

COMMERCIAL DIVISION

800.363.9865 www.nltubular.com



certifications...



Tubular Skylights — Cost-Effective and Environmentally Friendly

Tubular skylights are a highly-efficient, utility-free source of natural light. Our innovative product design produces 98% light reflectivity while reducing heat/cold transfer from the outside environment. Tubular Skylights greatly reduce energy consumption in three significant ways:

- 1) less energy is used to power fluorescent and incandescent lighting;
- 2) less energy is required to counter the heat produced by artificial lighting;
- 3) less energy is used by air conditioning and heating units, since these daylighting devices transfer almost no heat or cold.

Using our products is an easy and cost-effective way to earn LEED points, reduce lighting costs, and make your home/building a more pleasant place to live/work in.



ICC-ES Listed

Natural Light Tubular Skylights have been tested by Certified Labs and evaluated to building code compliance by professionally licensed civil, structural, fire, mechanical, and quality control engineers culminating in the ICC-ES Listing - ESR-3681.



Florida Building Code Approved

Natural Light Tubular Skylights are able to withstand Florida's harsh tropical storm weather and are approved for use in High Velocity Hurricane Zones.



Hurricane Tested and Approved

Natural Light Tabular Skylights underwent numerous tests by Miami-Dade approved labs in Florida and successfully passed to achieve a "Hurricane High Velocity Zone" rating.



25-Year Product Warranty

Natural Light backs up the quality and craftsmanship of our tubular skylights with our industry-leading 25-year warranty against manufacturing defects in material and deterioration. The warranty is subject to proper installation of the unit in accord with the written installation instructions.

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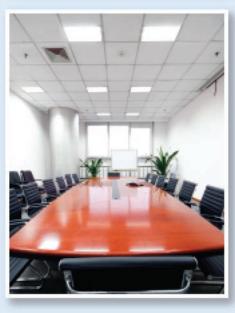






Netural Light ENERGY CASTEMS GRANA ENTRE PART





introduction...

About Natural Light Energy Systems

Natural Light Energy Systems is a leading manufacturer of tubular skylights and solar attic fans with many years of experience in the design, manufacturing, and sales of solar products. We were established in 2000 and are headquartered in Phoenix, AZ. Our main facility houses our manufacturing plant and warehouse as well as our national sales and customer service teams. We show our commitment to our customers by offering innovative energy saving products at affordable prices. All our products have been engineered to perform at the highest possible level. They are easy to install, require no maintenance, and operate on free solar energy. At Natural Light, we back up our models with an industry-leading 25-year product warranty.



Key Features:

- Quick and easy installation for all roof types
- ▶ No structural changes or wiring required
- ▶ Watertight and maintenance free
- ▶ Unique condensation release system prevents moisture build-up
- ▶ Built-in UV protection prevents fading
- ▶ Bug and dust proof sealing system
- ► Florida Building Code Approved
- Hurricane Tested and Approved
- ▶ 25-Year Product Warranty

Common Applications:

- ► Government Offices / Military Bases
- ► Hospitals / Healthcare Facilities
- ► Schools / Universities
- ▶ Retail Stores / Shopping Centers
- ▶ Auto Dealerships / Garages
- ▶ Industrial Plants / Warehouses
- ▶ Farm Buildings / Storage Facilities

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overview...

A Smart, Energy Efficient Custom Upgrade

Adding free sunlight into a workplace has psychological, physiological, and cost saving benefits. Simply put, people are just much happier under the sun, and the reduction of electric lighting saves money! Whether your next project is a new construction or a remodel, you should consider adding Natural Light Tubular Skylights to greatly improve the efficiency of the building and those inside.

