JY007_1

ComfortCapsule Concrete

concrete_design_competition_2008

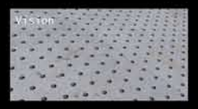
Concrete, nowadays, combined with different kinds of materials and features appears to achieve every quality one can imagine; There is concrete glowing in the dark, concrete which one can see through, buildig components of concrete that are exceptionally thin and concrete, plants can be raised on...
Hence, even concrete's most obvious lack has been abolished: In concrete embedded Comfort Capsules make it an enjoyable and exciting surface for every interior room.

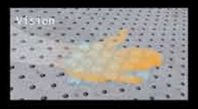
Comfort Capsule Concrete is designed to obtain the visual appearance of fairfaced concrete. Therefore it reacts to the alternating utilization of an interior room.
The Comfort capsules, embedded into the surficial area of the screed, respond to the heat a persons body on the floor pavement dispenses:

they increase their volume so that a dense bubble carpet appears upon the concrete surface. This carpet is not only soft to lay and sit on; As it absorbes noise, it also features an acoustic benefit to the comfort in a room.
When it is not needed, the carpet automatically disappears in the screed so that one can enjoy the plain visual appearance of concrete.

The thermo-dynamic actuation of the capsule does not necessitate any other source of energy than the heat of human body and works with an ecologically harmless and non flammable chemical mixture.

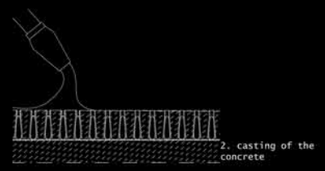
The Comfort Capsule Concrete keeps concrete up in the leage of interior room's surfaces as it convinces in the level of comfort, flexibility aesthetics.

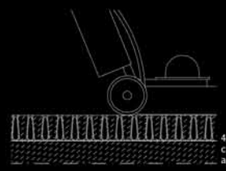


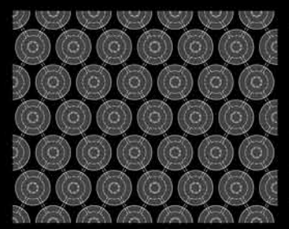



1. mat affixed on bottom plate

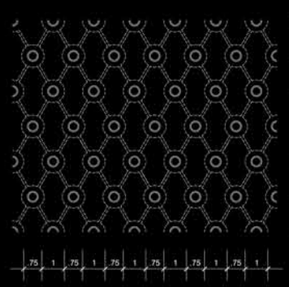

3. capsule expanding and pressing out excresent bulk, while concrete is dispensing heat of hydration


2. casting of the concrete

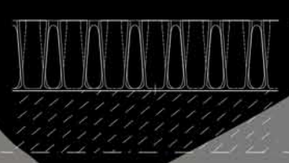

4. grinding concrete and mat to an even surface



surface view
M 1:1 [cm]
expanded capsules



surface view
M 1:1 [cm]
drawn-in capsules



sectional cut
M 1:1 [cm]
drawn-in capsules

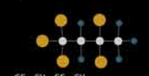
JY007_2

Blend of pentafluorobutane and heptaflouropropane

data_sheet

company_Solvay
product name_ Solkane®
components_ pentafluorobutane/
heptaflouropropane

pentafluorobutane

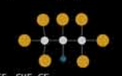


CF_3-CH_2-CF_2-CH_3

data_sheet

molecular weight average_ 148,09 [g/mol]
bubble point_ 40,2 [°C]
vapoure pressure_ 47 [kPa]
thermal conductivity of vapour _ 10,6[W/K]
flammable_ no
pH_ neutral

heptaflouropropane



CF_3-CHF-CF_3

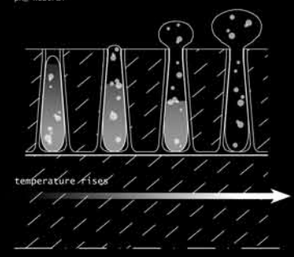
data_sheet

molecular weight average_ 184.05 [g/mol]
bubble point_ 6 [°C]
vapoure pressure_ 126 [kPa]
thermal conductivity of vapour _ 11,1 [W/K]
flammable_ no
pH_ neutral

