

# Roediger Agencies cc

REG No: 93/29837/23  
VAT No: 4200155465  
Polymer Chemistry Building  
De Beer Street, STELLENBOSCH 7600  
www.roedigeragencies.co.za

ANALYTICAL LABORATORY

PO Box 3202  
MATIELAND 7602  
Tel: +27 21 808 3175  
Fax: +27 21 886 4731  
Cell: 083 250 9281

6 January 2010

George Smith  
Laurus Consulting  
PO Box 2406  
2008 BEDFORDVIEW

Dear Dr Smith,

A sample of Insuladd® was sent to the analytical laboratories of Roediger Agencies to investigate the possible thermal insulating properties of the material when added to ordinary household paint. The packaging of a 375 gram sample is depicted below.



The powder was examined under a stereo microscope which showed that the material is spherical in nature as is depicted in the photograph above right... see the 500 times magnification of Insuladd®.

Insuladd® was added in the recommended proportions to Plascon Super Acrylic Polvin and mixed thoroughly. The mixing ratio was 100g of Insuladd® added to one litre of paint. Insuladd® dispersed easily and remained in suspension within the paint. Both dry walling and galvanized metal were painted with a control acrylic (no addition of Insuladd®) as well as the of Insuladd®/acrylic blend. The galvanized metal was first primed with a suitable primer to facilitate adhesion of the acrylic paint.

The Insuladd®/acrylic blend yielded a slightly rougher texture than the control acrylic primer on both surfaces. The panels were then used as covering panels for cooler boxes which were equipped with temperature data loggers which recorded temperatures. Hence the temperature transmission rates could be measured as well as insulating properties of the two substrates with and without the Insuladd® assessed. The graphs and relative data are given below.

Commercial “BigBoy” cooler boxes were modified so that the painted panels acted as a lid. The cooler boxes were placed in an air-circulated oven at a temperature of 70°C. The data loggers recorded the internal temperature every 10 seconds and the data downloaded and presented graphically.

### Test One

Two separate experiments were conducted on dry wall painted boards.

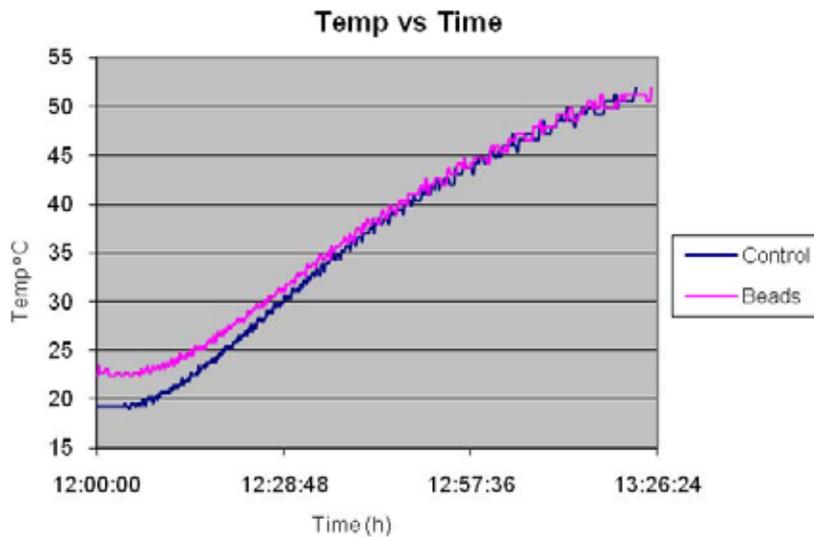


Figure 1.: Two separate experiments overlaying results of acrylic versus acrylic/Insuladd® blend on dry walling.

The slope of the rate of heat increase was measured for both curves between 21 and 31 degrees Celsius, in other words the rate of increase which occurred to heat the interior by ten degrees Celsius from the ambient temperature.

Sample	Time duration (mins)	Temp rise (°C)	Heat transfer (°C/min)
Control acrylic	16.17	9.2	0.569
Acrylic/Insuladd®	15.67	7.8	0.498

This equates to a ratio of 1.143 or a 14.3% slower heat transfer rate through the dry wall panel which was coated with the acrylic/Insuladd® paint. The obvious outcome in terms of maintaining a constant temperature within the sealed chamber would be that it would require 14.3% less energy to maintain the chamber which was insulated with acrylic/Insuladd® paint than the control.

## Test two

Two simultaneous experiments were conducted on dry wall painted boards.

