

# Ceramax

Offers reliable solutions

enhancing your

Energy Savings.

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# More than just another ordinary elastomeric. Ceramax minimizes thermal energy transfer!

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CERAMAX is a 100% Acrylic Elastomeric coating blended with a proprietary hollow glass micro sphere material creating a high-performance, Low-Density thermal barrier coating product. CERAMAX is a liquid applied fully adhered, "rubber like" membrane. It can be applied as part of a roof or wall system, on new or existing substrates.

Because CERAMAX is so versatile, It can be used on virtually any clean, dry, oil free, mechanically sound substrate, including Ballasted Built-up, Built-up, Modified Bitumen, Metal, Asphalt Shingles, Polyurethane Foam, Brick, Concrete, Cinder Block, Wood plus much more.

When applied correctly, CERAMAX will provide a waterproof, thermal protective barrier on either roof or wall applications. Because of it's durability, CERAMAX coatings will stand up to heat, snow, and ice, driving rain, salt spray and blowing sand.



CERAMAX is designed to reflect up to 90%+ of the heat from the sun. The reduction of the heat load on a roof will translate into savings in air conditioning, which means savings in energy use and costs.

When CERAMAX coatings are applied, there is no exposed metal to rust; no built-up roofing to dry out and crack; seams to pull apart or membranes to disintegrate. Because CERAMAX coatings will reflect up 90%+ of the heat from the sun, the thermal related stress the roof and wall systems under go every day will be greatly reduced. This will extend the life of the roof, walls, and substrate. When and if maintenance is needed, the coatings can be easily reapplied after a repair is completed.

CERAMAX is 100% Acrylic Elastomeric, and does not contain any plasticizers which cause chalking and makes the coating dry out overtime, plus the coatings have extremely good elongation properties. This allows the coatings to remain intact while the building expands and contracts, the coating acts like a rubber band, and it expands with the building or substrate, and comes back into place when building or substrate contracts.

# Roof Surface Temperatures as they Function in Sunlight

(For comparison temperatures of different coatings and coverings - see chart - Temperature of Coatings and Other Materials in Sunlight. This chart shows the difference in temperatures of CERAMAX Thermal Barrier Coating and other coatings, coverings, and substrates.)

## Durability Not Degradation Ambient Temperature of 90°F (32.2°C) Clear Sky

Fahrenheit Degrees	80	90	100	110	120	130	140	150	160	170	180	190	200
<b>CERAMAX@ 90°</b>													
White Paint	110°												
Aluminum Foil	+120°												
Light Beige Paint	+120°												
Light Gray	+ 130°												
Weathered Concrete	+150°												
Tar and Gravel	+160°												
Galvanized Steel	+165°												
Aluminum Coating	+170°												
Terra Cotta Tile	170°												
White Asphalt Shingle	+170°												
Black Single Ply												+190°	
Black Coating												+190°	

Every exterior wall, roof or substrate has a common enemy. It's called the Sun. Where conventional dark-colored roofs, and dark colored walls tend to absorb the sun's rays and break down due to UV degradation, CERAMAX Micro Sphere Low-Density Coatings actually reflect up to 90% away much of the sun's heat, radiation, and destructive UV rays.

This heat reduction can keep the surface temperature cooler (see chart - above) in summer than any regular coated or covered wall, roof or substrate. And the reduced UV degradation allows the surface to remain highly flexible, so it can tolerate the expansion and contraction of the substrate without cracking. Even at surface temperatures as low as -15°F (-26°C).

High durability translates into less maintenance, while repairs only require acrylic caulk or a coating touchup. All of which amounts to years or additional life for the wall, roof or substrate.

# Increased Energy Efficiency Starts with Ceramax

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## Environmental Energy Saving Coatings

Many building owners are realizing the benefits of energy upgrades. Few appreciate the potentially sizeable payback of reflective roofs and wall systems, like CERAMAX. This liquid applied roofing and wall system technology minimizes buildings heat gain and attacks energy waste in critical areas: interior-cooling loads.

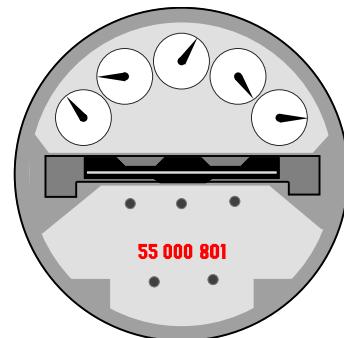
The U.S. Environmental Protection Agency's (EPA) Energy Star® programs promote reflective roofs and wall systems, which are energy-efficient and environmentally friendly. One such system is Acry-Tech Coatings' CERAMAX Reflective Elastomeric Coatings.

CERAMAX can reduce operating costs. The concept is simple. Reducing the temperature of the roof and or wall systems reduces the building's interior temperature and reduces the running time of the air conditioning systems. Also lowering the temperature at or above the roof's surface means the air conditioning unit doesn't have to work as hard to cool down the make-up air. CERAMAX will lower a building's energy costs. With the reduced cooling loads, building renovation projects would be able to install smaller, more efficient air conditioning units.

# Multiple Dividends Returned with CeramaX

## Saving Utility & Energy Usage

Heating costs can also be offset during winter months when a reflective roof and or wall system is used with adequate insulation. Researchers at Lawrence Berkeley Laboratory (LBL) worked with committee's to have reflective roofs included in their standard. Buildings that have highly reflective roofs can actually reduce their levels of insulation. Even with an increase in heating costs, buildings in cooler climates can save on overall energy costs



Acrylic Elastomeric base not only reflects heat and harmful UV's, but will also reduce thermal shock. Thermal shock occurs when cool rain hits a hot roof, causing a sharp drop in temperature. During these temperature changes, a roof and wall system expands and contracts, causing unnecessary stress on the roof and the wall systems. This condition also degrades the seams, making them more susceptible to leakage. A CERAMAX coated reflective roof will maintain a more constant temperature, so thermal shock and associated problems is significantly reduced.

### **REFLECTIVE ROOFING TERMS**

#### **REFLECTIVITY (ALBEDO):**

Amount of solar energy that is reflected away from a surface, usually given as a ratio.

#### **TYPICAL REFELCTANCE VALUES**

White, reflective coating or membrane (such as CERAMAX) – 0.85 plus

White paint – 0.60

Aluminized asphalt, weathered – 0.40

Concrete -- 0.22

Bitumen (asphalt) -- 0.09

#### **EMISSIVITY:**

Amount of absorbed heat energy that is radiated from a surface.

#### **SOLAR REFLECTIVE INDEX (SRI):**

The combined value of reflectivity & emissivity.

#### **R-VALUE:**

Measures the resistance to heat transmission through a material.

# CeramaX - Roof Coating Bottom-Line Benefits

The roof is essentially out of sight out of mind; maintenance and engineering managers generally do not consider the variety of chemical and physical stresses that roofing systems are exposed to regularly. Not to mention the roof system is the first line of defense against heat and heat radiation into a building structure.

Ultraviolet (UV) and thermal radiation from the sun repeatedly bombards the surface, accelerating oxidation and chemically degrading the roof system, causing it to become brittle. And if these challenges weren't enough, water in the form of rain, snow, sleet and hail further compounds the destruction through erosion, expansion and contraction forces, and mechanical impact.



But with a properly planned and executed maintenance program – including the use of CERAMAX roof coating – maintenance and engineering managers can prolong a roof's life and substantially reduce the chance of serious leaks.

