
THERMOLINE

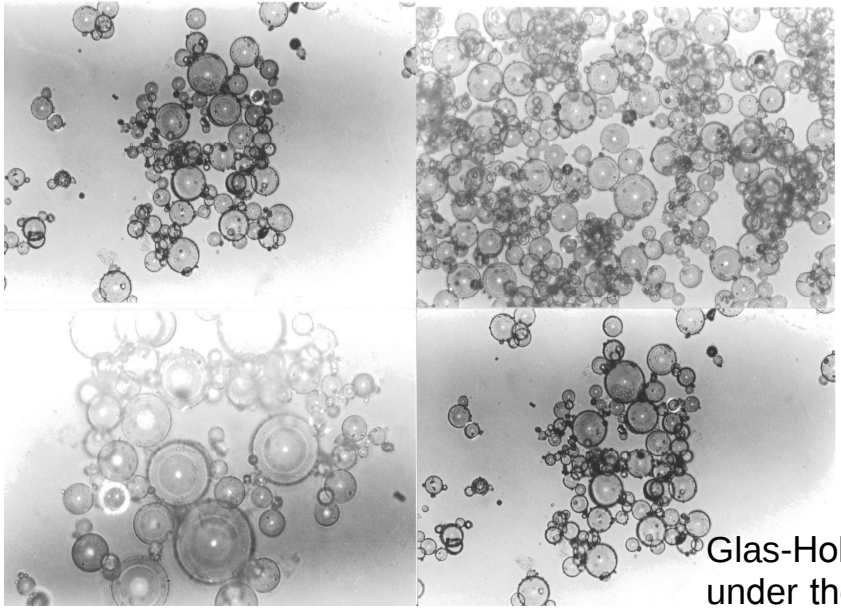
The Problem

Due to the change in how buildings are heated, from radiant heat (oven heating) to convective heating (boiler heating) about 60 years ago, physical defects in the construction of buildings have emerged. Some of these defects are general insulation, window insulation, ventilation systems, and so on. These problems should be corrected and, while trying to, we discovered that it leads to new problems.

The Solution

50% of the solid substance in

THERMOLINE is made from Glas

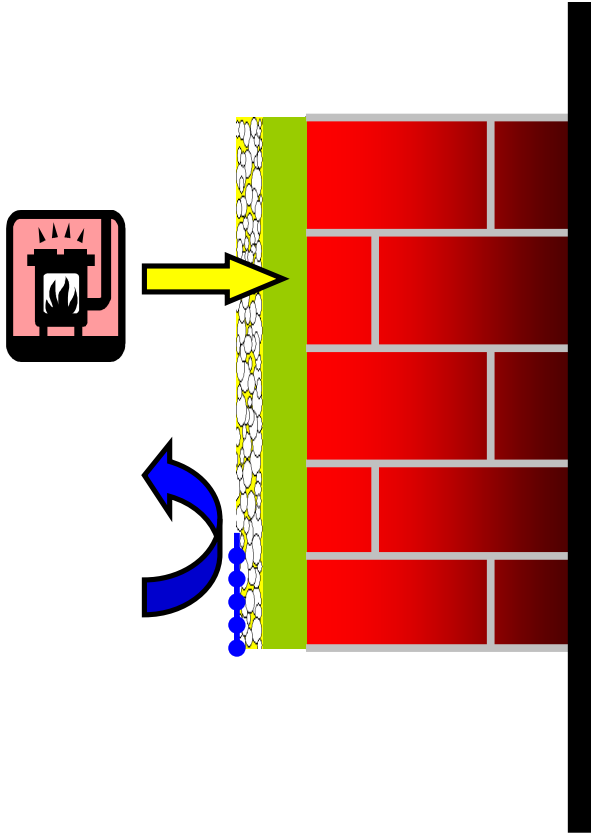


Glas-Hollow bodies
under the Microscope

THERMOLINE

INTERIOR

Interior coating (0.2 mm) with improved heat transfer to storable substrates



User benefits:

- Increasing the moisture retentive surface
- reduced moisture absorption of the subsoil
- removes easily moisture from the surface
- increased wall temperature
- predictable heating costs saves by up to 25%
- non-toxic, helps with mold prevention
- Comfort, health, wellbeing

THERMOLINE

Reduces the moisture absorption of the wall. Moisture can be better removed. The inner wall surface temperature increases by up to 3°C and, with improved heat radiation exchange between the walls, increases the comfort factor. Comfort with less room air temperature in conjunction with the indoor air humidity regulation reduces the heating demand.

