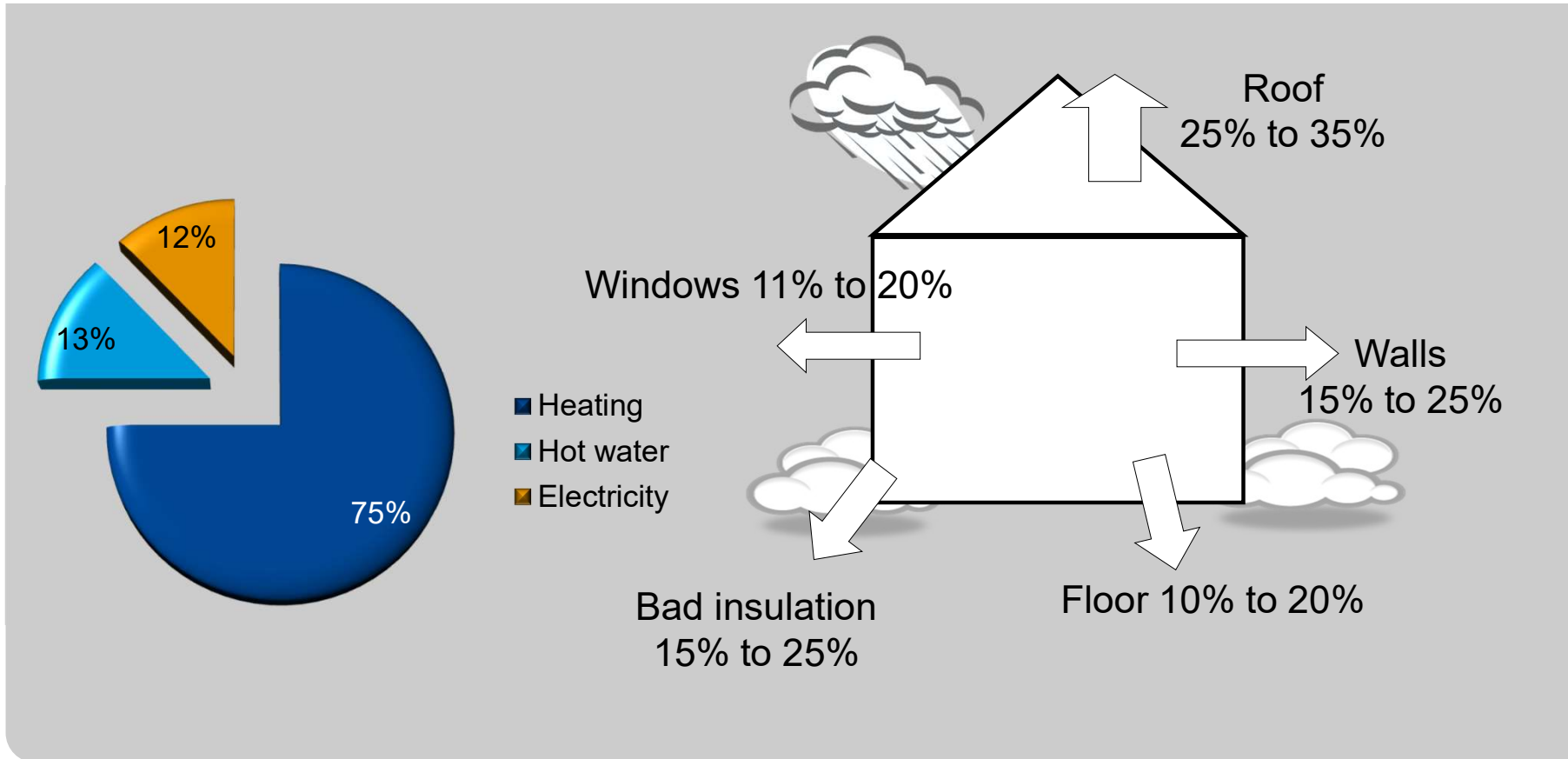


**iReflex**

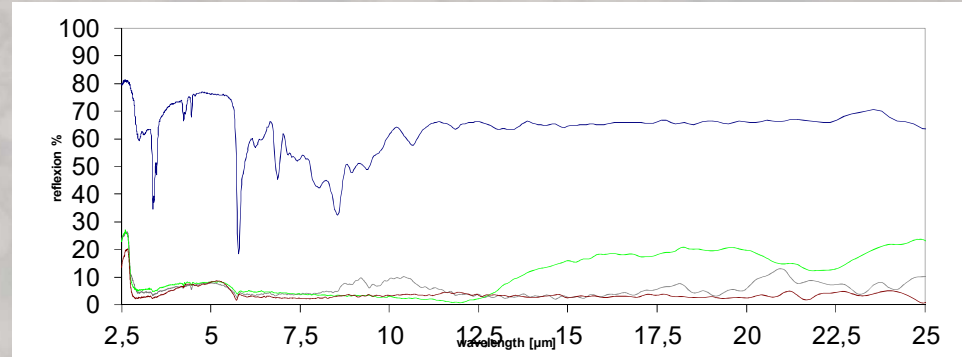
**Radiation reflection Indoor & Outdoor**

