REPORT

Product Technical Assessment

Revison-0

Metaltec TC Thermal Insulation Product

Imbokotho Engineering

Prepared By:

PRODUCT TECHNICAL ASSESSMENT – EXECUTIVE SUMMARY

Metaltec TC – Thermal Insulation Product

REVISION 0 – February 2012

Imbokotho Engineering reviewed the technical aspects and specifications of the Metaltec TC product which in now available in South Africa. We were interested in reviewing the product as a potential energy saving strategy for projects Imbokotho are involved with.

We have concluded that given the right application, the product has the potential to be used on Building and Industrial applications as an energy saving strategy with the following potential uses:

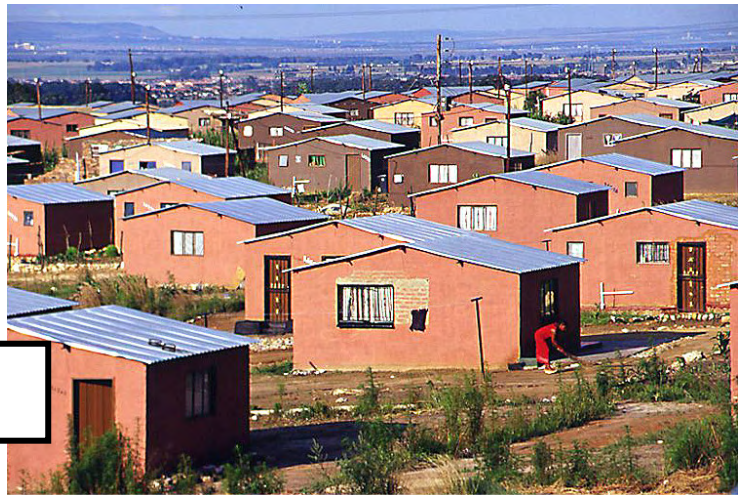
> **Commercial Buildings** – In particular the insulation of roofing and insulation to Air Conditioning and Heating equipment.
> **Industrial Plant and Power Stations** – Used as an insulation in various applications. It can be applied to hot surfaces and thus often does not require plant shut down for application.
> **Housing Projects –** As roof insulation to low cost housing developments.

Metaltec is a general-purpose liquid insulation, consisting of a complete mixture of various silicon and ceramic beads blended into an acrylic polymer. The product is painted or sprayed to a surface. It is designed to provide both thermal and acoustical insulation for a variety of industrial applications. Due to its excellent reflectivity and emissivity, it is effective at insulating structures and equipment from radiant heat gain. Metaltec claims 99% of the radiant energy that comes in contact with the product is either reflected or re-emitted, meaning only 1% of the radiant energy is absorbed. Because it physically adheres to a surface, it also significantly reduces corrosion problems and rust formation. It is lightweight and pliable, therefore, it expanding and contracting with the surface to which it is applied. *With conventional insulation, corrosion can still occur between the insulation and surface – Metaltec helps prevent this.*

> **Return on Investment**: As heat loss (*or gain*) is often directly proportional to the use and consumption of power on a particular site, acceptable return-on-investment calculations can be made to prove the viability of the product. In a building application *for example*, the costs are only slightly more expensive than conventional duct insulation in Air Conditioning applications, but given the ease of installation the product makes a viable alternative.
>
> **Eskom**: We believe the product should be considered as one of the strategies in energy savings for the Eskom DSM program and similar energy saving efforts.

IMBOKOTHO ENGINEERING is an **ESCO** company with active status.

BUILDING APPLICATIONS – Air Conditioning and Heating Equipment



HOUSING DEVELOPMENTS – Insulation to Roofing and Walls.

INDUSTRIAL APPLICATIONS AND POWER PLANTS – Various Insulation and Heat Protection Applications.

REPORT – Technical Product Assessment

MetalTec TC – Product Assessment

REVISION 0 – February 2012
(Initial Findings and Calculations Made – Included Technical Information as supplied by Metaltec)

Contents of Report

Queries regarding the report and our findings should be directed to:

Imbokotho Engineering – **Peggy Mahlaba** – 021 403 6335 / 073 132 8718

Imbokotho Engineering – **Matthew Winter** – 021 403 6335 / 078 533 0126

1. Introduction to Report

In buildings various Lighting, Power, Air Conditioning and Ventilation installations contribute to the power usage and consumption. Air Conditioning and Ventilation consume a large percentage of the used building power. By improving the insulation and thermal characteristics of a building much savings can be achieved from the power use associated with Air Conditioning and Ventilation.

Similarly in large Industrial applications poor insulation can be the reason for significant and unnecessary energy use.

