

White Paper  
Infra-Red Reflectance Coating  
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## Executive Summary

Accounting for 50% of global final energy consumption in 2018, heat is the largest energy end-use and contributes 40% of global carbon dioxide (CO<sup>2</sup>) emissions<sup>1</sup>.

Within rail transportation for example, reducing incoming heat from the sun into the carriage will reduce air-conditioning costs and improve the customer experience.

Blocksil has the capability to increase the infra-red reflectance of existing coatings.

The coating modification has little to no impact on the application methods used with the coating and so is an easy win for all concerned..

## Business Challenge

Reducing the amount of heat entering a building, vehicle or mass transport carriage from the roof reduces the discomfort of the inhabitants or passengers during summer. This in turn reduces the energy needed to run any air conditioning.

With global warming likely to lead to repeats of recent summers, such energy savings are going to be ever more important.

It is well known that a white or light coloured surface remains cooler than a black, or darker surface thanks to the interaction of the painted roof with the infra-red radiation emitted by the Sun. As infra-red radiation accounts for approximately 50% of the total energy of solar radiation, reducing the amount absorbed by the coating is clearly beneficial.

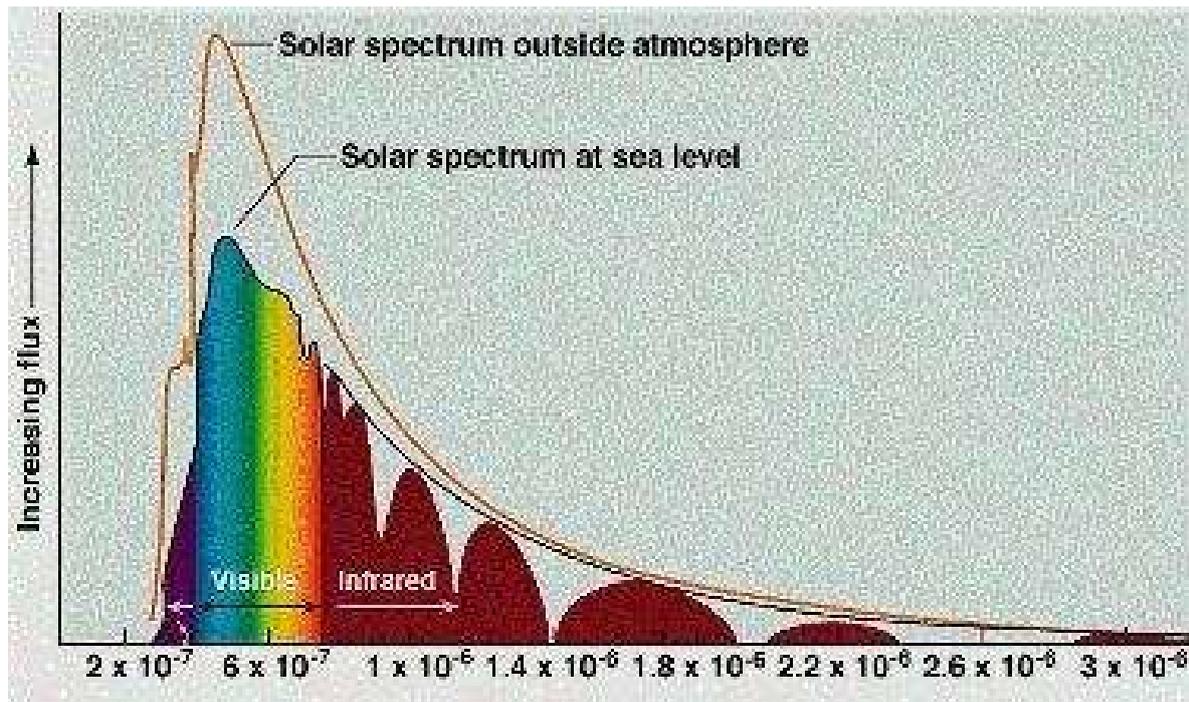
So why not have roofs painted white or very light colours? Because they will very quickly become dirty through use, resulting in both poor aesthetics and a now darker surface.

By modifying the pigments and additives within the paint, Blocksil can improve the Total Solar Reflectance of the paint, even with darker colours.

Depending on the paint colour and the levels of brightness, laboratory tests suggest a temperature reduction of between 8.7°C and 14.7°C, with an improvement in the Total Solar Reflectance (TSR) of between 50% and 32%.

An additional benefit of having an improved TSR is an enhanced lifespan of the paint. The reduced surface temperature will reduce the thermal degradation of the polymeric matrix.

Temperature differences between day and night, direct sunlight and shadowed areas might also level out. This in turn would lead to reduced thermal warping and stress.



The increased cost of the modified paint will be insignificant when compared with application (which has to be carried out anyway) as labour and access costs are always the highest cost elements. And there are no capacity constraints in supplying this modified paint.

### Solution

At Blocksil we have developed a method of incorporating an infra-red reflectance additive to a coating. The addition can be carried out on site if required, subject to certain controls.

The addition of this inert additive should not affect the main function of the coating but tests of specific systems ought to be carried out for peace of mind.

It follows on that industry specific tests should also not be affected, though again, safety related testing (such as fire testing) should be repeated.

The Blocksil solution is available now. Note that the solution is the additive but we can supply the complete coating if required.

## Target Markets

Industries that could use the Blocksil infra-red reflectance solution and help reduce the cost of energy and improve occupant comfort:

- Armoured vehicles and similar restricted opening vehicles
- Buildings – commercial, industrial and domestic: permanent and temporary
- Mass transport solutions
- Vehicles

Countries that could use our solution - worldwide.

## Benefits

- Can be added to the coating on-site.
- Can be added into a wide variety of coatings.
- Infra-red reflectance modified coating is applied as per the unmodified coating.
- Heat reduction and improved TSR will result automatically.
- Minimal if any impact on coating usage or performance.

## Summary

By using Blocksil infra-red reflectance modified coatings, clients can expect to see energy savings.

The coatings could also be expected to last longer.

The simple and easy to add additive will have a minimal impact on the overall cost of the applied coating system.

## References

- 1 IEA Renewables 2019 market analysis and forecast