

Is R-24 paint for real?

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A while back Glidden Paints had begun marketing Ceramic InsulCoat paint in Canada, claiming R-24 insulation values for a coat of paint. Does this new high tech paint really provide the equivalent of an R-24 insulation value to your Canadian home? No! In Canada, even the best reflective paint will not save you as many heating dollars as a layer of insulation with a certified value of R-24. The most discouraging part of this misleading marketing program is that it is being presented in Canada by a respectable paint manufacturer. It is probably a good paint. It is rated as a good reflective barrier. It appears to be a good product, lost in the wrong climate. You should first become suspicious when you see a great big 'R-24 Equivalency Tested' label, followed by the following fine print: 'This product is not meant to replace insulation. It is intended as an enhancement to existing insulation systems...' (and goes on with a complex effort to mix 'reported' savings and distorted laboratory test results). Most of Canada does not even require R-24 in our walls. If this paint is really equivalent to R-24 batt insulation, why in the world would we put any insulation in our walls at all. Either it is worth R-24 or it is not. The entire marketing campaign is based on one laboratory test undertaken by a very respectable testing facility. I suspect that the building scientists that undertook the testing are having sleepless nights after seeing what the marketing program has done with their results. Before we take a close look at that test, we need to review the simple scientific basics of heat transfer -- the proper term for heat travelling through our walls in both summer and winter. There are three mechanisms by which heat can move through our walls, whether it be the sun overheating our homes in the summer, or the heating system losing heat to the cold outdoors in the winter. Heat can move into and through walls and windows by the mechanism of radiation. This is the heat transfer that the InsulCoat paint is dealing with. Heat also moves through the walls by conduction. The wall becomes warm, that warms up what is inside the wall and then warms up the other side of the wall -- moving outward in the winter, inward in the summer. This is primarily what fibreglass insulation works to hold back. Heat also moves through the walls by convection. That basically means that it moves with flowing air, through the wall, or looping inside the wall, carrying heat from the warm side to the cold side. This is what air drafts and air barriers are all about. In air conditioning climates, those areas where the primary climate control costs are related to cooling, radiation from the sun is a very important part of the overall mechanism of heat transfer. If we can reflect the sun back away from the house, we can seriously reduce air conditioning costs. Hence in the southern US, radiant barriers of all kinds, from aluminium foils to reflective paints like InsulCoat paint are legitimate and valuable energy conservation measures. The catch is that in a heating climate, where household heating costs represent by far the larger part of annual climate control costs, conductive and convective heat losses represent almost all the heat losses that we deal with. In fact, reflective barriers, which could hold in a very small portion of the total heating load, actually keep out warming radiation from the sun even more effectively than they keep in the relatively low temperature heat that we find inside the house. No one yet has actually put fuel cost figures on the balance between the heat that they keep in, and the heat that they keep out, but we do know that proper use of passive solar energy is one of the most cost effective energy conservation actions we can undertake in Canada. Reflective paint on the outside, even the inside of the house, will seriously reduce any warming effect the sun has on our walls, winter as well as summer. So even though quality reflective paints and aluminium foils are effective at bouncing the radiation aspect of heat back to where it comes from, the total of radiation heat losses in a house is a very small percentage of winter heating costs, in any climate. So although it may marginally make a cold wall feel less cold ('perceived' as opposed to 'real' heat loss), it will have an almost negligible impact on your winter heating costs and if you do the whole outside of your house and the underside of your roof, you could potentially increase your winter heating bill. However, reflective paints, like aluminium foils, can help reduce your summer air conditioning costs. So what

about this independent laboratory report upon which they based their 'R-24 Equivalency Tested' marketing program? They built a box, put a heat source, followed by a cold source, in one side. They put thermometers on both sides and then down the middle separating the two sides they first put R-24 fibreglass insulation, then a thin sheet of InsulCoat paint. They measured temperatures on both sides for over 2 hours in each of the various arrangements. Fibreglass is not designed to provide a radiant barrier at all, and it is not intended to provide a convective barrier either. In fact, it will not provide it's rated R-value unless it is boxed into a closed system which does not allow for air movement. The InsulCoat official test report gives no indication that there was any effort to prevent air movement through the fibreglass. Research from the National Research Council of Canada has shown significant loss of insulating effectiveness with even slight air flows through fibreglass. Fibreglass is never used in Canadian houses without an air barrier. The paint membrane placed in the test chamber blocked both radiant heat and convective heat. This is like comparing apples to walnuts. In fact, I would have loved to see the test results with a single sheet of newspaper used in the place of the paint film, a convective barrier with almost no thermal insulating value, and no reflective value. If we subtracted those results from the paint film results, we would really see the contribution of the high tech reflective aspect of this paint. Even using their own numbers, the paint performed 9.4% less well than the R-24 fibreglass, not the R-24 Equivalency Testing that Glidden's marketing department claims. Then the upper end of the statement that 'end users report reduced utility costs between 4% and up to 50%' appears to be based on one consumer from Cabo San Lucas reporting on his air conditioning costs only. Yet this 50% savings claim is published throughout Canada, suggesting that we can expect this kind of heating cost reduction. Why is the R-24 Equivalency Tested claim accompanied by the long and misleading conditional text? Because in a heating climate, it is simply a paint, not a significant thermal barrier. Glidden doesn't need to withdraw the product from the market, but they should, in all good consciousness, withdraw their southern US marketing campaign from the cold north and quit claiming any significant heating cost savings. I am sure that it is in fact a great reflective barrier, but reflective barriers, even good ones, are of little use in the Canadian climate.

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