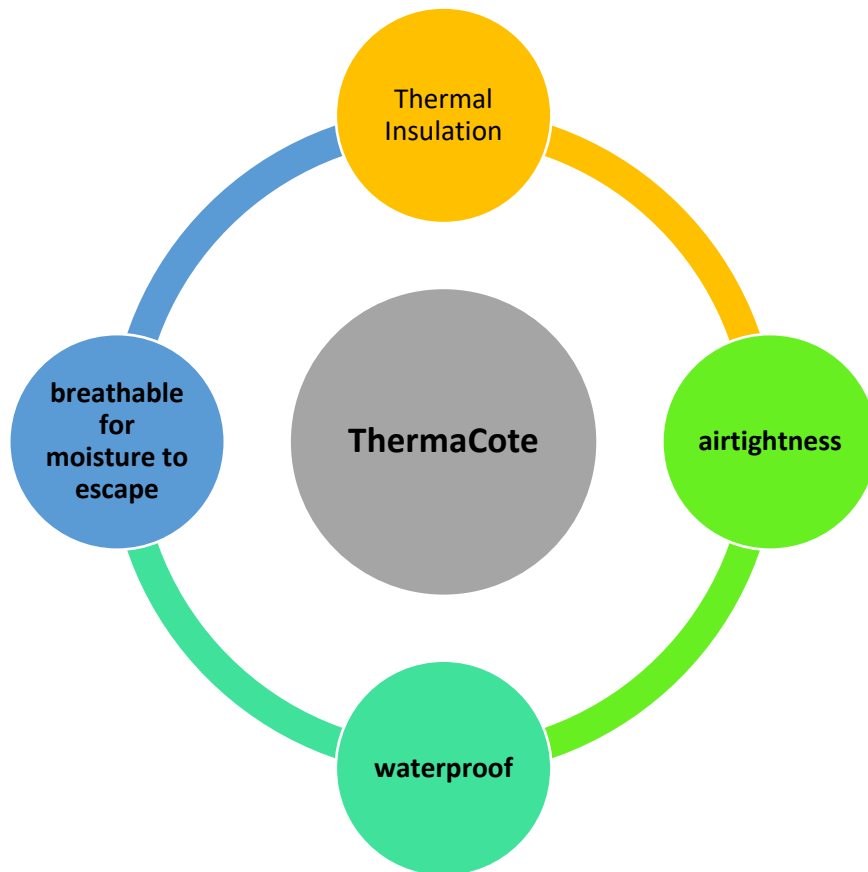


CONCRETE RICE SILOS

ThermaCote is a single component, fluid applied, high-performance acrylic coating for improving corrosion protection, sealing substrates from water and air intrusion and increases U-value and reflectance values of interior and exterior surfaces. It means that **ThermaCote is a 4 in 1 product: thermal insulation, waterproof but breathable for moisture to escape and airtightness.**



The water-based formulation, which weighs about half the weight of water in the wet state, offers a lightweight solution to maintain the structural integrity of exterior concrete walls, beams, ceilings, and roofs.

The ThermaCote formulation can be spray applied to nearly all exterior substrates to reduce or eliminate thermal bridges, air and water infiltration and common expansion and contraction issues caused by radiant, convective or conductive heat gain or loss.

ThermaCote Thin Insulation offers excellent thermal insulation: $R=1,87\text{m}^2\text{K/W}$, $U= 0,53\text{W/m}^2\text{K}$. One of its main advantages is with this thin thickness we can cover and create a complete envelop of the structure for a better efficiency than a conventional insulation. With ThermaCote we can treat any structure without any thermal bridge

ThermaCote is a thin reflective insulator, using the principle of thermal reflection to make any surface a "mirror with heat". The heat of the heating will be reflected to stay inside your home in winter and reflect the heat outdoors in the summer.

As a survival blanket for your building, ThermaCote improves the thermal insulation of the walls while treating most of the thermal bridges, bringing you comfort and energy savings.

The ThermaCote application remains breathable for moisture to escape from the coated substrate and allows concrete structures to remain drier and healthier, increasing their sustainability for longer periods.

ThermaCote is Breathability, it allows entrapped moisture in substrate to escape. It's like a gore-tex vest for the structure.

