

**COMMENTS ON THE REPORT OF
BODYCOTE MATERIALS TESTING CANADA INC.
ON THE CANSOLAIR SOLAR PANEL**

The report of Bodycote Materials Testing Canada Inc. (BMTC) on the Cansolair Solar Panel RA 240 dated 7 February 2002 indicated that the Thermal Performance of the Solar Panel was 57.5% under the test conditions as provided by CSA F378-87. This means that for Temperature input of 21 Degrees C and ambient temperature of 21 Degrees C the Solar Panel generated a temperature rise of 26.55 Degrees C. Converting this result to BTU and Watts results in 4510 BTU and 1321 Watts.

The points of significance in this report that Cansolair can and should use in its promotional material are as follows:

BMTC is the national testing facility and as such has performed a test that is accepted and can be relied on. The test results therefore constitute solid evidence of performance and are the points from which we can calculate further performance expectations. A statement in Cansolair materials to the effect that the Solar Panel is tested in The National Testing Facility may be used.

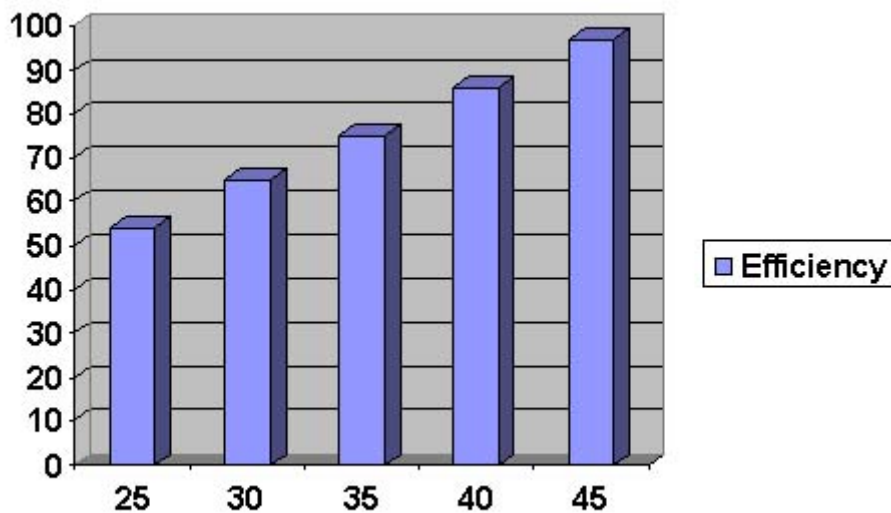
BMTC tested to the CSA test standard for Solar Panels, CSA F378-87, and this fact can be stated in the materials. One requirement of these tests is that a performance graph must be included as part of the written documentation supplied with the Panel.

BMTC were impressed with the visual appeal of the panel and plan to use it, with Cansolair's permission in BMTC's promotional material.

BMTC indicated that Angle of Incidence both in the horizontal and vertical planes did not materially affect performance and therefore the proposed installation on a southern exposure vertical wall is as good as any angle style installation. Given that the environmental conditions experienced in typical installations is going to be dynamic, a graph of expected environmental conditions versus performance would be a good way for Cansolair to interpret and present the performance expected in typical installations. In order for customers to determine performance they can measure the output temperature and use the graph to indicate performance. It is expected that performance would approach 90% plus in various environmental conditions. Such a graph is as follows:

ESTIMATED PERFORMANCE

It is estimated that performance will increase in the Solar Max 240 as environmental conditions change. The simplest method of showing this is the following chart which shows performance (thermal efficiency) in percent against temperature rise across the collector. Under test conditions the thermal efficiency was measured and calculated to be 57% with a temperature rise of 26.6 Degrees C. For different temperature rise numbers the thermal efficiency will increase, and these temperature rise figures can be measured.



The energy of the sun has been captured in a number of ways in recent years and it is now possible to equate the energy captured to the energy available and arrive at an efficiency ratio for each method of solar capture. The three ways of capture are: 1) solar heating panels which use the sun to heat water in the panels, 2) solar electric panels which use the sun to generate electricity through photovoltaic cells, and 3) passive solar collection through design innovations and heat sinks within the dwelling.

