

PASSIVEHOUSE & NATURAL MATERIALS

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BOAT FRAM: EXPEDITION OF NANSEN TO THE NORTH POLE - 1896 CREATERRA

BOAT "FRAM" IN THE ICE



BOAT FRAM: EXPEDITION OF NANSEN TO THE NORTH POLE - 1896 CREATERRA

TRAVEL ITINERARY OF NANSEN



APPLIED PASSIVE HOUSE STANDARD IN THE BOAT!

"... The sides of the ship were lined with tarred felt, then came a space with cork padding, next a deal panelling, then a thick layer of felt, next air-tight linoleum, and last of all an inner panelling. The ceiling of the saloon and cabinsgave a total thickness of about 15 inches. ... The skylight which was most exposed to the cold was protected by three panes of glass one within the other, and in various other ways. ... The Fram is a comfortable abode. Whether the thermometer stands at 22° above zero or at 22° below it, we have no fire in the stove. The ventilation is excellent, especially since we rigged up the air sail, which sends a whole winter's cold in through the ventilator; yet in spite of this we sit here warm and comfortable, with only a lamp burning. I am thinking of having the stove removed altogether; it is only in the way."

Fridtjof Nansen, 1896

FIRST PASSIVE HOUSE: KRANICHSTEIN - 1991





DR. WOLFGANG FEIST STILL LIVES THERE



PASSIVE HOUSE: 5 BASIC CONCEPTS





PASSIVE HOUSE: 50 CANDLES FOR HEATING - 1500W



COMFORT

(EVEN SURFACE TEMPERATURES, COOL IN SUMMER AND WARM IN WINTER)

HEALTH

(FRESH AIR - LOW CONCENTRATIONS OF VOC's)

QUALITY OF BUILDING

(NO MOLD OR HIDDEN HUMIDITY DAMAGES, BLOWER DOOR TESTED)

SECURITY

(LONG TERM LOW COST, LOCAL EMPLOYMENT, GEOPOLITICAL INDEPENDENCE, FIGHTING GLOBAL WARMING)



2020

2010/31/EU - NEARLY ZERO ENERGY BUILDINGS (NZE)

2018

ALL GOVERNMENT FUNDED BUILDINGS IN NZE STANDARD

SECURITY

(INDEPENDENCE OF ENERGY, BALANCE OF IMPORT/EXPORT)

ENVIRONMENT

(FIGHTING GLOBAL WARMING)





THE EFFICIENT PASSIVHAUS FROM STRAW PANELS

ECOCOON: WALL CONSTRUCTION





ECOCOCON: INTEGRATED REINFORCEMENT



ECOCOCON: WALL CONSTRUCTION



ECOCOCON: BUILDING EXAMPLE



ECOCOCON: WALL BUILD UP





AIRTIGHT MEMBRANE: OUTSIDE?





Airtight membrane but open for vapour - sd < 0,2m

No leakage of moist air no damages from moisture

Possible only because of woodfibre board on the outside.

WUFI CALCULATION



PASSIVE HOUSE **PREDAJNA**



PASSIVE HOUSE **PREDAJNA**

CREATERRA

STRAWPANELS **ECOCOCON**



BLOWER DOOR TEST: VERIFIED QUALITY

CREATERRA



Measured results of Blower door test at n50:

Stupava: 0,42 1/h Bad D. Altenburg: 0,32 1/h Predajna: 0,14 1/h Liptovska Kokava: 0,20 1/h Nová Bana: 0,31 1/h



PASSIVE HOUSE **PREDAJNA**



PASSIVE HOUSE **PREDAJNA**



BUILDING PHYSICS: THERMAL BRIDGES







Source: Passiv House Institute



THERMAL BRIDGE: FOUNDATION 2



THERMAL BRIDGE: OUTSIDE CORNER





PH Concept Ecococon specifics Project details Building advice

EcoCocon Passivhaus Manual HOW TO PROJECT A PASSIVE HOUSE FROM ECOCOCON STRAW PANELS Version 0.5 - Februar 2014 (The manual is "work in progress" so check for a new version) ECO Nurtured by nature in cooperation with CREATERRA Author: Bjørn Kierulf

PASSIVE HOUSE: CATALOGUE OF DETAILS



ECOCOCON **DETAILS**

fibre-board

136

plywood

CREATERRA

WOOD FACADE

25Ö

ß







ventilated timber facade / vapour permeable certified render system w<0,1kg/m^{2*}h STEICOprotect, woodfibre board airtight breather membrane Sd \leq 0,2 m straw panel Ecococon clay render

ventilated facade STEICOprotect, woodfibre board airtight breather membrane Sd ≤ 0,2 m straw panel Ecococon clay render











PASSIVE HOUSE WINDOWS



PASSIVE HOUSE WINDOWS: WINDOW DESIGN

CREATERRA



PASSIVHAUS WINDOW:

Narrow frame - more glass Insulated frame Triple glazing Airtight installation U_w< 0,80 W(m²K)





PASSIVE HOUSE WINDOWS: SHADING - SCREEN

PASSIVE HOUSE **WINDOWS:** SLIDING DOORS

OUR OFFICE: STRAW BALE DOME (2010)

OUR OFFICE: STRAW BALE DOME

CREATERRA

ARCHITECT: PROF. GERNOT MINKE - COFFEE SHOP IN PORTUGAL!

INSIDE THE STRAW BALE DOME

CLAY FLOOR DIRECTLY ON FOAM GLASS

TECHNICAL INSTALLATION: VENTILATION

VENTILATION: SMARTVENT 1: OUTSIDE - INSIDE

VENTILATION: WALL INTEGRATED UNIT: SMARTVENT 2

VENTILATION: EXAMPLE PLAN

VENTILATION: ENTALPY CONCEPTS

VENTILATION: ENTALPY CONCEPTS

CREATERRA

- High sensible and latent recovery rate
- No transfer of dirt
- antimicrobial characteristics of the membrane, resistant against mold and bacteria
- Washable with water
- Frost- and heat tolerant
- Long lifespan (approx. 15 years) at permanently high recovery rates

- 60-70% of humidity can be recovered
- possible to operate the devices at an outside temperature of -8°C without having any frost.

source: <u>dpoint.ca</u>

VENTILATION WITH HEAT RECOVERY: AIRPOHODA (CZECH REPUBLIC) CREATERRA

FROST PROTECTION -30°C EFFICIENCY >85% ENTALPY FUNCTION

VENTILATION: ENTALPY CONCEPTS

Figure 2.1: cold climate

Source: recair.com

VENTILATION WITH HEAT RECOVERY: AIRPOHODA (CZECH REPUBLIC) CREATERRA

WITH **COOL BREEZE:** DEHUMIDIFYING & COOLING

Figure 2.2: warm-humid climate

Natural materials & Passivhaus work well together

To go mainstream, we must adapted to the market

Provide added value with simple technology

There has never been a better oportunity!

THANK YOU FOR YOUR ATTENTION!

CREATERRA

WWW.FACEBOOK.COM/CREATERRA

WWW.CREATERRA.SK