Typically energy, heat loss and heat gain calculations are made based on standard heat flow theory, where a product has a particular U-value. When considering buildings with roofs or walls exposed to the sun solar gain is also considered. Heat is thus transferred in a number of ways through a product. Heat flow is thus dependent on the reflectance of a surface, conductance, emissivity, absorptivity and transmittances.

> Think the inside of a **thermos flask** – it has a high reflectance, and most of the heat is reflected internally. The heat that "escapes" or passes through the reflective material then needs to pass through the vacuum portion – or insulative portion – of the flask. The heat is thus kept in with reflectance and a good product U-value.
> …or, A **block of steel** left in the sun, compared to a block of wood – steel is a great conductor and "absorber" of heat.

In order verify and compare data, we also simulated an example of the product installed on the roof of a building. Please refer section 3.The energy simulation for the building was conducted using Carrier HAP version 4.4. This software is approved by the Green Building Council of South Africa and United States Green Building Council for simulation with regard to energy credits for Green Star and LEED.

IMBOKOTHO ENGINEERING is an **ESCO** company with active status.

2. Description of Product

Metaltec is a general-purpose liquid insulation, consisting of a complete mixture of various silicon and ceramic beads blended into an acrylic polymer. The product is painted or sprayed to a surface. It is designed to provide both thermal and acoustical insulation for a variety of industrial applications. Due to its excellent reflectivity and emissivity, it is effective at insulating structures and equipment from radiant heat gain. Metaltec claims 99% of the radiant energy that comes in contact with the product is either reflected or re-emitted, meaning only 1% of the radiant energy is absorbed.

Because it physically adheres to a surface, it also significantly reduces corrosion problems and rust formation. It is lightweight and pliable, therefore, it expanding and contracting with the surface to which it is applied. *With conventional insulation, corrosion can still occur between the insulation and surface – Metaltec helps prevent this.* Insulation and thermal products are often designed and marketed to offer a good U-value or good reflectance. Metaltec however attempts to address all aspects and modes of the heat transfer "spectrum".

2.1. Technical Performance of Product

Thermal Dynamic Heat Transfer (TDHT)

Thermal dynamic heat transfer (TDHT) is a never-ending process in which solids, gases and liquids are in the quest to reach equilibrium. Once equilibrium is reached total heat transfer has been achieved. Or in other words, if one thing is hotter than another, both substrates will try to reach the same temperature. This is where insulation enters the picture. The way in which an insulator blocks this TDHT determines how effective that insulator will be. However, there are several processes in which heat transfers and what medium it uses. These processes are termed as conduction, convection, and radiation. In short these terms are respectfully defined:

Conduction: transfer of heat by spreading the vibration of molecules in a solid.
Convection: transfer of heat through a fluid (water, air).
Radiation: transfer of heat by electromagnetic radiation.

Insulation - The above heat transfer methods can be expanded in great depth, but typically, most insulators employ a type of heat transfer method known as conduction. The way in which an insulator blocks the transfer of the molecule vibration defines its thermal conductivity (k) or R-Value.

The lower the "k" value (or the higher the R-Value), the better the insulator. However, this is only one of the ways in which heat can be blocked. Most conventional (Bat type) insulators use conduction as their main blocking agent to retard heat/cold. What about the other two heat transfer methods? How do they fit into the equation of THDT dissipation? As heat is transferred, the above terms all play important roles. This means that by examining these THDT methods, we can effectively design or employ blocking agents to make an insulator more effective. The below terms are descriptions in detail of ways to block THDT.

CONDUCTION

- Conduction is the transfer of heat, from molecule to molecule, throughout a solid material. The molecules inside the material, which are nearest to a heat source, gain kinetic energy. They vibrate vigorously, and their movement affects the molecules immediately next to them. They pass on some of their energy, spreading heat through the material. Conduction is chiefly associated with solids, because of the closely packed molecular structure of a solid is most suited to it.

Metals are very good conductors of heat. Conduction is a point-by-point process of heat transfer. If one part of a body is heated by direct contact with a source of heat, the neighbouring parts become heated successively. Thus, as shown in the diagram, if a metal rod is placed in a burner, heat travels along the rod by conduction. This may be explained by the kinetic theory of matter.

The molecules of the rod increase their energy of motion. This violent motion is passed along the rod from molecule to molecule. In considering the flow of heat by conduction, it is sometimes helpful to compare the flow of heat to the flow of electricity. The temperature difference can be thought of as the pressure, or voltage, in an electrical circuit. The ability of a substance to transfer heat (its thermal conductivity) can be compared to electrical conductivity. When the temperature difference (or voltage) between two points is great, the driving force to move heat (or current) is high. The quantity of heat (or current) transferred will depend upon the temperature difference (or voltage difference) and the resistance to the flow of heat (or current) offered by the conductor.