## Energy Balance

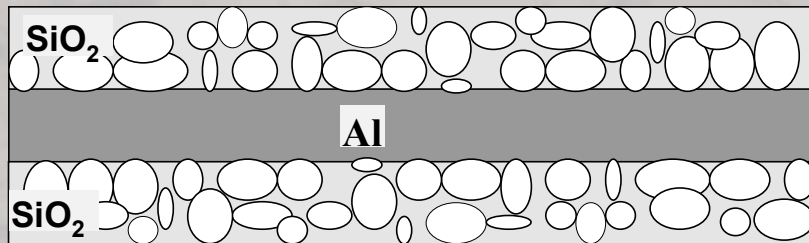


## STAPA® Aluminium Flakes as Reflectors

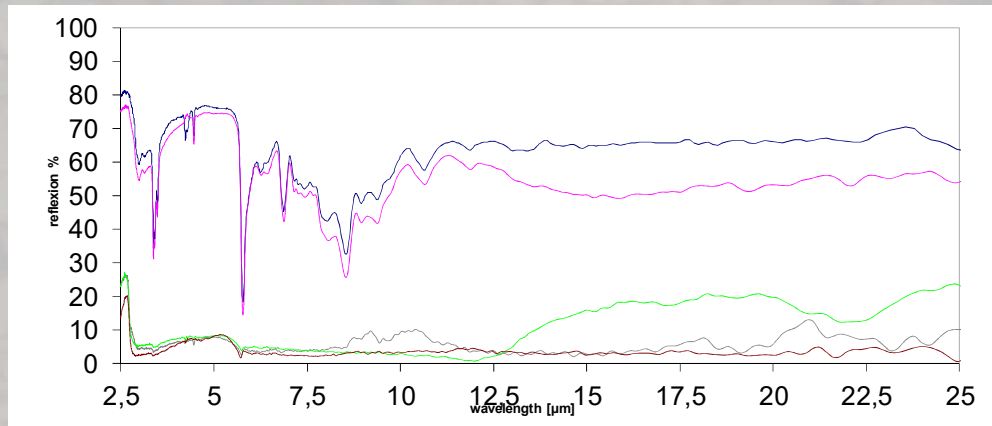
- Metal / aluminium provide high heat reflective properties
- The coarser the metal pigment, the better are reflective properties
- Flake shaped particles work like a mirror and best best suitable
- STAPA Hydroxal E 212



# ECKART Solution: iReflex



- Off white
- Price level to be considered
- Tintable to a variety of colours



## Radiation

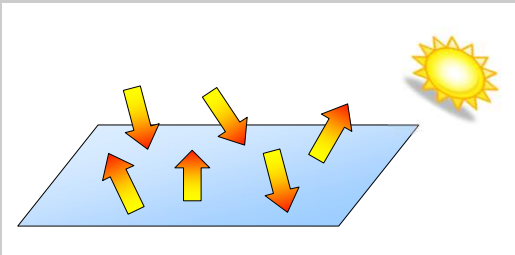
### External

#### Solar radiation

Spectrum UV / Visible / NIR

#### Desidered functionality

Reduction of heat inside the home through the reflection of heat towards the outside.



