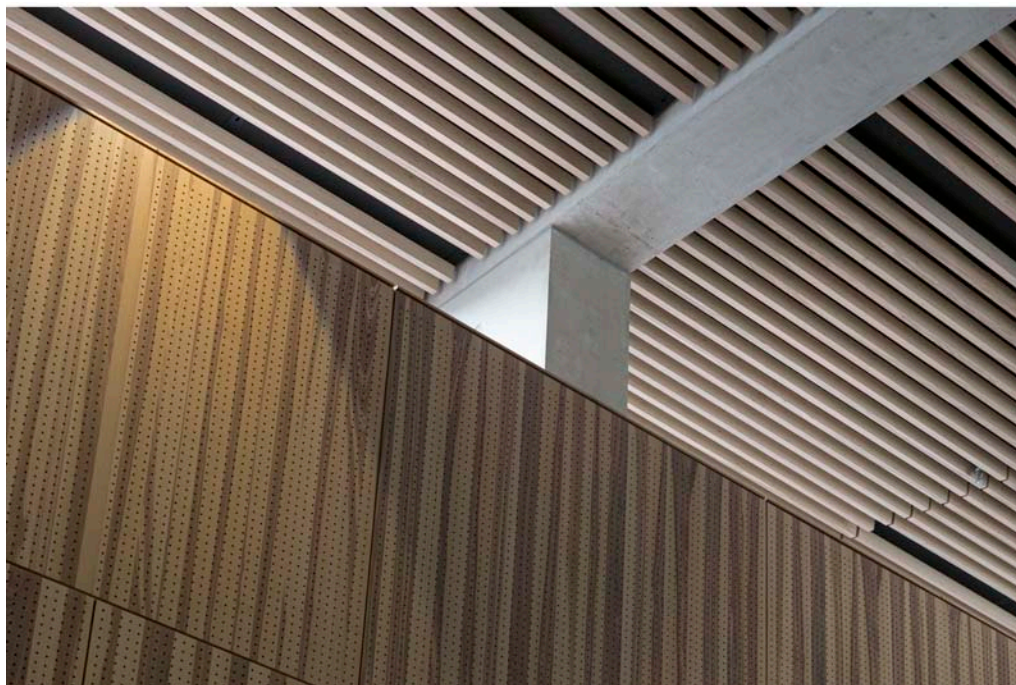
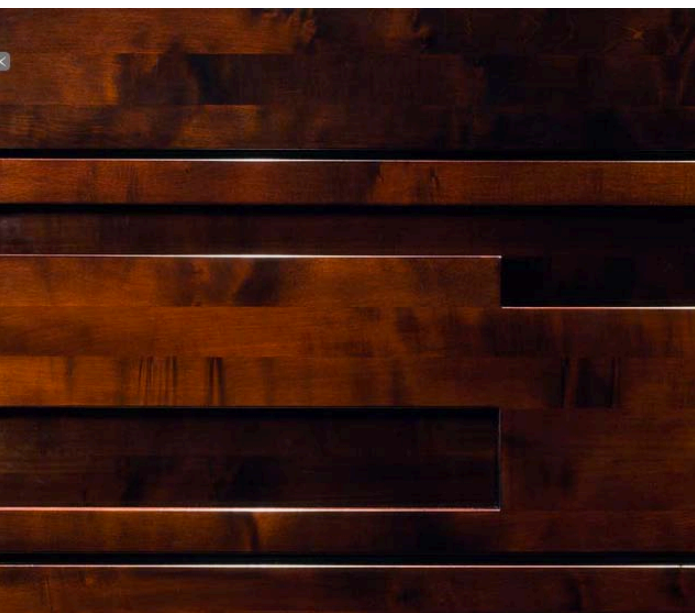
Materialer:

Humantoksicitet
Økotoksicitet
Indeholder REACH
stoffer?
Indeholder stoffer med
danske
grænseværdier?

Farlige stoffer brugt i
processen?