Day-Lighting Provides Invaluable Benefits for Workers

Extensive studies and data show:

- ▶ Natural light greatly improves worker productivity
- ▶ Brighter light encourages shoppers which improves sales in retail stores
- ▶ Students' performance and attitude is measurably improved
- ▶ Patients' mood and outlook are elevated in health facilities
- ▶ Full spectrum light reduces eye strain
- ▶ Natural light improves worker productivity
- ▶ Natural light improved overall health of workers reducing health care costs

Cost Saving Benefits of Adding Tubular Skylights to the Workplace

- ➤ Significantly reduces need for electric lighting saves on energy costs
- ▶ Energy savings can range from 40% to 80%, depending on the application
- ▶ Significantly reduces load and run-time of HVAC systems
- ▶ Energy efficient buildings are more desirable they rent and sell quickly
- Quick and Easy installation on a variety of roof types
- ▶ Engineered to eliminate leaking and maintenance

Maunfactured to be the Best with Quality Components

- ▶ High impact acrylic dome with stress absorbing aluminum collar
- ▶ Seamless commercial pure grade aluminum flashing
- ► Miro-Silver® super-reflective light pipe (98% reflectivity)
- Stylish powder-coated white trim ring for office installations
- ▶ Light diffuser spreads light evenly with no hot spots
- ▶ Blocks out 99% of harmful UV rays
- ► Can be fitted with a dimmer or electric light kit

















how it works...

CAPTURE ZONE

Sunlight Enters the Dome



The low-profile, impact resistant, durable acrylic dome captures sunlight on the building's rooftop from sunup to sundown. The flashing housing ensures that the unit is weather-tight and leak-proof.

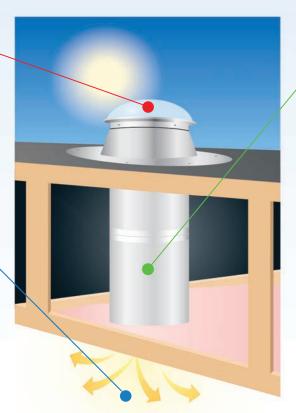
DELIVERY ZONE

Sunlight Enters into the Building



The light diffuser is uniquely designed to evenly spread the captured sunlight. The prismatic diffuser surface bounces the light in all directions eliminating the "hot spot" effect of traditional skylights, while the soft white diffuser provides softer illumination. The 21" model can illuminate the equivalent of up to 1,450 watts of light - without electricity!





2

TRANSFER ZONE

Sunlight is Reflected through the Light Pipe

Sunlight captured by the dome, travels through an extremely reflective, mirror-like tube. The light bounces several times through the pipe before entering the building. Our specially designed Miro-Silver® light pipe collects sunlight even when the Sun's position is low in early morning or late afternoon. Even on cloudy days, the tubular skylight works! Additionally, our tubular skylights filter out the harmful UV rays that can endanger health and can fade clothing, furniture, and carpeting.

The Miro-Silver® Advantage

The key component of the Natural Light Tubular Skylight is a super reflective, mirror-like light pipe with a 98% reflectivity. The entire length of the pipe's interior is coated with this reflective material called Miro-Silver which, unlike other products, won't delaminate over time or under high temperature conditions.

Some tubular skylight manufacturers use a much thinner material call Multi-layer Polymeric Film (MPF). A series of tests were conducted comparing the Miro-Silver light pipe to the more standard Multi-layer Polymeric Film (MPF). The test's purpose was to measure the amount of light reflected at different times of the day—particularly when the Sun's angle is low and light is really needed (early morning and late afternoon). Light reflection measurements were taken with the Sun's angle at 13.8 and 40 degrees on a 10 foot long x 12" diameter tube. Documented lab tests results prove that Natural Light's Miro-Silver light pipes transmit much more light than standard Multi-layer Polymeric Film (MPF). Using a 10 foot length of light pipe, the tests showed 78% more light is reflected at 13.8 sun angle and 17% more light at 40 degree sun angle than the standard Multi-layer Polymeric Film.

