MCM Construction Products

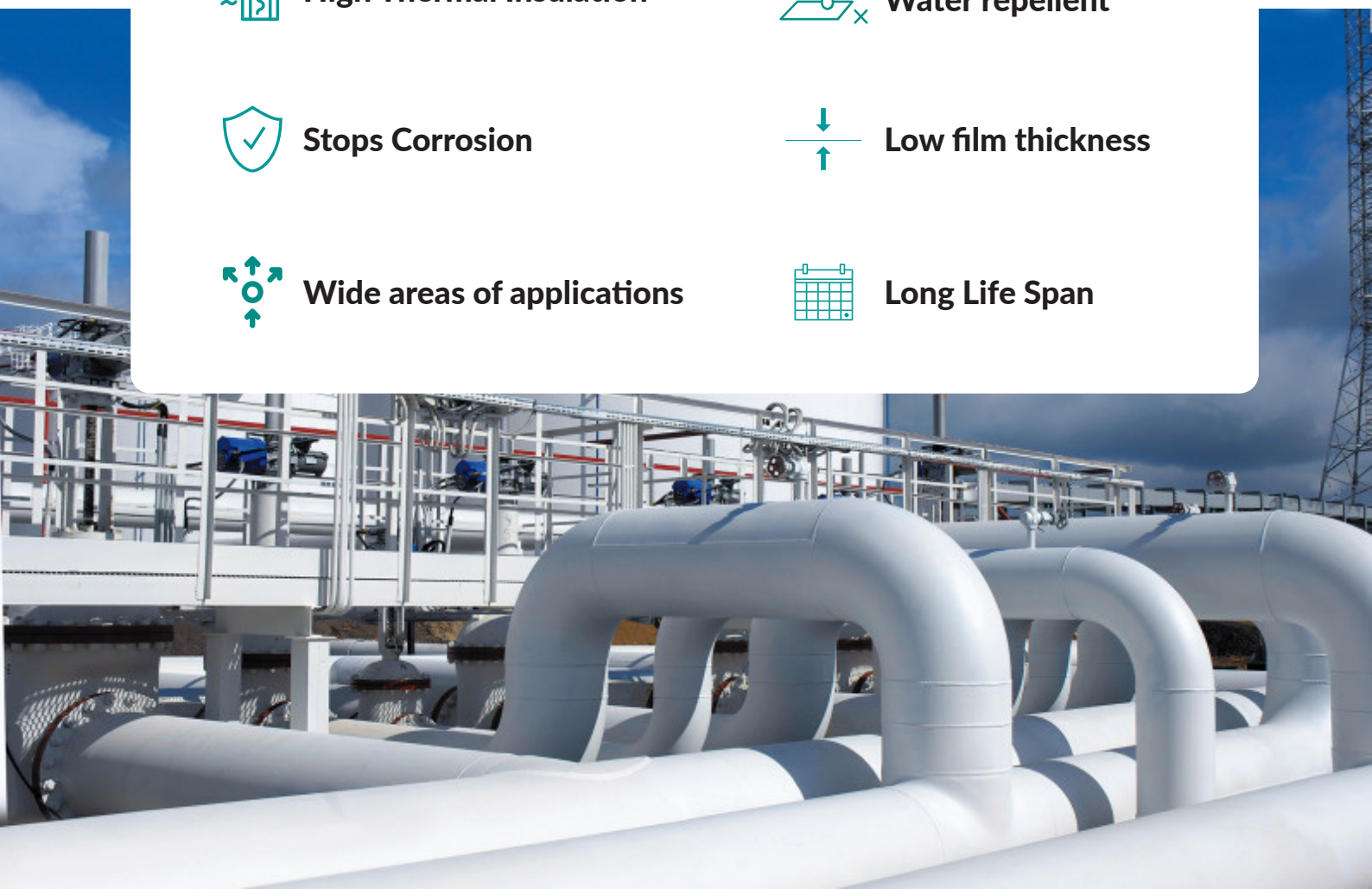
ALWAYS ONE STEP AHEAD

CERAMOR METAL

THERMAL INSULATION COATINGS

FOR INDUSTRIAL USE

- High Thermal Insulation
- Water repellent
- Stops Corrosion
- Low film thickness
- Wide areas of applications
- Long Life Span



What is Ceramor?