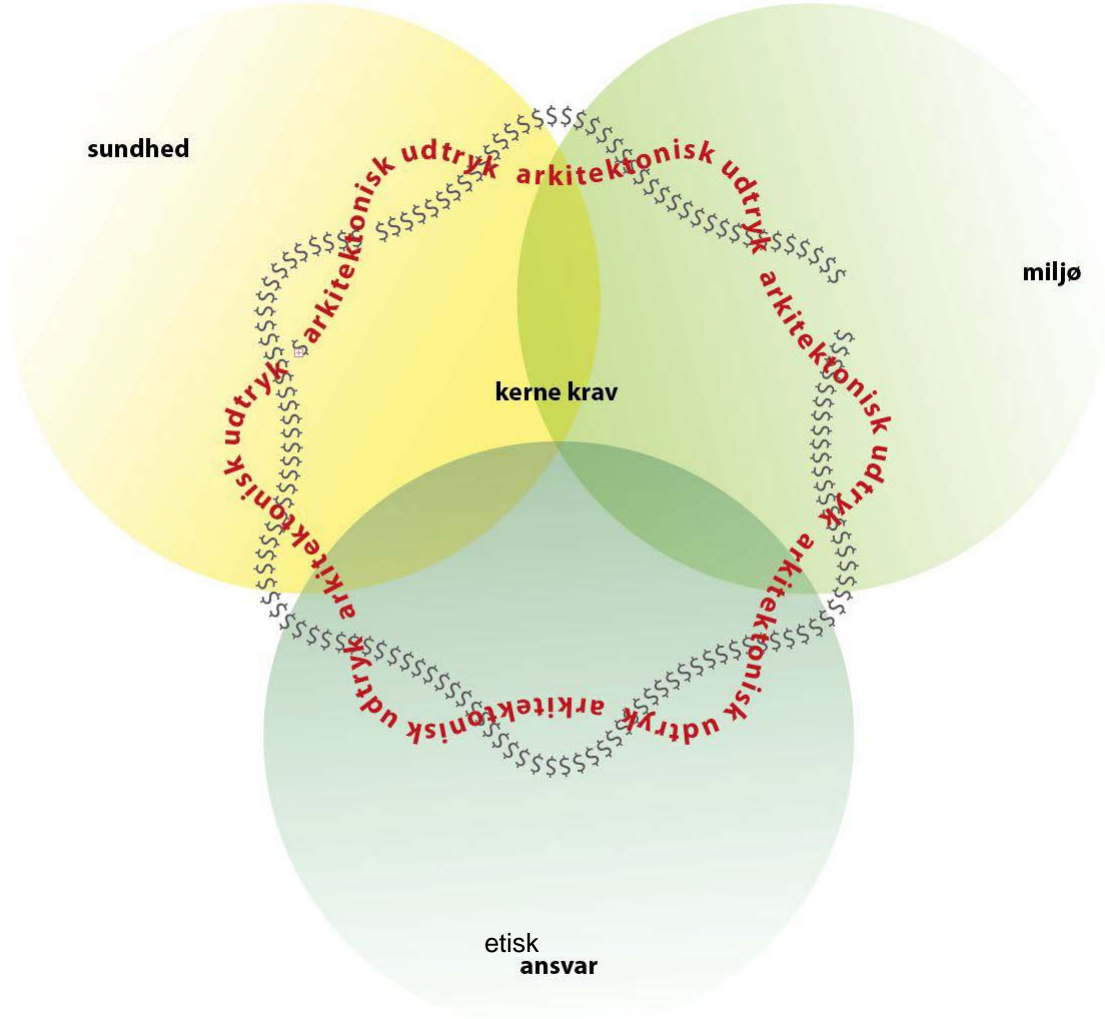
ved udvinding /
fremstilling
I udførelsesfase
I brug

Fælles nydelse:



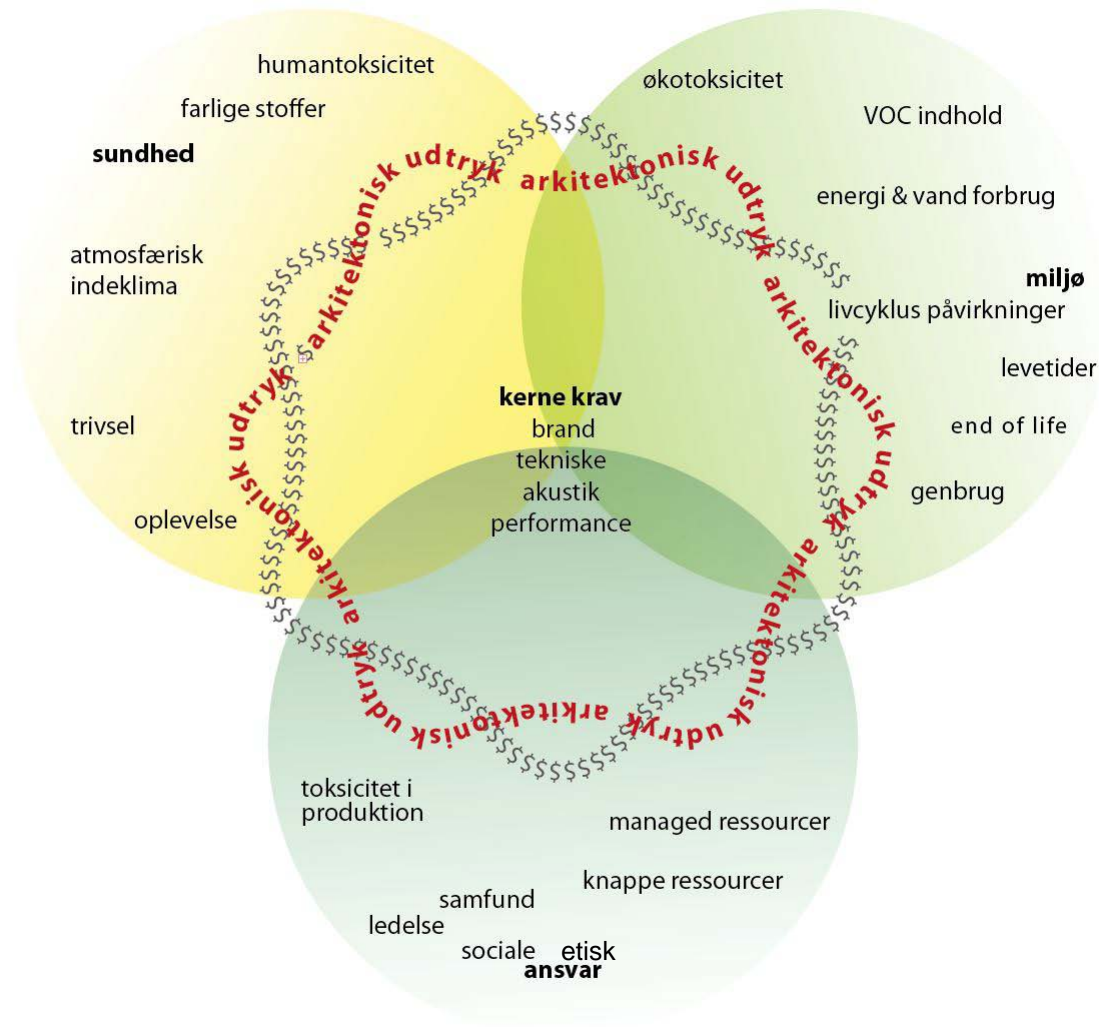
PROCES – materialevurdering

Hoved katagorier



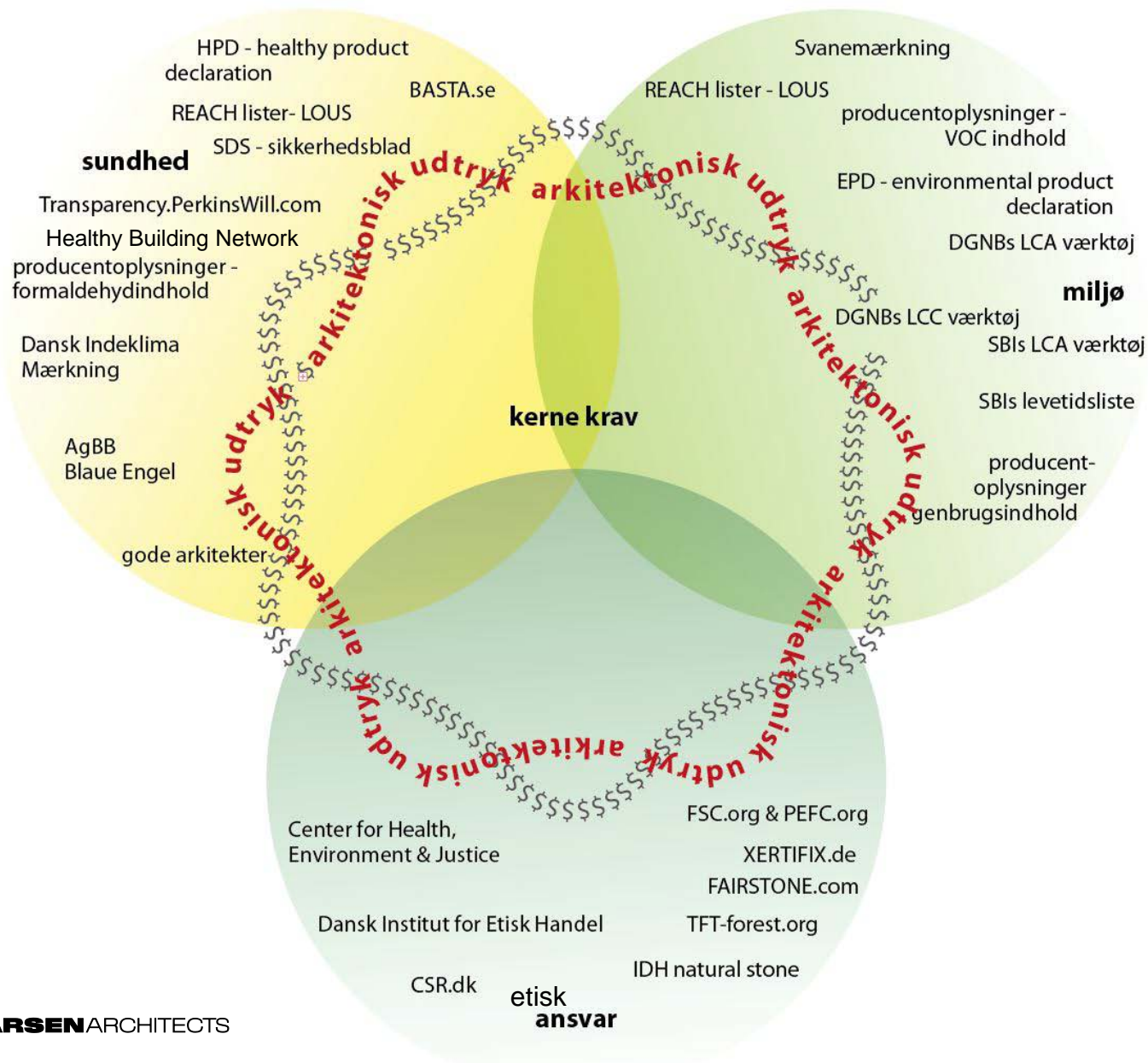
PROCES – materialevurdering

Fokus områder



PROCES - materiale vurdering