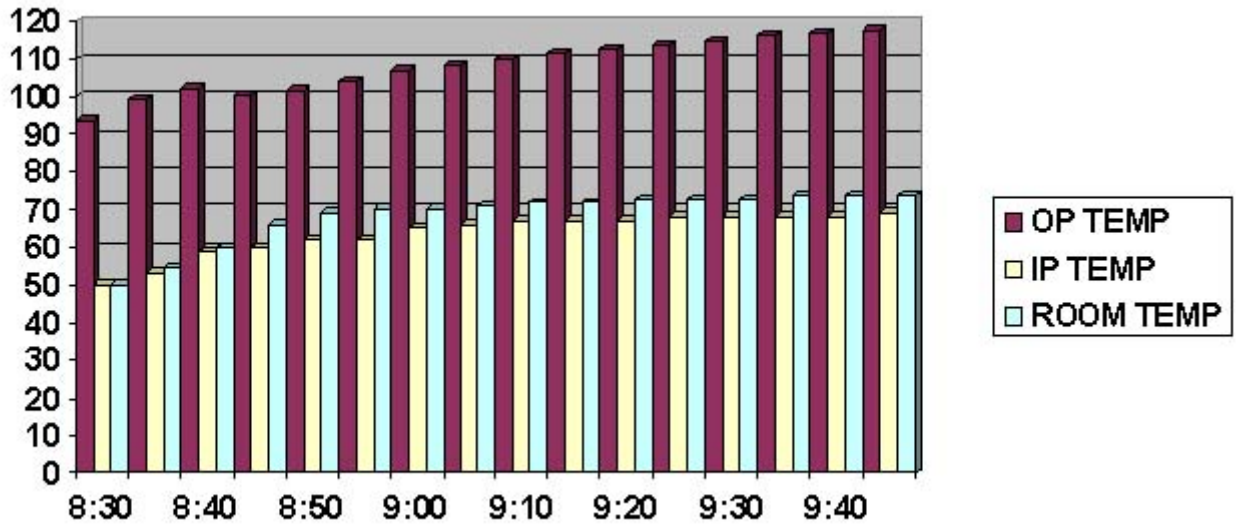
Solar radiation above the earth's atmosphere has been established at 1350 W/m² (Watts per square meter). Because the atmosphere scatters and absorbs the sun's rays, there is less intensity at the surface of the earth. This intensity has been measured as being a peak of 957 W/m² at latitude 45N. Also this intensity is not present during all sunlight hours, increasing from about 100 at dawn to about 700 at noon on a sunny day. Angle of incidence of the sun is also a factor making a calculation of solar radiation very difficult indeed. CMHC has calculated an average solar radiation of about 120 kWh/m² per month in the heating season. From this calculation the daily average would be four kWh/m².

The absorber plate in a liquid heating panel can be heated to 200 Degrees F in winter and almost 400 degrees F in summer. Water passing over the absorber plate can be heated in bulk storage to temperatures as high as 150 - 160 Degrees F, providing a source of heat when the sun is not shining and in the night. Solar Electric panels typically have an efficiency of less than 20% in converting the energy of the sun into heat. The industry providing solar heated water systems has progressed substantially in the US and system costs have more or less standardized. A typical system with 80 gals capacity can cost about \$3300 to buy and this will save the equivalent of 80% of the hot water needs of an average household of four persons. Savings are estimated to be in the range of 6 kWh per day, 180 kWh per month. For the province of Newfoundland this would mean a cash saving of \$10.80 per month or \$129.60 per year. Average cost of heating water at 7 cents per kWh is \$22.50 per month, or \$270.00 per year. Solar Heating can save about 50% of the cost of heating hot water. Indicated payback would be 25.4 years. In order to be reasonable it would appear that a payback of 10 years would be required, therefore a capital cost of \$1300.00 is indicated.

It has been estimated (by CMHC) that the Canadian average at 45 Degrees latitude of solar radiation is in the range of 100 - 120 kWh/m² per month in the heating season. On the assumption that 13 kWh/month are required to heat one square meter of space (CMHC Average), this amount of energy

would heat about nine square meters or about 10% of the energy requirement.

Estimated output of typical solar panels (4' X 8') is 1550 Kwh/year based on 2000 hours of sunshine per year (Solar Works Inc. US Calculation). This calculation can be equated to a figure of 0.78 Kw per hour of sunshine. The Solar Max 240 would achieve 2640 Kwh/year based on 2000 hours of sunshine. This is a 70% increase over the typical solar panel.



Actual Solar Panel Results in Degrees Fahrenheit October 17, 2001

What can be seen from the above results is that the output temperature of the solar panel quickly reached 100 Degrees F. Temperature in the room rose 10 Degrees F in a matter of 10 minutes and a further 10 degrees in the next 10 minutes. This temperature was maintained or showed a slight increase in the next 60 minutes, all with the early morning sun. Performance would increase as the sun rose in the sky. The conclusion that is made from these results is that the panel's performance increases with time and it quickly achieves its stable performance which under these conditions was approximately 65%