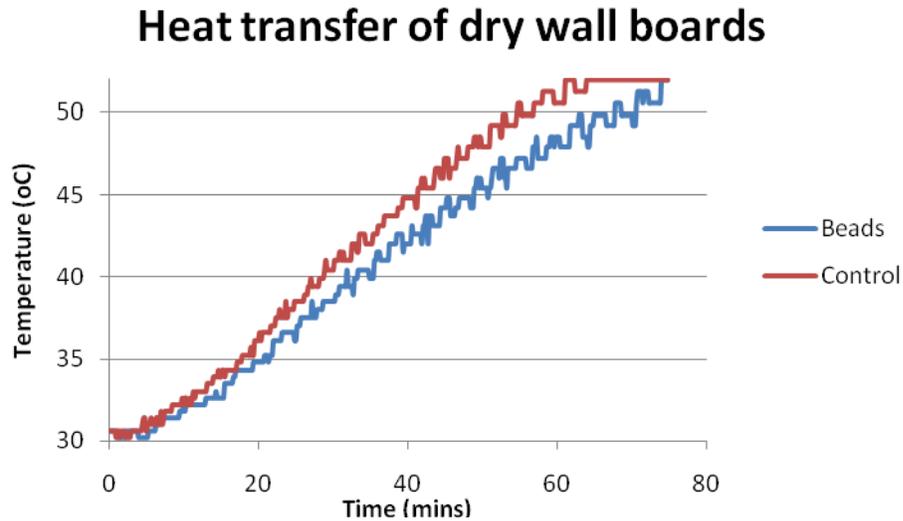


Figure 2.: Two simultaneous experiments overlaying results of acrylic versus acrylic/Insuladd® blend on dry walling.

The slope of the rate of heat increase was measured for both curves between 21 and 31 degrees Celsius, in other words the rate of increase which occurred to heat the interior by ten degrees Celsius from the ambient temperature.

Sample	Time duration (mins)	Temp rise (°C)	Heat transfer (°C/min)
Control acrylic	63.83	17.9	0.280
Acrylic/Insuladd®	63.83	21.3	0.337

This equates to a ratio of 1.190 or a 19.0% slower heat transfer rate through the dry wall panel which was coated with the acrylic/Insuladd® paint. The obvious outcome in terms of maintaining a constant temperature within the sealed chamber would be that it would require 19.0% less energy to maintain the chamber which was insulated with acrylic/Insuladd® paint than the control.

### Test three

Two simultaneous experiments were conducted on painted galvanised metal.

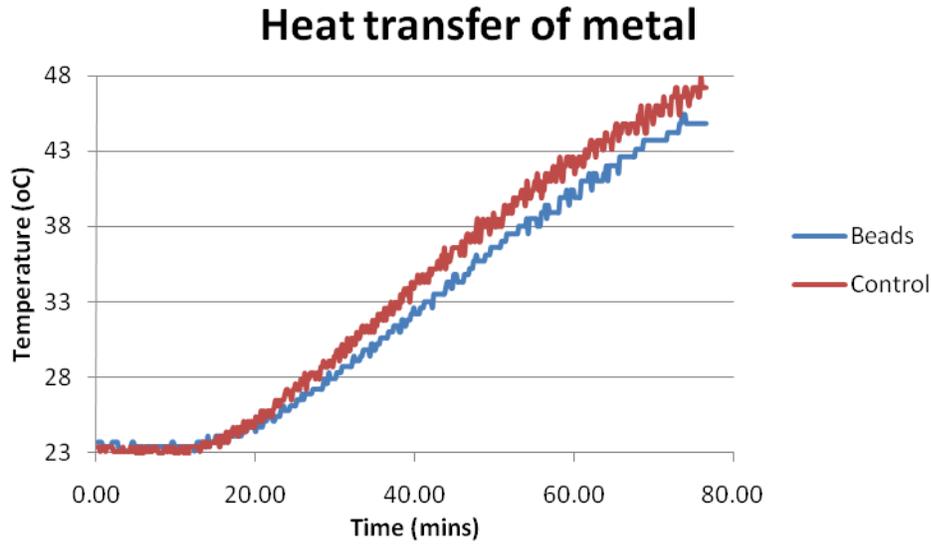


Figure 3.: Two simultaneous experiments overlaying results of acrylic versus acrylic/Insuladd® blend on metal plates.

The heat transfer through the metal painted with acrylic/Insuladd® is slower than the metal painted with acrylic only. The rates, however, do vary with time as indicated below from a 35% improvement in the first five minutes of exposure to a 7% improvement in the five minute period after 45 minutes exposure.

Time from beginning of test (min)	Ratio of heat transfer beads vs. control (5 min period)	Improvement (%)
5	1.35	35
10	1.21	21
15	1.18	18
20	1.18	18
25	1.14	14
35	1.12	12
40	1.09	9
45	1.08	8
50	1.07	7

## Summary

It appears that when Insuladd® is added at a rate of 100 gram per a litre of acrylic paint that an improved insulation factor is achieved on both dry walling board as well as metal sheeting. The rate of heat transfer (insulation) in the case of dry walling is decreased by 19% when Insuladd® is used compared to a control paint. In the case of metal the heat transfer rate decrease (insulation) varies from 35% down to 7% depending on length of exposure. It is obvious that should a constant temperature be required behind the panels, that an energy saving would be achieved when Insuladd® is added to the paint.

It is evident that Insuladd® is a ceramic product and thus is considered as non toxic.

We trust that you are pleased with the results.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'A. Roediger', written in a cursive style.

Dr. AHA Roediger.

***Please take note that samples will be retained for a one year period and discarded thereafter.***