CONSUMER'S GUIDE TO

Securing Your Windows





www.usace.com 1 888-607-000



This Consumer's Guide is provided as an educational service by Advanced Coatings Engineering LLC (ACE). Used and installed as directed, ACE™ security laminates have the potential to slow or deter attackers and can be an effective part of your home security plan. No window security film or laminate should be considered break-proof, bullet-proof or bomb-proof. At no time does ACE promote or lead readers to believe burglar-proofing, bullet-proofing or bomb-proofing can be achieved solely with the use of ACE products.

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Contact www.usace.com 1 888-607-0000 While it's difficult to protect your home from professional thieves, most home burglaries are conducted by amateurs. Common burglars and even more skilled thieves can be thwarted readily by employing some simple security precautions.

And how do most thieves enter your home? Usually, they enter through an unlocked door or they break a window.

And what is the most vulnerable part of any home or building? Windows.

Read this guide and you'll discover:

- How to avoid 3 window security rip-offs
- 4 costly misconceptions about window security film and laminates
- One simple test to tell if they know what they are talking about
- How to protect yourself from bait-and-switch scams
- The importance of laboratory testing and do they have it?
- The 4 types of burglars and how to protect yourself against them
- 11 things you can do right now to protect your home and family from burglars
- Why ACE[™] security and safety laminates are different
- Construction of ACE™ security laminates





Contact www.usace.com 1 888-607-0000 Dear Homeowner,

One of the most important things a family can do is secure their home. And securing windows is one of the most difficult challenges because glass is designed to break, making your windows one of the most vulnerable security points in your home.

From super low prices to products with misleading claims, how do you know where to start and what is the right decision to make when it comes to window security films and laminates?

Start by reading this Consumers Guide. In this fact-filled guide, you'll quickly learn more about securing windows than most window salesmen. You'll also learn how to avoid window film rip-offs, the deceptive claims made by many dishonest companies and how you can best protect your family.

We wrote this guide to help you better understand window security and window security films and laminates. With this information you can make an informed and intelligent decision.

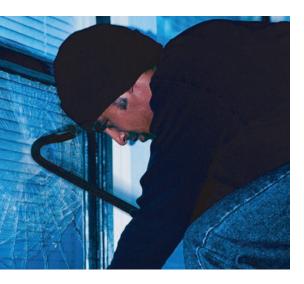
And if you have any questions about window security films and laminates, you can call us at 1-888-607.0000 or visit us at USace.com.

We'll be happy to help you in any way we can.

Sincerely,

Peter Fabian
Founder and CEO
Advanced Coatings Engineering LLC.





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Can Window Film Actualy Secure a Window?

Window films and tints have been around for decades. Films and tints are designed to keep the sun out of your house and reduce passive solar gain (heat). For the most part, window tint works really well at doing this.

Following the Oklahoma City bombing in 1995 and then the World Trade Centre attack in 2001, there was a growing need to secure glass given the catastrophic injuries that results from flying glass in bombing attacks. The window tint industry saw a new market for window film as a security product.

Does window film actually secure windows? The answer is both yes and no.

Any membrane will provide some reinforcement to a glass window. This is the reason why some people use masking tape to reinforce windows during hurricanes.

Does this work? Kind of, but not very well. The same thing goes for standard window tints and films. They provide some reinforcement but they're not designed to be security products.

Only window security and safety laminates designed specifically for security applications provide the protection you will need. And as with all things, some products are better than others, some perform better than others.

This guide will help you make an informed decision so you can choose the best solution for your home.





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How to Avoid 3 Window Security Rip-offs

Rip-off #1 UNBELIEVABLY LOW PRICES

To some degree, we're all attracted by low prices because most of us work within a budget. But be aware that low quality, generic films can be purchased for as little as pennies per square foot. And while they may look fine when first installed, cheap films and tints will de-laminate, peel, fade, crack and yellow often within a year. And, they won't protect you.

One way to cut costs in window film manufacturing is to leave out the ultra violet inhibitors required to prevent the adhesives from drying out. UV inhibitors are clear and invisible so the only way to actually measure if they are in the window film is by using a UV meter. Reputable suppliers will sell high quality films and laminates that have consistent UV performance. For a security application, this is critical otherwise the adhesives will weaken dramatically over time and ultimately fail.

By comparison, a high-quality security laminate will literally last the life of your window. And, because a high quality security laminate is assembled using premium quality adhesives, the protection levels offered will remain consistent through time and over a wide range of temperatures, from summer heat to winter cold.