CERAMAX is a proven coating for most low-slope roof systems – built up, single ply, modified bitumen, metal and SPF – and for a number of steep-slope systems – metal, ceramic tile, barrel tile and SPF. CERAMAX reflective coating protects and extends the life of the roof system by reflecting a substantial portion of the solar radiation that reaches the roof surface. By shedding this energy before it is absorbed as heat, CERAMAX can substantially reduce both the peak temperature and the daily temperature cycle seen by the roof membrane. CERAMAX coating applied to a roof system can reduce building energy costs by reducing the amount of energy absorbed through the roof system.

The American Society of Heating Refrigeration and Air Conditioning Engineers (AHSRAE) has an Absorptivity Ratio. This ratio is based on a calculation of energy absorbed divided by energy absorbed plus energy reflected. Low absorptivity roofing materials such as bright white CERAMAX liquid applied coating provide an absorptivity ratio of approximately 0.2, indicating that only 20% of the solar energy that reaches the surface is absorbed, and 80% is radiated or reflected back into the surrounding air. High absorptivity roof materials (black, even silver/aluminum) on the other hand such as new asphalt or black single-ply membranes-can have a 0.9 ratio, indicating that 90% of the solar energy that reaches these surfaces is absorbed, and only 10% is radiated or reflected back into the surrounding air.



When CERAMAX coatings are applied, there is no exposed metal to rust; no built-up roofing to dry out and crack; seams to pull apart or membranes to disintegrate. Because CERAMAX coatings will reflect up 90%+ of the heat from the sun, the thermal related stress the roof and wall systems under go every day will be greatly reduced. This will extend the life of the roof, walls, and substrate. When and if maintenance is needed, the coatings can be easily reapplied after a repair is completed.



# Ceramax Stopping Solar Damage

In today's faltering economy, maintenance and engineering managers with shrinking budget often look for ways to minimize and defer capital costs, but they should not view thermal barrier coatings solely as a way to postpone reproofing projects. CERAMAX and a few other reflective coatings can pay dividends by reducing the amount or frequency of roof maintenance by protecting roof materials. CERAMAX helps preserve roof waterproofing and can mitigate solar damage.

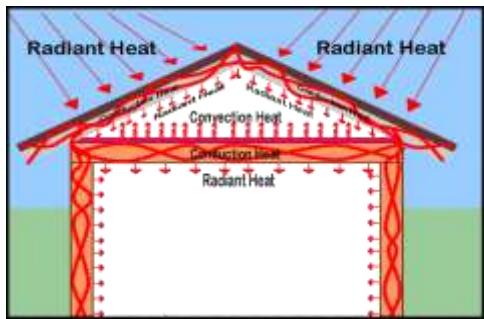
To understand solar protection it is necessary to discuss solar radiation and the damages it causes to roof systems. Radiation strikes the Earth in four wavelengths: X-ray, gamma, infrared (IR) and ultraviolet (UV). Of these, IR and UV radiation make it to the Earth's surface largely unaffected by the atmosphere.

IR radiation heats the Earth. And wavelengths visible to the human eye are narrow band of light between IR and UV frequencies. UV light, which has wavelength frequencies lower than visible light, is a disinfectant used to purify water, sterilize medical equipment, and kill mold and bacteria in HVAC ducts. Both IR and UV radiation are necessary for life on Earth, but both also can cause significant damage to roofs.

IR energy causes temperature variations that damage roofs. Roofs can reach up to 180° - 200°F from the sun's heat, but when a storm comes, the rains can cool that roof to 90°F within minutes. CERAMAX reflective coating will help minimize the expansion and contraction cycles that occur. CERAMAX keeping the roof surface at a cooler and constant temperature, fewer roof failures will result from flashings that loosen or fasteners that pop from the roof. Even regular daily fluctuations in temperature can damage roofing. Reducing overall roof temperature and helping to prevent daily swing in temperature is crucial to protecting the roof membrane.



UV light, which can fade paint and break down polymers and other materials, also damages roofs. Black-bodied asphalt roofing is particularly susceptible to UV damage through a process known as actinic deterioration. CERAMAX protects a roof from drying out causing an alligated surface. UV radiation on uncoated roofs or even roofs that have been painted in a solvent based aluminum color can oxidize the oils in asphalt or paint, causing brittleness and a loss of aggregates. CERAMAX while protecting roofs against UV radiation will help prevent the roof from drying out and losing thickness.



IR heat that builds up in roofing materials can allow heat to enter the occupied space of a building. This heat gain can result in higher energy costs, particularly if the structure has cooling ducts that run through the plenum or just below the roof. The application of CERAMAX coating with its high emissivity and low-density prevents heat gain or radiated heat to enter buildings. CERAMAX, a brilliant white elastomeric coating stays cooler than either black asphalt roofs or aluminum-coated roofing, which means CERAMAX has both higher albedo and emissivity. Silvery, aluminum-based coatings generally have a surface temperature close to a black roof temperature.

CERAMAX is one of the most effective thermal barrier liquid applied roof and wall system coating tools an owner or facilities manager has to maximize the service life of roofing and wall systems. Roofs are frequently dirty places; owners and facilities managers should pay more attention to them. One of the most important tasks owners and facilities managers can do is to properly clean the roof. This should be done with regular coating and rooftop inspection schedule which will add many years to a roof system.

# Reflectivity & Emissivity Cuts Energy Use Reduces Pollution

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With building and homeowners measuring energy savings in fractions of kilowatt-hours, the last thing they want to see are those savings going, quite literally, through the roof and wall systems. While properly installed roof and wall insulation systems are the first line of defense in fighting the energy conservation battle, other design and material options should be considered. One such option is CERAMAX, a liquid applied, rubber membrane type 100% acrylic Elastomeric thermal barrier coating system.

This type of innovation is driven as much by technology as by stricter energy use guidelines.

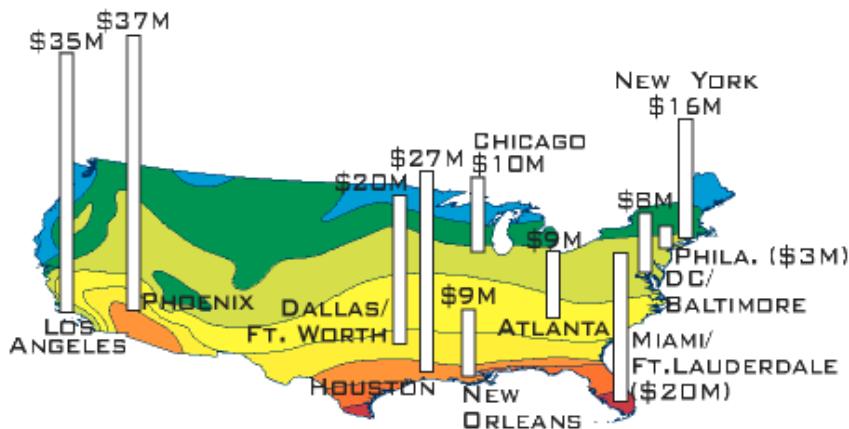
A major California, International architecture firm says a main concern is saving as much heating and cooling costs as possible. And the use of solar reflectivity like CERAMAX helps with cooling costs. Issues of reflectivity and emissivity are quickly becoming as important as R-value. Dark roofs and wall systems absorb heat, raising indoor temperatures during cooling season and taxing the air-conditioning load -- contributing to higher air-pollution levels as power plants work overtime to meet energy demand.

There has been a resurgence among building teams of looking at alternatives to traditional BUR with black-faced cap sheet, and considering such material as reflective coatings, such as CERAMAX with its rubber membrane type coating.

There is a new, increasingly important standard in roofing and wall systems, and it's best described as: *sustainability*. A sustainable roof and wall system is one that's going to be in place for a long time, is recyclable, won't end up in a landfill, will reduce energy costs, and assists in reducing air pollution.