REFLECTION

-Reflection occurs when light rays hit a surface and bounce off changing direction. Mirrors are usually used to demonstrate the reflection of light because their shiny surfaces reflect light more than dull rough surfaces. This is important when applied to heat because heat as well is transferred in a light wave. Reflection plays a role in reflecting the light waves and thus returning the waves, which also employ heat. Therefore if a substrate is exposed to the sun and its enormous amount of light as well as radiated energy a large portion of the energy is then transferred into the substrate. However if the substrate employs a white and shiny surface a large portion of energy transferred, is reflected back into the atmosphere.

This theory also works for radiated energy that can be reflected back to a substrate if the energy is transmitted from within. For example, if a pipe is covered with a shiny surface the reflected energy is then transmitted back to the pipe. If the surface were black the energy would simply be radiated to the atmosphere. Thus reflection plays an important role when considering how energy is either lost or gained.

RADIATION

-Radiation begins when the internal energy of a system is converted into radiant energy at a source such as a heater. This energy is transmitted by waves through space, just as the sun radiates heat outwards through the solar system. Finally the radiant energy strikes a body where it is absorbed and converted to internal energy. It then appears as heat. An electric heater produces radiant energy in this way (see diagram). It may be absorbed, reflected, or transmitted by a body in its path. When the radiant energy is absorbed, the internal energy of the body increases and its temperature rises. All bodies, whether hot or cold, radiate energy. The hotter a body is, the more energy it radiates. Furthermore all bodies receive radiation from other bodies. The exchange of radiant energy goes on continuously. Thus a body at constant temperature has not stopped radiating. It is receiving energy at the same rate that it is radiating energy. There is no change in internal energy or temperature. Heat transfer by radiation is not proportional to the difference in temperature between the hot and cold objects as it is in the case of heat transfer by conduction and convection. It is proportional to the difference between the fourth powers of the absolute temperatures of the two objects. Thus heat transfer by radiation is enormously more effective at high temperatures than at low temperatures. Radiation transfer depends also upon the shape of the radiating object. As radiational heat is understood the following new terms of emissivity, transmittance, and absorptance describe how radiational heat is transferred from one medium to the next. The following terms are described below.

EMISSIVITY

-Emissivity is the ratio of its power radiated per unit surface area to the power radiated per unit surface area of a black body at the same temperature. Materials with high emittance radiate *more heat than materials with low emittance. For example, black surfaces have an emittance of 0.98* and a polished aluminium surface has an emittance of 0.04. Aluminium tends to block radiant heat transfer while black surfaces tend to emit significant heat.

ABSORPTIVITY

-Absorpitivity and is defined as the fraction of the total incident radiation absorbed by the surface. Therefore, if the temperature of the surface is constant and energy is conserved, the emissivity is equal to the absorptivity.

TRANSMITTANCE

Transmittance **-** is the amount of energy that is transferred to a substrate. A low transmittance is desired for thermal insulators. This prevents heat transfer through the insulator by radiation.

Metaltec TC Coatings – Description of product specific performance

Conduction has been examined as an effective way to insulate most substrates. Yet, there are fMetaltec other methods in which heat is transferred. By examining and employing all blocking agents, insulators can be designed to be more efficient and less space constrictive. Therefore, we tried to employ the best in natural thermal dynamics blocking agent qualities of materials and combine them in a coating. This allows for natural thermal dissipation by using physics to Metaltec advantage. Below is a combined description of how each blocking agent principle works to Metaltec advantage.

All of Metaltec coatings employ a highly reflective particle composition structure (hollow ceramic glass insulating particle) to reflect light wave energy (heat) away from the substrate and back to the atmosphere in which it originated. (From a microscopic point of view, the particle looks like a piece of popcorn). This means that the coating deals with the heat prior to absorption to the substrate. Imagine a Thermos bottle. The coating is very similar in this respect. The coating actually reflects upwards of 85% of the heat generated back to the respective substrate or atmosphere. Now substrates remain cooler to the touch because they do not gain the heat like before.

All of Metaltec coatings employ a highly reflective particle composition structure (hollow ceramic glass insulating article) to reflect light wave energy (heat) away from the substrate and back to the atmosphere in which it originated. (From a microscopic point of view, the particle looks like a piece of popcorn). This means that the coating deals with the heat prior to absorption to the substrate. Imagine a Thermos bottle. The coating is very similar in this respect. The coating actually reflects upwards of 85% of the heat generated back to the respective substrate or atmosphere. Now substrates remain cooler to the touch because they do not gain the heat like before.

Delta T Coating unusually low emittance allows little heat-radiated into the atmosphere starting the convective process. This means that substrates feel actually cooler than if compared by a thermometer. And its transmittance and absorptance rates are very effective when compared to other conventional insulators allowing no transmittance due to its solid white colMetaltec and thus no gained absorptance whatsoever. This means that the coating does not gain infrared energy.