Tests were also conducted subjecting light pipe samples under high temperatures, 300 degrees Fahrenheit for 30 minutes. Upon inspection of the light pipe samples, Natural Light's Miro-Silver light pipes were unchanged while standard Multi-layer Polymeric Film (MPF) experienced delamination and orange peel dimpled surface damage which dramatically reduces reflectivity.

| Sun's Angle | Number of Reflections | Miro-Silver Advantage |
|-------------|-----------------------|-----------------------|
| 13.8° | 40 | +78% |
| 40.0° | 11 | +17% |



applications...

Tubular Skylights are Ideal for the following Applications:

Government Buildings / Military Facilities

Government offices and facilities can benefit from the improved morale experienced by employees working under a sky-lighting system. Daylight affects the body's production of melatonin - a hormone which drives our sleep-wake cycle. Workers with sufficient natural light during the day sleep better at night. As a result, "Day-shift office workers' quality of life and sleep may be improved via emphasis on light exposure and lighting levels in current offices as well as in the design of future offices." In short, government and military personnel can operate at a higher level of alertness/efficiency, when provided sufficient natural light.

Hospitals and Healthcare Centers

Exposure to daylight increases the body's production of Vitamin D - a vital component for normal immune system functioning. "A number of classic studies have shown that patients in hospitals recover more quickly and have fewer complications when they are treated in rooms with daylight and/or a view." A different study revealed that patients with diffused daylight did better than those exposed only to artificial light.

Schools and Universities

Educational institutions benefit from more natural light. The reason is simple: Students perform better, and teachers feel less stressed. Noted Maine architect Pandika Pleqi sites the research conducted by a Heschong-Mahone Group Case Study during which the effects of adding daylight to class rooms was studied. To paraphrase, "Students with daylight in their classrooms perform 20-25% better on reading and math tests... children in classrooms with natural lighting have higher attendance records, are more attentive and have fewer behavioral problems."

Grocery Stores

Grocery stores can benefit from lighting produced by skylights in at least two ways:

- They save money on utility bills. For example, a sky-lighting system in a typical grocery store in Los Angeles was found to save about \$10,000 per year, according to a case study performed by Pacific Gas & Electric.
- 2. They make money on customers who are willing to browse and shop longer. Customer interviews reported that the additional "pure" light from sky lights gave them a sense that the store felt "cleaner, more open", "more spacious", "brighter", "more inviting".

Warehouses and Manufacturing Plants

Tubular skylights have a unique design which captures the maximum amount of sunshine while dispersing daylight inside evenly. This can greatly increase employee safety and decrease employee absenteeism Consider the typical warehouse or manufacturing facility. Artificial light produces varying levels of "flicker" - which can produce eye strain, headaches, and even attention deficit problems.³ Also, overhead artificial light illuminates horizontal surfaces while casting shadows. Diffused daylight from a tubular skylight illuminates both horizontal and vertical surfaces evenly with no flicker.

- 1 "Exposure to Natural Light Improves Workplace Performance", Christopher Bergland, The Athlete's Way, 2013
- 2 Intensive Care Delirium. The effect of outside deprivation in a windowless unit", L.M.Wilson, Archives of Internal Medicine,1972
- 3 1999 Study conducted by the Heschong-Mahone Group, Fair Oaks, CA







models...

21" Model

Warehouse / Open Ceiling







The warehouse model is mainly used on suspended installations.

Flashings Available:

- ► Curb Mount
- ▶ Standard Flat Roof

Diffuser Styles:

- ▶ Soft White
- ▶ Prismatic

Accessories Available:

- ▶ LED Light Kit
- ► Dimmer Kit
- ► Extra Light Pipe (up to 20')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC



CURB MOUNT / WAREHOUSE TRIM



FLAT ROOF FLASHING

21" Model

Drop Ceiling







The drop ceiling model installs into a standard 24" x 24" office ceiling grid system using a transition box.