CERAMOR Metal is a water based thermal insulation material and designed to be applied on a variety of surfaces. Free of organic solvents and volatile compounds. It is a safe and non-toxic material suitable to use on wide range of industrial equipment, machinery, and pipelines.
Ceramor Metal is recommended primarily for metal structures.

WHAT CERAMOR DOES?

The insulation is an important step to significantly reduce the energy usage and costs at the buildings and various industrial equipment. Therefore, the insulation materials acquire special relevance for the customer. A high-quality thermal insulation, ensures a comfortable microclimate, protects the construction structures from the climate damage and destructive impact.

Ceramor provides high level of thermal insulation while protecting your equipment and metal surfaces against heat and external factors such as condensation and corrosion. Due to its unique texture, Ceramor can be easily applied to various of surfaces, including the hard-to-reach areas, and unconventionally shaped areas, without altering the look of the machinery or equipment. It creates a uniform, smooth insulation layer. It is ideal for the protection of new and old equipment, machinery, tanks, or pipelines.

A significant part of the energy resources is used at industrial facilities. Due to deficient insulation and aged equipment, big part of the heat is lost. The reduction of the heat losses can be achieved using of insulation materials. The application of Ceramor liquid insulation coatings is a complete and detailed solution for the protection of industrial equipment and metal surfaces without adding any weight to the surface due to the extra-thin, elastic, and low structural load application layer.

Water Resistant

Respects the Environment

High Adhesion to Metals

Energy Efficiency

Anti Corrosion

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How it works?

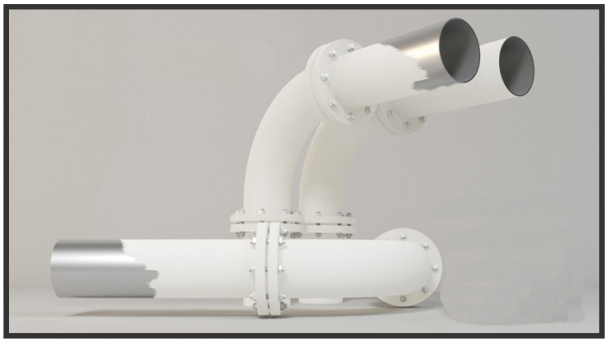
Under the laws of physics, the hot air rises, but if the buildings or equipment are not properly insulated (due to problems in the thermal insulation properties on the ceiling or cover, or due to lack of efficiency of the thermal insulation material used), then important heat losses are produced.

The good thermal conductivity of the metal may lead to a serious side effect, the emergence of “thermal bridges”, also increases heat losses and cause damage in construction. The “thermal bridge” is an external part of the building which has a stronger thermal conductivity than the main metallic structure.

For restoration, Ceramor is economically advantageous, convenient, and effective.
The construction projects concerning the use of Ceramor does not have any noise effect, respecting the staff tranquility and avoiding conflicting situations in the productive process when the building works are carried out. Ceramor avoid the possibility of damage at the building, improves the thermo-technical characteristics and provides a more pleasing appearance to the building façade.

Water-based thermal insulation material. Solvent and VOC free.

- Thermal insulation for cooling/heating conducts for both residential and industrial.
- Protection of metal structures from overheating.
- Thermal insulation of storage tanks, hangars, cold stores, warehouses ...
- Thermal insulation in metal ceiling (sheet metal roof tiles, ribbed sheeting ...)
- Thermal protection of air-conditioning, refrigeration, and trailers.



- Thermal insulation in transport vehicles.
- Prevents the formation of “thermal bridges” to save energy.
- Protection against adverse weather conditions (strong winds, precipitations and the excessively low or high temperatures), it also reduces the inspection costs, maintains, and protects the constructive elements and equipment from deterioration.
- UV resistant (protects from overheating resulting from the exposure to high temperature and direct sunlight).
- Prevention against temperature and condensation gradients.
- The anti-fungal coating inhibits the growth of mold, fungi and destroys the existing ones.
- Seals joints to prevent heat losses, as well as dirt, dust and rainwater infiltrations and its subsequent deterioration.
- Protection against ice sheet and frost penetration.
- An option that coats the hard-to-reach areas (pipe elbows, sphere-shaped containers, etc.).
- It has a low surface tension coefficient.
- It does not impose an additional overweight on the isolated surface.