Thus Metaltec coatings use the best in materials to help retard or stop the total heat transfer. This brings up an interesting conclusion on adding these heat-blocking principles together to represent the total heat transfer. In the past it has been safe to describe the way in which an insulator worked mathematically as:

Total Heat transfer (THDT) = conductivity of a material

Now it must be re-written as:

Total heat transfer (THDT)= Radiation + Conduction + Emissivity + Transmittance + Absorptance

This way of thinking applies to any type of insulator or insulating method. Without examining the whole, effective mathematical calculations will not describe insulating coatings or other insulators that use reflection to their advantage.

3. Energy Simulation – Building Example

As noted in the introduction to this report, in order verify and compare data, we simulated an example of product installed on the roof of a building. The energy simulation for the building was conducted using Carrier HAP version 4.4.

3.1. Simulated Building

The simulated building was kept simple so that good comparisons could be made with the product applied to the roof, and against a building with standard insulation, and also a building without.

The building considered was a typical office of 900sqm. (Building dimensions of 30x30m – with each side facing North, South, East and West respectively). The following assumptions in terms of internal loads were also made:

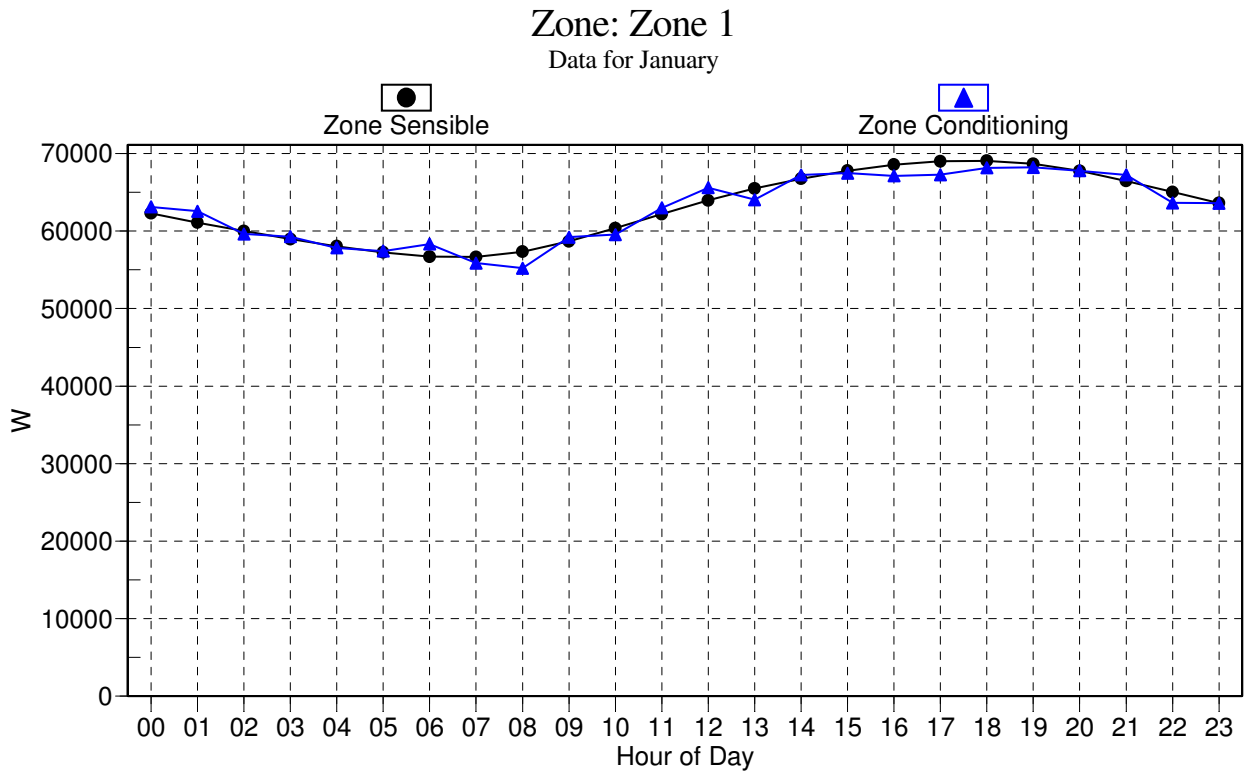
Occupancy: 1 person per 6sqm.
Lighting: 25Watt/sqm.
Equipment Loads: 20Watt/sqm.
Location: Johannesburg, South Africa.
Time: Daily office schedule, in Winter and Summer.

Total Building Air Conditioning (Heat Loads) can thus be tabulated as follows:

Note: Refer following pages 11-14 for printer results.