Informationskilder

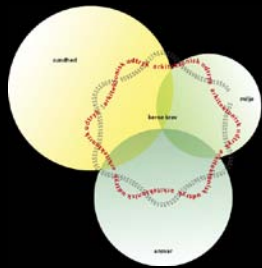




Spiegel Headquarters,
Hamburg 2011

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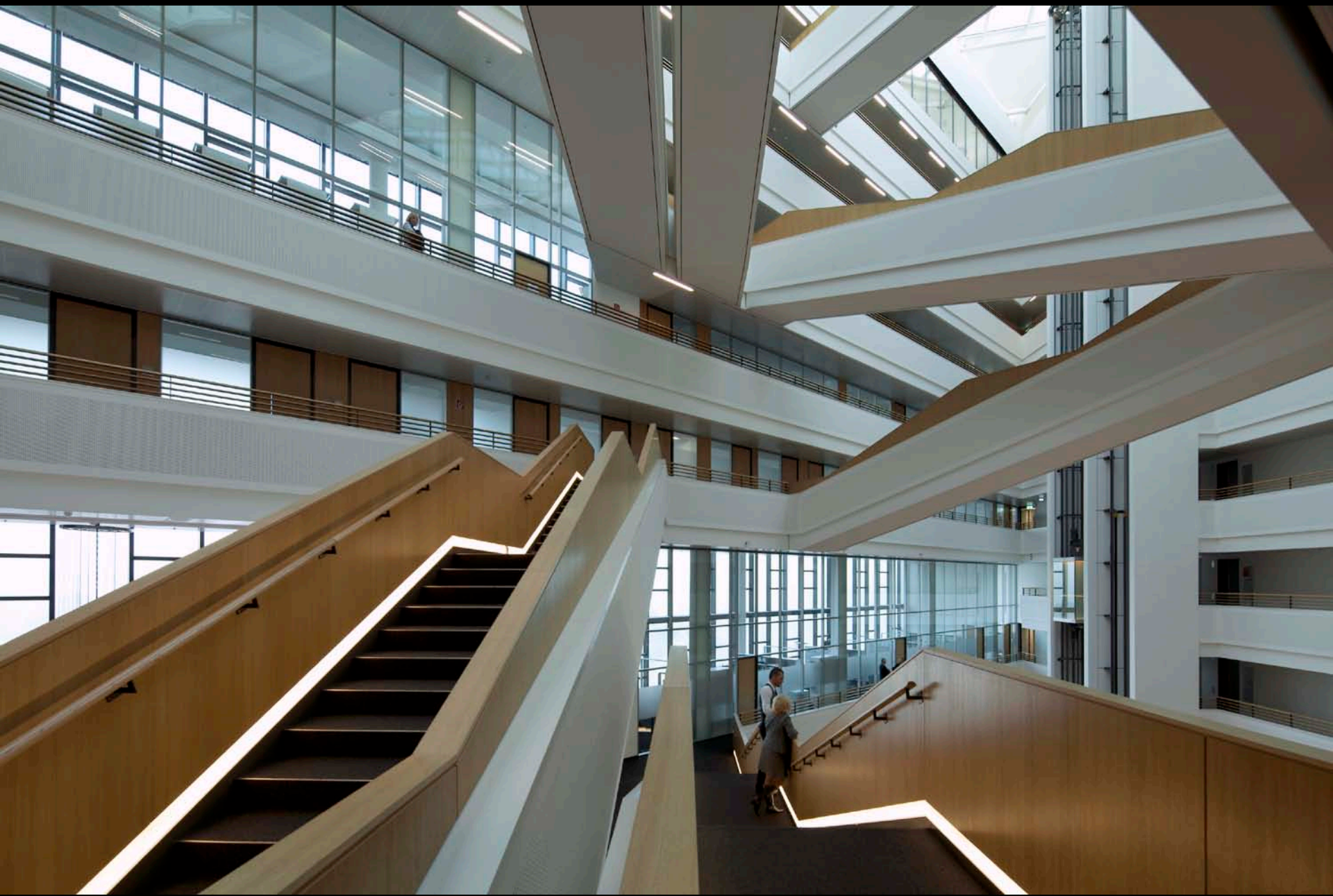
Spiegel Headquarters Certificeret "Gold" i HafenCity



Krav til materialer:

Halogenfri
Lavavgassende
Allergikervenlig





Udfordringer for rådgiver:

- Vurderingsgrundlag?
- Indhold?
- Fremstillingsdata?
- Geografiske oplysninger?