ratio of mixture 87/13

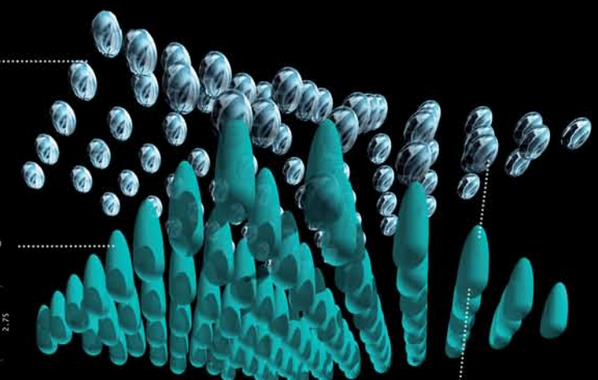
data_sheet

molecular weight average_ 150,6 [g/mol]
bubble point_ 24 [°C]
vapoure pressure_ 93 [kPa]
thermal conductivity of vapour _ 10,9 [mW/mK]
flammable_ no
pH_ neutral



The more the temperature rises the more of the blend changes it's phase from liquid to vapour and causes an expansion of volume up to at least 70 %.

The comfort capsules utilize the substance's feature, to expand their volume by changing the phase [liqiud to gas].
The change of phase depends on the temperature.
Comfort capsules use the human body heat for the expansion.
To create the necessary boiling point of approximatly 22-24 °C the used liquid is composed of two different substances, one with a high boiling point at 40,2°C and one with a lower boiling point at 6°C.
The ratio of mixture is 87/13.
The substances consist of carbon, hydrogen and fluorine.
Thanks to the large percantage of fluorine it is non flammable, non toxic and ecologicaly harmless.



TPE_thermo plastic elastomer_capsule skin

data_sheet

physical properties_ elastic
heat resistant_ 70 [°C]
thermal conductivity _ 14 [W/K]
flammable_ no
pH_ neutral

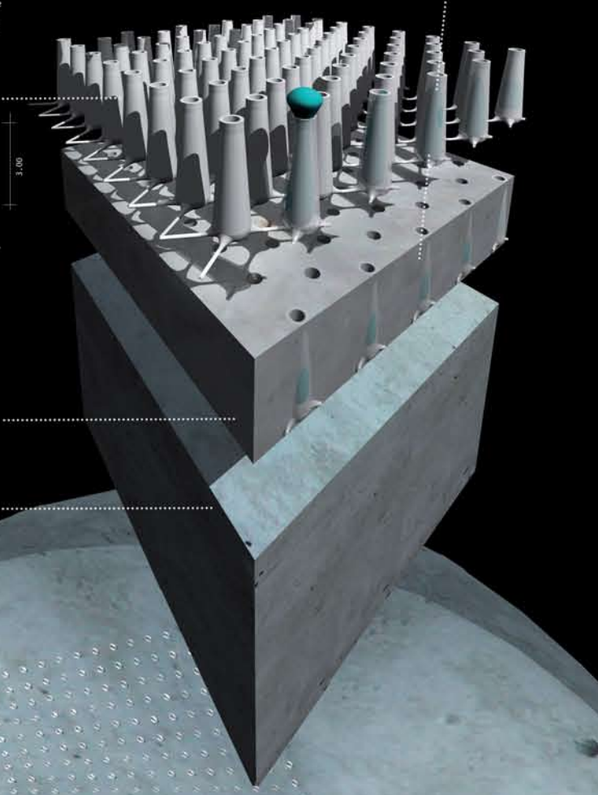
The capsule skin consists of extra adjusted polyblend (polymeres with different degrees of hardness), which provides the special properties to meet the requirements.
TPE is able to extend up to 800 times of it's original surface. Therefore it can easily capture the volume expansion of the gas inside.
As it is thermal deformable, it can be produced and recycled effortlessly.
The surface feel is comfortable and close to natural rubber.
On top it is available in various colors and range of tranlucency.

PET_ Polyethylenterephthalat plastic mat

data_sheet

physical properties_ solid
heat resistant_ 250 [°C]
thermal conductivity _ 14 [W/K]
flammable_ no
pH_ neutral

The plastic mat containing the TPE capsules, eases the handling on the building site.
It can be fitted ,by cutting, in every form and size.
The material is base resistand and deformable only at extreme heat.
As it is non toxic it can be applied in any environment.
Commonly PET is used as food wrapping, plastic bottles, film material, or also as stents in medicine.



screed with embedded comfort capsules

reinforced concrete