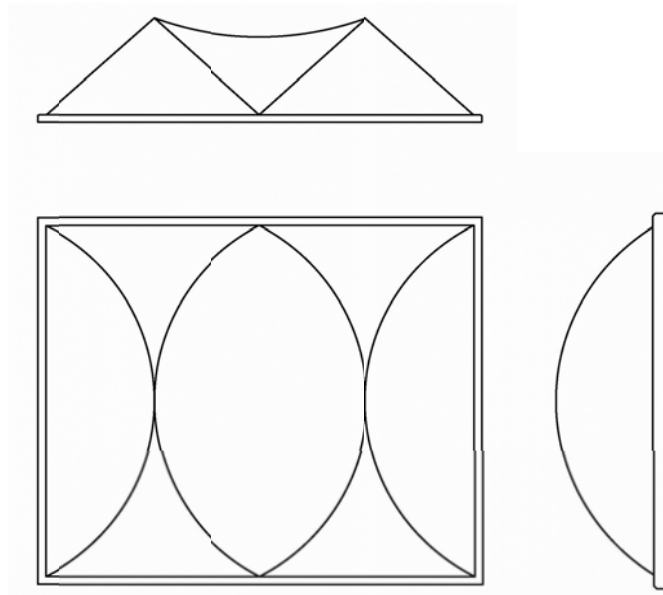


Report: Bristolite Quasar and Competing Prismatic Skylight Photometric Light Transmission Test

See the attached third party laboratory report of a photometric light test conducted in cooperation with CCL, Construction Consulting Laboratory West on a Bristolite 5' x 6" Quasar prismatic skylight and a competing 5' x 6" prismatic skylight. The purpose of the test was to determine whether dome shape affects the light transmission of similar skylights using similar glazing material. Both units tested were stock, standard units for the particular model and manufacturer represented.

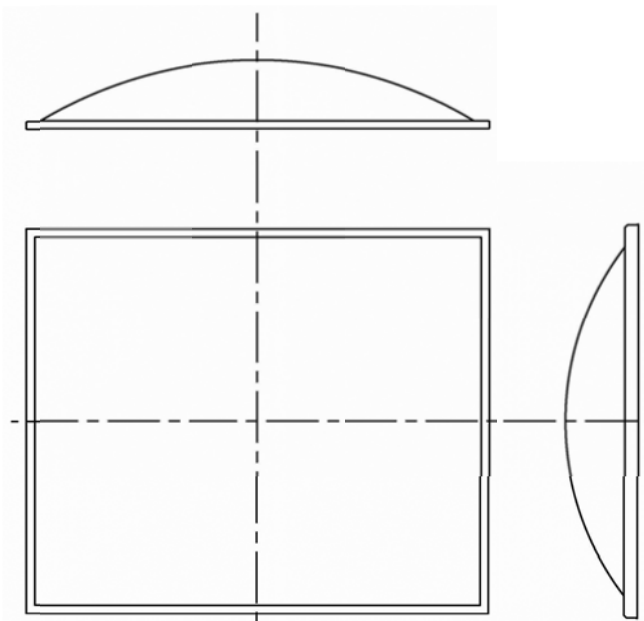
The Bristolite unit utilizes a computer generated, radial triarch, shape for the outer dome and a simple bubble shape for the inner dome as shown in the following illustrations 1.0 and 2.0.

Illustration 1.0



Quasar Radial Triarch Shape Outer Dome

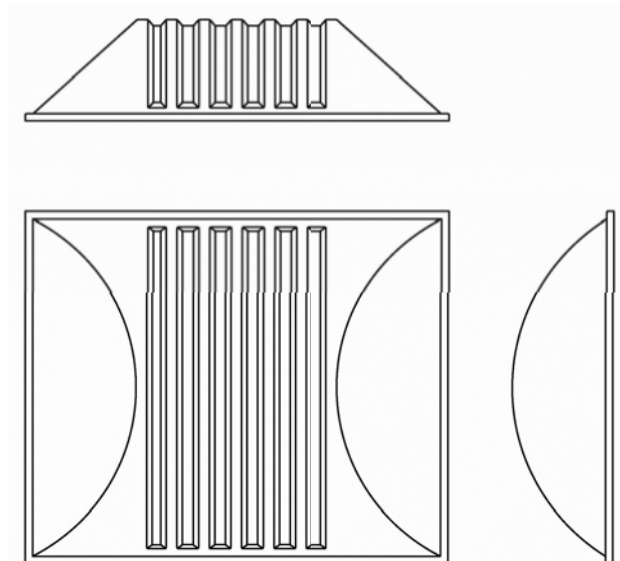
Illustration 2.0



Quasar Bubble Shape Inner Dome

The competing prismatic skylight unit utilizes a highly complex, multi-ribbed, shape for both the outer and inner dome as shown in illustration 3.0 below.