Flashings Available:

- ► Curb Mount
- ▶ Standard Flat Roof

Diffuser Styles:

- ► Transition Box with Prismatic Diffuser
- ► Transition Box with Soft White Diffuser

Accessories Available:

- ▶ LED Light Kit
- ▶ Dimmer Kit
- ► Extra Light Pipe (up to 20')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC





21" Model

Hard Ceiling







Flashings Available:

- ► Curb Mount
- ▶ Standard Flat Roof

Diffuser Styles:

- ▶ Soft White
- ▶ Prismatic

Accessories Available:

- ▶ LED Light Kit
- ▶ Dimmer Kit
- ► Extra Light Pipe (up to 20')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC



CURB MOUNT FLASHING



FLAT ROOF / CEILING RING

18" Model







Flashings Available:

- ► Curb Mount
- ► Standard Flat Roof
- ▶ Pitched Roof

Diffuser Styles:

- ▶ Soft White
- ► Prismatic

Accessories Available:

- ▶ LED Light Kit
- ▶ Dimmer Kit
- ► Extra Light Pipe (up to 20')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC





FLAT ROOF FLASHING

13" Model







Flashings Available:

- ► Curb Mount
- ▶ Standard Flat Roof
- ▶ Pitched Roof

Diffuser Styles:

- ► Soft White
- ▶ Prismatic

Accessories Available:

- ▶ LED Light Kit
- ▶ Dimmer Kit
- ► Extra Light Pipe (up to 20')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC



FLAT ROOF FLASHING

10" Model







Flashings Available:

- ► Curb Mount
- ▶ Standard Flat Roof
- ▶ Pitched Roof

Diffuser Styles:

- ► Soft White
- ► Prismatic

Accessories Available:

- ▶ LED Light Kit
- ▶ Dimmer Kit
- ▶ Vent Kit
- ► Extra Light Pipe (up to 18')
- ► Angle Adapter / Elbow



SOFT WHITE



PRISMATIC





FLAT ROOF FLASHING



components...

Kits include all components and hardware for a 4 foot installation.

Dome Assembly

Constructed of high-impact, UV stabilized acrylic or polycarbonate plastic. The dome is mounted in a stress absorbing seamless aluminum collar which prevents cracking caused by expansion and contraction due to temperature fluctuations. Double domes are also available.



Constructed of 1100 series, pure commercial grade aluminum with no seams. Its round shape minimizes damage to the roofing material during installation.

Curb Mount Flashing

Constructed of 1100 series, pure commercial grade aluminum with welded corners. The square shaped flashing easily installs over a pre-built curb.

Insulated Aluminum Curb Mounts

Insulated Aluminum Curbs can be built to customer specifications. Various curb heights can be accommodated: 4, 8, and 12 inches high. Each of our curbs are fabricated using .062 aluminum with fully welded corners and have options to add insulating natural spruce wood interior or semi-rigid insulation for better thermal performance characteristics. A 2"x2" wood nailer can be provided for easy skylight mounting when using semi-rigid insulation. All Curbs are available in Mill finish and standard colors: black, bronze, white, or clear coating. Custom colors are also available.

Highly Reflective Light Pipe

Features a Miro-Silver® interior surface specially designed for 98% reflectivity of pure light. A comprehensive test has shown that our light pipe outperformed other light pipes particularly during early morning and late afternoon when light is needed most. Our light pipe is NOT a laminated polymer sheet - it can't delaminate, yellow, crack or peel. The light pipe is assembled on-site with three securing methods ensuring a tight, dust-free seal.

Ceiling Trim Ring with Diffuser

The white powder-coated seamless aluminum trim ring is used on sheet rock ceiling installations. It snaps into place for easy installation and provides a tight seal to minimize heat gain or loss. It's available in both prismatic (curved or flat) and soft white (curved or flat) styles.

Warehouse Trim Ring with Diffuser

The seamless brushed aluminum finish trim ring is used on suspended ceiling installations. It provides a tight seal to minimize heat gain or loss. The light diffuser is constructed of durable acrylic and provides even light distribution without spotlight effects. It's available in both prismatic (curved or flat) and soft white (curved or flat) styles.