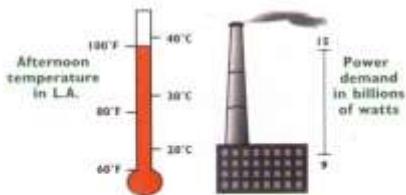
The U.S. Department of Energy (DOE) has joined Lawrence Berkeley Laboratories (LBL) and the National Aeronautics and Space Administration (NASA) encourages building teams and designers to consider roof and wall system temperatures when specifying materials, such as reflective coating systems. Studies also show that non-reflective and darker roof and wall systems degrade faster when exposed to ultraviolet radiation.

# Energy Conservation Air Quality, Abate Urban Heat



## The Energy Link

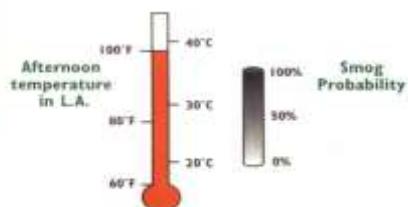
- Higher temperatures also mean increased energy use, mostly due to a greater demand for air conditioning. As power plants burn more fossil fuels, they drive up both the pollution level and energy costs.
- On warm afternoons in Los Angeles, the demand for electric power rises nearly 2% for every degree Fahrenheit the daily maximum temperature rises.



Graphic Courtesy of US Department of Energy/LBNL

## The Smog Connection

- Urban Heat Islands are not only uncomfortably hot, they are smoggier.
- Smog is created by photochemical reactions of pollutants in the air, and these reactions are more likely to intensify at higher temperatures.
- In Los Angeles, for every degree the temperature rises above 70°F, the incidence of smog increases by 3%.



Graphic Courtesy of U.S. Department of Energy/LBNL

Dark colored roofs and wall systems absorb a tremendous amount of solar radiation and become extremely hot. These hot surfaces are being targeted because they are unnecessary sources of heat that contribute to elevated air temperatures. In most geographic areas, air temperatures increased translates into an air quality decrease. Highly reflective roofs and wall systems diminish this condition and have been identified as the environmentally preferable roofing and wall coating solution.

Both the scientific and environmental communities recommend a universal proliferation of highly reflective roofing and wall surfaces. This is a practical coarse of action designed to help mitigate systematic increases in urban air temperature and to help improve air quality.

## Drop Temperatures Decrease Smog with CERAMAX

Potential net energy savings from changing roof reflectivity.

Savings are measured in dollars. Note that the net savings are the savings of cooling energy use less the penalties of heating energy use.

# CeramaX is Your Environmental & Energy Saving Alternative to a New Roof or Wall System

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CERAMAX 100% acrylic Elastomeric thermal barrier coating is the ideal environmental product. It is safe and easy to use. EPA qualified at "ZERO" VOC's. CERAMAX lowers roof and wall surface and inside temperatures. Big savings in cooling costs, heating costs as it lowers energy consumption, and reduces smog and environmental damage due to pollution. Not only will this product extend the life of buildings and material but it is extremely affordable and long lasting.

**Before Being Coated**



**After Being Coated**



CERAMAX is a white Elastomeric that can be tinted, recommended in only pastel colors for best results. The coating will generate savings, which will far exceed their initial cost. There are many savings with these coatings and here are a few:

- Very dramatic reduction in solar heat transfer from roof or wall system to inside of buildings. Heat loss in winter is reduced. Reduced humidity inside of buildings.
- Shielding surfaces from damaging UV radiation dramatically extends life of substrate where applied, delays replacement sometimes almost indefinitely.
- Sealing the substrates where applied reduces the possibility of water leakage and damage and developing additional costly repairs.
- CERAMAX coatings stop sun damage - adds additional moisture protection, and will actually strengthen the surface where applied increasing the longevity of substrate.
- Not only in the Southwest and South, but most buildings and homes will show dramatic savings in utility costs, as most duct work for Heating Ventilation Air Conditioning (HVAC) is in the ceiling just below the roof, and just inside of a wall system.

# **BENEFITS of 100% Acrylic Elastomeric Micro-Cell Glass Sphere Thermal Technology**

## **Renewal Process**

### BEFORE



#### APPLICATION OVER METAL ROOFING

Stops leaks \* Highly flexible \* Encapsulates & prevents rust \* Lowers roof temperatures \* Reduces thermal cycling

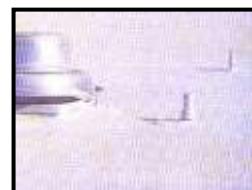
## **Energy Process**

### AFTER



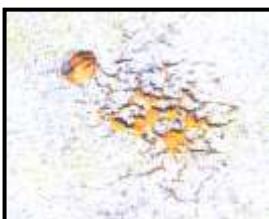
#### APPLICATION OVER ASPHALT ROOFING

Extends your roof's service life \* Prevents asphalt (UV) degradation \* Reflects 90% of heat from the sun \* Highly flexible \* Stops leaks



#### APPLICATION OVER CONCRETE ROOFING

Stops concrete expansion \* Bridges hairline cracks & gaps \* Prevents moisture penetration \* Excellent adhesion & elongation



#### APPLICATION OVER POLYURETHANE FOAM

Protects against UV damage \* Reduces accelerated aging & degradation \* Fills voids, hairline cracks & gaps \* Provides protection against hail damage



- Reduces daily expansion and contraction - thermal cycling.
  - Contains strong rust inhibitive pigments.
  - Reflects 90% of the heat and harmful UV rays of the sun.
- Excellent reflective properties, which helps to reduce cooling costs.
  - Prevents premature aging and leaks.
  - Contains strong mildewcide / fungicide.
  - Excellent adhesion to various substrates.
- Superior resistance to dirt pickup helps stay white longer & maintains reflectivity.
- Easy to use, easy clean up, non-toxic, "Zero" VOC's, water based coating.

# CeramaX

## Classified by EPA as 'Zero' VOC's



CERAMAX 100% Acrylic Elastomeric Thermal Barrier Coating Blended with Proprietary Micro-Cell Glass Spheres is Certified by the EPA as 'Zero' VOC's.



