

# TECHNICAL BULLETIN



## LuciteLux™ Design and Fabrication Solar Collectors

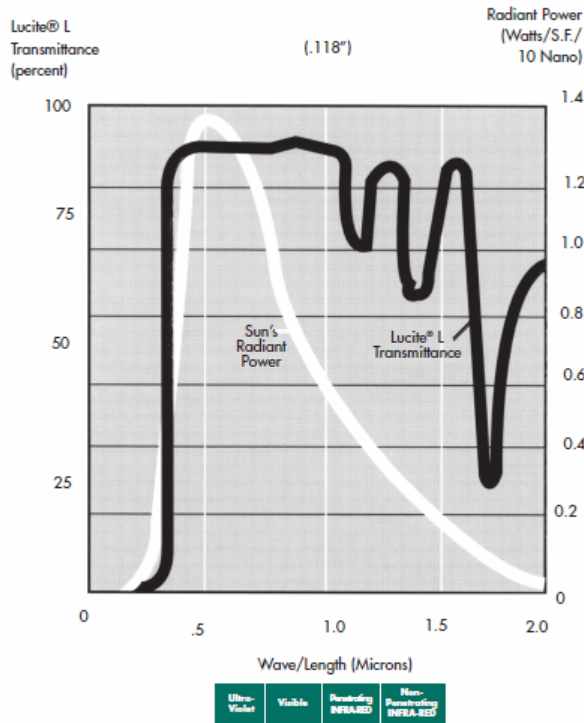
### General

LuciteLux™ acrylic sheet is an excellent outer glazing material for all types of solar collectors operating at 180°F or below. Because of its chemical structure acrylic sheet is inherently resistant to discoloration and loss of light transmission during extended exposure to weather.

### Light Transmittance

As seen in the graph at left, LuciteLux™ has a high percentage of energy transmittance over the wavelengths where radiant power of the sun's energy is greatest.

In addition, reports indicate that LuciteLux™ acrylic sheet improves on glass in its ability to trap IR re-radiation from hot solar collector plates.



### Forming and Fabrication

LuciteLux™ can be formed easily and inexpensively into an almost endless variety of configurations. It is frequently possible to take advantage of this forming ease to provide lowered unit cost and weight.

Common wood- or metal-working tools can be used to fabricate LuciteLux™ sheet. Circular saws, band saws, drills, routers, etc., can be successfully employed in shaping sheet contours. Bits and blades should, however, be kept sharp and feed should be slow and continuous to avoid chipping. Additional information on forming and fabrication is available from Lucite International, Inc., or from your nearest LuciteLux™ distributor.

\*Dupont registered trademark

In this respect LuciteLux™ is unsurpassed by any other class of transparent plastics.

Compared with glass, LuciteLux™ offers advantages in solar transmission, weight reduction, impact resistance and on-site fabricability. In addition, where curved or vaulted collector covers are desired, flat LuciteLux™ sheet can be simply inserted into a curved retaining channel thus avoiding bulky, preformed covers.

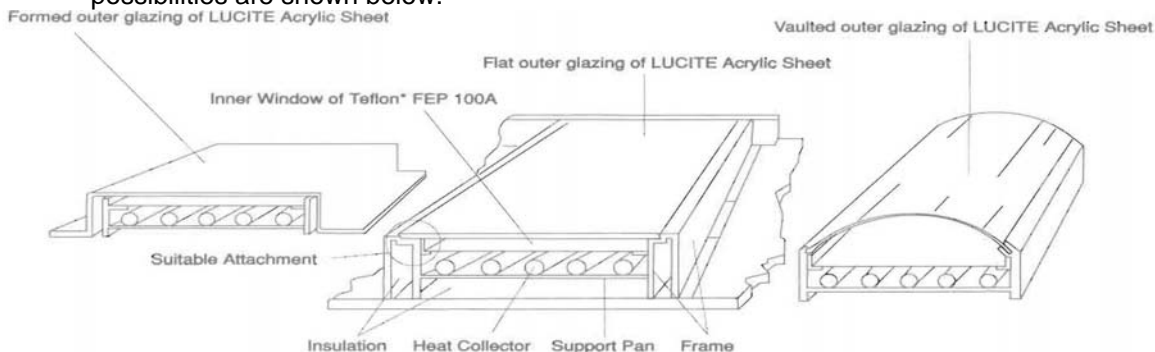
LuciteLux™ can be used with other materials such as Teflon\* FEP IOOA film to achieve outstanding collector insulation efficiency.

## Collector Design

LuciteLux™ sheet can be used with a wide variety of collector designs. Units employing flat glazing are probably the simplest but covers designed in a slight vault configuration provide improved load bearing characteristics.

Because of the outstanding weatherability and fabrication ease, LuciteLux™ can be used for the entire collector cover and case.

Schematic illustration of these design possibilities are shown below:



\*Dupont registered trademark.

## PROPERTIES

Physical properties of clear LUCITE acrylic sheet (0.236" thickness) are summarized below:

	Property	Test Method	Typical Value
OPTICAL	Total Solar Energy Trans.		89-90%
	Light Transmission	ASTMD-1003	91-93%
	Haze	ASTM D-1003	<1%
	Refraction Index	ASTM D-542	1.49
	Light Transmission After Accelerated Aging		88-92%
MECHANICAL	Tensile Strength	ASTM D-638	10,800 psi
	Flexural Strength (max.)	ASTM D-790	14,900 psi
	Modulus of Elasticity	ASTM D-638	427,000 psi
	Impact Strength	ASTM D-256	7 ft. lb./in. <sup>2</sup>
THERMAL	Coefficient of Thermal Expansion	ASTM D-696	4 x 10 <sup>-5</sup> in./in./F
	Heat Distortion Temp.	ASTM D-648	200°F
	Continuous Serv. Temp.	—	180°F
	Thermal Conductivity BTU/hr./ft. <sup>2</sup> /F/in.	Cenco Finch	1.4
MISCELLANEOUS	Weight (0.118" Thick)	—	0.73 lbs./ft. <sup>2</sup>
	Code Compliance	ANSI Z97.1	Safety Glazing
	Specific Gravity	ASTM D-792	1.19
	Water Absorption (24 hrs. @ 73°F)	ASTM D-570	0.24%

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