Building skins as open border between building and territory

THE BUILDING SKINS AS OPEN BORDER BETWEEN BUILDING AND TERRITORY

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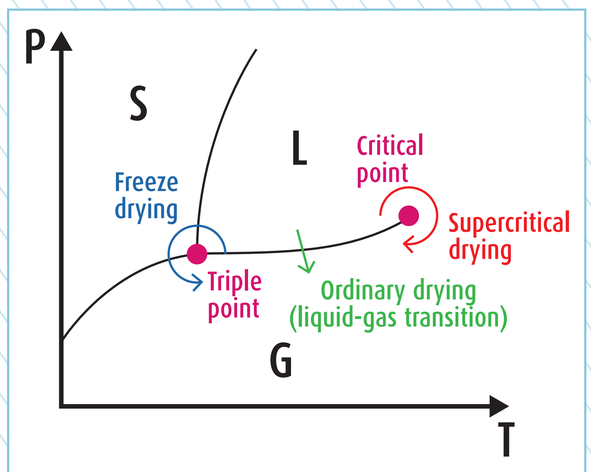
The concept

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



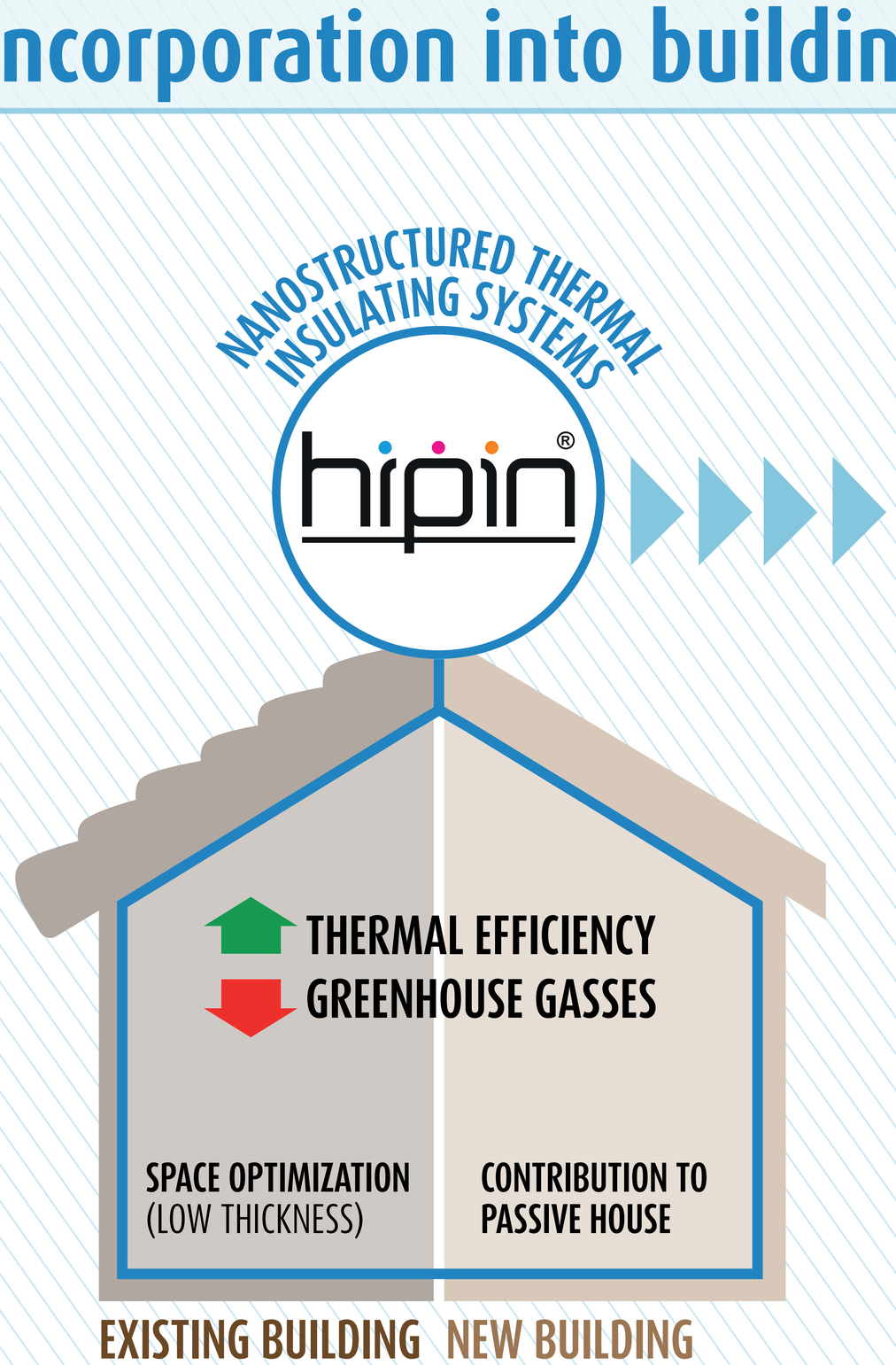
Phase diagram showing the supercritical drying (red arrow) which goes beyond the critical point

Starting from **TEOS** (R=CH3-CH2-), **IMS**, DI **water** and **HCl**:

1) Sol gel route: hydrolysis and condensation reactions;
2) Heating to promove **first level of hydrolysis/ condensation**;
3) Second hydrolysis/condensation step to **give an alcogel**;
4) Supercritical drying to **give an Aerogel**.

- HIGH THERMAL INSULATING EFFECT
- AFFORDABLE
- HIGH ROBUSTNESS
- EASY TO MIX
- FIRE RETARDANT
- LONG TERM PERFORMANCE

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**

SEVENTH FRAMEWORK PROGRAMME

PARTNERS

TWI
AkzoNobel
ARUP
ENVIRONMENT PARK
METHODO La Parete Ventilata
ORIENT RESEARCH CONSULTING ARCHITECTS & ENGINEERS
SEPAREX Supercritical Fluid Technology
Thomas Swan Chemical manufacturing since 1926
Vimark

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