Transition Box with Diffuser

The transition box is constructed of rugged aluminum powder-coated white so that it easily fits all standard drop ceiling grid systems. The prismatic light diffuser is made from durable acrylic plastic and provides even light distribution without rainbows and spotlight effects. Natural Light contracted UL Lighting Sciences Lab in Scottsdale, AZ to conduct photometric testing for our tubular skylights. As a result of these tests, Natural Light offers Architects and Engineers our certified IES photometric files for each size of tubular skylight. Also, the tests proved that the prismatic diffuser provided improved light output and distribution without rainbows or glare effects compared to the Fresnel lens diffuser.







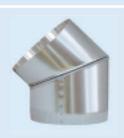


















accessories...

Dimmer Kit

The dimmer kit is a one foot section of light pipe that houses a rotating disc used to block out incoming light. The disc rotates 90 degrees to open and close utilizing UL approved motors rated between 24 volts through 265 volts AC. It is hard-wired using a single pole rocker arm center-off maintained switch (not normally included). One switch can easily control multiple dimmers. For example, using a maximum of 400 feet of 18 gauge copper wire, you can connect 20 dimmer kits with one switch. The dimmer opens or closes in about 25 seconds allowing the operator to control lighting levels at any desired level. In addition, the dimmer can be ordered with a 0-10v control circuit allowing various automated controls such as an occupancy sensor or photosensor. For periods of inactivity, the dimmers can be set to automatically close thereby optimizing SHGC and U-factor. Fully assembled and easy to install, it's perfect for any zone that may need to be darkened during the day such as TV or media rooms and conference rooms.

LED Light Kit

The light kit adds an electric light to your tubular skylight for night time use. The light kit is installed directly to the lower portion of the light pipe and is wired to a wall or wireless switch. The LED kits are a cheaper to operate, brighter, longer lasting and are a more environmentally friendly alternative to traditional light bulbs. Natural Light Energy Systems is currently designing state-of-the-art LED kits to complement their 21" Tubular Skylight product line.

Angle Adapter / Elbow

Used on installations where a straight run of light pipe is not possible. The 12 inch section allows you to change the direction of the light pipe to avoid any obstructions. The 21" and 18" elbows adjust from 0 - 30 degrees and the 10" and 13" elbows adjust from 0 - 45 degrees.

Extra Light Pipe

Available for all installations in either 12" or 24" lengths. The mak mum length of light pipe recommended for the 18" and 21" tubular skylight model is 20 feet.

Turret Extensions

Turret Ex ensions are available for our 10, 13, 18, and 21 inch units. The standard size is 4 inches in height; however, custom size s up to 4 feet are available upon special order. All turrets are made from commercial grade 303 Series Aluminum with a thickness of .040 inches.

Security Bar

The security bar is designed to prevent entry through the dome. The bar spans the diameter of the flashing opening and attaches to the flashing lip with two rivets.

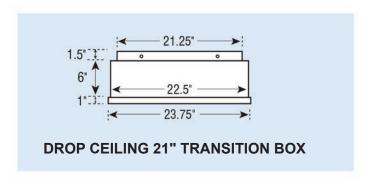


component drawings...

