குளிர்ச்சிக் கூரை

Cool Roof

BUILDING OWNER'S DREAM..... BEAUTIFUL FOREVER

abc WEATHER PROOF SRI TILE A DREAM COME TRUE -

Tile fixing assured and powered by

abc Light Weight Aggregates, abc Plus powder, abc Grout, abc Nano Acryl Liquid & abc Nano Liquid.

தகவல் திரட்டு
Compiled Information

by

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COOL ROOFS - A HOT IDEA?

Anything that works so well is going to be expensive, right?

Cool roof are one of the quickest and lowest cost ways, we can reduce our global carbon emissions and begin the hard work of slowing climate change.

The US Energy Secretary, Steven Chu.

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abc Vision

To offer cool roof in ceramic that could last for centuries without much of problem.

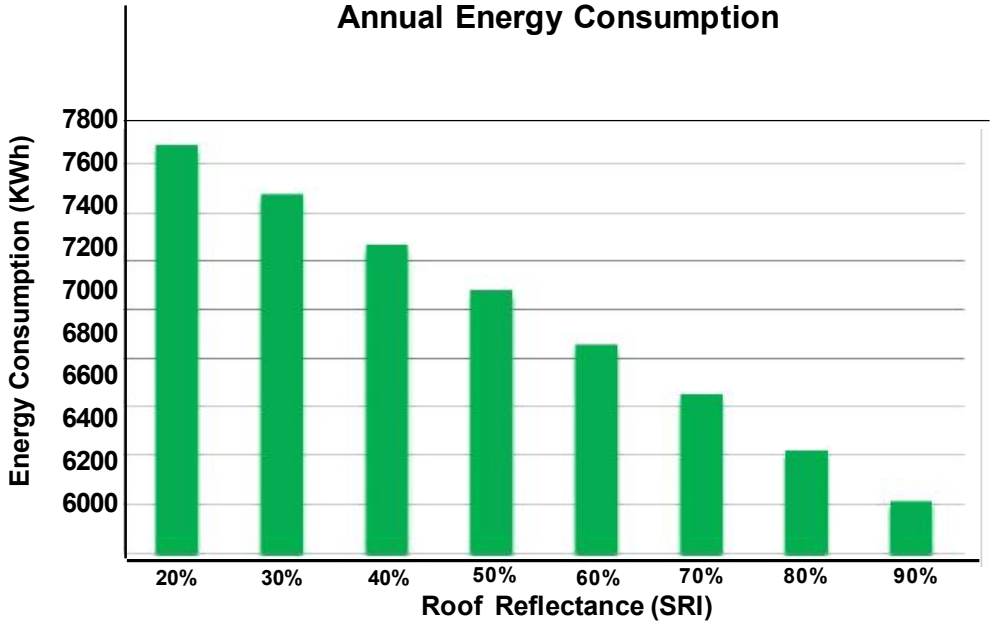
The century old system of Pressed Clay Tile based weathering course on roof top has to be eliminated in the present scenario of climate change, power crisis, time management and emerging technology transformation in the field of construction industry.

abc Product Policy

A good quality ceramic tile when designed for a cool roof and manufactured properly can give a permanent solution for water proof and heat proof on a terrace when they are fixed in a right way and maintained properly.

***G.Arivazhagan** M.Tech (Ceramics)*

Analysis - Cool Roof



Roof Type	*SRI value	Annual Electricity Consumption
Conventional	20	7700 Units
Cool Roof	90	6200 Units

*Solar Reflectance Index

ஆசிரியர் முன்னுரை :–

புவி வெப்பமாவதைத் தடுக்க ஒரு எளிமையான வழி என்னும் தலைப்பில் 9.6.2010 விடுதலை நாளிதழில் ஒரு கட்டுரை வெளியாகி இருந்தது. இதைப் படிக்கும் அனைவரும் வெள்ளைக் கூரையின் (White Roof) முக்கியத்துவத்தை நன்கு உணர முடியும்.

நான் செராமிக் படிப்பில் முதுகலைப் பட்டம் (M.Tech.) பெற்றிருப்பதாலும் குஜராத்தில் பல டைல்ஸ் கம்பெனிகளுக்கு ஆலோசகராக இருந்ததாலும் செராமிக் டைல்ஸ்களை எப்படி சிறப்பாக வடிவமைத்து Cool Roof - க்காக பயன்படுத்தலாம் என்பது பற்றி யோசித்து பல தகவல்களை திரட்டி ஒரு சிறிய நூலாக வடிவமைத்து உள்ளேன்.

இதோடு நில்லாமல் abc என்னும் பெயரில் தரமான டைல்ஸ்களை வடிவமைத்து உற்பத்தி செய்து விற்பனை செய்கிறேன். இதற்கு உறுதுணையாக உள்ளவர்களின் பட்டியல் மற்றும் பங்களிப்பு மிக மிக அதிகம்.

பொதுவாக செராமிக் டைல்ஸ்களை நம்மவர்கள் மேற்கூரையில் உபயோகிக்க தயங்குகிறார்கள். இதற்கு பல காரணங்கள் உண்டு. ‘செராமிக் டைல்ஸ்களை சரியான முறையில் வடிவமைத்து தரமான மூலப்பொருள்களை கொண்டு உற்பத்தி செய்து சரியான முறையில் பதித்து நல்லமுறையில் பராமரித்து வந்தால் மேற்கூரை வழியாக ஏற்படும் தண்ணீர் கசிவையும், வெப்பம் தாக்குவதையும் முற்றிலுமாக கட்டுப்படுத்தலாம்’ இதுதான் abc டைல்களின் டிசைன் கோட்பாடு.

Cool Roof என்பது SRI (Solar Reflectance Index) அளவுகோளை வைத்து மதிப்பீடு செய்யப்படுகிறது. SRI அளவு அதிகமாக இருந்தால் Cool Roof-ன் பலன் அதிகமாக இருக்கும். உதாரணமாக வெள்ளை நிறத்திற்கு SRI மதிப்பீடு 100 ஆகவும், கருப்பு நிறத்திற்கு பூஜ்ஜியமாகவும் இருக்கும்.

abc டைல்ஸ்களுக்கு SRI மதிப்பு 95 என்று சோதனைமூலம் உறுதிப்படுத்தியுள்ளேன். முதன்முதலாக செராமிக் டைலுக்கு SRI சோதனை செய்து Cool Roof உபயோகத்திற்கு அறிமுகப் படுத்தியுள்ளேன்.

இந்த தகவல் திரட்டைப் படித்து அனைவரும் பயன் அமையுமாறு கேட்டுக் கொள்கிறேன். நீங்கள் புதுவீடு கட்டினாலும், வீடு வாங்கினாலும், பழைய வீட்டைப் புதுப்பித்தாலும் மேற்கூரை சரியாக வடிவமைக்கப்பட்டு உள்ளதா? Cool Roof பொருத்தப்பட்டு உள்ளதா? நீண்ட நாட்களுக்கு Cool Roof –ன் தன்மை மாறாமல் இருக்குமா? மழை பெய்தாலும், வெயில் அடித்தாலும் Cool Roof –ன் தன்மை, டை– ன் தரம் மாறாமல் இருக்குமா என்று ஆராய்ந்துப் பார்த்து முடிவு எடுங்கள். abc டைலை உபயோகித்தால் இந்த பயன்களை அடையலாம் என்பதில் சந்தேகம் இல்லை.

கி.பி.2030–ல் இந்தியாவில் வெப்பத்தின் தாக்கம் எப்படி இருக்கும் என்ற ஆய்வுக்கட்டுரையை (பக்கம்30) படித்துப்பாருங்கள்! abc டைல்களின் முக்கியத்துவத்தை நன்கு உணரலாம்.

உங்கள் முடிவு வீட்டிற்கும் சுற்றுசூழலுக்கும் பேருதவியாக அமையட்டும்.

G.அறிவழகன், M.Tech. (Ceramics)
செயங்கொண்டம்.

