

## **Case Study**

# **15+ Years of Acrylic Thermal Insulating Coatings**

Acrylic insulating coatings have been used as a replacement for conventional insulation over the last 20 years because of their ability to prevent Corrosion Under Insulation (CUI) and their ease of maintenance, amongst other reasons. Even in harsh ambient or process environments, applications that were completed 20 years ago are still in service today. Most types of conventional insulation would have already seen 2 – 3 lifecycles during the same time period in similar conditions.

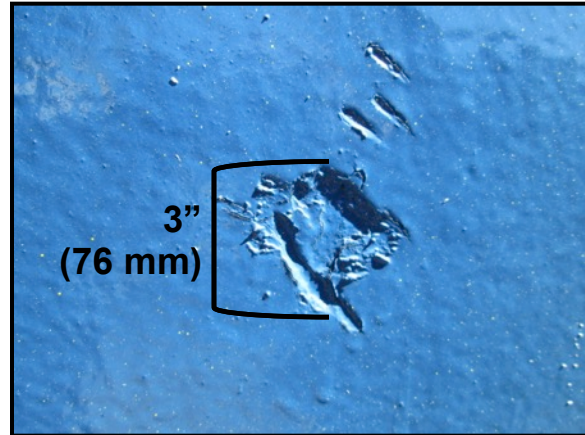
The key to the coatings' longevity is that they provide a seamless membrane on the substrate, which does not allow moisture intrusion. If the coating is damaged mechanically or by other means, it is localized at the point of impact. That damage is then easily repairable with a small application sprayer and an air compressor.

To effectively showcase the long life cycle of acrylic insulating coatings, Mascoat visited one of its oldest clients in the summer of 2014. This sugar mill is located 12 miles from the Louisiana Gulf Coast and has been using insulating coatings since the mid 1990's.

The coatings are very effective in sugar mills for a number of reasons. Usually the facilities are located in coastal areas that are prone to high humidity. Coupled with the steam and moisture involved in the refining process, CUI is a constant issue. Personnel working in the mills have the risk of being burned, as they have to work close to all types of hot process equipment. Also, energy retention is very important to keep refining costs as low as possible.

## Diffuser

16+ years service



This diffuser was coated with Mascoat Industrial-DTI and finished with a protective topcoat. It has been exposed to the humid Gulf Coast environment and at least 9 tropical storm or hurricanes since being coated. The plant manager noted that they have no problems whatsoever with corrosion and have had to perform very little maintenance.

To date, the only maintenance needed has been on areas damaged by personnel or flying debris during storms. In those cases, repairs were localized at the point of impact, as shown in the picture to the right. These repairs were completed with Mascoat's Small Application Sprayer using a portable air compressor.

## Evaporators

18+ years service



The evaporator on the right was coated with 80-100 mils (2.0-2.5 mm) of Mascoat Industrial-DTI, while 2.5-3 inches (63-76 mm) of mineral wool was installed on the one on the left. The facility did this to test the performance of the coating versus the mineral wool. When the plant is running, they operate between 212°-215°F (100°-102°C). During trial periods, no discernable difference in energy use was noted.

In the early 2000's, a fire started from a welding job nearby and the mineral wool caught fire very quickly due to molasses leaking into the insulation. After the site was cleaned up, they applied an insulating coating to that evaporator to reduce future fire risk.

Neither evaporator has needed any insulation maintenance since that time. Unlike conventional insulation, molasses is easy to clean up when it leaks on to the coating.

## Reheaters

12+ years service



These reheaters were subject to a similar test like the evaporators above. The one on the left has 2.5" (63 mm) of mineral wool and the one on the right has approximately 120 mils (3 mm) of Mascoat Industrial-DTI. No discernable difference has been noted in the performance, but the plant manager said that they have to perform regular maintenance on the conventional insulation. They have had to do very little to the one with the insulating coating.

The portholes pictured at right go down both sides of both reheaters. The seal on the conventional insulation has been problematic for the company because of the fabrication that is necessary during installation and maintenance. It is also vulnerable to leaks, which allows moisture to enter the system. The plant manager noted that it takes much longer to insulate a reheat conventionally because of the complex geometry. On the other hand, the coating is extremely easy to work around parts that don't need insulation. The applicator simply has to mask those areas off. Once it has been applied, no maintenance has been needed.

## Clarifiers

15+ years service



These clarifiers are used to separate mud (soil and plant residue) from the raw juice. As with the other processes in the facility, the operating temperature is 190-195°F (87-91°C). In addition to similar ranges of operating temperatures, the facility also saw a benefit in using a thermal insulation coating instead of conventional insulation. With little change in performance, faster installation, and reduced risk of corrosion, future clarifiers will all be coated with Mascoat Industrial-DTI, as it has proven to withstand the test of time in this environment.

Typical conventional insulation thickness before using Mascoat Industrial-DTI was 1.5-2" (38-50 mm). As with the evaporators, using a thermal insulating coating instead of conventional insulation significantly reduces the risk of fire.

## Continuous and Batch Vacuum Pans (11-18+ years service)



The vacuum pans are on the lower end of the temperature range found in this sugar mill. Operating at temperatures between 165–170°F (73–77°C), the sugar boils and results in crystallization. As you can see in the pictures above, these indoor pieces of equipment consist of very complex geometry that are very difficult to conventionally insulate. Along with the labor involved, there are many areas where moisture can intrude and promote CUI (flanges, inspection ports, support beams, etc.)

Similar to other pieces of equipment, a protective topcoat was applied after the Mascoat Industrial-DTI had fully cured. Because the primary concern is energy retention, a protective topcoat does not have a significant effect on the thermal insulating coating's performance value.