The moisture content of the wall has a direct impact on its thermal resistance. This is due to the increase of thermal conductivity value of the wall. Briefly, the humid wall problem has a direct consequence on energy consumption.

With ThermaCote a structure will perform closer to its assigned "R" or "U" value throughout its life.

ThermaCote protect from condensation in the structure due to its thermal performance, reflectivity, airtightness and high vapour permeable which can extract two times more moisture than it can enter.

Condensation: How to handle the risk of condensation when storing dry solids?

Condensation can be a major problem when storing several kinds of dry solids: moisture damages the material, causes clot formation, and facilitates fungal and bacterial growth. Particularly when storing food and animal feed, such conditions are totally unacceptable. With ThermaCote preventing or tackling condensation in storage silos is an important point of concern.

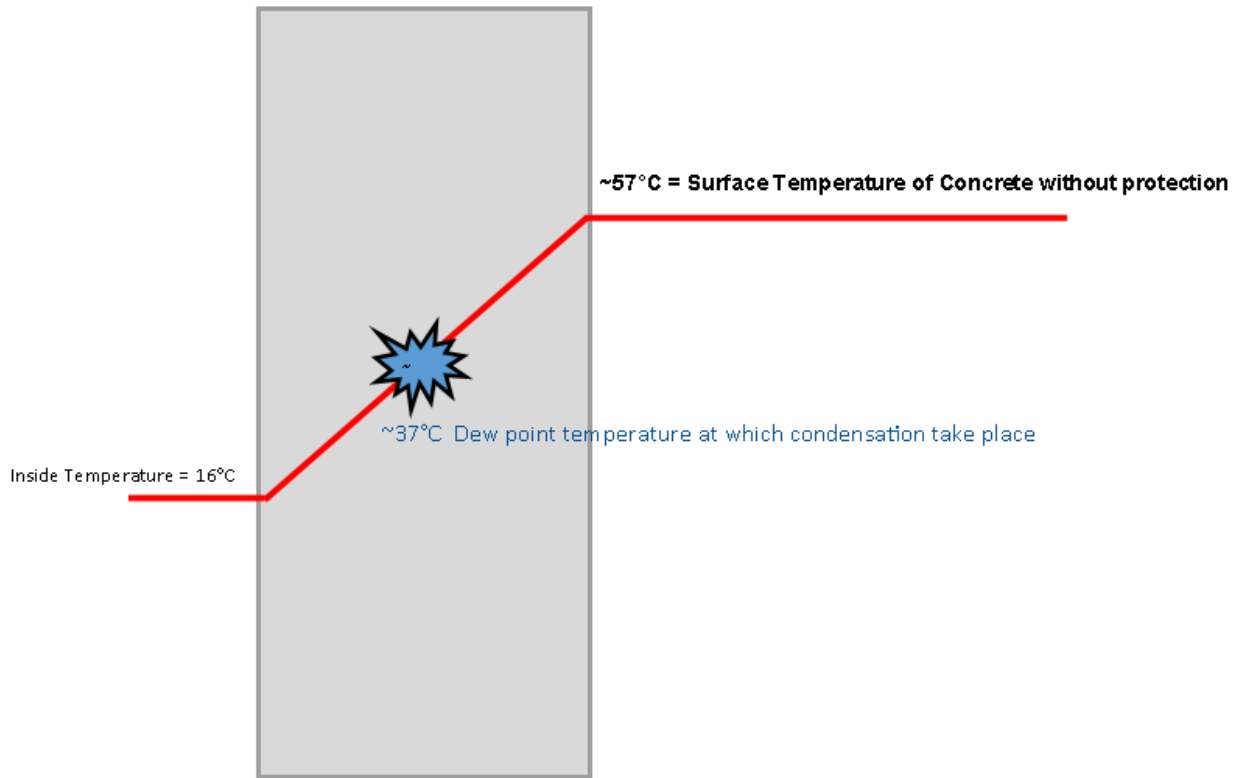
Condensation occurs when the amount of moisture in the air is higher than this volume of air can absorb. This is usually caused by the cooling of warm, humid air, so excess moisture condenses on the wall and on the material.