Can Ceramic Tiles be Used on Terrace (Cool Roof)?

Ceramic tiles can be used in many different applications, including floors, countertops and walls. They are not often seen outdoors, however, and most designers prefer to limit ceramic tile use to kitchens or bathrooms. This is partly due to their size and non availability of specific brand as weather proof SRI tile.

The 20 th century's famous building, Sydney Opera House roof top is made up of glazed ceramic tiles. Taj Mahal roof top is made up of broken glazed ceramic pieces.

Ceramic Tiles

- Ceramic tiles are simply clay that has been purified and compressed in tile-shaped moulds and then fired until they harden permanently. Although the tiles are designed to all be the same size, the firing produces slight variations between each tile that calls for attention to detail and careful planning when installing ceramic tile outdoors. Most ceramic tiles are glazed with a protective or decorative covering. **For terrace, protective coatings preferred.**

Frost

- Frost is the most common cause of ceramic tile damage outside. Water is absorbed into the tile, where it freezes as the temperature drops in winter and cracks the tile. Ceramic tile less than the common 3 percent absorption is more resistant to cold conditions, but tile rated with 0.5 percent absorption is most often used to protect from frost. **Some glazes can also seal tile so water cannot get inside. As a master degree holder, I choose right glaze.**

Heat

- Ceramic tiles are much more resistant to heat than cold. The temperatures that the clay was fired at reached far above any natural climate conditions, so they are well prepared to deal with even the hottest desert conditions. Dark colour absorbs more heat and hence white colour is preferred. The tile will breathe slightly in the heat, so **tile set in the wrong mortar or too close together may warp or crack.**

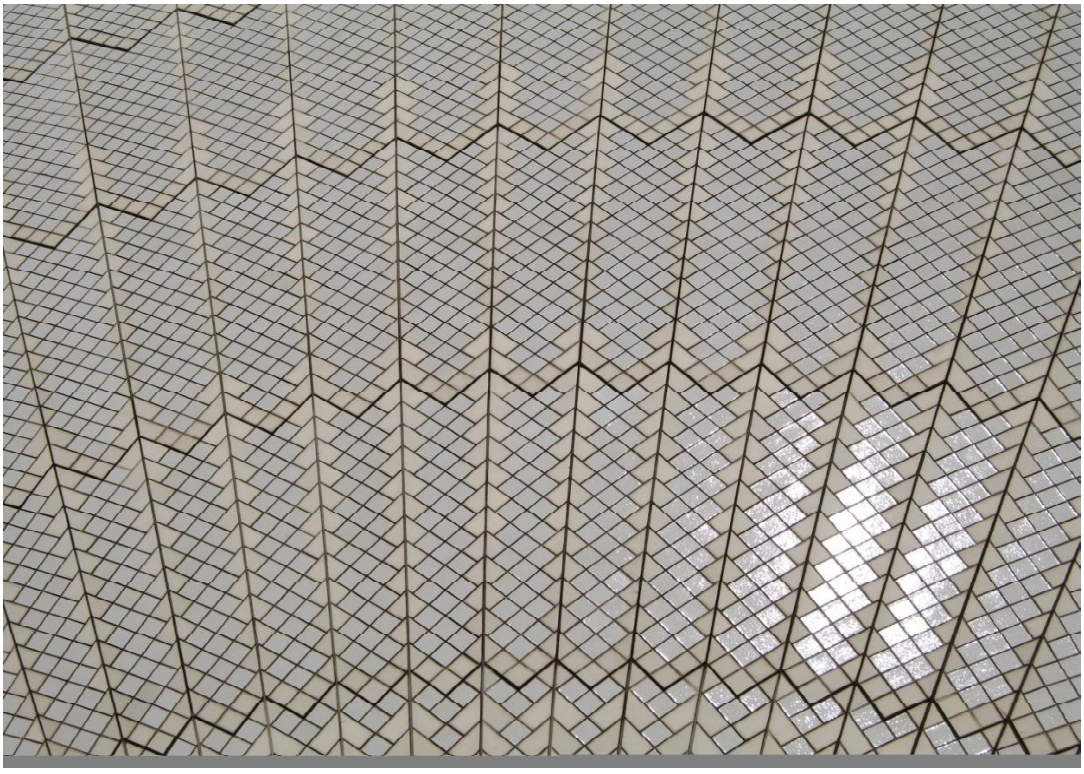
Hence, abc Weather Proof SRI Tiles is mfd. with special white glaze with white protective coating. Tile fixing is assured and powered by abc Light Weight Aggregates, abc Plus Powder, abc Grout, abc Nano Acryl, abc Nano Liquid etc.

Consider abc tiles for a sustainable roof top / terrace. Call our Engineers for a free demo (for >2000 sq ft).

Authentic Information to the customers of abc Weather Proof SRI Tiles

The **material** of a roof may range from banana leaves, wheaten straw or seagrass to lamininated glass, copper *(see: copper roofing)*, aluminium sheeting and precast concrete. In many parts of the world ceramic tiles have been the predominant roofing material for centuries.

Roof Top of Opera House Fitted with glazed ceramic tiles. One of the finest building of the 20 th century.



Similarly Taj Mahal roof top also made with broken glazed ceramic pieces. Before 400 years.....

Ceramic Tiles Roofing

By Daniel Lanback

If you are trying to figure out what would be the perfect type of roofing for your home, then here is how to save yourself from a lot of headache. Because when it comes to roofing solutions, ceramic tiles roofing are probably one of the best options out there in the market. Here's exactly what you need to know about it.

Ceramic tile roofing has lots of benefits for your home and for you as well. If you install it in your homes, you can be sure that it would last for a long time and it would work efficiently. And in the event that it gets cracked or broken, there are ways to repair it, in which you could even do it yourself. That is why it is indeed the perfect material for roofing purposes.

So what are these different benefits of having a ceramic tiles roofing in your house? One known benefit is, because it is made from ceramic, it could be able to withstand any climate condition. Whether under the heat of the sun, rain showers or snow, you could be sure that it is capable of working efficiently under these harsh conditions. This makes it ideal in any house, on any geographical location on the planet. The number one factor that makes these things possible is the fact that ceramic tile is outstandingly thermal - efficient and is a great insulator as well. **Because of this, you know that it would last for centuries without much of a problem.**

Another known advantage of ceramic tile roofing is the variety in design that it could provide. You could virtually choose from many different styles, various colors and hues and designs. This would be perfect for people with vanity issues. You could be sure that you could find one that would fit the design or style of your house. Style is definitely an important factor in these fields as well other fields that is why you should also consider having the right type of ceramic tiles roofing that would perfectly fit your house's preference.

However, before you go buy one for your house, you need to consider some few things. Before you buy it ask if the ceramic tile roofing is adequately fire - hardened or baked to make it impenetrable by water and durable enough to withstand freeze and thaw cycles.

In the event that your ceramic tile roofing gets damage, and usually, you would be dealing with cracks, there are two solutions to that problem. First is you could repair it, next is you could replace it with a new one. The problem with replacing it with a new one is the tile; the new tile would be a different color from the rest because of the different times of exposure to weather. If you plan to repair your roofing, do not delay it, do it right away because delaying it would only mean further damage to your ceramic tile roof so you better do it immediately.

The best method to repair a crack is through using tile roof fillers to seal off the crack completely.

And that should do it. Now get out there and ask your local dealer about ceramic tile roofing.

Effect of White Roof on Global Warming and Role of Ceramic Tiles

ABSTRACTS: ***This article is written and compiled by G.Arivazhagan, M.Tech (ceramics), Proprietor, Designer and Mfr. of abc Weather Proof SRI Tiles.. This article is covered from fundamental theory to the implementation of Cool Roof. The Q &A system enables the common end users to understand the impact of cool roof on global warming. Role of USA in the field of Cool Roof is really to be appreciated.***

The century old system of Red Clay based weathering course on roof top is to be eliminated in the present scenario of climate change, power crisis, time management and emerging technology transformation in the field of construction industry.