Building	Typical Roof Construction	Typical Roof with Metaltec
Maximum Cooling Load Requirements	104.1kw	78.7kw

Thus an energy savings of around 24% can be shown with use of the product.


Zone: Zone 1
Data for January
Zone Sensible
Zone Conditioning
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30000
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Hour of Day

Air System Sizing Summary for Office Without Metaltec

Project Name: MetalTec TC 02/09/2012
Prepared by: Green Line Consulting Engineers 10:39AM

Air System Information

Air System Name	**Office Without Metaltec**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**900.0** m²
Air System Type	**SZCAV**	Location	**Johannesburg, South Africa**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone L/s	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space L/s	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

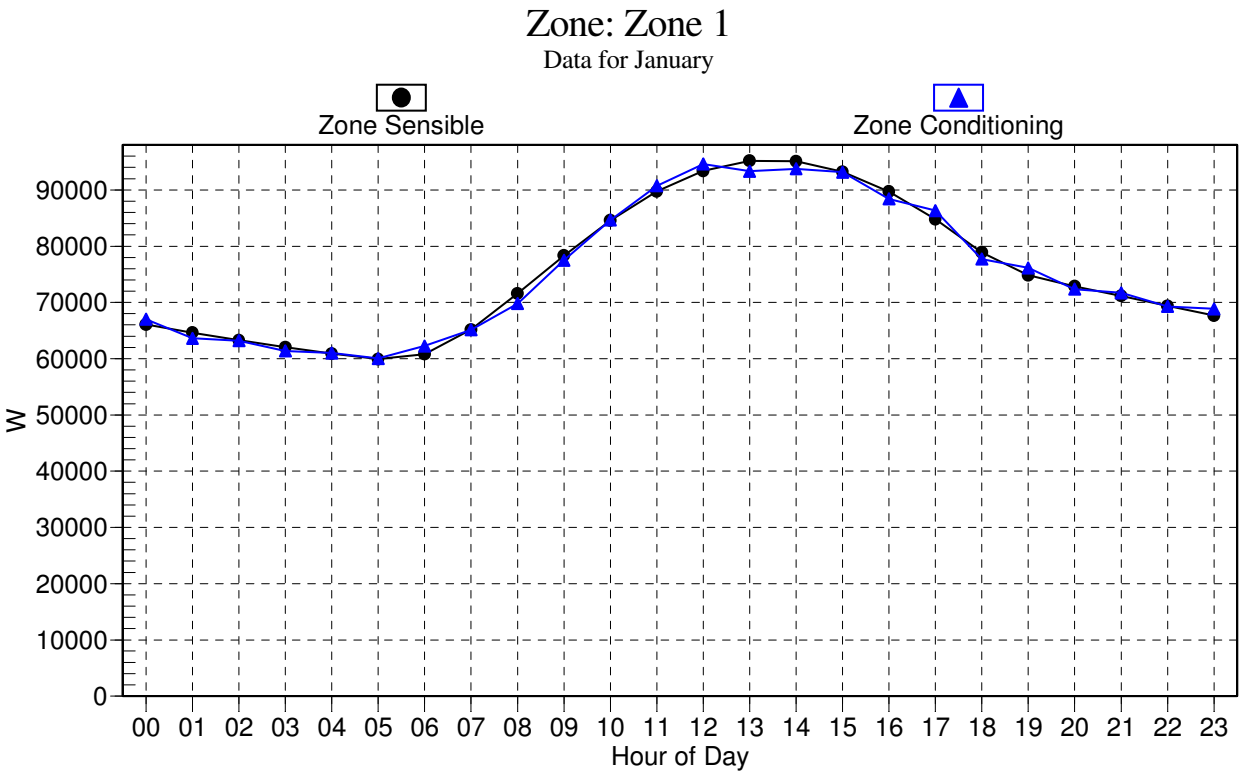
Total coil load	**104.1**	kW	Load occurs at	**Jan 1200**	
Sensible coil load	**94.6**	kW	OA DB / WB	**29.5** / **20.4**	℃
Coil L/s at Jan 1200	**9223**	L/s	Entering DB / WB	**23.0** / **15.7**	℃
Max block L/s at Jan 1300	**9223**	L/s	Leaving DB / WB	**12.5** / **11.8**	℃
Sum of peak zone L/s	**9223**	L/s	Coil ADP	**11.4**	℃
Sensible heat ratio	**0.909**		Bypass Factor	**0.100**	
m²/kW	**8.6**		Resulting RH	**50**	%
W/m²	**115.7**		Design supply temp.	**12.5**	℃
Water flow @ 6.0 ℃K rise	**4.15**	L/s	Zone T-stat Check	**1 of 1**	OK
			Max zone temperature deviation	**0.0**	℃K