### CERAMAX – Good for the Environment, Reduces Air Pollution, Smog, Saving Energy and Energy Costs

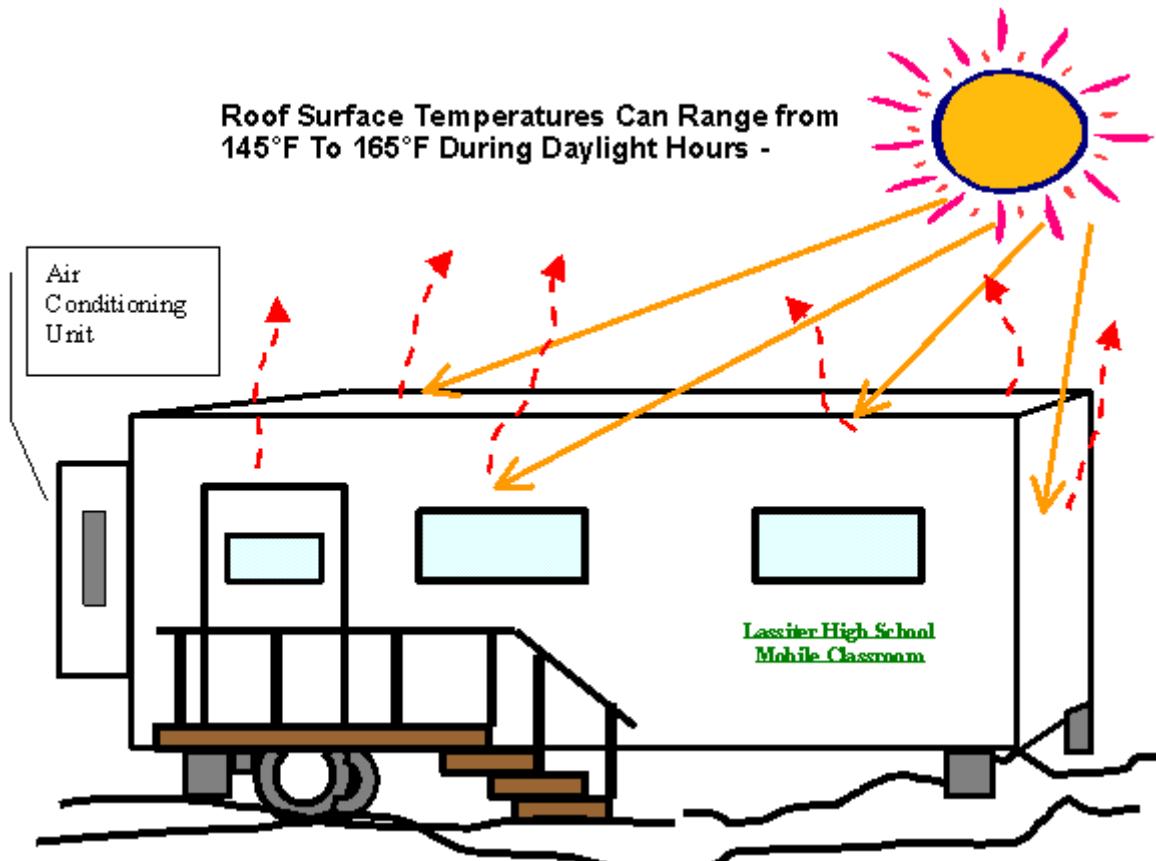
VOC's (Volatile Organic Compounds) are the fumes that you smell while you paint, and sometimes several days after. A VOC is an organic chemical that becomes a breathable gas at room temperature. Some examples are benzene, ethylene glycol, vinyl chloride and mercury.

VOC's in paint usually come from additives to the paint, such as fungicides, biocides, color, and spread ability agents. High levels of VOC's in paints can cause headaches, allergic reactions, and health problems in the very old, very young and in those with chronic illnesses.

Concerns about air pollution and hazardous waste have greatly reduced the use of oil-based paints, which can release high amounts of VOC's and contain toxic solvents. Alkyd-based paints and latex paints are much safer, but some still have high levels of VOC's. VOC's in paints and coatings are constantly being released for the life of the paint or coating; this is why a Zero VOC paint and coating is so important to the environment.

Because of health and safety concerns, Acry-Tech Coatings, Inc. has made and continues to make great strides in formulating paints and coatings that have 'Zero' to low –VOC's and that provide excellent results in applications.

# CeramaX - Energy Efficiency for Mobile School, Offices & Homes



The sun's high temperature transforms roofs and sides of metal portable class rooms (trailers) into heating panels which radiate heat to every surface and person within. A high school in Lincoln, NE, where 2,200 students attend was designed for 1,500 in the 1940's. The school has had to resort to using trailers to house 16 classrooms for an overcrowded facility.

These types of classrooms are becoming far too common. Despite record budgets, many districts don't have the money to build new schools or add on to present schools.

Applying CERAMAX to the exterior roofs and walls of the portable classrooms will create a comfortable, healthy learning environment, plus save energy costs in utilities and fuel.

## Everyone Benefits from CERAMAX

Students - benefit on lessons in energy conservation

Schools - benefit from cost savings - utilities

Communities - benefit from partnerships established among businesses

Environment - benefits from the more efficient use of fossil fuels-save energy

# CeramaX - Reduces Heat & Energy Use: Trailers, Refrigerated Trailers, Buildings

The sun's high temperature transforms roofs of trailers, refrigerated trailers, cold storage buildings, mobile homes, mobile school units into heating panels which radiate heat to every surface and person within the mobile structure!



## CERAMAX – Flexible-liquid applied, seamless, thermal barrier roof & wall system coating - saves on cooling and heating costs

- Protects & seals for both Summer and Winter
- Can reduce utility costs up to 50%
- Reduces roof movement & thermal shock
- Waterproofing
- Lasts years longer than other roof coatings
- Prevents corrosion – fights against the growth of mold, mildew, fungus & algae
- Good hail resistance & provides a sound barrier

CERAMAX can be applied with roller, brush or airless sprayer. Water based easy clean up and safe to dispose excess product and containers.

CERAMAX is Certified as 'Zero" VOC's with the EPA. CERAMAX is one of the very lowest in VOC's and is friendly to the environment.

CERAMAX complies with all of the directives established by the government regarding the environment and pollution.