What are grits?

VIDENSSAMLING – Henning Larsen Database

Materials

Modified wood facade

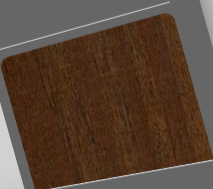
Modified wood gives a natural patinated surface that will turn silver grey over time. Modified wood refers to wood that has been processed by a chemical, heat, compression or other means for increasing the properties of wood. Those properties include biological durability, dimensional stability, hardness and UV-stability. The different modification methods are combinations of lumen filling, cell wall filling, reactions with wood polymers, cross links and degradations of cell walls. Pine (in different variations) are typically used as a material for modification. The different modifications gives the wood a better durability.

If not wood is not treated it will absorb and release water. Water based chemicals the hydroxyls form a group with the cellulose chains.

International ThermoWood Association: www.thermowood.com

Aesthetics **Health & Safety** **Environment** **Economy**

Toxins / REACH:



Materials

Copper facade panel

Copper facades panels create a rich surface that has a fabulous patina over several decades. Initially it has a highly reflective copper colored and with oxidation turns first dark brown, then to a more muted, greenish patina. It also can be manipulated - it can be perforated, formed, extruded and dented.


Copper on facades is a health concern as high levels in drinking water can cause kidney damage. The European Commission's guidelines for Environment and Construction 2010 forbid the use of copper on facades. Unfortunately the natural patina on panels can be pre-patinated and coated, unfortunately the natural patina can be pre-patinated and coated, unfortunately the natural patina can be pre-patinated and coated. Where there is no prohibition, copper run-off can be treated over other surfaces (concrete, stone) to absorb the copper particles sent through a heavy metal filter.

Copper is a finite resource and copper reserves are shrinking. The time - this also means theft can be an issue. Copper is reusable and at least 80% of all copper ever mined is still in circulation.

Cu, Copper Development Association Inc: www.copper.org
The Copper Book for Architecture: www.copperbook.com

Aesthetics **Health & Safety** **Environment** **Economy**

Summary: Copper requires 33GJ/t more energy used for primary copper coming directly from the mine than aluminum and nickel.



Materials

Aluminum facade panel

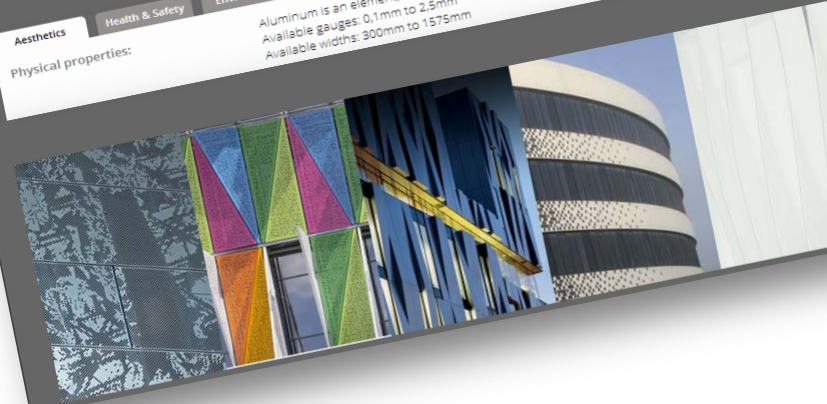
Aluminum facade panels create a smooth surface that is slightly reflective and very homogeneous. Aluminum can also be manipulated for creative expression - it can be perforated, formed, extruded and cast. Aluminum is an element, one of the lightest metals and has good corrosion resistant properties. Aluminum (ca. 90%) is usually alloyed with copper, zinc, magnesium, manganese, and / or silicon (ca. 10%). If not treated the panels will turn grey over time. This natural process is caused by an oxidation, which produces a thin layer of aluminum oxide on the surface. There are different types of aluminum; not all types are intended for exterior application. There are many options for surface treatment, and the harshness of the climate has an implication for which treatment is selected. Time is not friendly to aluminum facades - older aluminum facades lose their luster.