Advantages

HIGH THERMAL INSULATION
With Ceramor, you can enjoy the energy savings from 20% up to 90%. The product has a very low heat conductivity of **0.00037 w/mK (combined)** and it is a great alternative to traditional insulation materials such as rockwool or XPS-EPS boards.

STOPS CORROSION
Ceramor prevents corrosion on metal surfaces 100%. You no longer need to remove the insulation and check if there is any corrosion underneath.

WATER REPELLENT (HYDROPHOBIC)
Ceramor has a great water retention and repelling capabilities. It protects buildings and equipment by keeping the water and other harmful elements away from structures.

STOPS CONDENSATION
Condensation causes mold, mildew, or corrosion on structures. Ceramor stops condensation completely so you can enjoy “maintenance free” energy savings.

CHEMICAL RESISTANCE
Ceramor resists to most chemicals and harmful substances. We don’t recommend keeping the coating exposed to harmful substances on a regular basis constantly. Please see details below.

UV RESISTANCE
Ceramor is 100% UV resistant, and it doesn’t degrade when it is applied with colors. It also continues to work without any loss of performance, even under intense UV.

FIRE RESISTANCE
Ceramor doesn’t catch fire and it is safe to use in all areas, both indoors and outdoors. It is tested and passed 60 minutes time. If you wish to receive more details, please contact us.

Advantages

VERY LOW FILM THICKESS
Ceramor can be applied from 1mm to 4mm. Depending on the desired outcome and application area. It allows structures to keep their form and not be affected by bulky materials. Suitable for many surfaces.

SURFACE PROTECTION
Ceramor also protects the surfaces against harmful substances. In addition to water repellency, the material provides high level of protection against various external elements. You can find more info below.

SINGLE COMPONENT
Ceramor is only one component and ready to use. It doesn't require mixing multiple components or complicated preparation. It requires through mixing (3-5 minutes) and can be applied onto surface immediately.

FAST DRYING TIME
It takes only 24 hrs. to be fully cured for 1mm of application. For multiple layers, usually 4-6 hours between the layers are adequate. Please consult your representative for more details.

EASY APPLICATION
Ceramor is easy to apply. You can choose brush, roller, or spray for effective and practical application. Compared to traditional application methods such as rockwool, it saves users many hours of time and labor cost.

LIGHTWEIGHT
Ceramor is very light. 1 liter of material only weighs 500 grams. It doesn't add extra weight to your structures. It is also very easy to repair if ever needed.

CAN BE TOP COATED
Ceramor can be painted over or covered with other coatings if desired. No loss of performance will occur. Note: The topcoat you wish to use must also be suitable for the surface temperature.

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GREEN PRODUCT - ZERO VOC

All Ceramor coatings are water based and 100% friendly to the environment.
They are safe to use on indoor areas, food production facilities or hospitals.

LONG LIFESPAN

Ceramor coatings have a very long lifespan compared to traditional insulation materials such as rockwool, which must be replaced every 4-5 years. Life expectancy for indoor applications is minimum 12 years, for exterior applications around 10 years.

NO FUNGUS GROWTH

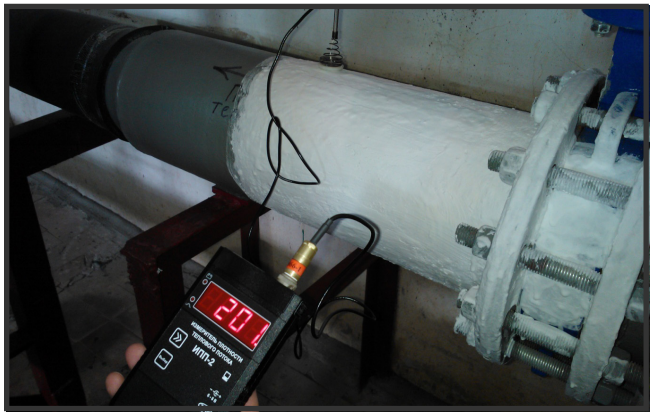
Ceramor stops condensation on equipment. As a result, it prevents the formation of fungus, rust and humidity on all surfaces.

WIDE USE AREAS

Ceramor can be used on variety of surfaces, areas, structures and equipment.
It offers great flexibility and ease of use for practical and effective thermal insulation.