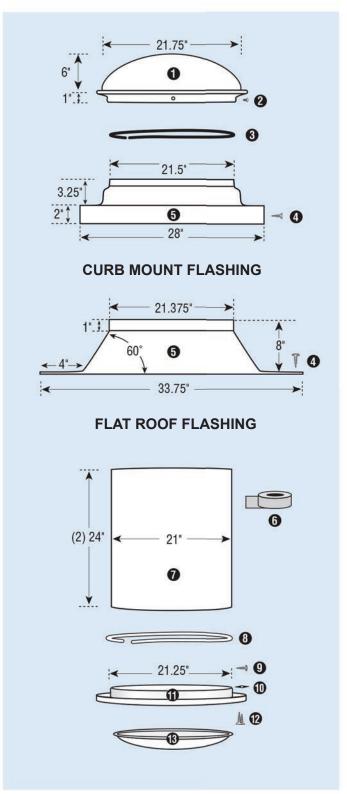
Part Descriptions

- 1. Clear UV Protected, 100% High-impact Acrylic Dome
- 2. (4) Phillips Head Stainless Steel 1/4" Sheet Metal Screws
- 3. Nylon horsehair Gasket (self-adhesive)
- 4. (6) Phillips Head Stainless Steel 1 V2" Screws
- **5.** Commercial Pure Grade, 1100 Series Aluminum Flashing
- 6. Heavy Duty Foil Tape
- 7. Light Pipe, (2) 24" Sections per Kit
- 8. Nylon horsehair Gasket (self-adhesive)
- 9. (6) Self-Tapping Screws
- 10. (3) Black Speed Nuts
- 11. Aluminum Ceiling Ring / Trim Ring
- 12. (3) Phillips Head Screws
- 13. Choice of Prismatic or Soft White Diffuser

21" WAREHOUSE TRIM RING

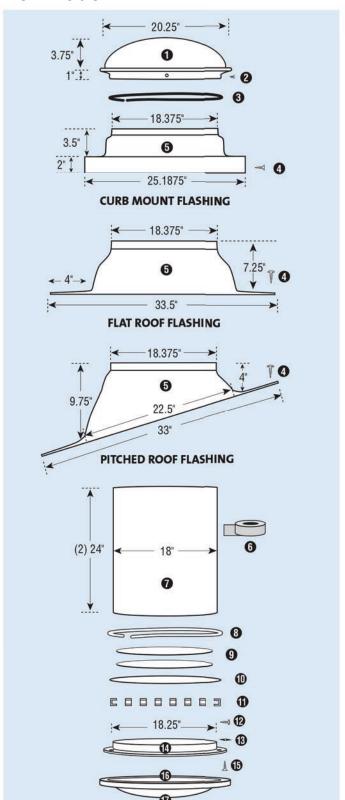


21" Model



component drawings...

