PROCESSING ON HIGH EFFICIENCY SOLAR COLLECTOR COATINGS

by

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Coatings are selective as the result of varying reflectivity with respect to wavelength. They are obtained by making the absorptive coating sufficiently thin to take advantage of a substrate with good infrared reflectivity. The problems with selective coatings usually come with their susceptibility to physical and environmental damage. Future development will come with coatings that have better transparence to infrared radiation and increased durability.

Figure 1. Stagnation temperature comparison (0.01579 m² replaceable panel evacuated tube collectors).

Figure 2. Heat gain versus inlet temperature curves (0.01579 m² replaceable panel evacuated tube collector).
Figure 3. Comparison of ideal selective coating and actual coatings.

Figure 4. Oxide film and interference patterns.
Figure 5. Interference patterns on black nickel (entire panel).

Figure 6. Interference patterns on black nickel (clamped area).
Figure 7. Reflective surface processing.

Figure 8. Typical reflective surfaces.

Figure 9. Typical selective coatings.

Figure 10. Improved black nickel weathering test.
Figure 11. Improved black nickel humidity test.

Figure 12. Comparison of ideal selective coating with a presently available selective paint.