Substances which are very sensitive to moisture, such as cement, sugar or Rice, require tougher (and more expensive) measures than those which accept some exposure to moisture, especially as long as the stored material does stay too long within the silo. Moreover, in case of concrete silos, condensation can affect the silo itself: cracks can appear, rust in reinforced structure, which not only reduces their life span, but can also cause contamination of the (corroded) steel and the stored substance.

to what extent condensation can occur? This has mainly to do with the temperature and humidity when storing the substance. Warm materials often contain water that 'steams', so evaporates into the air inside the silo. After cooling, this excess moisture condenses. Furthermore, the temperature difference between day and night, or in this case the difference between inside and outside, is a major influence. The greater the temperature difference, the higher the risk of condensation in the wall. Risk of condensation start when you have more than 10°C different between inside and outside.

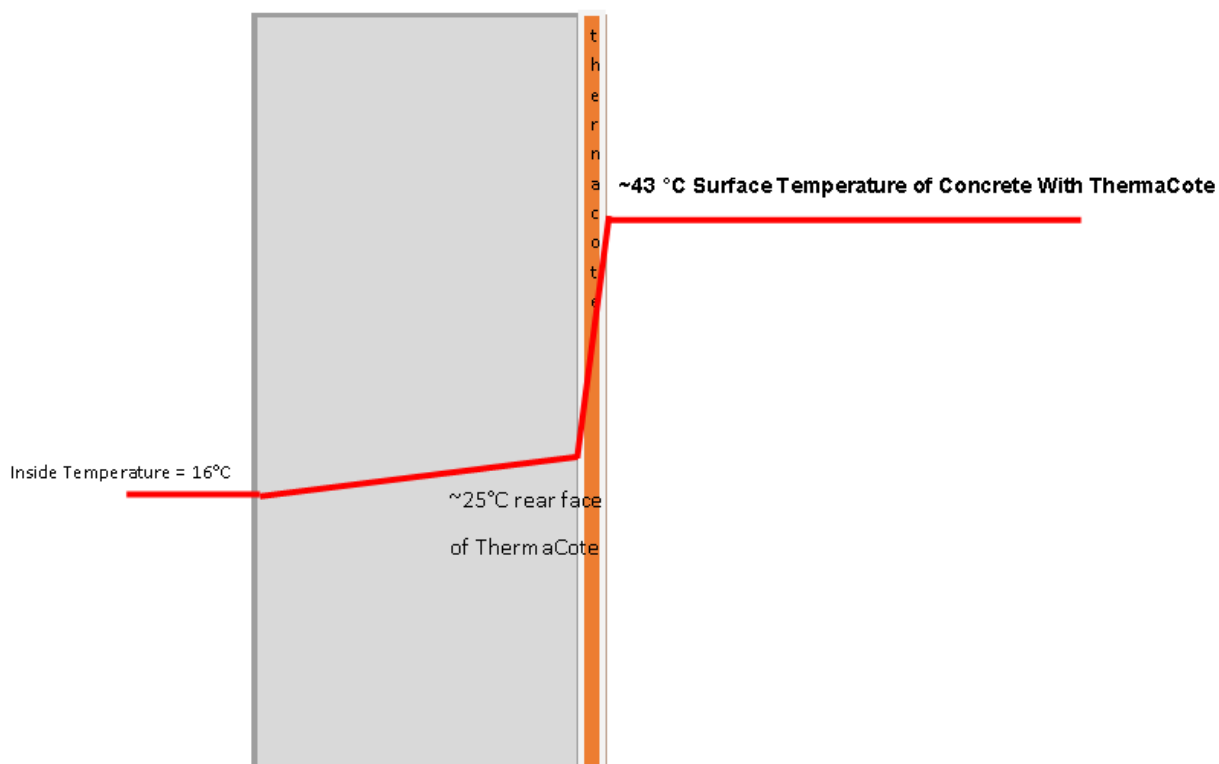
Without ThermaCote, a risk of condensation inside the concrete:

Average temperature (Average of the max daily recorded temperature = 42°C)