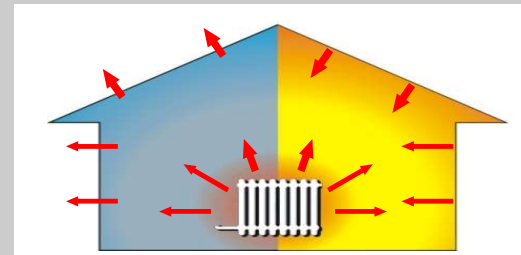
### Interior

#### Thermal radiation

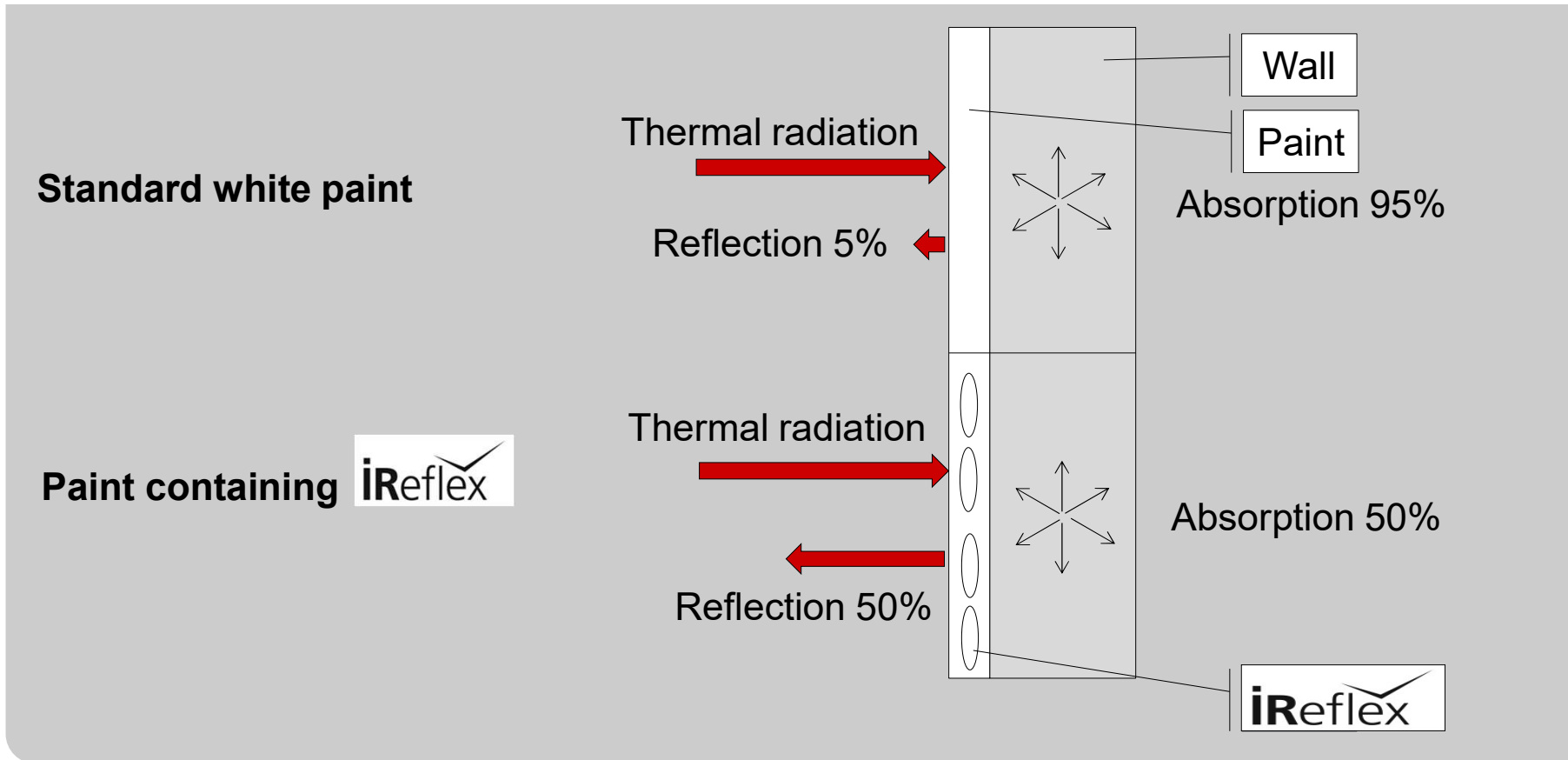
Objects such as radiators, walls, and humans emit MIR (20-100°C)

#### Desidered functionality

- Reduction of energy consumption
- reflection of heat inwards.
- Thermal comfort .



## Reflectivity of Radiation





**Bauhaus-  
Universität  
Weimar**



Independent study conducted at BAUHAUS UNIVERSITY\* in Weimar

\*Faculty of Construction Physics.