Illustration 3.0



Numerous ribs with steep shoulders and tight radii make this dome shape capable of utilizing thinner glazing but not without compromising light transmission.

Prior to photometric testing, field observation of the two skylights in actual installations revealed a stark contrast in illumination and illumination consistency as depicted in the following photographs 1.0 and 2.0.

Photograph 1.0 Bristolite Quasar installed, in-service



Photo taken at Noon on 12/21/2010 in Orange County, CA

Note the consistent level of highly diffused light.

Photograph 2.0 Competing prismatic skylight installed, in-service



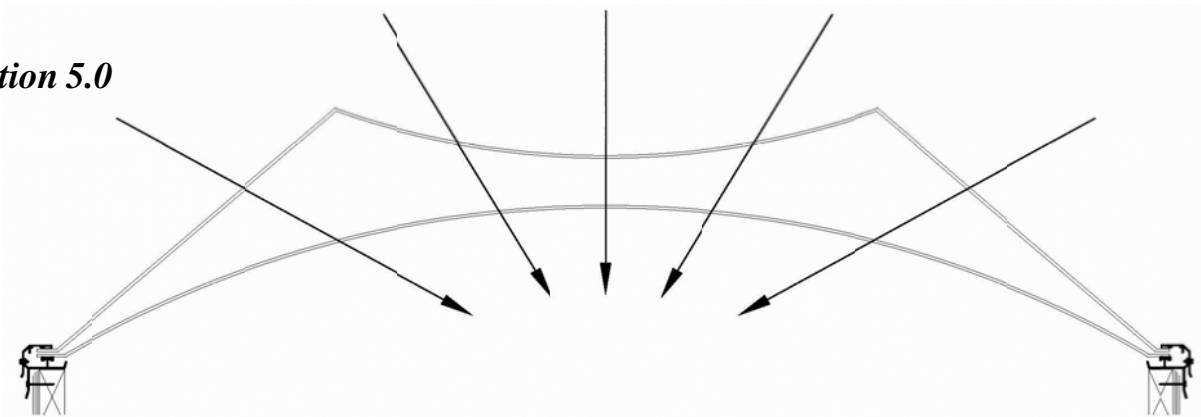
Photo taken at Noon on 12/21/2010 in Orange County, CA.

Note the heavy shadowing caused by light passing through multiple layers of the outer and inner dome due to the complex radical dome shape.

Based on inspection of the contrasting dome designs and heavy shadowing of the installed competing prismatic skylight unit it was theorized that shape of both the outer and inner dome may have a significant impact on the amount of light a skylight may transmit to an interior building space. In review of the test data, one can see that as measured in five degree increments from zero degrees (dawn) to eighty degrees (near noon) the competing prismatic skylight unit transmits more light than Quasar from 0 degrees to 30 degrees (approx. dawn to 9:00AM). After 30 degrees and through 80 degrees (approx. Noon) the Quasar transmits more light. For the total test, Quasar transmitted 574.5 lx while the competing prismatic skylight unit transmitted 494.0 lx. In total the Bristolite Quasar transmitted 16.3% more light than the competing prismatic skylight unit. Since both the Quasar and competing prismatic skylight units are symmetrical from end-to-end and side-to-side the photometric test would have produced the same result had the test been carried out from 0 zero degrees (dawn) to 0 zero degrees (dusk).

Illustrations 5.0 and 6.0 that follow depict an explanation of why the Quasar transmits 16.3% more light than the competing prismatic skylight unit.

