

# Efficient Envelope: High-Rise Investigations & Repair Strategies

Searching for the Best Value

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## What You Will Learn

- There are significant benefits of transitioning to more energy-efficient windows, including:
  1. It can lead to substantial reductions in heating and cooling costs, which can improve occupant comfort.
  2. There may be notable reductions in sound transmission, fostering a quieter indoor environment.
  3. Better energy performance can help offset increasing energy costs.
- Window price commonly remains the primary consideration during window replacement selection, but:
  1. Selecting the right glass lite can further refine potential energy savings.
  2. Different levels of window energy performance may get you available tax incentives.



## Common Windows in a High-Rise

Most Have Aluminum Frames

- Aluminum Storefront
- Punched Windows
- Ribbon Wall Window system
- Curtainwall

Alternate Frames

- Fiberglass





## Some Reasons Windows Need to Be Replaced

- They leak.
- Operability is poor.
- Glass panes (lites) are fogged.
- Maintenance costs increase progressively over time.
- They have exceeded their Expected Useful Life.
- Energy costs are increasing.



## The Windows Leak

What do all of them  
they rely on?



## Weather-stripping Gaskets.

- Between the window frame and glass.
- Between frame-to-frame junctions.

Some gaskets are  
accessible and therefore  
can be replaced.



## The Windows Leak

What else do all of them they rely on?



Sealants.

Most sealants are NOT accessible and therefore cannot be easily replaced.





## The Windows Leak

### Sealants Between the Window and Building Fail:

- Exterior sealants are one primary line of defense
- The problem:

Sealants have a much shorter Expected Useful Life (EUL).





## Common Questions People Ask:

### Do the Windows Need to Be Replaced?

- Do they leak?
- Does the cost to maintain the windows exceed the value of complete window replacement?





## Do the Windows need to be Replaced?

Develop a system to track window performance.

Survey:

- By Unit
- By Drawing Elevation
- Track Costs
- Over Time



## Do the Windows Need to be Replaced?:

Have the windows reached their Expected Useful Life?



## Selecting the Right Window Involves Many Factors

Window frame material?

- Aluminum
- Aluminum w/ a thermal break
- Aluminum filled with insulation
- Aluminum filled with Gas versus air
- Fiberglass
- Other



## What is Solar Heat Gain Coefficient?

How much of the sun's heat goes through the window.



## What is U-Value?

- The rate of heat transfer through a material.
- Number of BTUs that passes through
- How well the window insulates.





## What is Low-E Glass Made of?



- Low-E coatings can be applied to both the exterior and interior glass surfaces.
- On an exterior glass surface, a Low-E coating can reflect the heat or cold.
- On an interior surface, a Low-E coating can reflect back the existing indoor temperature.





## What is Low-E Glass Made of?

One or more extremely thin layers of metallic particles are bonded to the glass:

- Silver
- Indium Tin Oxide, other

## What does that do?

- It allows it to act like a sieve: Long wavelengths (heat), are filtered out.
- Short wavelengths (the visible light spectrum) are allowed to pass through.
- By changing the types of particles used in the layers of Low-E, and by increasing or decreasing the number of layers, different Low-E glass types can be created.



## Window Replacement Cost

- You don't have to stick with the product the manufacturer offers.
- You can "Mix & Match" frames with different glass lites.
- Compare energy consumption of different combinations.

## Local Tax Incentives are a Factor

U-Value equal or  
less than .30 for all  
glazing combined.

Savings:

- Annual Cash savings.
- Tax Break.



## Common Questions People Ask:

### Should the Windows Be Replaced?

- Would more energy efficient windows pay for themselves?
- How fast would they pay for themselves?