An article appeared in Viduthalai daily inspired me a lot in the field of Cool Roofs. The same article is attached in page No 20.

Why we should be scared, very scared, of global warming?

Science says that the average temperature on earth has been rising rapidly. And it says this is the result of growing concentrations of ógreenhouse gasesô that are emitted whenever any fuel is burnt to produce energy. Science also says that if something is not done immediately to stop the increase in the concentrations of these gases, there will be catastrophic consequences in the next few decades. Glaciers will melt, sea levels will rise, low-lying areas will be submerged, crops will be damaged, extreme weather events like cyclones and storms will become more frequent. In short, the world will become a difficult place to live in and millions of people may lose their lives.

In USA, California is the first state to enforce building code. A committee was formed and 344 pages for building codes were recommended. One of the foremost codes was white roof to save energy. They are doing white coating of several combinations. There, in USA, ceramic tiles are expensive.

In India, white tiles are available at affordable prices. Whether white paint or tiles, the roof surface must be highly reflective. For tiles, the base body must be

porous enough to achieve heat insulation for effective cooling. Glazed white wall tile is the best option instead of glazed floor tiles or vitrified tiles.

What is a Cool Roof?

A cool roof is a roof which is designed to stay cool in hot weather, rather than absorbing heat and growing warmer as the day progresses. Cool roofs are useful for a number of reasons, ranging from building efficiency to durability, and they are especially common in tropical and subtropical areas, along with desert regions. Residents of temperate climates can also benefit from using cool roofs in building construction.

White cools the roof, then what are the benefits?

- White roofs with high reflectivity can be 70°F cooler or more during hot summer days when compared with traditional roofing materials.
- White roof systems save money and energy during peak cooling demand periods - typically mid-days, when electricity demand and costs are highest.
- White roofs are effective in virtually all climates. Building owners in some areas have seen a 40% reduction in energy consumption during peak times of the year after installing white, highly-reflective roofing systems.
- In non-conditioned space, white roofing can reduce workspace heat, improving working conditions, and increasing employee productivity.
- A white roof surface can reduce the cost of operating rooftop HVAC units because the units will use cooler air than if mounted on a dark roof surface.
- White roof systems help reduce the urban heat-island effect by reflecting solar heat rather than absorbing and transferring it to buildings.
- By keeping moisture out while reflecting ultraviolet (UV) and infrared (IR) radiation, a white roof can help to protect underlying insulation and the roofing substrate from deterioration.

abc Weather Proof SRI Tiles can give all above benefits.

Are cool roofs affordable?

Yes. Many cool roof varieties cost the same amount as other comparable roofing materials, and for those that cost slightly more, the difference can usually be quickly recovered in savings from reduced energy costs.

A study at Calcutta IIM building shows that payback period for Cool Roof is 2.70 years.

What is the status of Cool Roof in India?

Delhi govt made mandatory for all govt buildings to install cool roofs, specifically Glazed Tiles. Maharashtra govt is considering following Delhi govt. The central govt made ECBC codes are mandatory for eight states from FY 2012. IGBC is striving to implement Green concepts. ECBC is a wing under the Ministry of Power in Central Govt.

What is the expected life of roofs?

Hashem Akbari, Dr. Rosenfeldôs colleague at the Lawrence Berkeley laboratory, says he is unsure how long it will take cool roofs to truly catch on. But he points out that most roofs, whether tile or asphalt-shingle, have a life span of **20 to 25** years.

How much carbon di oxide emission can be prevented by white roofs or cool roofs?

The scientist Mr. Chu calls his hero, Art Rosenfeld, a member of the California Energy Commission who has been campaigning for cool roofs since the 1980s, argues that turning all of the worldôs roofs ñlightòover the next 20 years could save the equivalent of 24 billion metric tons in carbon dioxide emissions.

About one ton carbon-di-oxide can be prevented per 100 sq ft (10x10 ft area) of white roof per year.

A 100 sq ft of abc Tiles is nearly equivalent to one big tree (~15 years old).

What is abc and abc Tiles? Where are they used? Is it reliable?

abc (ari bhai concept):

A good quality ceramic tiles when designed and manufactured properly can give a permanent solution for water proof and heat proof when they are fixed and maintained properly.

So far, we sold more than five lac sq ft. Our customer is from remote villages in Ariyalur district as well as Padmashree awarded architect in Chennai. The list extends furtheré é é é é 30000 sq ft for GAMESA in Gujarat and 20000 sq ft in SIDCO Corporate Office in Guindy, Chennai -32. These two projects are green Building concept.

abc Tiles are reliable and complies with ECBC codes. Suitable tests are conducted for sustainability in well equiped laboratories.

How effective is the white roof in terms of temperature reduction on roof surface?

1. Roof before treatment, thermometer reads **178-**degree Fahrenheit at the roof surface on a hot summer afternoon. (Conventional dark colour roof).

2. After a cool roof was installed, there was a dramatic decrease in roof air temperature **93-**degree Fahrenheit. (White paint or white tile). This is surface temperature of the roof.

Is there any comparative research between normal roof and white roof?

Yes.Please read following selective data out of a 37 page report prepared in Florida, USA,

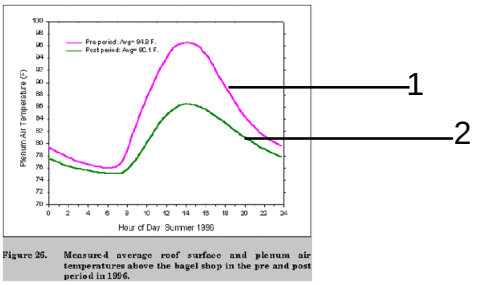


Figure 26. Measured average roof surface and plenum air temperatures above the bagel shop in the pre and post period in 1996.

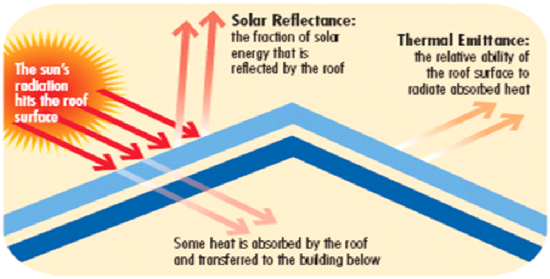
1: before white coat 2: after white coat

Comparative Average Performance Before and After Roof Whitening.

Before: June 27 - July 26, 1996; After: Aug. 19 - Sept. 10, 1996 Weather Conditions

Ambient Temperature (°F)	Relative Humidity (%)	Wind Speed (m/s)	Solar Irradiance (W/m²)	Roof Temperature (°F)
81.3	78.8	2.77	240	235 5.0
81.2 0.1	79.6 -0.8	2.90 -0.13	92.8	79.1 13.7

Store Front	Plenum Temp.	Interior Temp.	AC/kWh Day	Peak Plenum Temp.	Peak Interior Temp.	AC Pk KW
Bagel Shop						
Before white	84.6	74.8	48.18	92.5	75.6	2.245
After white	79.9	74.9	41.79	83.8	74.3	1.834
Difference	4.7	-0.1	6.39	8.3	1.3	
0.411 Percent	13.3%			18.3%		
Realty office						
Before	84.8	72.7	37.32	95.4	73.1	2.051
After	80.1	73.4	30.11	85.0	74.1	1.565
Difference	4.7	-0.70	7.21	10.4	-1.0	0.486
Percent	19.3%	23.7%				



The above information from the original research paper of 37 page report.

What are Solar Reflectance and Thermal Emittance?

Solar reflectance and thermal emittance are the two radiative properties used to measure the ñcoolnessòof a roof.

Where the white roofing is compulsory as one of the building codes?

California, Florida and Georgia in the US have adopted building codes that encourage and insist white-roof installations for commercial buildings. Tax benefits are also offered for white roof.