Metal Roofs

Industrial Containers



Hot - Cold Pipes

Production Facilities

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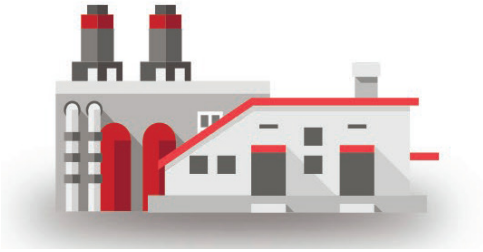
Areas of Use

PIPELINES AND ANTI-CORROSION PROTECTION

Some application areas:

- Water pipes and heating supply (hot and cold water)
- Steam pipelines
- Condensed pipes
- Industrial pipelines (oil, gas, etc.)
- Others



Pipes are a comprehensive part of industrial process, and they are used to move different substances, both liquid and gaseous and also are used to connect important elements of pipe system and equipment components.

To make life more comfortable any house needs fuel to heat up the living area in winter and the provision of hot water throughout the year.

Both domestic and industrial installations require a special attention to improve technological functions: for example, to protect them from heating, excessive freezing, corrosion, and condensation.

- Provide continuous insulation which is thermal-stable and prevents temperature fluctuations
- Keeping the liquid temperature stable by the reduction of heat exchange
- Improve energy efficiency by reducing heat losses
- Reduction of emission CO2
- Provide safety in use: protection against burn by contact with hot surfaces
- Prevention and protection of metal against corrosion and condensation
- Noise insulation produced by substances inside the pipes
- Protection against direct sunlight and excessive heating
- Protection against low temperatures. FREEZING.
- Protection against high and low temperatures. Maintenance constant indoor temperature.
- Maintenance of water and liquids pipelines temperature.
- Energy efficiency improvement
- Reduction of carbon dioxide emissions
- Protection against burning when in contact with a hot surface
- Prevention of condensation and metal corrosion protection
- Protection against sunlight and overheating
- Extends the lifespan of your pipes

Areas of Use

THERMAL INSULATION OF METAL ROOFS AND STRUCTURES

Some application areas:

- Metal structures, containers
- Various kinds of equipment
- Heated or cold tanks
- House roofs and industrial installations
- Metal structures and roofs of public places.
- Metal buildings, garages, warehouse roofs, hangars warehouses and other premises
- Fences, doors, barriers, container houses

Good thermal metal conductivity may cause a serious secondary effect, “thermal bridges” appearance, which increase caloric losses of energy and cause damages in construction. “Thermal bridge” of a building and has a stronger thermal conductivity than main structure. Example: a cantilevered balcony’s corbel, roof overhangs, etc. “Thermal bridges” provide a temperature reduction in a building surface and as a result, the humidity that form part the building’s envelopes.

An efficient insulation in roofs and metal structures:

- Remove effectively thermal bridges
- Avoid heat flow in metal beams
- Protect metal against corrosion
- Keep heat energy in winter and reduce heating in summer to protect against heating and considerably cooling to reduce heating costs and air conditioning of installations and warehouses
- Reduce the pressure produced by temperature and possible damages in metal structure support
- Protect against condensation
- Protect against heating and considerably cooling to reduce heating costs and air conditioning of installations and warehouses
- Provide lifetime extension
- Prevention of heat transfer in metallic structures
- Decreasing of heat in summer, reducing the expenses of air conditioning
- Thermal stress reduction
- Protection against condensation and corrosion
- Extends the working life of the surfaces where it has been applied

Areas of Use

THERMAL INSULATION OF STORAGE TANKS

Some application areas:

- Storage tanks and transport of products derivative from oil (gasoline, diesel, gasoil, industrial oil, etc.).
- Storage reservoirs and chemical substances transport.
- Storage containers and chemical substances transport.
- Storage tanks and transport of cold potable water.
- Vessels for liquid substances transport.

Storage containers and tanks are thoroughly used storage and transport different substances. Ships have different sizes, shapes and temperature depending on the transported liquids. However, any boat type needs a safe thermal insulation to ensure its technical functionality, reduce heat losses and the contact protection to assure a safe conservation of the transported substance.

Transport vehicles, both, earth, and water have a negative impact in the environment and require a reliable thermal insulation to retain their operational capabilities. Moreover, a suitable thermal insulation is necessary to carry out cargo transport without damaging the quality of this.

