Building skins as open border between building and territory

Original
((Intervento presentato al convegno 9th ENERGY FORUM: Advanced Building Skins tenutosi a Bressanone nel 28-29 October 2014.

Availability:
This version is available at: 11583/2577542 since:

Publisher:
EF ECONOMIC FORUM

Published
DOI:

Terms of use:
openAccess
This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository
THE BUILDING SKINS AS OPEN BORDER BETWEEN BUILDING AND TERRITORY

The concept

HIPIN (High Performance Insulation Based on Nanostructured Encapsulation of Air) project aims to develop a sustainable and affordable technology to produce a nanostructured thermal insulating layer to improve thermal efficiency in new buildings and retrofitting of existing buildings.

HIPIN aerogel

Starting from TEOS (R=CH3-CH2-), IMS, DI water and HCl:
1) Sol gel route: hydrolysis and condensation reactions;
2) Heating to promote first level of hydrolysis/ condensation;
3) Second hydrolysis/condensation step to give an alcogel;
4) Supercritical drying to give an Aerogel.

Incorporation into building materials

3 THERMAL INSULATING SYSTEMS

THermal PAINT
Solventless (VOC regulation)
Stable for 2 years/wet and 5 years/dry
Colour and gloss are stable over time
Thickness 20-50µm (dry-film)
Thermal Conductivity < 0.7 W/mK

THermal PLASTER
Pre-mixed (fast application)
Finishing and paintable
Breathable
Thickness < 45 mm
Dry bulk density < 250 kg/sqm
Thermal Conductivity < 0.03 W/mK

THermal PANELS
Fast application
Vapour diffusion
Thickness < 30 mm
Thermal Conductivity < 0.013 W/mK

ACKNOWLEDGEMENTS
HIPIN is a collaborative project funded by the European Union’s Seventh Framework Programme managed by REA-Research Executive Agency [FP7/2007-2013] under Grant Agreement Number 260117.

(HIPIN aerogel)

Phase diagram showing the supercritical drying (red arrow) which goes beyond the critical point.