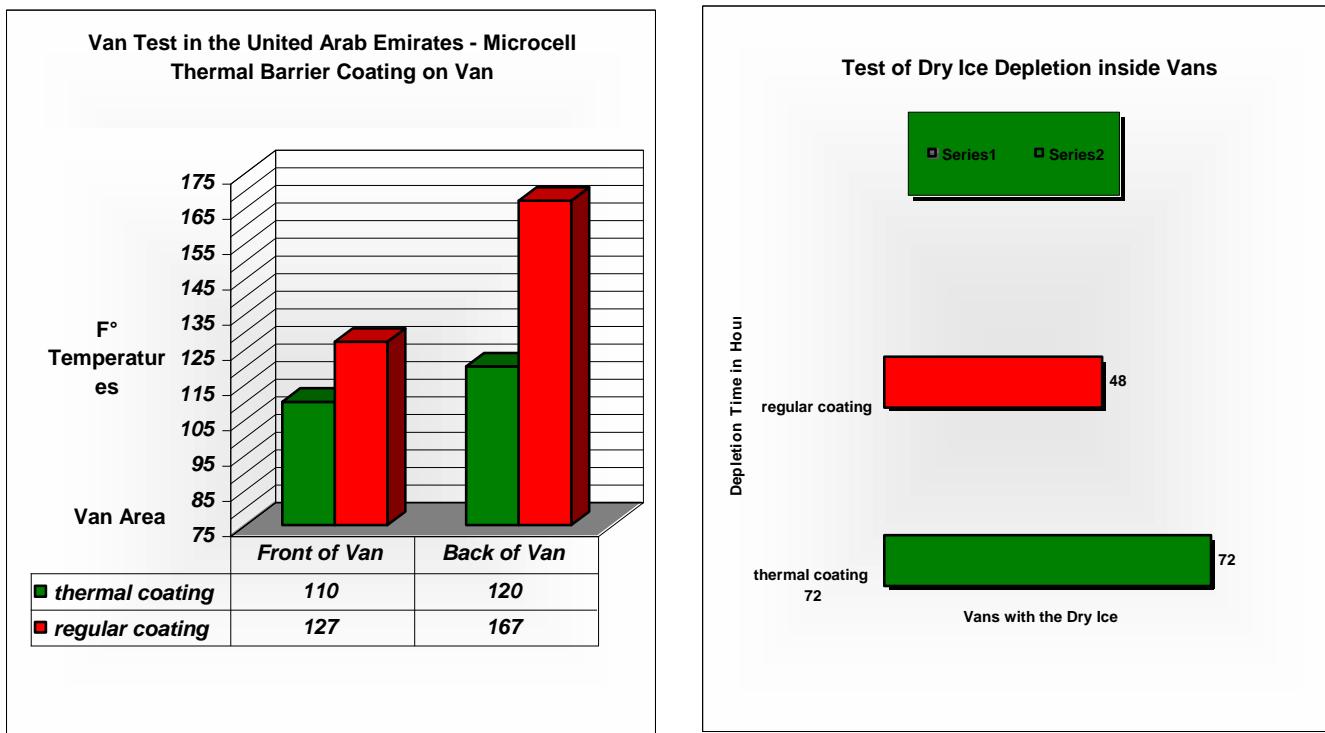
# TEST RESULTS

## Refrigerated Units

### United Arab Emirates

#### TESTS OF THERMAL BARRIER COATING

#### Test Held in the Heat of the United Arab Emirates (U.A.E.)



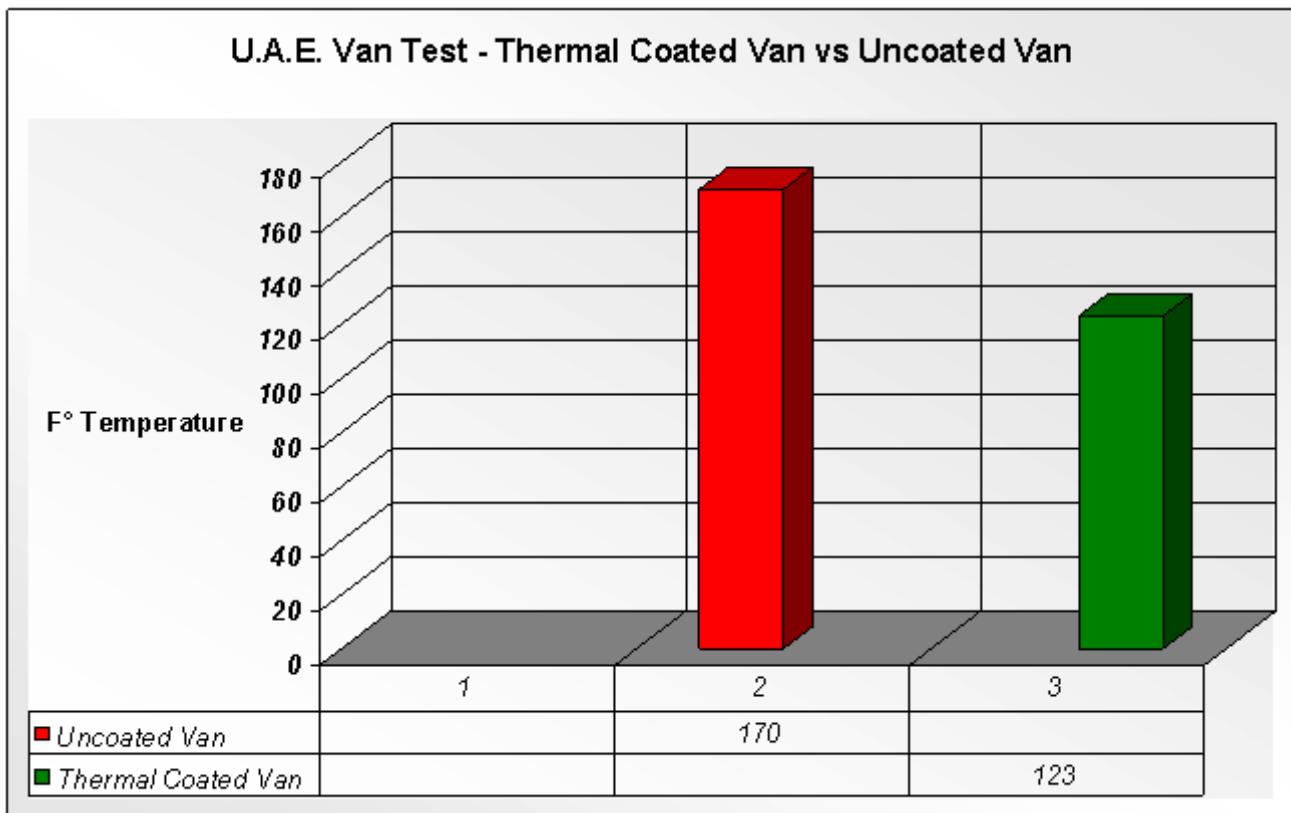
Truck Van Test Exterior Front & Back			Dry Ice Depletion Test Inside of Truck Van	
Coating Type	Front – Van	Back – Van	Coating Type	Depletion Time in Hours
Thermal Coating	110°F	120°F	Thermal Coating	72
Regular coating	127°F	167°F	Regular Coating	48
% Difference	13%	28%	% Difference	50%

# Thermal Barrier Coating U.A.E.

## Delivery Van Test Results

### United Arab Emirates

### Heat Control Test on a Truck Delivery Van



The above chart is the results of test performed in the heat of the United Arab Emirates (U.A.E.) with our 100% Acrylic Thermal Barrier Coating applied to a delivery van operated by one of the largest cigarette manufacturers in the world. Two (2) identical vans were used in this test. One van was coated with Thermal Barrier Coating while the second van was left with regular coating. The chart shows that the van coated with the Thermal Coating was 47°F cooler.

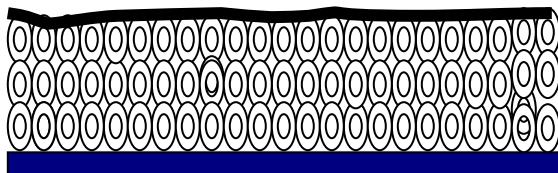
The application of the Thermal Barrier Coating (CERAMAX) will assist in lowering heat and temperatures, which will assist in reducing energy use, and reduce costs of fuel and repairs, plus the replacement of damaged goods and equipment.

# CeramaX

## How It Works

### THERMAL CONTROL

CERAMAX is a proven superior high-performance Low-Density thermal barrier coating. A key feature of CERAMAX is the placement of proprietary manufactured ceramic micro cellular irregular hollow sphere shape particles. The placement of these particles as a component specially formulated with a 100% acrylic Elastomeric mastic coating that keeps the spheres in uniform suspension. CERAMAX is fluid applied and it forms a seamless monolithic seal, eliminating virtually all air infiltration which can be a major source of heat radiation transfer into buildings. CERAMAX coatings actually reflect up to 90% of the sun's heat, radiation and destructive UV rays. With it's Low-Density it equates to substantial reductions in energy usage and costs.



Close packed hollow micro cellular glass spheres. Blended with acrylic elastic polymers filling the voids. With our 100% elastomeric emulsion system, as the water evaporates the hollow glass spheres approach each other, eventually touch and fuse together to form a continuous film barrier. Much like a thermos bottle or thermal pane glass window.

### **Substrate Where CERAMAX is applied**

### CONTROL OF CONDENSATION & WATER PENETRATION

CERAMAX has excellent elongation and recovery properties. These properties yield a protective barrier resistant to hail, water and wind damage. The hollow micro-spheres used in CERAMAX are over 60 % void. They are bound directly to the surface forming a seamless blanket. This eliminates any hot/warm air to cool/cold surface contact and reduces the temperature differential thereby reducing or eliminating condensation. In areas where excessive moisture is present it is necessary to provide adequate ventilation.

The reduced UV degradation allows the surface to remain highly flexible, so it can tolerate the expansion and contraction (thermal shock) of the substrate without cracking. High durability translates into less maintenance, while repairs only require acrylic caulk or a coating touchup. All of which amount to years of additional life for the roof or wall system.