An efficient insulation at storage tanks and containers

- Continent protection from excessive heating because of direct sunlight exposure or high outside temperatures
- Keeps temperature inside the container, temperature of transported substance and increase of useful lifetime
- Losses reduction of transported substances by evaporation or freezing through the protection from temperature gradients
- Protection against overheating under temperature exposure and direct sunlight
- Protection against corrosion
- Improve transport safety
- Protection against low temperature exposure
- Useful life extension of storage tank
- Increase transport safety
- Extends the working life of both the buildings and contents
- Protection against fire
- Reduction of substance losses due to evaporation or freezing through the temperature gradients
- Maintains the temperature of the material

Areas of Use

THERMAL INSULATION OF TRANSPORT VEHICLES ANTI-CORROSION

Some application areas:

- Railway transport.
- Airfreight transport.
- Military equipment and specialized machinery.
- Light motor vehicles and trucks.
- Water transport.
- Containers transport.

Transport vehicles both earth and sea are exposed to the negative impact of environment, thus they need a reliable thermal insulation to keep their operational characteristics. Moreover, an appropriate thermal insulation, essential for cargo quality transport without suffering damages.

Ceramor liquid insulation make an excellent work of thermal insulation in the different types of transport vehicles: railway cars, water bowls, automobiles. It can be easily applied at both, external and internal parts of a vehicle. After this application, a uniform and smooth surface is created and protect against the negative influence of environment, extending the useful vehicle life and reducing fuel costs because of proper condition.

An effective insulation at transport vehicles:

- Continent protection, roof, and external part of the vehicle against excessive heating or ice cover.
- Protection against temperature gradients and condensation prevention.
- Walls insulation, floors, interior ceilings, compartments, and storage areas.
- Prevention of dust, dirty and humidity entry.
- Temperature maintenance in order to reduce heat loss and air conditioning costs.
- Protection against corrosion.

Protection of outside parts of the vehicle against overheating

Performance

HEAT REDUCTION CHART

The table of decrease in temperature on the surface of the metal Ø pipeline of 150 mm according to requirements Construction Norms and Regulations.

Thickness CERAMOR	Temperature on top of surface (Celcius)					
	60 °C	80 °C	100 °C	120 °C	150 °C	200 °C
1 mm	42 °C	54 °C	64 °C	68 °C	77 °C	100 °C
1.5 mm	33 °C	42 °C	56 °C	57 °C	64 °C	76 °C
2 mm	31 °C	35 °C	45 °C	51 °C	58 °C	70 °C
2.5 mm	30 °C	31 °C	42 °C	46 °C	50 °C	66 °C
3 mm	28 °C	29 °C	35 °C	42 °C	45 °C	52 °C
4 mm	25 °C	26 °C	32 °C	35 °C	39 °C	46 °C

*** The table presents the average values, the temperatures may differ by around 10% depending on the environment, the condition of the coating, etc.**

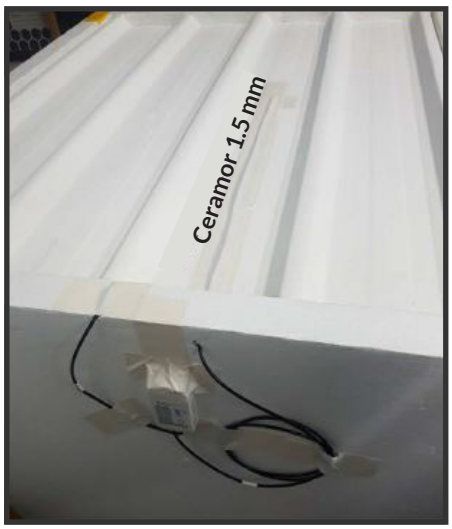
Ceramor 200 applied over a hot storage tank (1,5 mm). Temperature dropped by 42%.

Please contact us at **info@mirava.co** for more case studies.

