

# STORM WINDOWS & SCREENS

## ESSENTIAL KNOWLEDGE

The storm window has traditionally been a product for cold climate regions, with small manufacturers providing custom unit sizes. Adding a storm window unit to an existing window provides several improvements. A storm window will dramatically reduce air infiltration and significantly increase the thermal performance of a single-pane window while reducing the impact of weather on the prime (original) unit. Available options such as low-e glazing will further reduce energy consumption while available tilt-in sash allows for ease of maintenance. High performance storm windows are also suitable for noise reduction.

The material of choice is aluminum, which provides high strength with a narrow profile. The poor conductive properties of aluminum may be mitigated by existing wood windows which serve as a thermal break. Conventional storm windows are typically not suitable for installation on vinyl prime units because the elevated temperatures between the units escalate the expansion and contraction of the frames. Storm windows may have a similar effect on windows joined with lead coming. Aluminum windows benefit from the addition of storm windows but the differential movement between the windows must be accommodated with material such as a double-sided adhesive cork tape.

Storm windows may be installed either on the interior or the exterior of the prime unit, and are typically available as sliding units operating vertically or horizontally, or as a fixed unit suitable for removal. Units are available in sizes large enough for sliding glass doors. Operable units available in double- and triple-track configurations provide for air circulation and self storage of a screen. Fixed units are suitable for picture windows. However, they require seasonal maintenance when used in conjunction with operable prime units.

The performance of a storm unit should be evaluated as a complete assembly. The design and material of the frame, its assembly, the installation, and (perhaps most importantly) the weatherstripping details all contribute to performance, which can vary dramatically even among models from the same manufacturer. An AAMA certified manufacturer or NFRC program participant should be able to provide the performance rating for the full product line.

Steel windows are particularly good candidates for storm windows to compensate for their high level of conductive heat loss. A storm unit will reduce transfer through the individual lites typical of a steel window sash. Storm windows may be applied to existing steel sash frame with fasteners, magnetic trim, or adhesive tape, or can be affixed to material adjacent to the steel frame.

Storm windows are commonly available with screen units. The traditional aluminum screening material provides strength but is subject to denting and corrosion. Fiberglass screening, significantly less expensive than aluminum, will not dent but can stretch. A screen's primary purpose is a barrier to insects, although some new screening materials have been developed that improve energy performance. Various fiberglass products are now available that reject unwanted heat gain in warm climates, but reduce ventilation and natural day-lighting (Fig. 1). The energy savings of such screening can be significant and some utilities subsidize their cost in hot climates. These screens are particularly effective on east and west elevations where the sun is at a low inclination, and passive solar control strategies such as awnings and overhangs are not generally effective. Fine aluminum louver shades can also reject the vast majority of the summer sun similar to Venetian blinds. Both products reject heat and damaging UV light before it reaches the prime window, thus protecting the window itself and reducing heat gains.

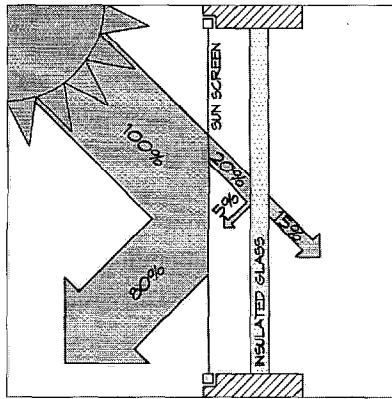


FIGURE 1

## SOLAR SCREEN REFLECTION OF HEAT GAIN

On homes in coastal regions, copper, bronze, or stainless steel screening is a good choice because it resists corrosion better than aluminum. Such screening should not be combined with aluminum windows, as corrosive galvanic action may occur. Aluminum windows protected by paint or vinyl finishes are satisfactory for coastal regions.

## TECHNIQUES, MATERIALS, TOOLS

### 1. INSTALL INTERIOR (FIXED/REMOVABLE) STORM WINDOWS.

Interior storm windows are typically secondary window units attached to the frame of an existing prime unit by a variety of means so as to provide for ease of removal (Fig. 2). With a storm window there are two separate frames, minimizing conductive transfer and air infiltration while preserving the exterior window appearance. Units are available either custom-fit or in do-it-yourself kit form, with a variety of glazing products. Acrylic glazing products are a popular choice for this application because they are lighter weight, easy to cut to size, and more damage resistant. Such units are available from national and regional



FIGURE 2

INSTALLATION OF AN INTERIOR STORM WINDOW UNIT AS MANUFACTURED BY THE ALTERNATE WINDOW COMPANY. UNIQUE SPRING TENSION FRAME COMPENSATES FOR MOST OUT-OF-SQUARE APPLICATIONS AND DOES NOT REQUIRE FULL PERIMETER TRACK.

manufacturers, including Allied Window, Alternative Window Company, Magnetite, Thermo-Press, Petit, and Window Saver Company, among others.