18" Model

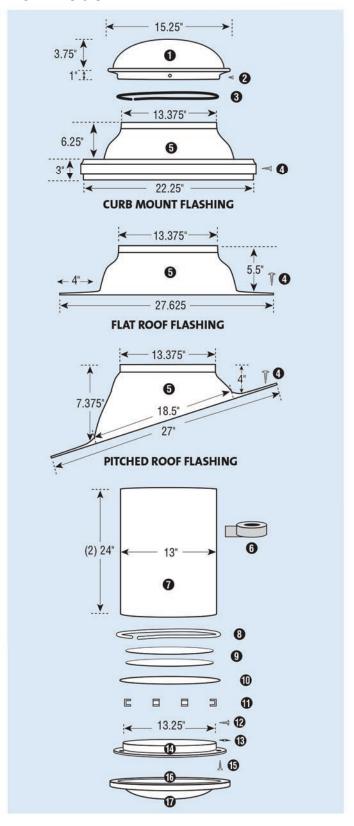


Part Descriptions

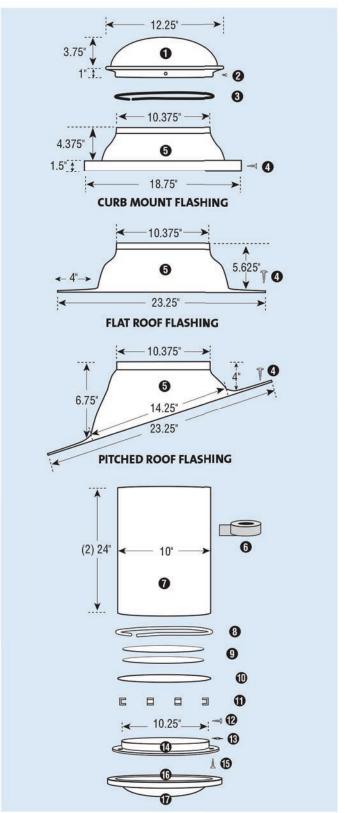
- Clear UV Protected, 100% High Impact Modified Acrylic Dome
- 2. (4) Phillips Head Stainless Steel 1/4" Sheet Metal Screws
- 3. Nylon horsehair Gasket (self-adhesive)
- 4. (6) Phillips Head Stainless Steel 1 1/2" Screws
- **5.** Commercial Pure Grade, 1100 Series Aluminum Flashing
- 6. Heavy Duty Foil Tape
- 7. Light Pipe, (2) 24" Sections per Kit
- 8. Nylon horsehair Gasket (self-adhesive)
- 9. (2) Small clear Polycarbonate Lenses
- 10. (1) Large Polycarbonate Lense
- **11.** (8) U-channel Self-Adhesive PVC Tabs 18" model (4) U-channel Self-Adhesive PVC Tabs 13" and 10" model
- 12. (6) Self-Tapping Screws
- 13. (3) Black Speed Nuts
- 14. Aluminum Ceiling Ring
- 15. (3) Phillips Head Screws
- 16. White Powder Coated Aluminum Trim Ring
- 17. Choice of Prismatic or Soft White Diffuser



13" Model



10" Model



installation...

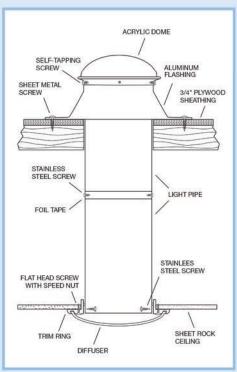


The tubular skylight installs easily in about two hours with no structural changes.

Summary of Steps

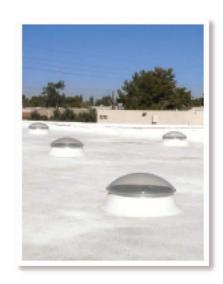
- ► Cut opening in desired location
- ► Place flashing over hole or pre-built curb, and secure with provided screws
- ▶ Measure light pipe length needed
- ➤ Secure light pipes together with provided screws and insulation tape
- ▶ Slide pipe through flashing
- ▶ Secure dome to flashing
- ➤ Attach trim: standard or warehouse trim ring or transition box

Hard Ceiling



Flat Flashing / Hard Ceiling

Please refer to installation instructions for detailed steps.





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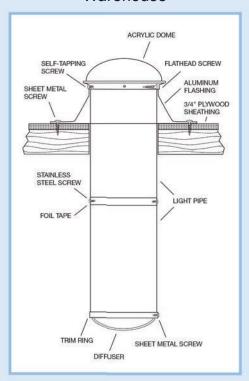
Flat Flashing or Curb Mount / Warehouse

Please refer to installation instructions for detailed steps.





Warehouse



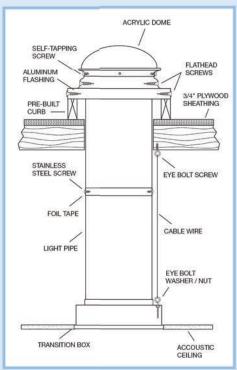
Flat Flashing or Curb Mount / Drop Ceiling

Please refer to installation instructions for detailed steps.





Drop Ceiling







case studies...

Natural Light Energy Systems Phoenix, Arizona

Project Type:

Commercial Building Manufacturing Warehouse and Office Space 44,000 square feet

Description of Project:

The Natural Light Energy Systems' Headquarters underwent a renovation and is now completely day lit by harvesting available sunlight using strategically installed tubular skylights. The sunlight is distributed throughout the entire building creating a healthier, cost-effective alternative to fluorescent and incandescent lighting. The chart below shows the actual energy use before and after the installation of the tubular skylights.