Material	Roof temperature rise above air temperature (degrees F, full sun, no wind)	Remarks
Bright white smooth materials	15 F	The coolest construction materials. Can be roof coating, membrane, metal, **glazed tile**, etc.A soiled white is warmer, about 30 F.
Rough white surface	35 F	Rough surfaces of any given material absorb more sunlight than smooth surfaces
Very light (pastel) colours	15 to 55 F	
Intense but not very light colours (green, red, blue, etc.)	79 to 83 F	Research may identify cooler colours
Medium grey	52 F	Reflectance half way between white and black
Built-Up Roof (BUR) covered with gravel	61 - 83 F	Cooler values obtained with lighter gravel
Black materials	90 F	

How to use the Cool Roofing Materials Database?

Examine the relative ñcoolnessòof various types of building materials, to select a type of roofing or roof coating which may meet your needs to reduce air conditioning energy use or to improve comfort.

The table below shows the temperature rise in full sun. Assumed that there is little wind (wind helps cool the roof). Keep in mind that this is the temperature rise, not the temperature itself. Thus a temperature rise of 90 degrees F on a 100 degree F day means the roof temperature peaks at 190 degrees F!

How carbon credit is calculated and what is the rate?

Most existing flat roofs are dark and reflect only 10 to 20% of sunlight. Resurfacing the roof with a white material that has a long-term solar reflectance of 0.60 or more increases its solar reflectance by at least 0.40. Akbari et al. estimate that so retrofitting 100 m2 (1000 ft2) of roof offsets 10 tonnes of CO2 emission per year.

(For comparison purposes, we point out that a typical US house emits about 10 tonnes of CO2 per year.) Emitted CO2 is currently traded in Europe at about $25/ tonne, making this 10-tonne offset worth$250.

What the US president says about white roofs?

WORLDnews

Obama says paint your roof white to save energy The Examiner 2009-05-27

LONDON(AFP) (AFP) - US Energy Secretary Steven Chu said Tuesday the Obama administration wanted to paint roofs an energy-reflecting white, as he...

The Daily Beast Obamaûs Secret Climate Pact

What about the insulation value of a tile roof?

Tile roofs are good insulators. The combined effect of the SRI roof tiles, thermal mass and the air space within the tiles allows for better air circulation and thereby reduces direct heat transfer. This results in lower air conditioning costs in the summer and decreases the formation of ice dams in the winter. Porosity of base tile body, porosity of sand-cement mortar, nature of sloping material and tile thickness etc are plays key role on roof insulation.

abc Tile dealers will give all data and explain for various options.

How long will the glazed tiles last?

If the right product is selected (similar to abc quality) for the area and if it's maintained properly, the tile could **last the lifetime of the home.**

What kind of tiles (properties) are good for roof top and why?

abc weatherproof SRI tiles are the best choice. These are at par with ECBC/ LEED guidelines.

The glaze coat contains 10% zirconium oxide. This is one of the excellent ingredients for opaque surface. The embosed tiles surface is printed with special material for long life.

Solar Reflectance Index (SRI) is 95. This is a certified value as per ASTM by BPL (Building Performance Laboratory) at CEPT University.

95% heat is reflected and hence easily possible to walk even during hot summer noon time without chapel. Century old red clay tile's reflection is only ~20%.

abc Tiles are 100% stain free and hence the SRI (95%) will remain for life time. Only periodical cleaning on roof top is required. abc tiles are acid resistant and any kind of cleaning aids can be used.

Scratch hardness on Moh's scale is between 5 to 6, much better than other Cool Roof tiles.

Base body is about 30% porous and tile's back side is provided with deep grooves for better bonding with bed material.

Ceramic tiles will skid during raining and can"t we use the roof top?

The top surface is embossed and also printed with protective coating for better grippes. Hence, abc tile provides anti skid effect and enable to walk during rain also.

How to fix abc Tiles and whether water proofing is required before fixing abc tiles?

There are certain methods strictly to be followed for the best result and contact your local dealer for instructions. This is to avoid common problems such as tile lifting and water seepage through grouting etc. Insist tiles fixing instructions from the dealer.

Water proofing is not required wherever abc tiles are fixed. For other areas, water proofing is required.

abc Tile is an ordinary ceramic tile and how it is suitable for roof top?

Yes, abc Tile is ordinary ceramic tile but designed in different way suitable for roof top. The common issues like tile lifting and crack will not appear in abc Tiles. An optimum SRI value, sufficient anti skid effect and availability in different shades are additional strength for abc Tiles.

We also prescribe the most suitable laying methods. Ceramic tiles are heated and baked at 1100 deg C. Nothing will happen when ceramic tiles are used on roof top if tiles are fixed properly and roof top is properly maintained.

abc Tiles does not contain any imported material.

SRI value is tested and assured for abc Tiles. abc is the first brand with certified SRI value.

abc Tiles are expensive as high as vitrified tiles: we can"t afford such costlier tiles for roof top: we are only contractors and some one going to use the roof top.

Compare the price of abc tile with **white** vitrified tile and not with Ivory base tiles. Cost is due to the addition of white pigments.

Payback period for white roof is 2.7 years as this is clearly established in a study carried out at IIM building in Calcutta. When a building is planned for beautiful interior and elevation, roof top is neglected. In fact, roof top decides the life span of any building.

Building / apartment owner has to insist for roof top specification.

Glazed tiles will reflect more solar heat and glare at noon time of summer and how to over come this glare? What are the colours available in abc brand?

More reflection means more glare. This is applicable for all cool roofs. This is a little discomfort when compared with huge benefits.

If the roof is to be used frequently during noon time (rare case), use light colour tiles like pink and blue etc. SRI value will be 80 to 90 and still this value is more than sufficient for a cool roof. abc is the only brand supplying colour cool roofs. If you are a good planner, you can choose your colour choice and we can help you to match any colour subject to certain conditions. Contact your nearest dealer for details.

We may construct one more floor in future and what to do?

In this case, use any light colour tiles which can be used as floor when one more floor is constructed. Consult our engineers for guidance.

Trees Vs White Roofs – an unbelievable fact!!

A satellite image in USA confirmed that white roofs are more effective than planting trees. This does not mean that growing trees are bad idea!!! The white roofs are also as effective as growing trees. A tree will take years and years to grow and to give benefit whereas white roofs are beneficial from the day one after the installation.

How much CO2 gas is absorbed by one tree?

What is the ratio of white roof and tree?

It depends on the size of tree, type of tree and other factors. Following data is collected from various sites.

One tree absorbs 7.5 to 13 kg co2 gas per year.

1000 kg co2 gas is absorbed by one tree per year.

1 kg co2 gas is absorbed by 1.5 kg of tree per year

1000 kg co2 gas is absorbed by one cubic meter of timber per year.

To sum up by using above data, a 1000 sq ft white roof is equivalent to 10 trees.

A 1000 sq ft white roof reduces 10 ton (10000 kg) CO2 gas per year.

When you go for roof option, please think of abc Cool Roof.

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பூமியை வெப்பமாக்கும் கார்பன்-டை-ஆக்சைடு குறைக்க எ□ மையான ஒரு வழி

தட்பவெப்பநிலை மாற்றம், உலகு வெப்பமடைதல் போன்ற சொற்கள் நமது அகராதியில் இடம் பெறுவதற்கு வெகுகாலத்திற்கு முன்பே காற்றாடிகளும், குளிரூட்டு பெட்டிகளும் அறிவியலை அறிந்திருந்த கிரேக்கர்களால் கண்டு பிடிக்கப்பட்டுவிட்டன. தங்களின் வீட்டை வெப்பம் தாக்காமல் இருக்க அவர்கள் வீட்டிற்கு வெள்ளை நிறத்தை அடித்தனர். மத்திய தரைக்கடல் பகுதி நாட்டுகளில், இவ்வாறு செய்வது குளுயைமாக இருப்பதற்கான வழி என்பது சோதனையால் கண்டு அறியப்பட்ட உண்மையாகும்.