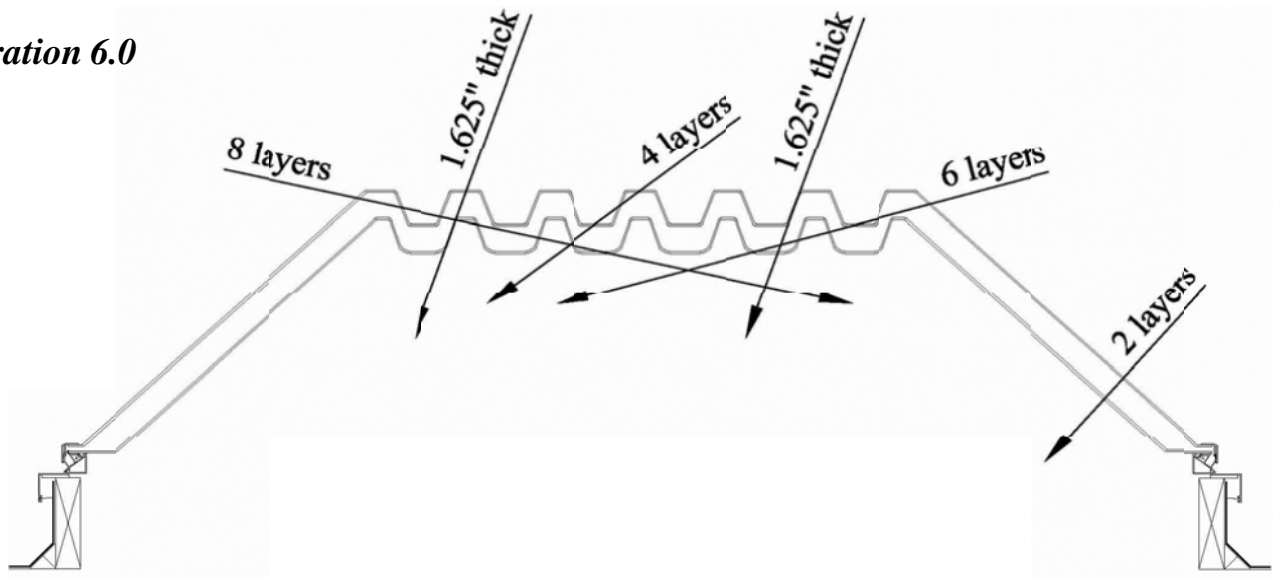
Illustration 5.0



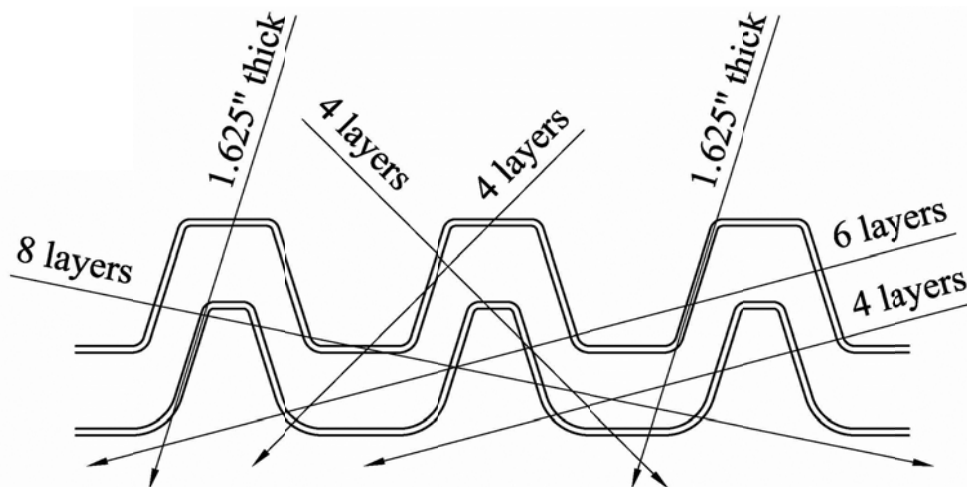
Light Passing Through Quasar' Radial Triarch and Bubble Shape Domes

From dawn to dusk sunlight never passes through more than two layers of glazing on the Quasar unit.

Illustration 6.0



Light passing through the competing prismatic skylight highly complex, ribbed shape domes. Both the outer and inner domes have the same shape.



A large portion of the available sunlight during the day must pass through multiple layers of the glazing and the twenty-four 1.625" long rib shoulders on the competing prismatic skylight unit.

As you can see between thirty degrees (approx. 9:00AM) and one hundred eighty degrees (approx. 3:00PM) a good portion of the available sunlight must pass through up to eight layers of glazing and travel through the twenty-four 1.625” length of the shoulders of the steep ribs of both the outer and inner domes. This is the cause of the darkened areas in the skylight viewing area as shown in the previous Photograph 2.0. These darkened areas, called shadows are transmitting very low levels of light to the interior of the building.

Conclusions:

1. Dome shape can have a significant effect on the light transmission of similar skylights using similar glazing material.
2. Simple shapes that provide the necessary strength for a dome to withstand the elements of weather and meet OSHA fall protection standards are best.
3. Overly complex and or radical dome shapes so designed to allow the manufacturer to use thinner and less expensive dome material can adversely affect light transmission performance.
4. While all skylight manufacturers report Visible Light Transmission (VLT) for their skylights and most architects and building owners specify a minimum acceptable VLT for skylights in their projects; laboratory test for VLT do not necessarily reflect the true light transmission of a formed dome in a complete skylight in service. Most laboratories that offer VLT testing, test light transmission on 4” by 4” unformed samples of the glazing material submitted by the skylight manufacturer. While these laboratories,

reporting VLT with a number from 0 to 100 do provide useful information, it should be understood that the laboratory VLT test does not have the means to account for variations in light transmission performance due to dome shape. As clearly demonstrated in this test, dome shape can significantly affect the light transmission of similar skylights using similar glazing material.