Performance

COMPARISON WITH ROCKWOOL

CERAMOR METAL VS ROCKWOOL



Temperature monitoring (all measurements are in Celsius ℃)

Plain roof vs. Rockwool insulated roof (130mm) vs. Ceramor Metal Applied Roof (1.5mm)

Time	Ambient Temp.	Plain Roof Surface	Plain Roof Underside	Plain Roof Space Temp.	Classic Insu-lation Surface	Classic Insulation Underside	Classic Insulation Space Temp.	Ceramor 1.5mm Surface	Ceramor 1.5mm Underside	Ceramor 1.5mm Space Temp.
8:00	13.85	15.23	15.27	15.78	14.24	14.20	14.54	14.88	15.01	15.36
9:00	14.71	15.91	15.91	16.08	16.73	14.88	14.97	18.87	15.83	15.74
10:00	16.04	16.51	16.47	16.69	18.19	16.99	16.69	16.64	16.64	16.56
11:00	17.37	17.03	16.99	17.07	19.39	18.36	18.06	17.37	17.29	17.07
12:00	19.52	33.03	32.99	24.88	35.09	23.42	20.98	21.45	20.50	20.98
13:00	26.98	30.63	30.97	29.38	32.09	25.57	23.12	27.67	24.15	23.38
14:00	26.90	30.46	30.84	26.98	32.39	26.08	23.94	24.97	22.52	23.16
15:00	23.64	20.89	21.10	22.18	20.93	22.09	21.66	20.42	19.77	20.76
16:00	21.23	17.84	17.84	19.17	17.63	19.52	19.52	17.67	17.54	18.53
17:00	19.30	17.54	17.54	17.41	17.59	18.02	18.23	17.50	17.41	17.24
18:00	18.27	17.59	17.59	17.72	17.72	17.46	17.54	17.59	17.59	17.59

As you can see the on the table above, Ceramor with its very low heat conductivity of (0,00037 - 0,0012 W/mK) and thin film thickness (1.5 mm) performs better than 13 cm of rockwool.

With Ceramor, you don't need to renew the application every few years as with traditional insulation materials. It also provides countless other benefits in addition to its superior insulation capabilities. Please see the full features section above for more details. If you wish to receive the complete report of this test, please send an email to **info@mirava.co**

Performance

CHEMICAL RESISTANCE CHART

	Interaction Resistant	Constant Interaction
Aqueous solutions of salts	+	-
Lime	+	-
Cement	+	-
Gypsum	+	-
Slaked lime	+	-
Ammonia solution	+	-
Alkalis	+	-
Soap	+	-
Washing powders, soaps	+	-
Solutions of hydrochloric acid	+	-
Solutions of nitric acid	+	-
Solutions of sulfuric acid	+	-
Weak lactic and carbonic acid	+	-
Salts and fertilizers	+	-
Bitumen, bituminous mastics, cold bituminous adhesives	+	-
Paraffin oil	+	-
Petrolatum	+	-
Diesel oil	+	-
Synthetic oil	+	-
Silicone oil	+	-
Methyl and ethyl alcohol	+	-
Organic solvents (acetone, benzene, turpentine)	+	-
Gasoline	+	-
Diesel fuel	+	-

(+) It resists the substance and don't lose any of its qualities. Must be cleaned afterwards.

(-) It is not suitable for constant exposure and must be top coated if required.

Test Results

Some of our test results / Metal 300

Please contact us for all available tests and the TDS of other versions.

Hardness	60 - Shore “A”/15:64	ISO 868:2003
Density	290 kg/m3	ASTM D 1622-98
Elasticity	5,0	DSTU ISO 1519
Thermal conductivity (tested) **(conductive only)**	0.035 W/mK	ASTM C 518-10
Thermal conductivity (equivalent) **(conductive + convective + reflective)** *Please see our test report for details.*	0,00037 - 0,0012 W/mK	ASTM C518-21 ISO 6946:2017 ASTM E 1980:11
Vapor diffusion	1,9 ± 0,3	EN 12086:2013-07
Solar reflective index	110,00%	ASTM E 1980:11
Pull of strength (adhesion) concrete	1,3 [N/mm]	DSTU ISO 4624
Pull of strength (adhesion) steel	1,0 [N/mm]	DSTU ISO 4624
Pull of strength (adhesion) brick	1,5 [N/mm]	DSTU ISO 4624

Some Applications

Industrial equipment on the left was coated with Ceramor Metal 200 at 1.5mm thickness. Surface temperature dropped from 130° C to 77° C.

In addition, Ceramor also protects metals surfaces against corrosion and provides maintenance-free applications.

Industrial pipes were coated with Ceramor Metal 100. The device being used is called BTU meter and it displays the amount of heat passing the pipes at any given moment.
Uncoated surface is passing 393 BTU while the coated area is only giving out 201 BTU, with only 1mm of application.

Some Applications

Metal roof application: From 46° C to 22° C.