உலகம் வேகமாக வெப்பமாகி வரும் ஆபத்தைக் தடுக்க உலகில் உள்ள கட்டடங்களில் கூரைகளையெல்லாம் வெள்ளை நிறத்தில் அமைக்க வேண்டும் என்று அமெரிக்க ஆற்றல் துறைச் செயலாளர் ஸ்டீவன் சூ தெரிவித்துள்ளார். ஸ்டீவன் சூ ஒரு பைத்தியக்கார விஞ்ஞானியோ, கிறுக்கரோ அல்ல. மரியாதைக்குரிய இயற்பியல் அறிஞரான அவர் நோபல் பரிசு பெற்றவர். தனது வயதின் பெரும் காலத்தை ஆற்றல் ஆய்விலேயே கழித்த அவர் தான் என்ன பேசுகிறோம் என்பதை நன்கு உணர்ந்தவர். பசுமையின் குரு என்று அவர் பல நேரங்களில் பெருமையுடன் பேசப்படுவர். தனது ஆற்றல் துறைக்குத் தலைவராக இருக்க அவரை அதிபர் ஓபாமா தேர்ந்தெடுத்துள்ளார்.

லண்டனில் நடைப்பெற்ற நோபல் பரிசு பெற்றவர்களின் கருத்தரங்களில் பேசும்போது பேராசிரியர் சூ கூறினார். ?உலகில் தட்பவெப்பநிலை மாற்றம் ஒரு மிகப்பெரிய அச்சுறுத்தல் தான். கட்டடங்களின் கூரைகளை மட்டுமல்லாமல், சாலைகளையும் மென்மையான வர்ணங்கள் தீட்டி அமைக்க வேண்டும். இவ்வாறு செய்வதால், (உலகில் உள்ள அனைத்து கார்களும் 11 ஆண்டு காலம் சாலையில் ஓடாமல் இருந்தால், உலகில் எந்த அளவுக்கு தட்பவெப்பநிலை பாதிப்பு இருக்காதோ, அந்த அளவுக்கு பாதிப்பு குறைக்கப்படும். நிச்சயமாக இது தட்பவெப்பநிலை மாற்ற ஆபத்தை முற்றிலுமாகப் போக்கிவிடும் என்று கூற இயலாது என்றாலும் அதன் பாதிப்பை காலம் தாழ்த்தும் என்பது மட்டும் நிச்சயமானது.ò

இந்த கருத்தில் உள்ள அறிவியல் உண்மை மிகவும் எளிமையானது. கறுப்பு போன்ற நிறங்கள் வெப்பத்தை உள்வாங்கி அதில் அதில் 10–20 விழுக்காடு அளவு வெப்பத்தை மட்டுமே பிரதிப– க்கின்றன. ஆனால், வெள்ளை நிறம் 80 விழுக்காடு அளவு வெப்பத்தை பிரதிப– க்கிறது. பூமியால் இவ்வாறு பிரதிப– க்கப்படும் ஒளியின் விழுக்காட்டை அறிவியலாளர்கள் ?அல்பிடோ பாதிப்பு÷ என்ற அழைக்கின்றனர். கட்டடங்களின் கூரைகளும், சாலைகளும் வெள்ளை நிறத்தில் அமைந்தால், அது பூமியையே ஒரு மாபெரும் கண்ணாடியாக மாற்றிவிடும். சூரிய ஒளி மீண்டும் விண்வெளிக்கே திருப்பி அனுப்பப்படுகிறது. இவ்வாறு திருப்பி அனுப்பப்படும் சூரிய ஒளியினால் சுற்றுச்சூழல் தட்பவெப்பநிலை பாதிக்கப்படுவதில்லை. ஆனால் கருப்பு நிறம் அதற்கு மாறாக சூரிய ஒளி வெப்பத்தை உள்வாங்கி பூமியிலேயே தக்க வைத்துக்கொள்கிறது. வெள்ளை அல்லது மென்மையான வண்ணங்கள் கோடை நாள்களில் குளிர் ஊட்டும் சாதனத்தின் செலவை 20 விழுக்காடு வரை குறைக்கும். இதே

தத்துவம் தான் வாகனங்களுக்கும், உடைகளுக்கும் கூடப்பொருந்தும். உங்கள் காருக்கு நீங்கள் வெள்ளை வண்ணமடித்தால், குளிர் ஊட்டுவதன் தேவையை அது குறைக்கிறது. வெள்ளை உடைகளை அணியும் போது, குளுமையுடன் இருப்பதாகவும், கறுப்பு உடை வெப்பத்தைக் கவர்ந்திழுத்து தக்க வைத்துக் கொள்ளும் வகையிலும் உள்ளன.

க– போர்னியா பெர்க்– தேசிய சோதனைச் சாலையின் மூன்று விஞ்ஞானிகளான ஆர்ட் ரோசன்பீல்ட், ஹாஷம் அக்பரி, மற்றும் மும்பை பல்கலைக்கழத்தில் முதுகலை அறிவியில் பட்டம் பெற்ற சுராபி மேனன் ஆகியோர்தான் தனது இத்தனை சிந்தனைக்குக் காரணமானவர்கள் என்று பேராசிரியர் சூ கூறுகிறார். 11 ஆண்டு காலம் கார்கள் ஓடாமல் இருந்தால் என்ன பாதிப்பு குறையுமோ, அந்த அளவுக்கு பாதிப்பு இவ்வாறு வெள்ளை வண்ணத்தை கட்டடங்களின் கூரைகளுக்கு அடிப்பதன் மூலம் ஏற்படுத்த இயலும் என்ற கருத்தை சுராபி மேனனும் ஏற்றுக்கொள்கிறார்.

கார்டியன் ஏட்டிற்கு தங்களின் கோட்பாட்டை ஹாஷெப் அக்பாரியும், சுராபி மேனனும் விளக்கினர். 100 சதுர அடி பரப்புள்ள வெள்ளை வண்ணம் அடித்த கூரை 1 டன் கார்பன்–டை–ஆக்ஸைடு வெளியாவதைத் தவிர்க்கும். பூமியில் உள்ள பலகோடிக்கணக்கான சதுர அடி கூரைகளைக் கணக்கில் எடுத்துக் கொண்டு பார்த்தால், பூமி வெப்பமடைவதைத் தாமதப்படுத்தும் அளவில் சூரிய ஒளியை அது பிரதிப–க்கும். கார்பன் வெளிப்படுத்துவதைக் கட்டுப்படுத்தும் வேறு வழிகளைக் கண்டறிய நமக்குத் தேவையான கால அவகாசத்தை இது அளிக்கும். அமெரிக்காவில் உள்ள அனைத்து கட்டடங்களின் கூரைக்களுக்கும் வெள்ளை வண்ணமடிக்கப்பட்டால், மின்கட்டணச் செலவு 1 பில்–யன் அமெரிக்க டாலர் அளவுக்குக் குறையும் என மதிப்பிடப்படுகிறது.

இந்தக் கருத்தை முதல் முறையாக நடைமுறைப்படுத்தியது க– போர்னியா மாநிலம்தான். தட்டையாக உள்ள அனைத்து வணிக வளாகக் கட்டடக் கூரைகளும் வெள்ளை வண்ணத்தில் தான் இருக்க வேண்டும் என்று சட்டம் இயற்றப்பட்டது. அதன்படி சில குடியிருப்புக் கட்டடங்களின் கூரைகளும் அலை திட்டம்–2009இல் மற்ற நடவடிக்கைகளுடன் கட்டடக் கூரைகளுக்கு வெள்ளை வண்ணம் அடிக்கப்பட வேண்டும் என்பதும் பரிந்துரைக்கப்பட்டுள்ளது.

தனிப்பட்டவர்கள், குடியிருப்போர் சங்கங்கள், கட்டடம், கட்டுபவர்கள், உள்ளாட்சி அமைப்புகள் போன்றவை பங்கேற்கும் பெரும் அளவிலான ‘வெள்ளை வண்ணம் பூசும் இயக்கம்’ ஒன்றினை மேற்கொள்ள வேண்டும் என அக்பாரி கோருகிறார்.