Supply Fan Sizing Data

Actual max L/s at Jan 1300	**9223**	L/s	Fan motor BHP	**0.00**	BHP
Standard L/s	**7510**	L/s	Fan motor kW	**0.00**	kW
Actual max L/(s-m²)	**10.25**	L/(s-m²)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**0**	L/s	L/s/person	**0.00**	L/s/person
L/(s-m²)	**0.00**	L/(s-m²)			


Zone: Zone 1
Data for January
Zone Sensible
Zone Conditioning
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70000
60000
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00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour of Day

Air System Sizing Summary for Office With Metaltec

Project Name: MetalTec TC — 02/09/2012
Prepared by: Green Line Consulting Engineers — 10:39AM

Air System Information

Air System Name	**Office With Metaltec**		Number of zones	**1**	
Equipment Class	**CW AHU**		Floor Area	**900.0**	m²
Air System Type	**SZCAV**		Location	**Johannesburg, South Africa**	

Sizing Calculation Information

Zone and Space Sizing Method:

Zone L/s	**Peak zone sensible load**		Calculation Months	**Jan to Dec**	
Space L/s	**Individual peak space loads**		Sizing Data	**Calculated**	

Central Cooling Coil Sizing Data

Total coil load	**78.7**	kW	Load occurs at	**Feb 1600**	
Sensible coil load	**69.2**	kW	OA DB / WB	**31.7 / 20.9**	°C
Coil L/s at Feb 1600	**6693**	L/s	Entering DB / WB	**23.0 / 15.9**	°C
Max block L/s at Jan 1800	**6693**	L/s	Leaving DB / WB	**12.5 / 11.8**	°C
Sum of peak zone L/s	**6693**	L/s	Coil ADP	**11.3**	°C
Sensible heat ratio	**0.880**		Bypass Factor	**0.100**	
m²/kW	**11.4**		Resulting RH	**51**	%
W/m²	**87.4**		Design supply temp.	**12.5**	°C
Water flow @ 6.0 °K rise	**3.14**	L/s	Zone T-stat Check	**1 of 1**	OK
			Max zone temperature deviation	**0.0**	°K

Supply Fan Sizing Data

Actual max L/s at Jan 1800	**6693**	L/s	Fan motor BHP	**0.00**	BHP
Standard L/s	**5450**	L/s	Fan motor kW	**0.00**	kW
Actual max L/(s-m²)	**7.44**	L/(s-m²)	Fan static	**0**	Pa

Outdoor Ventilation Air Data

Design airflow L/s	**0**	L/s	L/s/person	**0.00**	L/s/person
L/(s-m²)	**0.00**	L/(s-m²)			

Annexure A – Product Technical Sheets

MetalTec-TC

THE ultimate solution in thermal insulation

MetalTec-Europe

Tel : (27) 71.52.82.779
Fax: (27) 21.790.5068
Email :
metaltec@me.com
website
www.metaltec.co.za

Content

MetalTec-TC is a general-purpose liquid insulation, consisting of a complete mixture of various silicon and ceramic beads blended into a high quality acrylic polymer. MetalTec-TC is designed to provide both thermal and acoustical insulation for a variety of industrial applications, providing an effective, inexpensive alternative to the high cost of typical insulation systems. Due to its excellent reflectivity and emissivity,

MetalTec-TC excels at insulating structures and equipment from radiant energy gain. 99% of the radiant energy that comes in contact with MetalTec-TC is either reflected or re-emitted, meaning only 1% of the radiant energy is absorbed. MetalTec-TC also performs very well at protecting personnel from burn hazards on hot or cold structures or equipment. Because it physically adheres to the surface, MetalTec-TC significantly reduces corrosion and rust formation.

MetalTec-TC is extremely lightweight and pliable, therefore, it expands and contracts with the surface to which it is applied.

The use of MetalTec-TC is effective at providing insulation while at the same time eliminating corrosion under insulation (CUI). over other forms of insulation.

Standard colors are white & black. Special colors available upon request.

Passes ASTM C1055-99 standard for protection from burn injuries.

ProductAdvantages

- Excellent radiant reflectivity and emissivity properties : significantly reduces radiant energy gain
- Low thermal conductivity : good conductive insulation properties
- Very good burn safety characteristics : excellent for personnel protection
- Light weight : less weight than other insulations
- Good adhesion : bonds well to a variety of substrates
- Moisture resistant : helps to prevent corrosion and rust formation
- Easy application/installation : installs in much less time than other insulations
- Eliminates CUI
- Reduces or eliminates condensation

TypicalApplications

- Pipe and Valve Insulation
- Tank Insulation
- Roof Coating
- Interior and Exterior Wall Insulation
- Interior and Exterior Ducting

Primers

Steel : properly primed steel
Non-Ferrous Metals and Galvanized Steel : self-priming
Concrete : self-priming
Wood : self-priming

Topcoats

Compatible Acrylic Systems

Technical Information

Coating Distrigaz Boilers

Miller Lite Reefers
insulated on top and walls

SOLID VOLUME 89.5%

RECOMMENDED DFT (DRY FILM THICKNESS) 0.4 - 7 mm; 0.4 to 0.8 mm per coat, multiple coats required to obtain greater thickness. Thickness varies with application. Please consult your technical representative for assistance.