THERMOLINE INTERIOR

and TCSystems Thermodyn IR Radiant heating

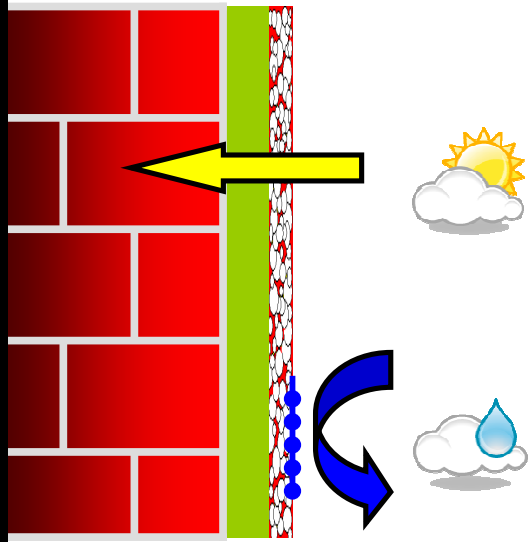
Thermal comfort in rooms is made possible as a rule not by warm air, but by warm walls.

The IR radiant heating system, Thermodyn, uses the physical laws of nature and heating by radiation, warming the surrounding surfaces of lounges. In conjunction with IR Thermodyn radiant heating system, THERMOLINE INTERIOR achieves its full development. The rapid ventilation of surface moisture produced by THERMOLINE INTERIOR helps the heat waves generated by Thermodyn IR radiant heating to eficiently reach the interior of the walls.

The result is a warm and dry wall.

THERMOLINE
EXTERIOR

Facade coating (0.2 mm) with improved heat transfer to storable substrates (brickwork)



Advantages for the user:

improved solar heat entry even with diffuse radiation ■
warm in winter and cool in summer ■
predictable heating costs reduced by up to 15% ■
water and dirt repellent ■
non-toxic ■
algae prevention, thus extension of renovation intervals ■

THERMOLINE

Stores valuble solar energy and prevents the walls from transmitting heat loss from inside out.

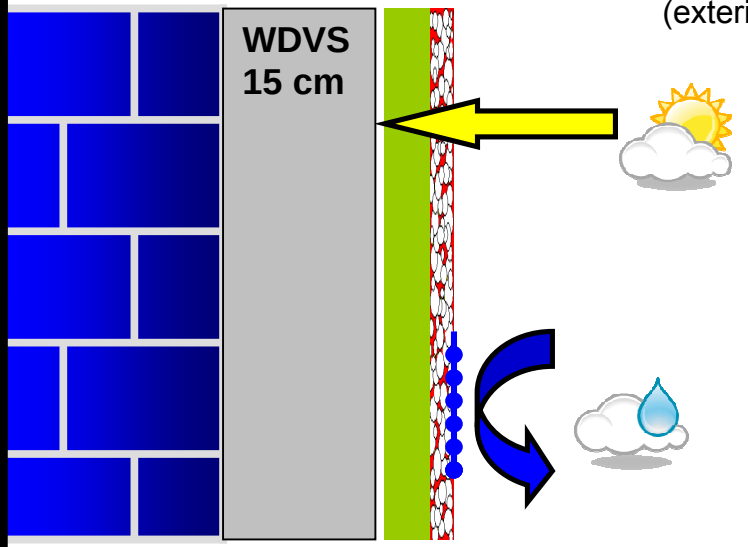
THERMOLINE

Opens up better storable compositions for solar energy, thus making a valuable contribution to the reduction of heating costs.

Facade surfaces insulated on the exterior brittle quickly and dry more slowly. Pollution and algae is the result.

THERMOLINE
EXTERIOR

Facade coating (0.2 mm) with improved heat transfer to EIFS (exterior insulation)



Advantages for the user:

- fast drying facade ■
- water and dirt repellent ■
- toxic-free algae prevention ■
- extension of the renovation intervals ■
- protects the building ■

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Is highly resistant to environmental influences and therefore considerably less brittle facades with EIFS (exterior insulation and finish system). By sun-warming the reinforcement, the facade surface dries quickly.

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stays brittle-free and water-repellent, heated through the warmth of the Sun with solar energy, the reinforcement and the plaster dry faster, they remain clean and free of algae. Renovation intervals are extended by up to 100%.

