

Kaiser Aluminum & Chemical Sales, Inc.

General Sales Office, Palmolive Building, Chicago 11, Illinois

EXECUTIVE OFFICE, KAISER BUILDING, OAKLAND 12, CALIFORNIA

KAISER ALUMINUM SHADE SCREENING*

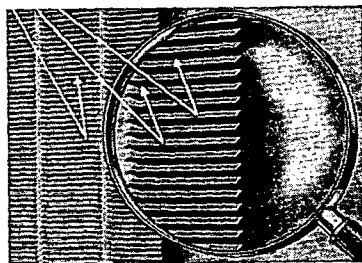
* Patented

Kaiser Aluminum Shade Screening is scientifically designed to keep interiors cool by blocking hot sun rays. Shade Screening is being widely used in conjunction with air conditioning systems to reduce the solar load—thus permitting more economical operation by reducing the work load.

The effect of using Kaiser Aluminum Shade Screening is shown on these

graphs prepared by Kaiser Aluminum engineers following a test procedure similar to that used at the ASHAE Laboratory (1, 2) during experimental work on the shading of sunlit glass. The accompanying charts illustrate the amount of instantaneous heat gain to a room both through unshaded windows and windows protected with Kaiser Shade Screening.

Kaiser Aluminum Shade Screening has 17.5 louvers per inch permanently tilted at a downward angle. This stops sun rays before they hit the window glass. With sun angle (apparent) at 37 deg 100 per cent of sun rays are blocked. At 30 deg, 85 per cent. At 25 deg, 75 per cent. At 15 deg, 55 per cent. At 0 deg, 30 per cent. Thus Shade Screening can reduce the amount of instantaneous heat gain through unshaded windows by as much as 78 per cent, while still providing insect protection.



TYPICAL CALCULATIONS OF COOLING LOAD REDUCTIONS

DURING PERIOD OF EXTREME MIDSUMMER SOLAR RADIATION AT 40° N. LATITUDE.

Shade Screening reduces the load on air-conditioning units . . . permits use of smaller units. These typical calculations show how this is possible:
FIGURING 24 WINDOWS ON THE EAST SIDE 3 1/4' x 6'

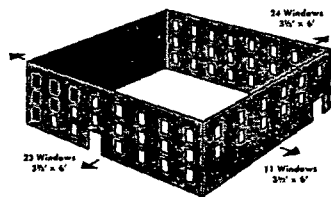
Total area 3 1/4' x 6' x 24 = 504 Sq. Ft.
Use 10:00 A.M. peak load
Instantaneous Heat Gain through Unshaded Windows . . . BTU/HR
504 Sq. Ft. x 138 BTU/HR per Sq. Ft. . . . 69,500
Instantaneous Heat Gain through Windows shaded by Kaiser Aluminum Shade Screen . . . BTU/HR
504 Sq. Ft. x 35 BTU/HR per Sq. Ft. . . . 17,650

Quantity of Heat Gain Blocked by Shade Screen . . . 51,850
Heat Blocked = 4.31 tons* of refrigeration

FIGURING 23 WEST WINDOWS 3 1/4' x 6'

Total area 3 1/4' x 6' x 23 = 483 Sq. Ft.
Use 4:00 P.M. peak load
Instantaneous Heat Gain Unshaded Windows . . . BTU/HR
483 Sq. Ft. x 138 BTU/HR per Sq. Ft. . . . 66,654
Instantaneous Heat Gain through Windows shaded by Kaiser Aluminum Shade Screen . . . BTU/HR
483 Sq. Ft. x 35 BTU/HR per Sq. Ft. . . . 16,905

Quantity of heat blocked by Kaiser Aluminum Shade Screen . . . 49,749
Heat Blocked = 6.35 tons* of refrigeration



FIGURING 11 SOUTH WINDOWS 3 1/4' x 6'

Total Area = 3 1/4' x 6' x 11 = 231 Sq. Ft.
Use 12:00 noon peak load
Instantaneous Heat Gain Unshaded Windows . . . BTU/HR
231 Sq. Ft. x 138 BTU/HR per Sq. Ft. . . . 31,778
Instantaneous Heat Gain through Windows shaded by Kaiser Aluminum Shade Screen . . . BTU/HR
231 Sq. Ft. x 35 BTU/HR per Sq. Ft. . . . 8,085

Quantity of heat blocked by Kaiser Aluminum Shade Screen . . . 23,693
Heat Blocked = 1.52 tons* of refrigeration

* 1 ton of refrigeration = 12,000 BTU/HR

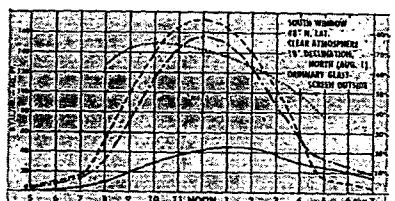
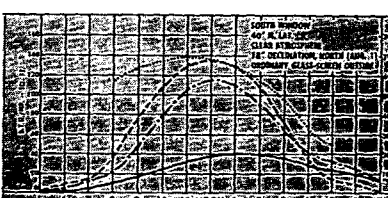
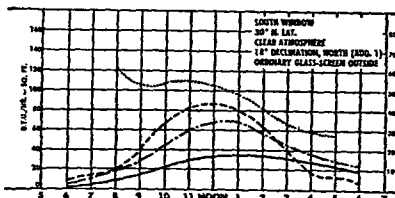
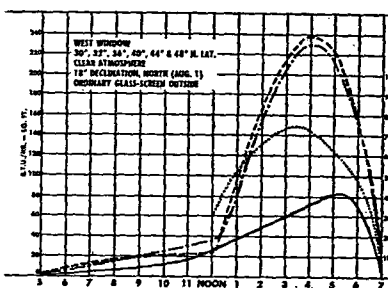
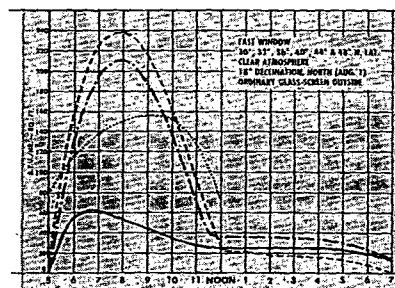
KAISER ALUMINUM SHADE SCREENING

The instantaneous heat gain measurements included *transmitted* direct solar radiation plus the *absorbed* heat gained by convection and re-radiation plus transmission of heat through the glass caused by inside-outside temperature differentials. Kaiser Aluminum Shade Screening reflects more heat than other

commonly used materials thus the screening itself remains cool and emits at a very low rate.

These factors of high reflectivity and low emissivity combine with the sun-blocking feature of Shade Screening to produce cooler interior temperatures.

- Total Solar Load
- Instantaneous heat gain through unshaded windows.
- Instantaneous heat gain through windows protected by Kaiser Aluminum Shade Screening.
- % of heat blocked.



1. ASHVE Research Report, "The Shading of Sunlit Glass—An analysis of the effect of Uniformly Spaced Flat Opaque Slats," by G. V. Parmelee and W. W. Aubele, June 1952.

2. ASHVE Research Report, "The Shading of Sunlit Glass—An Experimental Study of Slat-Type Sun Shades," by G. V. Parmelee, W. W. Aubele, and D. J. Veld, October 1952.