DRY TIME (50% R.H.)

Temperature	Dry to Touch	Recoat Time	To Normal Use
20°C	180 min.	12 hrs.	24 hrs.

THEORETICAL COVERAGE Spray Application : 1.475 m²/liter @ 0.5 mm

NET WEIGHT PER LITER Wet : 0.67 k/l Dry : 0.38 k/l

STORAGE TEMPERATURE Min 5°C, Maximum 25°C. Cool storage is recommended

SHELF LIFE 12 months at recommended storage temperatures.

HEALTH AND SAFETY Materials are safe for handling. Consult Material Safety data Sheet for descriptive handling and safety information.

TEST RESULTS

Cross Hatch Adhesion- (ASTM 3359)	100% passed, no failure
Flame Spread (ASTM E84-98)	25
Smoke Developed (ASTM E84-98)	45
Accelerated Aging (ASTM G53) no primer	No discoloration at 200 hours
Brookfield Viscosity, #3 spindle, 30 rpm	3564 centipoise
Specific Heat (23°C)	1.1120 W-s/gm-K
Thermal Diffusivity (23°C)	0.00239 cm²/sec
Thermal Conductivity (23°C)	0.00077 W/cm-K 0.0563 Btu/hr-ft-°F
Solar Reflectance (ASTM E903)	0.83
Emittance (ASTM E408-71)	0.94
Service Temperature	Continuous : -40 / + 200°C Maximum Surge : 232°C

Piping easily coated with airless spray

Materials are safe for handling.
Consult Material Safety Data Sheet for descriptive handling and safety information.

APPLICATION TECHNIQUES

MIXING Power mix contents of container using a mud paddle at 300 rpm or less for 3-5 minutes, making sure to blend in all solids on top of container.

SURFACE TEMPERATURE Minimum 15°C, Maximum 175°C. Coating will not dry below 15°C. Prior to applying to substrates at temperatures greater than 66°C, please contact distributor for assistance.

METHODS & EQUIPMENT Apply MetalTec-TC on a dry, clean substrate free from oil, grease, wax, dirt, rust or corrosion. Use airless sprayer with 205 Atm, 4.75 L/min, 28:1 ratio with a 0.53 mm tip size. A Spray Gun using shop air may be used for small applications. Allow product to completely dry between coats. This is a one-coat system with dry time of 12 hours under room temperature conditions. Elevating temperature of substrate will accelerate recoat time. Brush may be used for touch up, but it is not recommended for full application, except for under 50 m².

Crude Tank kept at temperature

RECOMMENDED THICKNESS

Suggested MetalTec-TC Insulation Thickness
To Reduce Surface Temperature To Approx. 150°F/66°C

Thickn. Mils/mm	45/1.4	60/1.5	75/1.9	90/2.3	105/2.7
Extreme situation	90/2.8	120/3.0	150/3.8	180/4.6	210/5.4
Temperature F	230°F	275°F	350°F	415°F	450°F
Temperature C	110°C	135°C	177°C	213°C	233°C

Hot Valve coated with 5 mm for personnel safety

Annheuser-Busch (Budweiser) cold storage in Hawaii

Classical Use

RooftopInstallation:
0.4 mm thickness can reduce solar heat flux roof by 99% through refraction and re emission.
BoilerorHotPipeinstallation :
Actual installations have shown that a 1.5 mm thickness will reduce exterior boiler wall temperatures from over 180°C to less than 90°C. Excellent for insulating hot pipe/surfaces up to 260°C or cold pipe/surfaces in hot environments.
RV/Bus/Truck/Trailer/ContainerInstallation:
a. 0.4 mm thickness on a roof can cut solar heat flux by 99%. Can be sealed by a white acrylic or alkyd enamel over the MetalTec-TC.
b. 1.2 to 1.5 mm thickness in the engine compartment/fire wall can cut the heat inside the RV/Bus.
c. 0.8 mm on the walls, ceiling and floor of the interior shell can increase the insulation of the RV/Bus/Trailer/Container without increasing wall thickness.
Ships:

a. Hulls can be coated with approx. 1 mm to insulate & seal. Keeps moisture off hulls.
b. Insulate hot or cold piping (1.6-2.7 mm)
c. Insulate hot or cold tanks, refrigeration units or systems. (1.6-2.7 mm)
d. Insulate deck housing from solar heat. (0.4 mm)