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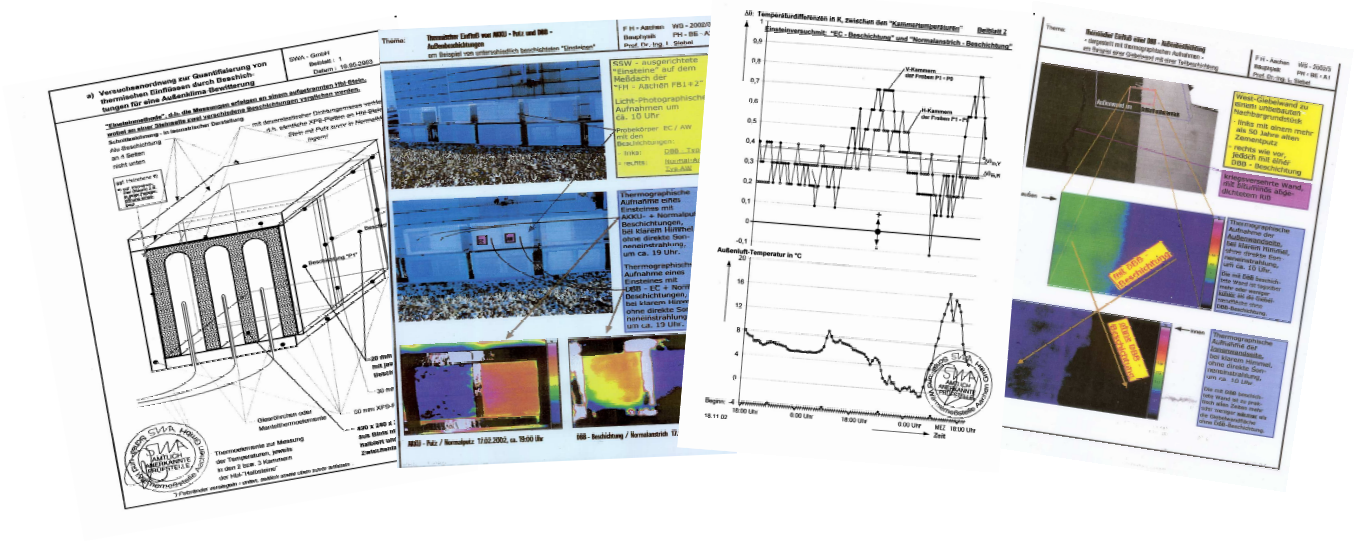
The surface coating with improved heat transfer to thermal energy storable substrates



The energetic effect of facade coatings with
THERMOLINE EXTERIOR
is proven by laboratory and field tests.

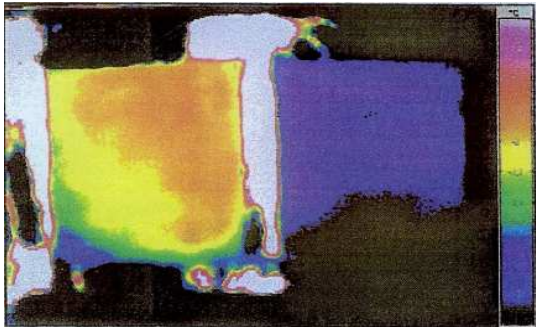
In conjunction with storable substrates, THERMOLINE products absorb significantly more solar energy than standard facade paints.

Thermography

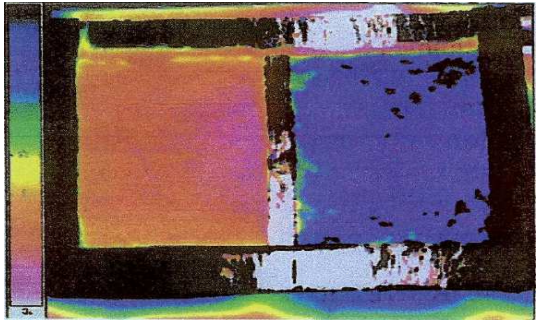
Thermographic pictures at test setup with homogeneous bricks.

The left side is with **THERMOLINE** ,

the right side is coated with normal exterior paint. Tested on February under a clear sky, out of direct sunlight, at about 19.00.



■ The right side of the specimen was coated with normal exterior paint on plain facade. The surface absorbs little energy and grows cold quickly.



■ The left side of the specimen was coated with THERMOLINE. During the day there is significantly better solar energy, or heat radiation, the heat is stored in the structure and can be slowly released back into the night.