Primary Aluminum production requires high energy consumption. Most aluminum contains a high recycled content and can also be recycled at end of life. A current survey by the European Aluminium Association has established an average recycling rate of more than 95% for aluminum applications in the construction sector.

European Aluminium Association (English) <http://www.alu.org.uk>

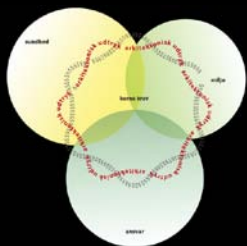
Aesthetics **Health & Safety** **Environment** **Economy** **Links & Galleries** **Generics** **Structure Tags**

Physical properties: Aluminum is an element, number 13 in the periodic table - density - 2700 kg/m³
Available gauges: 0,1mm to 2,5mm
Available widths: 300mm to 1575mm



Details **Gallery**

NovoNordisk Hovedsæde



Materialer :

Nordisk identitet

NovoNordisk identitet

Etisk vurdering

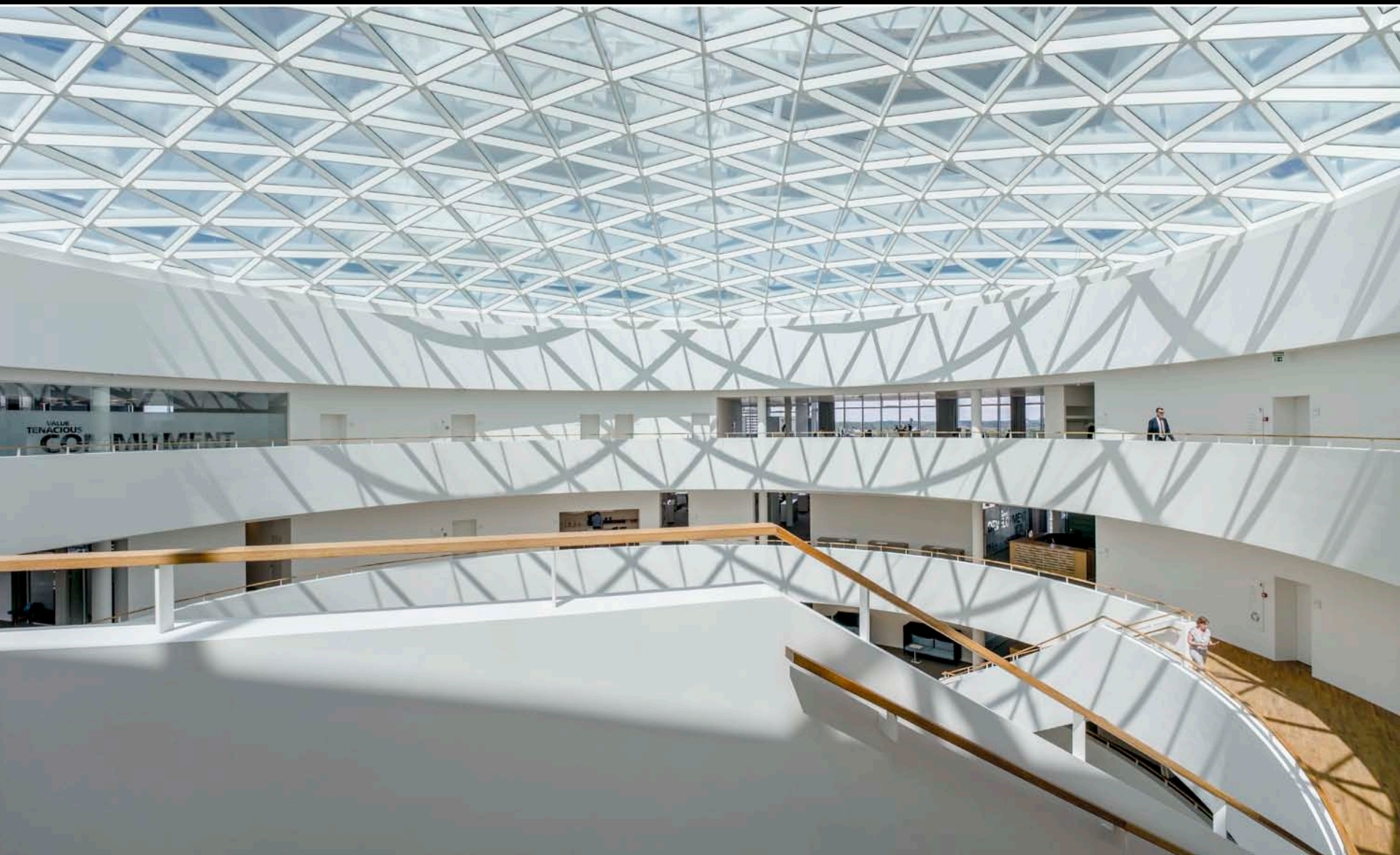
Lavafgassende

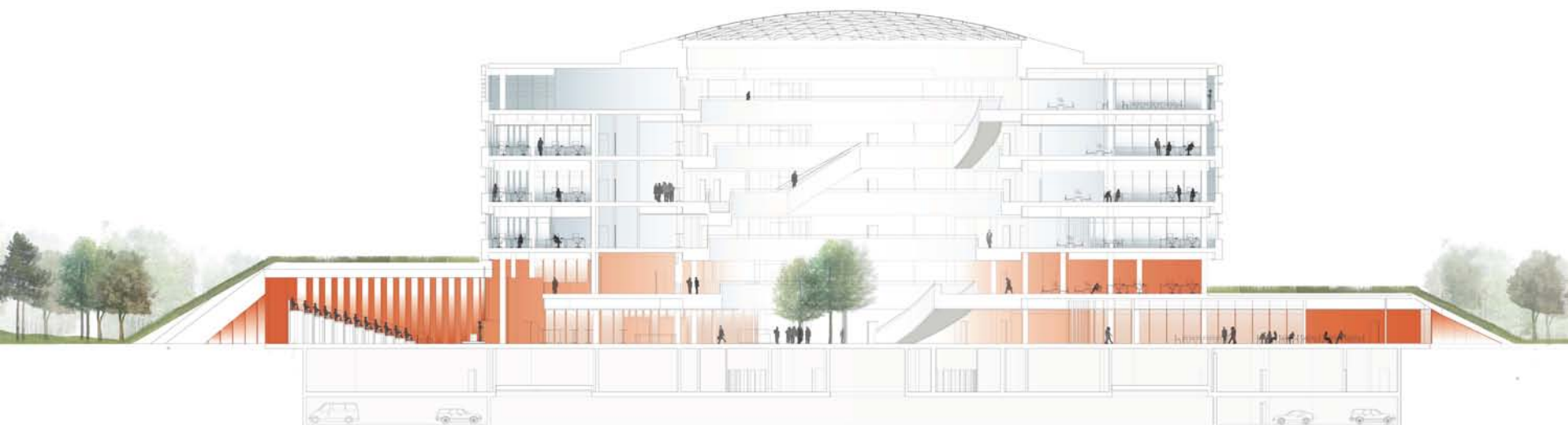
Økonomi over levetid

Klimabevist









MATERIALER





Smartere og grønnere materialer . . .

Mere transparens i producenternes opplysninger

Smartere  rådgiver og grønnere og sundere materialer!