Classical Use

Air Conditioning Duct Work
Aircraft Interior Walls
Airplane Hangers
Alaska Metal Buildings
Alaska Slurry Truck Tanks
Backs of Vinyl Siding
Barracks' Roofs
Bridge Bottoms (reduce freezing)
Built Up Roofs
Bus Conversion Interiors, Engine Area, Roofs
Cat Walk Guards

Cat Walk Handles
Chicken Farm Roof Tops
Commercial Freezers/Refrigerators
Corrugated Roof Tops
Crane Beams
Decks of Galleys
Decks of Lobster Boats
Engine Room Hot Oil Lines
Exposed Water Hydrants
Exterior Bulkheads
Fishing Boat Tanks and Piping

Flooring
Garages
Grain Silos
Hog Farm Roofs
Horse Trailer Roofs or Interiors
Horse Barns
Hot Water Heaters
Hulls of Ships
Interior Walls of Old Homes
Living Quarters Walls
Living Quarters Roofs
Metal Roofs

TESTIMONIALS

Boiler connector & bend

Application on a kettle in Turkey

MetalTec-Europe
Tel : (27) 71.52.82.779
Fax: (27)21.790.5068
email : metaltec@me.com
website
www.metaltec.co.za

Oil Companies
FINA OIL AND CHEMICAL COMPANY - “When applied on hot oil tanks/ heater treaters, keeps oil at a constant temp, preventing loading difficulties from hardening of oil.”
EXXON CORPORATION - “Reduced oil well pipe line temperatures by over 55°C. Previously, the extreme temperature of this well caused all other coatings to fail. The ceramic coating is continuing to provide insulation.”
SHELL WESTERN - “Reduced office building temperature by 10 degrees and reduced highly concentrated well head temperature by 55 degrees.”
MAJOR CANADIAN OIL REFINERY – “We were able to take a 232°C pipe, coat it with 5 mm of product and reduce the surface temperature to 82°C. Due to its location inside a building, this lowered the building temperature considerably and reduced the noise inside the building dramatically.”
Building Industry
ATLANTA GAS LIGHT COMPANY - "Since spraying our roof with your ceramic coating, we have had no further water leaks and have reduced our cooling costs considerably. It is really a fine product that performs as promised."
CORPUS CHRISTI ARMY DEPOT (CCAD) "Since MetalTec-TC was applied, we have had no leaks and the air conditioning system now cycles off and on. Before the building was treated, the air-conditioning system ran all day without ever cycling and without very effective cooling."
ANHEUSER-BUSCH KAUAI COLD STORAGE - We coated the south and west walls and the roof in January with MetalTec-TC. Even in January, this cut the heat through the walls and roof by 8 to 11°C. In the summer, it should be much higher.
CAPITAL STUDIOS - We used 1mm of MetalTec-TC on the walls and ceiling of a new sound production room. It cut the acoustical noise dramatically so as to not have a sound “ping”. The only problem now is that the room is too cold as the air conditioner thermostat is in an adjacent room that is not insulated with MetalTec-TC, thus is warmer.
“Coating the roof of one of our metal buildings with MetalTec-TC dropped the under roof temperature by 22°C!!!”

Vehicles
ARIZONA BUS SALES - “After coating the roof of our first 40-foot transit coach with MetalTec-TC, the interior roof temperature dropped 10 degrees from one day to the next. In a side by side test of two coaches with one roof coated with MetalTec-TC and one roof with white paint, the inside ceiling temperatures were 48°C vs. 58°C. The MetalTec-TC roof was 10°C cooler. This was in May before our extreme summer heat. We are coating the underside of transit coaches because of extreme floor heat from hot road surfaces.”
AMERICAN REFRIGERATION & ICE - “Coated top of delivery truck and lowered temperature from melting point to steady temperature of –11°C eliminating condensation and loss of several sacks of ice.”
DANVILLE DISTRIBUTORS (BUDWEISER BEER) - After the reefer roof was coated, we pulled the temp down to 1.1°C and left it overnight in a hot humid evening with the reefer off and the next morning it was still 4.4°C. We were very pleased. On the trailer, we are now able to keep it down to 4.4°C which we couldn't do before.
Universities
THE UNIVERSITY OF GEORGIA - “Cooperative Extension Service feed a bin test indicates inside air space temp. of a bin coated was 27 degrees lower than uncoated bin.”
AUBURN UNIVERSITY - Dept. of Chem. Eng. - “By applying two coats of MetalTec-TC (on two waste oil tanks), we successfully maintained the oil temperature above 77°C in the tanks for nearly 12 hours. The initial temperature was 82°C and the outdoor temperature ranged from –1 to 16°C. We are very pleased with the results.”