### ASSISTS IN NOISE CONTROL

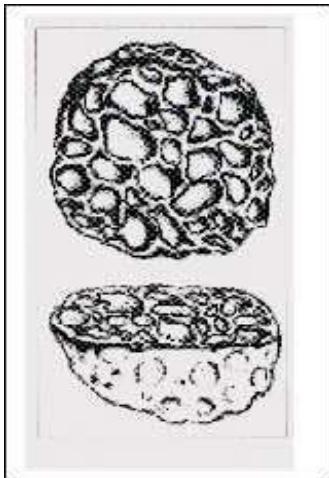
CERAMAX is ideal for sound level reduction in some applications. Unlike other products that absorb sound and thereby transmit noise, CERAMAX can reflect sound back to the source. With the added hollow glass micro-cell spheres reduces the surface to conduct sound. This makes CERAMAX an excellent choice for some applications such as hospitals, schools, motel and hotels and other public buildings where excessive noise levels occur.

# CeramaX Glass Micro-Spheres

## Tech Data Sheet

### CERAMAX Glass Micro-Spheres

#### Premium Pure White Inorganic Hollow Glass Material



The enlarged view of a cross-section and sphere of micro-cell glass particles shows the internal cell structure and irregular surface having tiny cavities or pores. The closed cellular particles resist penetration, yet substantial moisture may be held on the exterior surface. These micro-cell particles provide some or all of the following benefits: Significant Cost Reduction; Weight Reduction; Low Density Control; Excellent Insulation. Our Micro-Cell Glass Sphere's may be used throughout a temperature range of minus 400°F to plus 2,000°F without significant change in properties.



- Micro-Cell-Spheres are glass micro cellular fillers that are inert, inorganic, non-toxic, hollow glass particles whose shapes vary to combine different geometries spherical and irregular. These shapes provide advantages as reinforcement.
- Micro-Cell-Spheres are a High Quality, Cost-Effective, Environmentally Safe Natural Mineral that is lightweight, has low-density and offers many benefits.
- Micro-Cell-Spheres particles are irregular sphere shapes and have a greater tensile strength than the usual spherical bubbles. These Micro-Cell bubbles mechanically key into the binder where other bubbles depend almost totally upon coupling agents for cohesive strength.
- Since the shape of each Micro-Cell particle resembles a cluster of micro bubbles, if one surface is broken during handling or processing, there are more bubbles within each particle to provide excellent low-density properties, and maintain the radiant and UV barrier.
- The low specific gravity (E.S.G. = 0.18) has been found to be cost effective in the manufacture of a Thermal Barrier Elastomeric Coating.
- The aspect ratio of Micro-Cell-Spheres particles imparts tensile strength; and, at the same time, stresses are transmitted throughout the "bubbles" and provide a greater stress and impact distribution. Micro-Cell-Spheres are not affected by thermal shock.

# CeramaX

## Coating Applications

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- On the southeast coast of Florida directly on the ocean, two (2) block type Florida Villa's were coated with CERAMAX. It is now going on 5 plus years and the coatings are still performing as when first applied. The coatings have assisted in keeping excess heat from entering the buildings while keeping the buildings sealed, protected and looking great. These buildings are at the beach, face the ocean and are subject to the wind, sand, salt, and sun. The coatings have been holding up to all of the elements of the weather and performing as designed.
- Working with a major poultry processor in the southeast, Thermal Barrier Coatings were applied to the roof of one of two identical chicken houses, and to the feed silo for the house. The one house was coated in the spring, heat and temperature tests were performed all summer with temperature readings taken in the underside of each roof of the coated and uncoated houses. The bottom line results from the tests are that the house that was coated with Thermal Barrier coating, there were NO chickens lost due to heat stress. In weighing the chickens in the coated and uncoated houses, on average, the chickens in the Thermal Barrier coated house weighed 2000 lbs. more in total, from the house that was uncoated. The chicken houses are cooled down with fans placed hanging from the ceiling of the houses. It is noted during this testing time that half of the fans needed to be operated in the house that had the Thermal Barrier coating on the roof. With this information energy usage and costs are saved due to the reduced use of the fans. The results of the feed silo that was coated showed no excess steam, smell, or dampness being developed from the feed, and no clumps forming in the feed being passed to the house. A very basic test on the silo was in the mid-morning with the sun shining you could not lay their hand on the uncoated silo with out being burnt, but on the Thermal Barrier Coated silo there was no problem excessive heat on the surface.
- CERAMAX coatings are being marketed and sold internationally. We have customers in Singapore, Malaysia and the adjoining area that have been having great success with these coatings. We also have customers in Guam, Israel, India, China and other areas in the Pacific Rim. Plus other countries are testing and developing a marketing plan for the coatings as well.
- The city of Atlanta, GA and other metro counties have used CERAMAX on roofs and other applications. In one application in the city of Atlanta at one of the sewer and water redemption centers, a steel tube type of ladder next to the incinerator was coated. Before the coating was applied the ladder was so hot that when someone would have to climb the ladder to open a roof hatch, they would have to wear heavy gloves to keep from being burnt. After the coating was applied no gloves were needed, and the ladder was cool to the touch.
- A test for the military on two Helicopter Blade Containers on a tarmac for two days in the blazing Dallas, Texas (USA) sun. One of the containers had been coated with CERAMAX coating - the other, had not. During the two days the uncoated container recorded temperatures up to 33% higher than the CERAMAX coated container. Average temperatures of the uncoated container were also higher by 30% the first day and 27% the second day.

# CeramaX

## Coating Applications

Continued

- In Tucson, AZ (where Hot is HOT) roofs of homes were coated with CERAMAX. Not only did the home take on an added architectural look, but added protection to the roof substrate. The homeowners are realizing a savings in energy costs at 30%+. The usage of less energy in running air conditioning units results in lower utility bills and less pollution to the environment. Comparing costs for the same time one (1) year prior shows that there is a savings of 40.2% in the use of energy (electric).
- CERAMAX coatings were applied on a 48-foot (dry box type) trailer owned and operated by Cobb County High School Band. The trailer is used to move the bands equipment and large instruments. The trailer had problems with excessive heat, which could damage equipment, and need to be sealed to stop any leakage that could develop. The use of CERAMAX on the roof of this trailer sealed the roof, protects the roof, and is reducing the excessive heat that develops inside this type of trailer. To say the least, the Lassiter H.S. Band of Cobb County, Georgia, which were the 1998 and 2002 National Champions, are very pleased with the results, and have also applied the coating to two of their out buildings at the high school.
- A Major and renowned NASCAR and CART Racing Team out of N.C. is using CERAMAX coatings inside the cockpit of the racing vehicles to keep the driver cooler while racing. Also on fuel cells to keep the fuel cooler reducing the possibility of bubbles forming in the fuel lines causing loss of power. Drivers of the race cars are cooler, more alert, and can drive longer with out fatigue.

### OTHER PRODUCT USES & APPLICATIONS – (but not limited to):

Roofs and Wall Systems – most any types  
HVAC Ductwork  
Steam Lines  
Boiler Tanks  
Shipping Containers  
Rail Cars  
Hot Oil Tanks  
Cryogenic Tanks & Tubing  
Water Tanks  
Mobile Homes – Portable Buildings & School Trailers  
Commercial Buildings  
Live-Stock Buildings & Breeding Barns  
Refrigerated Delivery Trucks & Trailers  
Oil & Gas Transfer Lines  
Plus much more, limited only to the imagination...

# Ceramax Coating Specifications

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## **SCOPE**

The intention of this specification is to outline the procedures for the application of CERAMAX reflective roof coatings for the purpose of coating different surfaces. These suggested specifications describe materials, methods and conditions necessary for the proper application of CERAMAX. Actual applications requirements are the responsibility of the installer.

## **MATERIALS**

All materials used shall be manufactured by and approved by Acry-Tech Coatings, Inc., and shall meet specifications.