- Inhouse application in air conditioned chamber
- "Feelix" wired with 7 km of electrical cables and sensors to mimic human body`s thermal comfort
- Comparative testing standard white wall paint vs. **iReflex** containing wall paint

Test conditions:

- Underfloor heating
- Outside temperature: -5 °C
- Initial room temperature: +21 °C
- Painting: based on Shinedecor IReflex 5000 White with a 50% reflection value
- Feelix heat flow density:  $q = 70.2 \text{ W/m}^2$  - Comfort point of an average human body

## Independent Study: Results

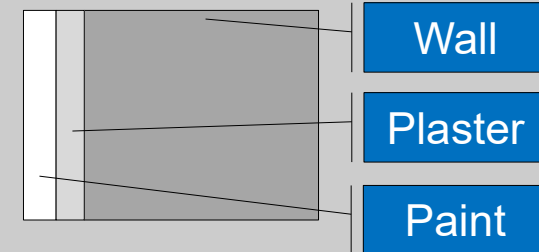
Simulated room	Type of construction	Outside wall temperature (internal wall)	Saving
two walls facing outside and ceiling	Old building	14,7 °C	22 %
	Building of the 1970	16,4 °C	19 %
	<b>Passive House</b>	<b>19,6 °C</b>	<b>16 %</b>
just a wall facing outside	Old building	14,7 °C	17 %
	Building of the 1970	16,4 °C	17 %



## Outdoor Application: Algae and mildew

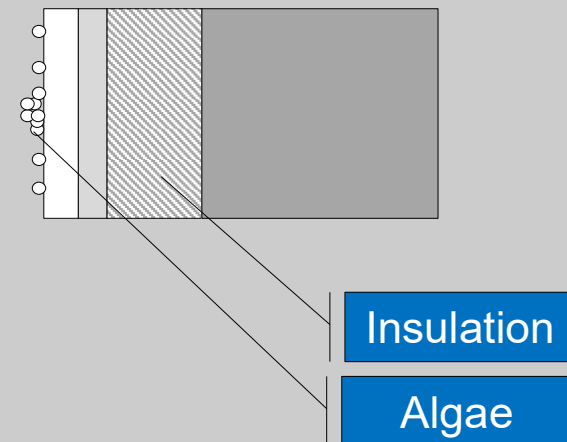
Exterior wall without insulation

- > wall surface temperature higher than environment
- > no microbial attack



Energy efficient wall; perfectly insulated

- > wall surface temperature lower than environment
- > no microbial attack (algae / mildew formation) and subsequent degradation

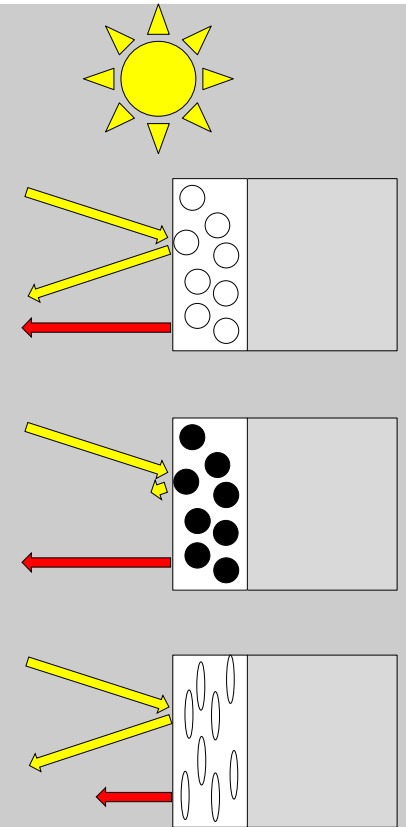


Use of toxic biocides is common (short term efficiency).

## iReflex **In Exterior Applications**

- Preventing water condensation on the façade stops the growth of microorganisms.
- Exterior wall coat containing low emission paint containing **iReflex**
- Low-emission paints retain more heat in the plaster and release it over a longer period of time.
- In this way the façade remains warmer reducing the formation of condensation water
- No formation of algae and mildew

- Highly reflective (white) wall  
sunlight is reflected; high emissivity  $\varepsilon = 0,9$   
wall gets cool
- High absorptive (black) wall  
sunlight is absorbed; heat build-up; high emissivity  $\varepsilon = 0,9$   
cooling during night
- Low emissivity wall with **iReflex**  
low heat emission  $\varepsilon = 0,3 - 0,7$  (depending on formulation)  
no cooling; no algae / mildew





- Fraunhofer Institute for Construction Physics
- Holzkirchen (nearby Munich), a very rainy and windy area
- Initial results confirm for low emissivity paint with significantly reduces water condensation on exterior walls.
- After 3 ½ years of exposure: no growth of algae and mildew while “normal” exterior walls displayed algae and mildew growth

## Summary **iReflex**

- Interior Application
  - reduces heating costs
  - creates well-being atmosphere
- External Application
  - reduces growth of algae and mildew formation (shift of dew point)
  - reduces costs (heating / air conditioning)

In any case is easy to apply

**Thank you for your attention!**