With ThermaCote, no risk of condensation inside the wall,

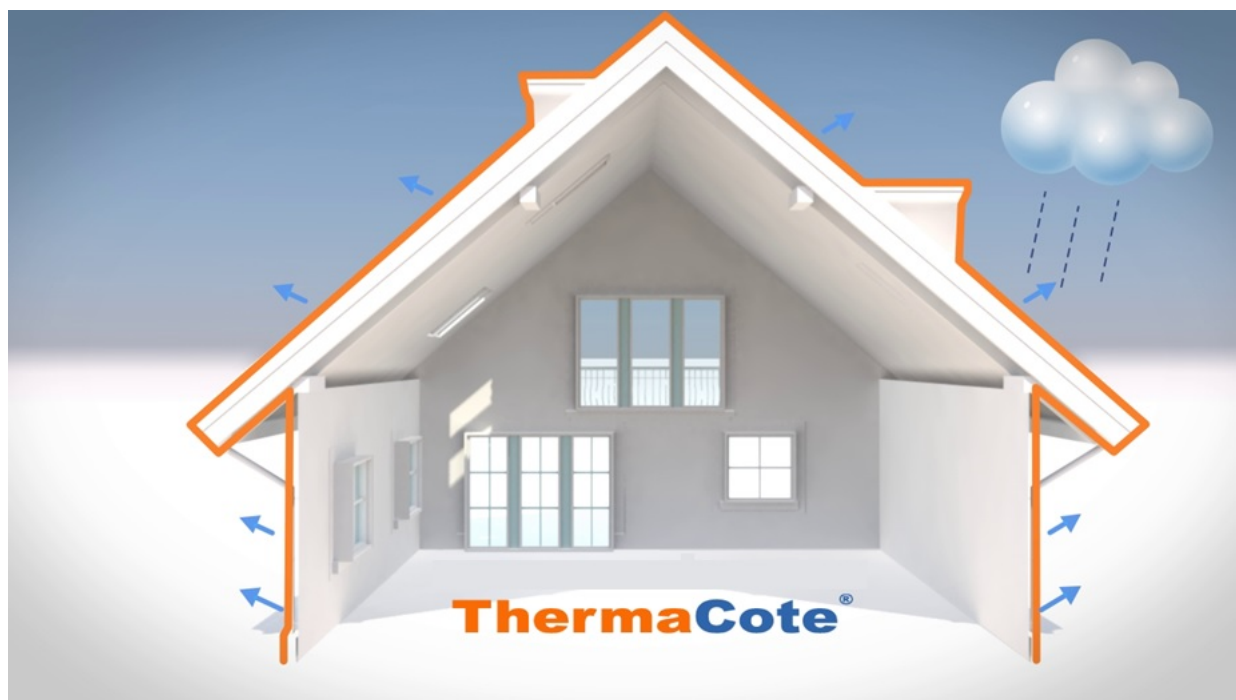
Average temperature (Average of the max daily recorded temperature = 42°C)



Building materials such as concrete, mortar, bricks, wood etc are porous in nature and expand by absorbing moisture. A reinforced concrete, as your case, need to be protect from condensation and dew point to avoid any rust of the reinforced structure, decrease life of the structure and possibility of cracks. As ThermaCote will protect, control and extract moisture in the concrete structure, it will protect it to any expansion and cracks.

Condensation and dew point on the structure could be critical for rice storage because it can increase the humidity. as it need to be store at low humidity. ThermaCote will protect from moisture can guarantee a low humidity of the concrete and help to maintain a low humidity to store Rice in the best condition.

Extraction of moisture: ThermaCote will remove most of the residual hygrometry of the wall, knowing that moisture is an aggravating factor of heat transfer. The water vapor permeance of ThermaCote is 6.779 Perms in the inner to outer direction while it is only 3.618 Perms in the outward inward direction. It is therefore normal for the residual humidity of a wall to migrate towards the outside:



The ThermaCote® formulation includes our 'BMR' (Black Mold Resistant) technology to resist the formation of algae and black mold in hot and humid and, as well, cooler climates and protects your projects your SILOS in different whether conditions.

ThermaCote will protect structure to any problem of Condensation.

As with ThermaCote we will insulate and guaranty that the temperature will be stable we can avoid any problem of condensation. Condensation can appear in any structure when you have more than 10°C difference between inside and outside.