Natural Light Products Installed:

10" Tubular Skylight Kits with SVFANS

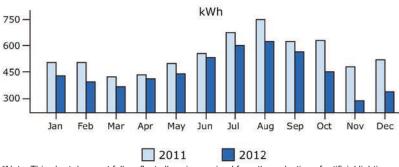
13" Tubular Skylight Kits

18" Tubular Skylight Kits

21" Drop Ceiling Kits with Transition Box

21" Warehouse Kits

Actual Yearly Energy Use:*



*Note: This chart does not fully reflect all savings gained from the reduction of artificial lighting. It covers a time period during which additional machinery and production lines were deployed.



Kansas City Art Institute Warehouse Kansas City, Missouri

Project Type:

Daylighting the Art Studio Warehouse 10,000 square feet

Description of Project:

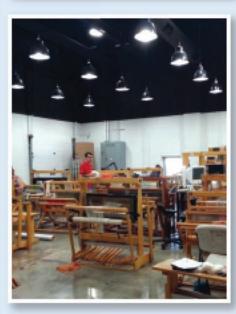
El Dorado was hired as both architect and general contractor for the design and construction of a new Fiber Building on the Kansas City Art Institute's emerging north campus. The project required a complete shell renovation of a 10,000 sf. warehouse building, as well as new MEP infrastructure and finish to meet the needs of one of the nation's premier Fiber Departments. Simply called "The Warehouse," the building features white OSB walls for students to pin-up artwork through-out, high-bay ceiling lights, and Natural Light Tubular Skylights against a matte-black ceiling.

Natural Light Products Installed:

(18) 21" Curb Mount Kits













Other Notable Installations of Natural Light Energy Systems' Products include:

University of Wisconsin Madison, Wisconsin Student Housing (18) 21" Kits

Major Pharmaceutical Company Appleton, Wisconsin Corporate Building (9) 21" Kits

Travis Air Force Base Fairfield, California (97) 13" Kits

Mountain Home Air Force Base Mountain Home, Idaho (9) 21" Kits

Coast Guard Station Petaluma, California (45) 21" Kits

Coast Guard Station Apra Harbor, Guam (4) 21" Kits

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project gallery...

Pueblo Pintado School, New Mexico













Riverside Elementary, Phoenix, Arizona













Maryvale Gymnasium, Phoenix, Arizona













Manufacturing Facility, Arizona













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Mercedes-Benz Dealer, Fairview, California







Student Housing, Madison, Wisconsin





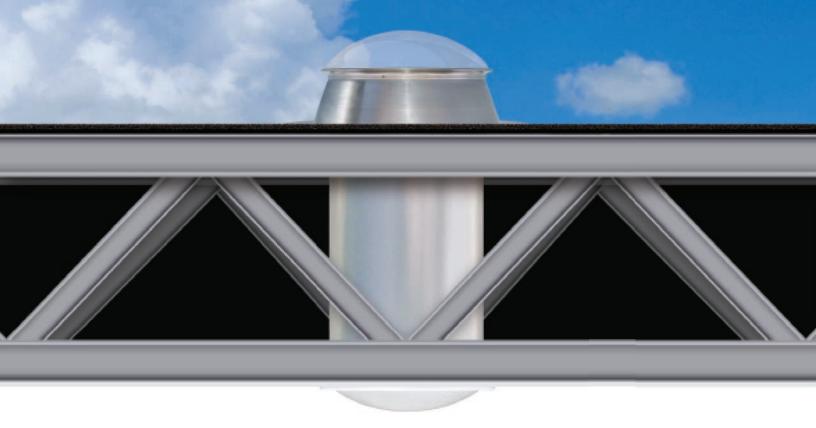


Office Building, Mexico City, Mexico









Improve Life/Work with Daylighting