1mm of Ceramor 100 applied.

Ceramor stops condensation completely. No more corrosion or fungus formation.

Ceramor coatings passed 60 minute mark for fire retardancy.

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Some Applications

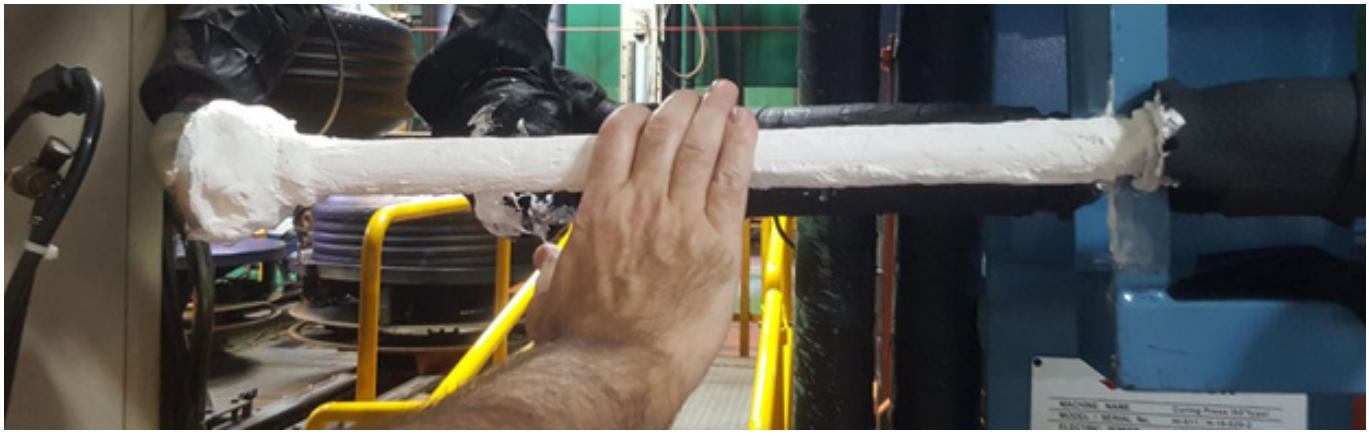
Uninsulated section
140° C

Ceramor 200 Metal
58° C

This application was done at a tire factory in South Korea.

Ceramor Metal 200 applied at 2,5mm and surface temperature has dropped from 140° C to 58° C.

Also, it protects the metal from corrosion and no maintenance required.



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Product Versions

Ceramor Metal has different versions:

Material selection should be made based on the surface temperature of the application area.

CERAMOR Metal 100:	Surface temperature up to 100 °C
CERAMOR Metal 200:	Surface temperature up to 200 °C
CERAMOR Metal 300:	Surface temperature up to 300 °C
CERAMOR Metal 600:	Surface temperature up to 600 °C
CERAMOR Topcoat:	Protection layer coat. For additional abrasion resistance where extra surface protection is required. Maximum surface temperature should not exceed 100 °C.

Packaging

All Ceramor Thermal Coatings come in 20-liter pails.

Consumption

Please refer to TDS for consumption details.

About Us

BEST THERMAL INSULATION COATINGS FOR INDUSTRIAL AND RESIDENTIAL USE

The products manufactured by MCM company are advanced insulation solutions for the protection against heat, condensation, corrosion, waterproofing and climate deterioration. Our formulas are continuously improved based on the experience, continuous research and development to expand our range of products according to particular requirements and needs of our customers.

INNOVATION

Innovative approaches of the products developed by us do not have any equivalent due to specialization in this technology. Ceramor maintains a high demand in the private and industrial sectors in small, medium, and large companies.

QUALITY

The production is subject to strict quality test, allows us to guarantee the quality and safety of our products, its respect for the environment, compliance with the standards and requirements concerning the production and high quality of our products.

The unique formulas of our products, allow us to satisfy the requirements of our customers in the world market, it counts with a commercial structure in the present countries to provide an appropriate commercial and technical attention. Our products can be exported to any part of the world.

CO-OPERATION

We provide individual approach for each customer. Free advisory services of highly qualified professionals are also available. We train and qualify our sales representatives and distributors worldwide. Ensuring the perfect product selection and application everyt ime.

If you are interested in getting more information about our products and distribution opportunities, please contact us at **info@mirava.co**

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