Comments on How Exterior Paints and Interior Paints Can Play Roles in Conserving Energy

For
Tech Traders Inc.

By
H. F. Poppendiek

June 2002

GEOSCIENCE LTD
620 Marindustry Drive
San Diego, California 92121

Geoscience LTD
LABORATORY TESTING DIVISION
6260-B Marindustry Drive San Diego, CA 92121

I. ENERGY SAVINGS PRINCIPLES

There are two types of paint that can assist in saving energy in residential and industrial buildings. One relates to the reduction of the solar load to roofs and to exterior walls. The second one relates to interior room wall paints. These features are discussed below.

Solar Load Reduction Paints

When the sun shines on exterior surfaces of commercial and residential buildings, the solar load can be high enough in the summertime to require the use of excessive air conditioning in interior rooms in order to have comfortable conditions. If the exterior paints or coatings have reasonably good solar reflectivities, however, then the solar load being absorbed by the building would be reduced and the air conditioning required would also be less, thereby conserving energy.

Interior Room Heat Transfer Reduction Paints

If the emissivities in the infrared region of interior wall coatings or paints are lower than ordinary paints, then the radiant hat transfer from the warmer outer walls of rooms would be less in the summertime, thus giving greater comfort to persons in the rooms because the radiant heat fluxes would be less, and there would be less warming of ambient room temperatures. Under these conditions, energy would be conserved because less air conditioning would be required.

Under wintertime conditions, where furnace heating is normally required in residences and buildings, if the interior outer wall paints have lower emissivities than normal paints have, ambient room temperature cooling would be less and the comfort level of persons in the rooms would be greater because the radiation heat loss to cold, interior outer walls would be less, and the ambient air temperature reduction would be less. Thus, again, as in the summertime case, energy can be conserved if low emissivity interior wall paints are utilized.

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II. ENERGY SAVINGS RESULTS WHEN USING INSULADD

In the case of solar load reduction, the energy savings accrued by using INSULADD additive paint rather than ordinary house paint would be,

$$(0.81 - 0.70) \div (1 - 0.70) \text{ X } 100 = 37\%$$

The radiant heat flux gain from a warm interior surface of an outer wall of a residence or building in the summertime is reduced if the infrared emissivity is reduced by a paint additive like INSULADD. Specifically, the percent energy savings in this flux term would be,

$$(0.85 - 0.75) \div (0.85) \text{ X } 100 = 11.8\%$$

The radiant heat flux loss to a cold interior surface of an outer wall of a residence or building in the wintertime is reduced if the infrared emissivity is reduced by a paint additive like INSULADD. Again, the energy savings in this flux term would be about 11.8%.

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PROPERTY CERTIFICATION

DATE: May 6, 2002

CLIENT: Tech Traders, Inc
307 Holly Road
Vero Beach, FL 32963

MATERIAL INVESTIGATED:

Dry wall painted with two coats of latex house paint

P.O.: Mr. David Page's Authorization FAX of 4/19/02

PROPERTY MEASURED:

Infrared Emissivity

MEASUREMENT METHOD:

ASTM E-408

RESULTS:*

Infrared Emissivity = 0.85

*Details of the investigation are not included in this Property Certification; the results presented here apply only to the samples tested.

Heinz Poppendiek

CERTIFYING OFFICER H.F. Poppendiek

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6260-B Marindustry Drive San Diego, CA 92121

PROPERTY CERTIFICATION

DATE: May 6, 2002

CLIENT: Tech Traders, Inc
307 Holly Road
Vero Beach, FL 32963

MATERIAL INVESTIGATED:

Dry wall painted with two coats of latex house paint
with Insuladd (32 fluid oz. per gallon of paint)

P.O.: Mr. David Page's Authorization FAX of 4/19/02

PROPERTY MEASURED:

Infrared Emissivity

MEASUREMENT METHOD:

ASTM E-408

RESULTS:*

Infrared Emissivity = 0.75

***Details of the investigation are not included in this Property Certification; the results presented here apply only to the samples tested.**

Heinz Poppendiek

CERTIFYING OFFICER **H.F. Poppendiek**

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PROPERTY CERTIFICATION

DATE: May 3, 2002

CLIENT: Tech Traders, Inc
307 Holly Road
Vero Beach, FL 32963

MATERIAL INVESTIGATED:

Dry wall painted with two coats of latex house paint

P.O.: Mr. David Page's Authorization FAX of 4/19/02

PROPERTY MEASURED:

Infrared Emissivity

MEASUREMENT METHOD:

ASTM E-1918; incident and reflected solar radiations are measured using 3' X 3' coated test samples. The procedures of ASTM E-1918 are similar to those of the CEC shading coefficient test method under Title 25 (Chapter 1, Subchapter 1, Article 5). A number of measurements are made over the period 11:00 A.M. to 3:00 P.M. under clear sky conditions.

RESULTS:*

Infrared Emissivity = 0.85

Please note that the incident solar radiant fluxes measured by the radiometer are in good agreement with ASHRAE solar radiation values for our latitude, the time of the year and time of the day.

***Details of the investigation are not included in this Property Certification; the results presented here apply only to the samples tested.**

Heinz Poppendiek

CERTIFYING OFFICER **H.F. Poppendiek**

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PROPERTY CERTIFICATION

DATE: May 3, 2002

CLIENT: Tech Traders, Inc
307 Holly Road
Vero Beach, FL 32963

MATERIAL INVESTIGATED:

Dry wall painted with two coats of latex house paint
with Insuladd (32 fluid oz. per gallon of paint)

P.O.: Mr. David Page's Authorization FAX of 4/19/02

PROPERTY MEASURED:

Infrared Emissivity

MEASUREMENT METHOD:

ASTM E-1918; incident and reflected solar radiations are measured using 3' X 3' coated test samples. The procedures of ASTM E-1918 are similar to those of the CEC shading coefficient test method under Title 25 (Chapter 1, Subchapter 1, Article 5). A number of measurements are made over the period 11:00 A.M. to 3:00 P.M. under clear sky conditions.

RESULTS:*

Infrared Emissivity = 0.81

Please note that the incident solar radiant fluxes measured by the radiometer are in good agreement with ASHRAE solar radiation values for our latitude, the time of the year and time of the day.

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***Details of the investigation are not included in this Property Certification; the results presented here apply only to the samples tested.**

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