தட்பவெப்பநிலை மாற்றம் மற்றும் பூமி வெப்பமடைவதைக் தடுக்க அவ்வப்போது தோன்றும் புவியியல் பொறியியல் கருத்துக்களுடன் ஒப்பிட்டுக் காணும்போது, லாரன்ஸ் பெர்க்– குழுவின் கட்டடக் கூரைகளுக்கு வெள்ளை வண்ணமடித்து என்ற இத்திட்டம் மிகவும் எளிமையான ஒன்றாகும்.

டில்– நகரில் கட்டடக் கூரைகளின் மொத்தப் பரப்பளவு என்ன என்பது தெரியாது என்றாலும் 100 சதுர அடி வெள்ளை நிறக்கூரை 1 டன் கார்பன்–டை–ஆக்ஸைடு வெளிப்படுவதைத் தடுக்க

இயலும் என்றால், இக்கருத்து பரிசீலனை செய்யத் தகுதி வாய்ந்ததேயாகும். அரசைப் பொறுத்த வரையில் இதில் செய்ய வேண்டுவதெல்லாம், கட்டடங்கள் கட்டும்போது என்ன செய்ய வேண்டும், என்ன செய்யக்கூடாது என்ற பட்டிய– ல் மேலும் ஒரு பிரிவைச் சேர்க்க வேண்டும் என்பது மட்டும்தான்.

நாம் கூரைகளுக்கு வண்ணமடிப்பதைப் பற்றித்தான் பேசிக் கொண்டிருக்கிறோம். மொத்த கட்டடங்களுக்கும் அடிப்பதைப் பற்றியல்ல. சாலைகளுக்கும், நடைபாதைகளுக்கும் வெள்ளை வண்ணம் அடிப்பது என்பது தொழில்நுட்பம் மற்றும் அரசு ஒதுக்கீடு செய்யும் நிதியின் அளவைப் பொறுத்து.

இந்தியாவில் இருந்து சராசரியாக ஒவ்வொரு மனிதப் சார்பிலும் வெளிப்படும் பசுமையை அழிக்கும் வாயுக்களின் அளவு 1.7 டன் அளவாகும். இது அமெரிக்காவில் 23 டன்னாகவும், சீனாவில் 5 டன்னாகவும் இருக்கிறது. இத்தகைய வாயுக்களை அதிக அளவு வெளியிடும் நாடுகளின் பட்டிய– ல் இந்தியா நான்காவது இடத்தில் உள்ளது. இந்தியாவில் இருந்து வெளியாகும் கார்பன்–டை–ஆக்ஸைடில் 68 விழுக்காடு நிலக்கரி பயன்படுத்தப்படுவதால் வெளியாவதாகும்.

இந்தியாவில் சராசரியாக வெளிப்படும் பசுமையை அழிக்கும் வாயுக்களின் அளவு வளர்ந்த நாடுகளில் வெளிப்படும் அளவைக்காட்டிலும் அதிகமாக உயர அனுமதிக்காது என்று பிரதமரின் தட்பவெப்பநிலை மாற்ற தூதுவர் சியாம் சரண் அறிவித்துள்ளார். உங்கள் நாட்டில் வெளிப்படுவதன் அளவை முத– ல் நீங்கள் குறையுங்கள். அதன் பின் நாங்களும் அதைச் செய்கிறோம் என்று கூறுவதுதான். இது என்றாலும் இதுப்பற்றி உலக அளவில் பேச்சு வார்த்தைகள் தொடரும்போது, அடுத்த ஆறுமாதங்களுக்குள், இந்தியாவில் இருந்து வெளிப்படுத்தப்படும் கார்பன்–டை–ஆக்சைடின் அளவு குறைக்கப்பட வேண்டும் என்று இந்தியாவுக்கு நிர்ப்பந்தங்கள் வரலாம். மறுபடியும் பேராசிரியர் சூசுவின் நினைவுதான் வருகிறது. உலக நாடுகளிடையேயான பேச்சுவார்த்தைகள் பற்றி சிறிது நேரம் மறந்துவிடுவோம். உங்கள் வீட்டுக் கூரைக்கு வெள்ளை நிறம் அடியுங்கள் வேறு எதுவும் இல்லாவிட்டாலும், உலகம் வெப்ப மயமாவது பற்றிய அடுத்த சுற்றுப் பேச்சுவார்த்தைகளில் ஏற்படக்கூடிய ஒப்பந்தத்தின் போது, நமது தார்மீகப் பெருமையை நாம் பாராட்டிக் கொள்ளலாம்.

நன்றி
விடுதலை

abc Tile Fixing Guidelines

1. Soak **abc tiles** in clean **abc Nano** water for 10 to 15 minutes. Remove defective tiles, if any.
2. Level the roof top with **abc** light weight aggregates or suitable material @ 1" for 10 ft or so.
3. Sand-Cement mortar @ 15 : 1 ratio. This is to fix abc Tiles on the levelled surface.
4. Fix abc tiles by using cement slurry. Prepare slurry by using 3 part cement (UltraTech or equivalent) and 1 part **abc Plus Powder.**
5. Water content in 15:1 mortar and cement slurry has to be fine tuned and make sure each tile is fixed properly in wet condition only. Use 3 mm **abc spacer** to maintain uniform gap between tiles.
6. After fixing the tiles, one day curing with water and clean the tiled area. Ensure that ecah tile is fixed firmly and check for proper cleaning and neatness on the tiled area before applying the grout.
7. Mix abc Grout with **abc Nano Acryl** / **abc Nano** water. Apply **abc Grout** in three mm gap (in wet condition).
8. Sealing. To ensure water proofing, seal the grout to prevent staining and water penetration. Wait until the grout is cured (24 hrs) before sealing. Sealing has to be done by using **abc Nano Acryl / abc Nano** water.
9. abc Tiles will help a lot for water proofing the flat roof. However, parapet walls, outer sides and other areas are also to be water proofed suitably. Use abc Nano Liquid / abc Nano Acryl for such water proofing.
10. Now your roof is safe for water proof, heat proof and also stain free. Hence, the labelled SRI value of the **abc** Tiles can be retained for ever.
11. Due to white colour, desgin and more glaze coat, certain micro hairlines may be here and there which are visible only after fixing the tiles. These can be touched up by using weather proof whitener.
12. Never fix abc Tiles during raining or on too wet roof. In such situation, delay the grouting work . Upward water evaporation is not possible in glazed ceramic tiles. Only downward water evaporation which will show water mark.

***Note:* Good workmanship is no substitute for any written procedure. Even a well-designed layout or premium quality tiles can be ruined by poor cutting / fixing, resulting in chipped tiles, crooked grout lines, and a grouting haze left on the tile, difficult to remove at later stage.**

தமிழ் செராமிக்ஸ்

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வேலாயுத நகர், ஜெயங்கொண்டம் – 621 802. **Cell : 9047574999**

Stockist for abc Weather Proof SRI Tiles

கூரைகளுக்கு வெள்ளை நிறம் அடிப்பதற்கு மிகச்சிறந்த ஒரு வழி தரமான செராமிக்ஸ் (கிளேஸ்) டைல்களை பதிப்பதாகும். சர்வதேச தரக்கட்டுப்பாடுப்படி தயாரித்த **Ceramic tiles** ஒரு வரப்பிரசாதமாக அமையும். இவ்வாறு தயாரிக்கப்பட்ட டைல்கள் வெள்ளை மற்றும் பல மென்மையான நிறங்களில் கிடைக்கிறது. வீட்டின் மேற்கூரை மழைக்கும் வெயிலுக்கும் உட்படுவதால் சர்வதேச தரக்கட்டுபாட்டுக்கு உட்படுத்தப்பட்ட டைல்களை உபயோகிப்பது மிக மிக அவசியம்.