## **DELIVERY & STORAGE**

Materials shall be delivered in their original, tightly sealed containers or unopened packages, all clearly labeled with the manufacturer's name, file number, and lot numbers. Materials shall be stored out of the weather in their original tightly sealed containers or unopened containers as recommended by the manufacturer.

## **CONTRACTORS**

An experienced and competent contractor or applicator should apply CERAMAX products. It is recommended that you do your research to make sure that any contractors that are hired are licensed and insured to do business in your area. It is also possible for this product to be applied by homeowners as well. Please follow all of the manufacturer's recommendations to insure that you have a quality outcome that will last you for years to come. Please contact us if you have any questions at all concerning the application of the product.

## **SURFACE PREPARATION**

Preparation shall include all requirements specified by Acry-Tech Coatings, Inc. to insure proper adhesion of the CERAMAX products to the existing substrate. New roofing surfaces must be allowed to cure a minimum of 90 days prior to application. Preparation shall include but not limited to - All unnecessary and non-functional equipment and debris shall be removed from the roof.

Substrate must be pressure-washed with good degreasing type cleaner. A minimum working pressure of 3,000 psi shall be used to remove all dirt, dust, previous paints & coatings, which are delaminating as well as waste products (oil, oil-based roof cements, solvents, grease, animal fats, etc.). Power vacuuming, brooming, high-pressure air or water washing or any combination that assures a clean surface may be used. HVAC condense drains shall be properly routed to roof drains to allow roof membrane and coatings to properly cure and dry. All roof penetrations, curbs, soil waste stacks, vent stacks and related roof penetrations are to be flashed in accordance with roof manufacturer's specifications. All laps and wall flashing are to be repaired in accordance with roof manufacturer's specifications. Wet roof insulation and damaged membranes are to be removed and replaced as necessary to match existing specified material. Asphalt emulsions may be needed for severely deteriorated roofs

# Built-Up Roofing Specifications

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## COATING APPLICATION

Examine substrate to receive roof coating. Do not proceed with installation of CERAMAX until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer. CERAMAX roof coating is to be applied only after asphalt emulsion has thoroughly cured. Contact Acry-Tech Coatings, Inc. for additional information, if necessary.

Apply base coat of CERAMAX roof coating at a rate of 80 square feet per gallon. Dry film thickness shall be approximately 10 mils per gallon. Apply intermediate coat of CERAMAX roof coating at a rate of 80 square feet per gallon. Dry film thickness shall be approximately 10 mils per gallon. Total thickness of CERAMAX roof coating at this point is to be no less than 20 dry mils. Apply finish coat of CERAMAX roof coating same as previous two (2) coats, with a total thickness of CERAMAX at this point is to be no less than 30 dry mils. Each coat must be allowed to dry for 24 – 48 hours depending on humidity and temperature. The roof is to be inspected for defects, flaws or penetrations and repaired if necessary before a subsequent coat is applied.

## APPLICATION RATES

2 gallons per 100 sq. ft. yields 20 dry mil / 3 gallons per 100 sq. ft. yields 30 dry mil  
When estimating area of roof, add 20% for pitch and ribs.

## RESTRICTIONS / LIMITATIONS

This system is to be used only in conjunction with commonly accepted roofing standards but not limited to the following –

No application of materials shall commence during inclement weather or when precipitation is imminent. No thinning of materials is permitted. No materials are to be applied to wet, dirty, or frozen surfaces. No materials are to be applied at temperatures below 55°F. No materials are to be applied at ambient air temperatures above 100°F. No materials are to be applied at relative humidity levels above 88%.

In conjunction with the final inspection, all debris, containers, materials and equipment are to be properly removed from the job-site. Grounds are to be cleaned undamaged and acceptable to the owner. Reflectivity of coatings may be reduced if roof surface is not cleaned on a regularly scheduled basis. Ponding water areas must be repaired prior to any coating application so as to allow water to drain off the roof.

**CAUTION:** Do not apply within two (2) hours of sunset, rain, fog or freezing temperatures. CeramaX coatings must be completely dry before exposing to water or foot traffic. Keep containers covered when not in use. Dispose of all containers in accordance with state and local environmental regulations. Keep away from children. If ingested, DO NOT induce vomiting. Call Physician immediately.

Our suggestion installation specifications are based on information from laboratory and field testing which we believe to be reliable and correct; however, accuracy and completeness of said tests are not guaranteed and not to be construed as a warranty, either expressed or implied. Since the use of the material is beyond manufacturer's control, buyer assumes all risk whatsoever as to their use or results obtained. We guarantee our products to conform to Acry-Tech Coatings, Inc.'s quality control. Acry-Tech Coatings, Inc. warrants only the standard quality of material. Manufacturer's sole responsibility shall be to replace the portion of the product that the manufacturer has deemed to be defective.

# **Concrete Roofing Specifications**

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## **COATING APPLICATION**

Examine the substrate to receive roof coating. Do not proceed with installation of CERAMAX Coatings until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer. Primer coat may have to be applied to some substrates, and allowed to cure for 24 hours. Contact Acry-Tech Coatings, Inc. for additional information, if necessary.

Apply a base coat of THERM-X roof coating at a rate of 1.5 gallons per 100 square feet of roof area. Apply intermediate coat of CERAMAX roof coating at a rate of 80 square feet per gallon. Dry film thickness shall be approximately 10 mils per gallon. Total thickness of BOTH roof coatings at this point is to be no less than 20 dry mils. Apply finish coat of CERAMAX roof coating same as previous coat, with a total thickness of CERAMAX at this point is to be no less than 30 dry mils. Each coat must be allowed to dry for 24 – 48 hours depending on humidity and temperature. The roof is to be inspected for defects, flaws or penetrations and repaired if necessary before a subsequent coat is applied.

## **APPLICATION RATES**

2 gallons per 100 sq. ft. yields 20 dry mil / 3 gallons per 100 sq. ft. yields 30 dry mil  
When estimating area of roof, add 20% for pitch and ribs.

## **RESTRICTIONS / LIMITATIONS**

This system is to be used only in conjunction with commonly accepted roofing standards but not limited to the following –

No application of materials shall commence during inclement weather or when precipitation is imminent. No thinning of materials is permitted. No materials are to be applied to wet, dirty, or frozen surfaces. No materials are to be applied at temperatures below 55°F. No materials are to be applied at ambient air temperatures above 100°F. No materials are to be applied at relative humidity levels above 88%.

In conjunction with the final inspection, all debris, containers, materials and equipment are to be properly removed from the jobsite. Grounds are to be cleaned undamaged and acceptable to the owner. Reflectivity of coatings may be reduced if roof surface is not cleaned on a regularly scheduled basis. Ponding water areas must be repaired prior to any coating application so as to allow water to drain off the roof.

**CAUTION:** Do not apply within two (2) hours of sunset, rain, fog or freezing temperatures. CeramaX coatings must be completely dry before exposing to water or foot traffic. Keep containers covered when not in use. Dispose of all containers in accordance with state and local environmental regulations. Keep away from children. If ingested, DO NOT induce vomiting. Call Physician immediately.

Our suggestion installation specifications are based on information from laboratory and field testing which we believe to be reliable and correct; however, accuracy and completeness of said tests are not guaranteed and not to be construed as a warranty, either expressed or implied. Since the use of the material is beyond manufacturer's control, buyer assumes all risk whatsoever as to their use or results obtained. We guarantee our products to conform to Acry-Tech Coatings Inc.'s quality control. Acry-Tech Coatings, Inc. warrants only the standard quality of material. Manufacturer's sole responsibility shall be replacing that portion of the product that the manufacturer deems to be defective.

# Metal Roofing Specifications

## **Preparation:**

Wet roof insulation and damaged membranes are to be removed and replaced as necessary to match existing specified material.