End of report summary

Special Note to Sales: If a customer or potential customer with competing prismatic skylights installed on one of their facilities would like to see a side-by-side comparison of the competing prismatic skylight and Quasar for themselves, from the floor of their facility, following is our offer. We will ship a Quasar dome set to their facility and send a field engineer to their facility to replace one competing prismatic skylight dome set with a Quasar dome set for their personal observation. This service is offered at no charge and made available at the customer's convenience.

We want them to see the Quasar difference in their facility with their own eyes.

Continue to the next page to see the third party test report.



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November 11, 2010

TESTED FOR

BRISTOLITE SKYLIGHTS
401 E. Goetz Ave.
P.O. Box 2515
Santa Ana, CA 92707

TESTING PERFORMED

Light Comparison Test

DATE OF TEST

November 10, 2010

SCOPE

Test and compare the amount of light which passes through a Bristolite Quasar 6072-AL-CM-2-CC/WTH-PRISM/PRISM-MF and a Competitor's complex multi-ribbed dome product at specific angles. This report is intended for internal informational use only.

TEST PERFORMANCE

A lightweight frame, with a hinge in the center, as used to elevate the light source to specific angles from 00 to 80° (see photo #1) in 5° increments.

Using a Minolta Illuminance Meter model T-1H (serial# 919016), the amount of light which passed through each skylight dome was read and recorded.

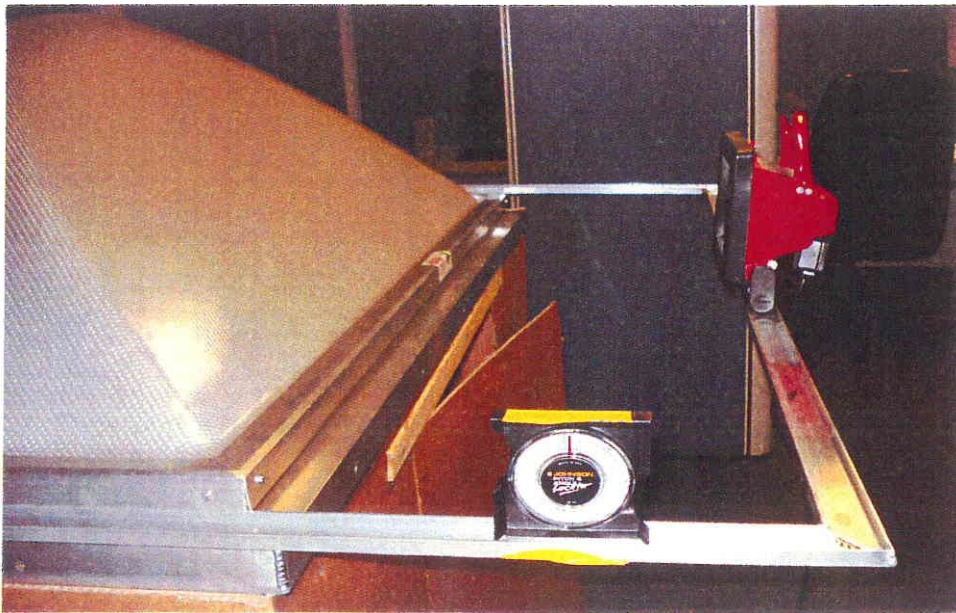


Photo #1

TEST RESULTS

Light was read and recorded in lux (lx) meters.

Angle	Bristolite - Quasar 6072-AL-CM-2-CC WTH-PRISM/PRISM-MF	Competitor- Complex multi- ribbed dome	Difference - Bristolite / Competitor
00	13.9 lx	15.2 lx	-1.3 lx
50	19.3 lx	20.4 lx	-1.1lx
10°	22.3lx	24.9lx	-2.6 lx
15°	25.11x	26.4 lx	-1.3 lx
20°	26.81x	27.51x	-0.7 lx
25°	28.51x	28.4 lx	+0.1 lx
30°	30.3 lx	29.1lx	+1.2 lx
35°	32.91x	30.0 lx	+2.9lx
40°	35.31x	30.4lx	+4.9lx
45°	37.7lx	31.0 lx	+6.0 lx
50°	40.91x	32.2lx	+8.7lx
55°	41.6 lx	32.6lx	+9.0 lx
60°	42.4lx	32.6lx	+9.8lx
65°	43.61x	33.0 lx	+10.61x
70°	44.51x	33.3 lx	+11.2 lx
75°	44.81x	33.51x	+11.3 lx
80°	44.6lx	33.51x	+11.1lx

COMMENTS

This concludes the light comparison testing performed at Bristolite Skylights by Construction Consulting Laboratory West on November 10, 2010.



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Construction Consulting Laboratory West



Jack W. Jackson
Construction Consulting Laboratory West
President / Manager of Testing