Ceramic Tiles அதிக வெப்பத்தில் தயாரிக்கப்படுவதால் **(1150°)** கனம் **(Thickness)** குறைவாக இருந்தாலும், உறுதியாக **(Strength)** இருக்கும்.

முதன் முறையாக செராமிக் டைலுக்கு **SRI (Solar Reflectance Index)** சோதனை செய்து **Cool Roof** க்கு பயன்படும் வகையில் வடிவமைத்து abc என்ற பிராண்டை வெற்றிகரமாக விற்பனை செய்து வருகிறோம்.

கடந்த **6** ஆண்டுகளாக தரமான டைல்களை தேர்ந்தெடுத்து மொட்டை மாடிக்கென்றே பிரத்தியேகமாக விற்பனை செய்து வருகிறோம். சரியான முறையில் பதித்தால் எந்த குறையும் வராது. இதுவரை **2** லட்சம் சதுர அடிகளுக்கு மேல் விற்பனை செய்துள்ளோம்.

குறைந்த பட்ஜெட்டிலும் எங்களிடம் வெதரிங் டைல்ஸ் **(Cool Roof)** கிடைக்கிறது. **abc** டைல்ஸ்களை சிறந்த முறையில் பதிப்பதற்கும் எங்களிடம் அனுபவம் உள்ள ஆட்கள் உள்ளனர்.

For a sustainable roof, use following items;

abc Light Weight Aggregates, abc plus powder, abc Grout, abc Nano Acryl Liquid & abc Nano Liquid.

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abc Light Weight Aggregates for insulation roof.

abc LWA + abc Tiles = The best roof choice.

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Advantages of abc Light Weight Aggregates:

Light weight & good compatibility with abc Weather Proof SRI Tiles.

Thermal insulation due to a low conductivity coefficient

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We also under take abc Tile Fixing job work

THE HINDU

NEW DELHI, January 19, 2011

Cool roofs to conserve energy

In order to conserve energy used for cooling buildings, the Delhi Government plans to promote the concept of ñcool roofs.ò

Delhi Chief Minister Sheila Dikshit made this announcement during a presentation on ñCool roofs for cool Delhiõ at Delhi Secretariat on Wednesday.

The Government would encourage the creation of cool roofs which are prepared with materials that have both high reflection and emission levels. The concept would be tried in Delhi Secretariat and various hospitals and schools first.

Residentsô welfare associations would also be roped in to enhance the acceptability of cool roofs.

During the presentation, it was stated that research has shown that cool roofs also help increase the life expectancy of roofing systems because extreme cycles of heating and cooling tend to wear out materials as they expand and contract with the temperatures. Cool roofs, on the other hand, keep the roof at a more constant temperature and the structures therefore tend to last longer.

Cool roofing can be implemented in three ways. These involve use of paint, glazed tiles and lime coating. While lime coating is the cheapest, it requires repetition after every six months whereas laying of glazed tiles, though costlier,tiles is more long lasting. As for application of paint, it was stated that it will cost in between the two and will have life of around two years.

At the meeting, which was also attended by several senior Delhi Government, New Delhi Municipal Council and Municipal Corporation of Delhi officials and engineers, it was also suggested that a pilot project be launched in a particular colony to assess the benefits of cool roofing on a larger scale.

Keywords: energy conservation, cool roofs

The Indian EXPRESS
JOURNALISM OF COURAGE

Cool white roof is new mantra to save energy

New Delhi, Thu Jan 20 2011,

The Delhi government is set to implement the ócool roofôconcept in a bid to promote energy conservation. As part of the pilot project, the government will first take up its own buildings.

There are three methods of cool roofing: High-albedo paint, glazed tiles and lime coating that can be applied on visible patches on roof surface. While the lime coating is cheaper, it requires repainting every six months. The glazed tiles, however, last longer but are expensive. Application of high-albedo paint, meanwhile, is cost effective and lasts around two years.

Officials have suggested use of pieces of glazed tiles on roof tops, which will be cheaper than using the whole tile and last longer.

ñWe want to encourage cool roofs in the Capital. They have the ability to reflect and reject heat because the roofs are prepared with materials which have properties of high solar reflectance,òChief Minister Sheila Dikshit said after attending a presentation on the concept.

It was decided that the government will introduce cool roofing on its big buildings such as Delhi Secretariat, hospitals, schools, etc. The government also plans to bring out a manual to increase awareness about the concept. Though no concrete decision has been taken in this regard the government plans to shortlist a colony in which this concept will be tried out first to assess the benefits.

Research has shown that cool roofs also help increase the life of roofing systems because extreme cycles of heating and cooling tend to wear out the material as they expand and contract with the temperatures.

PRESS TRUST OF INDIA

Last Updated: Wed, Jan 19, 2011 23:38 hrs

Delhi to introduce 'cool roof' concept in government buildings

New Delhi: In tune with its green initiative, Delhi Government will soon introduce the concept of ñcool roofsò in its buildings to minimise consumption of energy.

Chief Minister Sheila Dikshit was today given a presentation on benefits of ñcool roofò concept following which she announced that it would be introduced in government buildings.

Cool roofs reduce both the energy use and energy demand of a building.

Dikshit said the government will encourage cool roofs in the city as they have the ability to reflect and reject heat and will help in cutting down overall energy consumption of Delhi.

It was decided that the government will introduce cool roofing in its big buildings such as Delhi Secretariat, hospitals and schools initially.

Further, the government will also launch an awareness campaign to educate people about the concept.

The RWAs will be involved in the campaign. An official said it was decided to carry out a pilot project in a particular colony.

ñThere are three methods of cool roofing. High-albedo paint, glazed tiles and lime coating could be applied on visible patches on roof surface,òsaid the official.

He said lime coating will be much cheaper but it will require repetition after every six months whereas laying of glazed tiles will be costlier but will last longer.

கி.பி.2030-ல் இந்தியாவின் பருவநிலைப் பற்றி சகிபத்தில் செய்த ஆய்வறிக்கை

THE TIMES OF INDIA

Special Report

2 Hot, too soon

Jayashree Nandi, TNN | Sep 9, 2012, 06.54AM IST

A new study to be published in the next issue of Current Science predicts upto 2 degrees rise in temperature in India as early as the 2030s. Climate change's catastrophic effect, it seems, is here faster than anyone had expected.

A two degrees rise in the average global temperature is considered the danger line beyond which climate change will have intense impacts. Till now the general belief was that there is enough time to avert what scientists call ócatastrophicô climate change. Perhaps not any more.

A new research by climate scientists at the Indian Institute of Science (IISc) says India will experience a 1.7 to 2 degrees Celsius rise in temperature (compared to preindustrial levels) as early as the 2030s. The study, which is to be published in the next issue of the journal Current Science, also projects that precipitation in India is likely to increase by 4-5 % by the 2030s.

According to the authors of the report, a two degrees rise can be severe for India. ñWarming of equal to or in excess to two degrees is considered ódangerousô by the United Nations Framework Convention on Climate Change and the science community . India is also a signatory to the Cancun Agreement to limit warming to less than two degrees. But this threshold may be breached in India after 2030s and the all-India mean temperature rise could reach up to 4.8 degrees by 2080s if global CO2 emissions continue unabated,ò says one of the authors of the study, N H Ravindranath, who is professor at the Centre for Sustainable Technologies and Centre for Ecological Sciences at IISc.

Long term projections of the study reveal that mean warming in India is likely to be between 3.3-4 .8 degrees Celsius by the 2080s and precipitation is projected to increase by 6-14 % towards the end of the century. A two degrees rise in temperature in India means extreme warm periods across the country. Northern India, particularly Rajasthan, Madhya Pradesh, Uttar Pradesh, Uttarakhand, Himachal Pradesh, Delhi, Punjab and Haryana are projected to experience higher levels of warming compared to the rest of the country . In northeast India, Arunachal Pradesh is likely to experience relatively higher levels of warming. These projections are made under a óbusiness-as-usualô scenario, which means if the worldôs green house gas emissions continue to pollute at the current levels, there will definitely be a breach of the two degrees mark.