**ADVANTAGES:** Manufacturers claim a reduction in air infiltration of 75% or more and almost a 100% improvement in the R-value, frequently better than new prime units. The removable fixed unit is less costly than operable units and suitable for windows of all types without changing the appearance of the exterior. The addition of another glazing layer will reduce noise transmission, the likelihood of condensation, and will provide the opportunity to utilize improved glazing (such as low-e).

**DISADVANTAGES:** Interior storm units may promote condensation along the cold surface of the prime unit and in some instances cause damage to wood frames. These units are typically not operable and must be removed for ventilation. Acrylic products can discolor over time and cannot be cleaned with ammonia-based products.

## **2. INSTALL EXTERIOR (OPERABLE) STORM WINDOWS.**

Exterior storm windows, in addition to providing a second unit, may also serve to protect the prime unit. Most new operable storm units employ several tracks, sashes, and screens that are self-storing. These units are significantly stronger and more costly because they must often serve the same functions as a primary unit. The criteria for selection of exterior storm windows are the same as for prime units. However, thermal conductivity is not a critical issue when attaching to a wood frame. Consideration should be given to elevated temperatures and humidity that might affect the prime unit. Storm windows are available from Allied Window, Harvey Industries, Keep In Touch Restoration Products, and Larson Mfg. Co., among others.

**ADVANTAGES:** Often provide the most cost-effective solution for poorly performing windows. Exterior storm units provide a barrier against weather and damage for existing prime windows.

**DISADVANTAGES:** Most units are visible from the exterior and create a flat appearance to windows. The addition of a storm unit will generally increase humidity and temperatures between units, which may damage either vinyl or wood window frames.

## **3. REPAIR OR REPLACE SCREEN MATERIAL.**

New materials, such as fiberglass, are easier to install because of their flexibility and ease of cutting and resistance to denting, but may stretch or sag over time. Aluminum, the metal of choice, admits more light but is about twice as costly as fiberglass and can produce glare. Some aluminum products are painted gray or black to reduce glare. Other metals, such as bronze or copper, are suitable for corrosive environments but may not be used with common aluminum frames and are considerably more costly. These materials are commonly available through local building supply companies, or by mail from the McNichols Company, among others.

**ADVANTAGES:** The replacement of screens with the introduction of new materials allows for a simple repair.

**DISADVANTAGES:** Careful selection of material is necessary so as to assure compatibility with adjacent materials and environment.

## **4. INSTALL EXTERIOR SUN SCREENING DEVICES.**

Exterior sun screening devices are effective in blocking the majority of sunlight before it reaches the prime unit, but may trap hot air between the two layers. Reduced daylight and visibility may not be significant in a cooling-dominated climate. The units require regular seasonal maintenance for optimum performance. These products are available in sunny climates throughout the nation from regional distributors. National manufacturers include Phifer Wire, among others.

**ADVANTAGES:** Sun shading screens quickly pay for themselves in homes with electric central air conditioning in warm climates. Unlike new spectrally selective glazing products, full spectrum may be recovered by removing the screen.

**DISADVANTAGES:** Shading devices obstruct views and daylight and require seasonal maintenance.

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## **FURTHER READING**

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"What's The Difference - Door and Window Screening: Aluminum or Fiberglass?" Bruce Greenlaw, *Fine Homebuilding*, p.120, Sept. '95, No. 97.

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## **PRODUCT INFORMATION**

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Allied Window, Inc., 2724 W. Mc Micken Avenue, Cincinnati, Ohio 45214; 800-445-5411 (interior and exterior storm windows).

Alternative Window Company, 15 Sherman Drive, Simsbury, CT 06070; 800-743-6207 (interior storm windows).

Harvey Industries Inc., One Moody Street, Waltham, MA 02154-5339; 800-882-8945.

Keep In Touch Restoration Products Group, 30 Lafayette Sq., Vernon, CT 06066; 800-569-9075.

Maclanburg-Duncan, 4041 North Santa Fe, Oklahoma City, OK 73118; 800-654-8454 (screen and storm window components and materials).

McNichols Company, P.O. Box 30300, Tampa, FL 33630-3300; 800-237-3820; [www.permaglas-mesh.com](http://www.permaglas-mesh.com) (screen material).

Perma-Glas Mesh; P.O. Box 220, Dover, OH, 44622; 800-762-6694 (screen material).

Petit Industries Inc., P.O. Box 1156, Saco, ME 04072-1156; 207-283-1900.

Phifer Wire Products, Inc., P.O. Box 1700, Tuscaloosa, AL 35403-1700; 800-633-5955 (screen material).

Winstrom Architectural Products, 70 North St., P.O. Box 310, Park Forest, IL 60466; 312-748-8200.