Normal facade paints

Regular facade coatings reflect the sunlight spectrum of 400-2500 nm in freshly painted state to about 80%. Just a few months after the application of standard masonry paints, the reflection property is reduced from about 80% to only 45%. The result is embrittlement, crazing and receiving capillary moisture from the outside air sturated up to 100% rel. humidity. Only 4% damness from the ground humidity of the outer wall reduces the isolation properties of the construction by about 50%. With increased dampness (humidity transports heat) large quantities of heating energy are consumed. With increased dampness and the associated heat input, by insufficiently reflective facade suface, even the air conditioning system is extremely stressed and consumes large amounts of electrical energy.

Normal interior colors

Interior paints are mainly used for color design. In homes the human moisture is absorbed through walls and ceilings. The better it is dehumidified, and the less evaporation energy is produced on surrounding surfaces of a room, the less energy for heating the ambient air is required. Because usually only by high energy consumption, the humidity absorbed by the wall / ceiling can be re-released into the air (heating / ventilation), discomfort and high heating costs are the result of the entire phase change. Simultaneously pollutants are transmitted into the air, which significantly affects the health of residents, by the permanent moisture transport processes into the wall / ceiling and from the wall / ceiling. Air conditioners are dehumidifiers and have the task to cool the air after dehumidification. The better dehumidified, the less energy is required for cooling the room air. As a rule, while the humidity absorbed by the wall / ceiling can be released only by high energy input again into the air, air conditioning / dehumidification systems are in continuous operation. Electric air conditioning / dehumidification systems are very costly.

FUNCTION OF THERM O LINE EXTERIOR

THERMOLINE EXTERIOR, by its special composition and structure, prevents rapid embrittlement of the surface. The glass-filled paints in THERMOLINE EXTERIOR are largely resistant to acids, alkalis, high and low temperatures. The reflection properties of the surface remains intact. Approximately 20% of the solar radiation can penetrate through the glass-filled membrane in the construction and leads to its heating. Moisture from the outside ambient air can not infiltrate, the already existing moisture in the walls can be better evaporated through solar irradiation. Optimum thermal insulation properties of the outer wall are achieved and the heating energy consumption is reduced by up to 15%. In summer, the improved insulating properties of the outer wall, the increased inward vapor pressure and the better reflection of the surface enable the reduction of the energy consumption of operating air conditioning / dehumidification systems by up to 20%.

FUNCTION OF THERM O LINE INTERIOR

THERMOLINE INTERIOR, by its special composition and structure, enlarges the moist receptive surface. Moisture molecules can dock on the enlarged wall and ceiling surfaces, in normal housing conditions, without infiltrating into the depth of the wall / ceiling. Thus, the occurring humidity is drying easily and without large amounts of energy. The fast vanishing humidity shortens the phase change and allows rapid thermal comfort through the dry and heatable surface. The heating cost diminishes up to 25%. At the same time, due to less moisture transport processes into the wall / ceiling and from the wall / ceiling, less pollution (radon, thoron, etc.) is transferred into the air, which is beneficial to the health of the residents. Biologically, THERMOLINE INTERIOR paints were tested and rated "excellent", and they guarantee the best indoor air quality. In summer, the fast evaporation of humidity relieves air conditioners, enabling rapid thermal comfort. The energy savings in air conditioning / dehumidification systems can be up to 20%. When using THERMOLINE EXTERIOR facade paints and THERMOLINE INTERIOR interior paints, heating costs can be reduced by up to 30%, and cooling loads can be reduced by upt to 20%, by component moisture regulation, reflection and air conditioning, depending on the existing building materials.

THERMOLINE

is available in more than 50,000 shades according to color charts of

■ NCS ■ RAL ■ Adler ■ Sto ■ Caparol ■ Sigma
■ Sikkens ■ Einza ■ Keim ■ Herbol ■ Zero ■ Terranova ■ Baumit ■ Relius

with glycol-free pigments

- light and weather resistant.
- alkali and acid resistant
- very good coverage
- APEO-, VOC- and plasticizer free
- compliance with RAL-UZ 102
- high pigment concentration - no over pigmentation
- for organic and inorganic colors

The highly elastic properties of
THERMOLINE EXTERIOR allows full tones under the lightness value of 20

THERMOLINE

and TCSystems Thermodyn IR Radiant Heat

- improves the energy use
- improves the exchange of thermal radiation
- improves the absorption of solar energy even in low radiation
- improves heat transfer on heat storage-enabled surfaces
- due to the surface of glass particles, better warmth storage effect for the walls
- improves thermal comfort and indoor climate
- reduces convection
- reduces and prevents formation of mold without toxic substances
- creates uniform surface temperatures
- creates uniform temperatures in the room
- adjusts the wall moisture and the air humidity
- protects the building materials
- environment friendly

THERMOLINE

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