However, a large section of people find such extreme scenarios hard to believe. So how reliable are these projections? ñScientists are not speculating,ò says R K Chaturvedi, the lead author of the study and a national environmental science fellow . ñOur findings are based on robust climate models. In fact, for the first time, we have used an average of 18 climate models to arrive at a finding which will have a smaller margin of error. These models have managed to predict our past correctly. So if the temperature rise in the past has been predicted correctly and we have compared them with real data, why will it throw up incorrect projections for the future?ò

Ravindranath reaffirms that the situation is serious. ñJammu and Kashmir and a few other parts of the Himalayan region will be the worst affected. The region is projected to experience the highest mean warming up to 8 degrees by 2080s. Iôm not joking when I say there will be no snow in Kashmir. The only way to remember snow fall in Kashmir will be to watch the old ShammiKapoor flick Junglee,ò he says wryly.

Even scientists not connected with the study agree that a future doomsday scenario is possible. ñThe findings are quite reasonable,ò says S K Dash, head of the department of Centre for Atmospheric Sciences at IIT Delhi. ñNot many studies have been done based on so many climate models . Therefore, the results of this study are likely to be reliable. Our own studies have shown that India has experienced an average temperature rise of about 1.2 degrees in the past 100 years. So itôs not strange to assume a two degrees rise by 2030,ò he says.

Many scientists feel that India, especially , would feel the heat of this projected change in temperature more than others. SudhirChellaRajan, professor at the department of humanities and social sciences at IIT Madras, who recently evaluated Indiaôs National Climate Action Plan on Climate Change, says that India is more vulnerable because of a variety of reasons. ñFirst, our vast size and geography has hot spots like the Himalayas and the coastal areas. Then there is poverty. The poor are not resilient enough to deal with intense impacts like very warm periods or even floods. Thatôs why itôs time we reacted faster to this impending disaster.ò

Singeing survey

One of the first Indian studies where climate change projections have been made based on multiple models encompassing a range of new scenarios for 2005 to 2100

The 2 degrees C threshold may be breached for India in 2030s and the all-India mean temperature could reach 4.8 degrees by 2080s

Number of extreme rainfall days (8 cm/day) is likely to increase by 60% after 2050s

North India will experience very high temperatures in the summer months. Projected warming in these regions will further exacerbate the heat stress.

White Roofs Cool Cities More Than Tree

Reuters Cities are hot spots. Their paved surfaces and **dark rooftops absorb energy from the sun,** which creates localized areas of high temperatures. Expanded out from the building scale to the city scale, these hot roofs and blacktops collectively create a blanket of retained warmth in a city, raising temperatures an annual average of about 2 to 5 degrees Fahrenheit. Itôs a phenomenon known as the urban heat island effect, and it can have huge impacts on energy use and even health in the warm months. Itôs like wearing a city-sized sweater on a hot day in July.

While trees can help bring down temperatures (in addition to a variety of other beneficial impacts), new research suggests that it might make more sense to invest in white roof (tile) than white ash.

In a study just published online in the journal *Building and Environment*, researchers out of Yale University show that the cooling effect of tree cover and other vegetated areas is far outpaced by the cooling achieved through reflective roofing. By analyzing satellite imagery of the city of Chicago from around 1995 and 2009, the researchers found that parts of the city that had increased their reflectivity show greater reductions in temperature than areas that increased their vegetation.

ñThat might be contrary to the established view the field has,òsays Chris Mackey, lead author of the report who started the research as an undergrad studying architecture at Yale.

That's not to say planting trees is a bad method. It's just not as good as making a rooftop more reflective.

One neighbourhood had an estimated 80 percent conversion from black tar roofs to reflective surfaces, and Mackey says the observed temperatures in that area dropped at least 3.5 degrees Celsius. Another collection of warehouses with reflective roofs saw drops of at least 5 degrees Celsius.

What obviously did not show any significant signs of cooling are the city's famous green roofs. Because the vegetation of these gardens is at such a low density, it hardly registered in Mackey's analysis. Not even the well-known City Hall green roof exhibited cooling power.

"The green roof is barely doing anything in comparison to the tree, and the tree is barely doing anything in comparison to painting a warehouse roof white," Mackey says. "I don't want to discredit green roofs as not potentially a good thing at all. But it would take a lot of money and effort to get a high enough density of vegetation to start cooling things down."

What takes less money and effort is the reflective roof approach. The EPA estimates that "cool roof" coatings and membranes cost about 5 to 20 cents more per square foot when compared to traditional roofing methods. A 10,000 square foot roof might cost about $4,500 to coat with reflective roofing, while a similarly sized green roof could cost upwards of $150,000.

"If you were trying to develop a heat island strategy, reflective roofs would be the easiest and most effective," Mackey says.

But green roofs and planting shouldn't be ignored. Mackey suggests that the reflective roof approach would be a good way to make dramatic changes quickly.

"Once you reach that capacity, then you could start to focus on vegetation increases," he says.

A city full of white roofs would be cool, but a city full of trees would be cool in a much different way.

Keywords: Chicago, Vegetation, Temperature, Heat Island Effect, Green Roofs, trees

COOL ROOF MAINTENANCE & LIFE

As a cool roof becomes dirty from pollution, foot traffic, wind deposited debris, pended water, and mold or algae growth, its reflectance will decrease, leading to higher temperatures. Especially dirty roofs may perform substantially worse than product labels indicate. Dirt from foot traffic may be minimized by specifying designated walkways or by limiting access to the roof. Steep sloped roofs have less of a problem with dirt accumulation because rainwater can more easily wash away dirt and debris.

Some cool roof surfaces are ñself-cleaningòwhich means they shed dirt more easily and may better retain their reflectance. Cleaning a cool roof can restore solar reflectance close to its installed condition.

Always check with your roof manufacturer for the proper cleaning procedure, as some methods may damage your roof. While it is generally not cost effective to clean a roof just for the energy savings, roof cleaning can be integrated as one component of your roofs routine maintenance program. It is therefore best to estimate energy savings based on weathered solar reflectance values rather than clean roof values.

If you are trying to figure out what would be perfect type of roofing for your home, then here is how to save yourself from a lot of headache. Because when it comes to roofing solutions, ceramic tiles roofing are probably one of the best options out there in the market.

The number one factor that makes these possible is the fact that ceramic tile is outstandingly thermal - effcient and is a great insulator as well. Because of this, you know that it **would last for centuries without much of a problem.**

Now get out there and ask your local dealer about ceramic tile roofing.

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News Letter (all abc associates)

The ab concept (ari bhai concept - abc) is reaching very well in the roof tile sector. This can be confirmed from the duplication of abc tiles. There are suppliers in the market copying **abc** tiles and selling in their box. The **abc** associates are proud of such duplications. This is a growing signal for **abc.**

The abc associates are decided to give better service to the end users of **abc** Tiles.

To give value added services to the regular customers of abc tiles, following services are available:

Abc Nano Liquid - Water Proofing the entire tile ï India First Full Body Water Resistant SRI Tile.

Abc Light Weight Aggregates ï This is used to give better slope on the roof.

Abc Nano Acryl ï This is used to mix in abc grout for better strength. The same chemical can be used to laminate a building and water proofing critical area like parapet wall etc. Ideal for cool coat on asbestos sheet as well as on terraces with pressed clay tiles.

Abc Grout ï Compatible with abc Tiles

Abc Plus Powder ï better workability for cement slurry

ORBIT 10 x 15 ï digital wall tiles from the mfrs of abc Tiles.

ORBIT 10 x 10 ï Antiskid with water proof for bath room floor.

All abc associates are kindly requested not to scare on duplication of abc Tiles. Give better services to our clients. Organize builders meet and engineers meet etc. I will also be participative.

This is for your kind attention and necessary planning.

Regards

G.ARIVAZHAGAN, M.Tech (ceramics)