Preliminary repair work consists of surface preparation and all flashing details. After completion of substrate preparation, all problem flashing details, horizontal seams, penetrations and curbs must be flashed with 6 inches of fabric and CERAMAX Coating. CERAMAX Coating must be feathered and the edges to allow water to easily flow over the various flashing details.

**Curb Flashing:** All curb flashing, including cricket details, must be flashed with at least a 8 inch wide layer of CERAMAX Coating, one (1) layer of fabric and then a final layer of CERAMAX Coating to completely encapsulate the fabric. CERAMAX Coating must be feathered at least 1 inch beyond each side of the 6 inch width to allow water to flow over the seam. Fabric must be cut about all fasteners so that it lies flat. Encapsulate all fasteners using CERAMAX Coating.

**Dented / Damaged Panels:** Installer shall repair dented and/or damaged metal roof panels. Dents shall be mechanically removed to the maximum extent possible. If ribs are broken, Contractor shall cover the broken rib area with a sheet metal cap. Sheet metal caps must be "sealed" to the roof by applying CERAMAX coating over the entire rib area to be capped prior to use of new fasteners. Should roof panels be severely damaged, Contractor shall remove and replace damaged areas prior to application of roof coatings.

**Fasteners, Downspouts & Gutters:** All fasteners must be re-tightened, secured or replaced, as necessary. All stripped fasteners must be replaced with larger diameter fasteners, and the area re-secured by adding a new fastener next to the one that was stripped. All missing fasteners must be replaced. All fasteners must be totally encapsulated with CERAMAX Coating. Replace downspouts as needed. Gutter straps that are fastened above roof panels must be totally encapsulated with CERAMAX Coating, including the fasteners.

**Gaps:** All large or excessive gaps existing between roof panels must be closed or made flush with self-drilling fasteners.

**Horizontal Seams:** All damaged horizontal seams must be reinforced with at least an 8" wide layer of CERAMAX Coating, one (1) layer of fabric and then a final layer of CERAMAX Coating to completely encapsulate the fabric. CERAMAX Coating must be feathered at least 1" beyond each side of the 6" width to allow water to flow over the seam. Fabric must be cut around all fasteners so that it lies flat.

**Penetrations:** CERAMAX Coating shall be applied around base of penetration extending 4" on vertical and 4" on base. Embed 6" width of fabric using additional coating, as necessary. Cut the fabric to accommodate the shape of the penetration.

**Ponding Water:** Contractor shall make every effort to mechanically eliminate all ponding water areas on the roof prior to application of roof coatings ("Ponding water" is defined as water which does not properly drain and remains for more than 48 hours).

# Metal Roofing Specifications

Continued

## **Rakes:**

All fixed rake details for the roof must be secured and sealed with 8" wide layer of CERAMAX Coating, one (1) layer of fabric and then a final layer of CERAMAX Coating to completely encapsulate the fabric. CERAMAX Coating must be feathered at least 1" beyond each side of the 6" width to allow water to flow over the seam. The fabric must be cut around all fasteners so that it lies flat. If fixed rake metal is fastened to top of roof panel rib and extends back onto the roof, trim off excess metal and follow horizontal seam flashing procedures.

**Ridge Caps:** Except as noted, all ridge caps must be flashed with an 8" wide layer of CERAMAX Coating, one (1) layer of fabric and then a final layer of CERAMAX Coating to completely encapsulate the fabric. THERMALASTIC Coating must be feathered at least 1" beyond each side of the 6" width to allow water to flow over the seam. The fabric must be cut around all fasteners so that it lies flat.

## **PRIMER APPLICATION**

Examine substrate to receive roof coating. Do not proceed with installation of CERAMAX roof coating until all problem areas have been corrected in a manner acceptable to the manufacturer.

**Treatment of Residual Asphalt:** Installer shall make every effort to remove all loosely adhered asphaltic roofing, elements. Removal efforts must include the use pressure-washers, scrapers, wire brushes, wire-wheels, or other similar tools. Residual asphaltic areas are to be coated with CERAMAX Coating at a rate of 30 mils (in 3 separate coats).

**Treatment of Rusted Metal:** Entire roof can be coated with CERAMAX, and this coat can act as a primer coat for lightly rusted roofs. For heavy rusted roofs a water based rust inhibitive metal primer should be used at the recommended rate by the manufacturer.

Primer coat must be allowed to cure for 24 – 48 hours depending on humidity and temperature. The roof is to be inspected for defects, flaws or holidays and repaired if necessary.

## **COATING APPLICATION**

20-mil system:

Apply first coat of CERAMAX roof coating at a rate of 100 square feet per gallon. First coat shall be applied perpendicular to the ribs of the metal roofing. Dry film thickness shall be approximately 10 mils per gallon.

Apply final coat of CERAMAX roof coating at a rate of 100 square feet per gallon. Second coat shall be applied parallel to the ribs of the metal roofing. Dry film thickness shall be approximately 10 mils per gallon. Total thickness of CERAMAX is to be no less than 20 dry mils. For added mil thickness and coverage follow, as above alternating between perpendicular and parallel between each added coat.

# Metal Roofing Specifications

Continued

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Each coat must be allowed to cure for 24 – 48 hours depending on humidity and temperature. The roof is to be inspected for defects, flaws or holidays and repaired if necessary.

## **APPLICATION RATES**

2 gallons per 100 sq. ft. yields 20 dry mil / 3 gallons per 100 sq. ft. yields 30 dry mil  
Roof should be 30 dry mils. with (3 coats) thickness. When estimating area of roof, add 20% for pitch and ribs.

## **RESTRICTIONS / LIMITATIONS**

This system is to be used in conjunction with commonly accepted roofing standards but not limited to the following:

No application of materials shall commence during inclement weather or when precipitation is imminent. No thinning of materials is permitted.

No materials are to be applied to wet, dirty, or frozen surfaces. No materials are to be applied at temperatures below 55°F. No materials are to be applied at ambient air temperature above 100°F. No materials are to be applied at relative humidity levels above 88%.

In conjunction with the final inspection, all debris, containers, materials and equipment are to be properly removed from the jobsite. Grounds are to be cleaned undamaged and acceptable to the owner.

Reflectivity of coatings may be reduced if roof surface is not cleaned on regularly scheduled basis.

Known ponding water areas are to be repaired using commonly acceptable roofing practices so as to allow proper drainage of roof area.

**CAUTION:** Do not apply within two (2) hours of sunset, rain, fog or freezing temperatures. CeramaX Coatings must be completely dry before exposing to water or foot traffic. Keep containers covered when not in use. Dispose of all containers in accordance with state and local environmental regulations. Keep away from children. If ingested, DO NOT induce vomiting. Call Physician immediately.

Our suggestion installation specifications are based on information from laboratory and field testing which we believe to be reliable and correct; however, accuracy and completeness of said tests are not guaranteed and not to be construed as a warranty, either expressed or implied. Since the use of the material is beyond manufacturer's control, buyer assumes all risk whatsoever as to their use or results obtained. We guarantee our products to conform to Acry-Tech Coatings, Inc.'s. quality control. Acry-Tech Coatings, Inc. warrants only the standard quality of material. Manufacturer's sole responsibility shall be to replace that portion of the product that the manufacturer deems to be defective.

# **Additional Roofing Substrates**

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## **ADDITIONAL ROOFING SUBSTRATES:**

**Modified Bitumen Roofing**

**Polyurethane Foam**

**Single-Ply Roofing**

**Tile Roofing**

The same application procedures outlined in Built-Up Roofing, Concrete Roofing, and Metal Roofing can be followed.