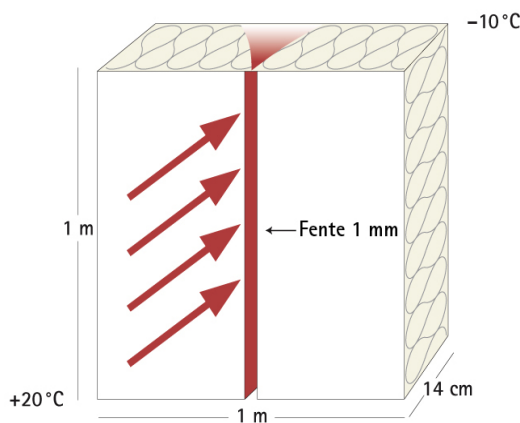
ThermaCote® has been tested and is UL CLASSIFIED (with a zero-flame spread and low smoke development) as a CLASS A Fire Retardant in all of North America and includes the Canadian UL. ThermaCote is a CE mark for CONCRETE PROTECTION (which also includes carbonation protection) means that ThermaCote is concrete's best friend!

Carbonation of reinforced concrete is one of the most common forms of deterioration in buildings and infrastructure. Untreated masonry is also highly vulnerable to the damaging ingress of water and heat cycling. Carbonation is a natural process and is virtually impossible to avoid in unprotected concrete as the process begins as soon as concrete is exposed to the elements.

Carbon dioxide from the atmosphere reacts with the concrete, leading to a loss of alkalinity and subsequent corrosion of the reinforcing steel. Structural integrity can therefore become severely compromised, so it is critical to specify anti-carbonation coatings for both new and existing structures.

Airtightness primarily focuses on the elimination of all unintended gaps and cracks on the external envelope of the building. Airtightness is an essential part of creating a healthy, comfortable, energy-efficient living environment. In contrast, air leakage is where leaks occur due to gaps and cracks that should not be there in the first place. This can cause for up to 50% of all heat losses through the external envelope of a building. There are many factors which can cause air leakage such as poor build design, poor workmanship, or indeed the inappropriate materials used. It is important to remember that an airtight building does not mean it is hermetically sealed, rather it means that the air leakage has been reduced to a minimum.

Insulation requires high levels of airtightness to perform.



Comparison between sealing and non-airtightness

The Institute of Building Physics Stuttgart has studied a thermal insulation structure of 1 x 1 m, with an insulation thickness of 14 cm. The study allowed confirm insulation performance of 0.30 W / m²K, previously calculated, with airtight performance, without any slits. On the other hand, if the same structure has a wide slot of only 1 mm in the airtight layer, the U value deteriorates and climbs to 1.44 W / m²K.

This structure therefore causes heat loss almost five times greater than that of the airtight structure.

Therefore, for insulation in a structure to perform it needs to be protected against air movement on both sides

Comparison of air leakage rate of different materials:

Materials	Average leakage rate at 75 Pa in L/s.m ² of surface
polyethylene of 0,15 mm (6 mil)	no measurable leak
Expanded polystyrene of 25 mm	4,7
Fibreboard coating of 12 mm	1,6
Construction membranes permeable to water vapor	between 0.011 et 3,6
Closed cell foam insulation	0,001
Uncoated brick wall	1,6
Uncoated concrete blocks	2,1
ThermaCote	0.0001

As ThermaCote is applied by airless sprayer and low thickness it can create a real envelope of the structure grant a High-performance airtightness, which is essential for energy-efficient construction and optimal performance in

summer and winter. ThermaCote enhances the airtightness of the structure & building, which is an essential key to thermal performance, save energy and enhanced life of the structure.

In addition to thermal losses generating discomfort and excessive energy consumption, parasitic air leaks are also a source of pathologies damaging to the building structure (moisture, mold, degradation of thermal performance, corrosion in structure, etc.).

The airtightness of the building envelope is therefore also an essential stake for its conservation and durability.

For the insulation to play its role, the envelope must be free of any air leak (a sweater full of holes will not keep you warm even if it is thick)

Thermal insulation separates indoor and outdoor climates. The difference in temperature between these two climatic zones tends to equilibrate by airflow. Therefore, in winter, warm air tends to escape from the building to the outside through the building. The airtight layer prevents this flow, called convection, and therefore the loss of hot air to the outside.

But sealing is not about hermetically isolating the interior space from the outside air, as a plastic bag would do, it's about airtightness and not water vapor!

On rice silos ThermaCote will help to cool down and maintain the temperature of the Rice inside the silos. You can save energy and save time of working for cooling system. as Cooling system and ventilator will work less time we can extend the life of your system and lower cost for maintenance.