Not all window films and laminates are the same and they are not as cheap as some unethical companies would like you to believe.





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Rip-off #2 BAIT AND SWITCH COUNTERFEITING

Every year, an estimated \$700 Billion in counterfeit goods are sold around the world. According to the International Anti-Counterfeiting Coalition, up to 7% of all goods sold around the world are counterfeits.

On the job site, yet another problem exists: bait-and-switch scams. Consumers are sold one thing and disreputable contractors substitute out the real item for a low-cost alternative. From automotive parts in your local garage to building materials on a construction site to bottled products in a hair salon, this is a major problem for consumers and it goes mostly un-noticed.

Unethical contractors know that to the typical consumer a thin, clear piece of plastic will look like any other. Consumers and homeowners are also trusting that their contractor will work with them in an honest manner. This makes window security laminate particularly susceptible to bait-and-switch practices. There are three things you can do to protect yourself from this practice:

- **1.** Be aware this practice exists.
- **2.** While not fool-proof, simply measuring the thickness of a tint or film installed will indicate if the correct gauge of product was used. A micrometer to make the measurement can be purchased for as little as \$15.
- **3.** If you have suspicions, ask your contractor for his original material purchase receipts.
- **4.** Call the product manufacturer and find out if the contractor is actually a registered vendor of their product.



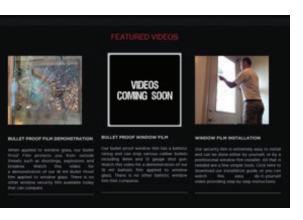


Image: Screen capture from a web site for a window film company advertising "bullet-proof" film

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Rip-off #3 UNBELIEVABLE AND DECEPTIVE CLAIMS

When it comes to securing windows, there are a lot of misleading and deceptive claims being made. The following are the most commons deceptive claims:

- The film is bullet-proof
- The film is bomb-proof
- Using vague descriptors such as "high-impact" window film
- In hurricane zones, implying or stating the product meets hurricane ratings

Bullet-resistance or bomb-resistance can be attained and ethical, competent suppliers will always state the level of bullet or bomb resistance attained and under what conditions. However, nothing is bullet-proof or bomb-proof. Be aware of suppliers making this claim.

Unethical companies will also imply performance by using vague terms such as "high impact" or "high security".

Security films and laminates can indeed provide impact resistance and protection but the level of protection provided should reference a test standard using a known and recognized methodology.





Image: This sign is an example of a misleading claim. Note: "High Impact" is in quotation marks which implies the film is impact rated but does not state it. This is highly misleading.

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Contact www.usace.com 1888-607-0000 Commonly referenced test standards include:

- Underwriters Laboratory S332 (Standard for Burglary Resisting Glazing Material),
- ANSI Z97.1 (Safety Glazing Materials Used in Buildings) or,
- CPSC Title 16 CFR 1201 (Safety Standard for Architectural Glazing Materials)

Be aware of unethical companies making claims of performance. If in doubt, ask them for copies of their test reports AND ensure that the test report is for the product they are proposing to provide you.

Finally, if you live in a hurricane zone, pay particular attention to the claims being made.

While a high-quality security laminate can add significant protection to your windows, keeping the glass fragments in place and preventing possible injury in the event of a violent storm, there is a problem. While the glass may be strengthened, the ability of the frame to hold the glass in place is not strengthened. In other words, the glass may come out of the frame or the frame itself might fail.

Further, some companies even go so far as to say that their products are "Miami-Dade Tested". What they fail to tell you is that they FAILED the test.

In short, to be Miami-Dade compliant, the entire window assembly including the frame must pass the testing protocol.

Beware of this deception. In 2009, the Economic Crimes Division of the Florida Attorney General's Office specifically required members of the window film industry to cease with all such deceptive and misleading claims.

This is not to say that window security laminate can't help prevent injury and storm damage. It can. However, a company that operates ethically will tell you the full story so you can make an informed decision.





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Costly Misconceptions About Window Security Films

Misconception #1 IF IT'S JUST AS THICK, IT'S JUST AS STRONG

Different grades of window security laminate and window film are often categorized by their thickness which is measured in an Imperial unit of measure called mils. One mil is one-one-thousandth (1/1,000) of an inch. Note: a mil (which is an Imperial unity of measure) is not the same as a millimetre (which is a metric unit).

Manufacturers and suppliers often refer to the grade of a window film by its thickness. The implied assumption is that thicker is better AND that all films and laminates of the same thickness work the same and are just as good as the next.

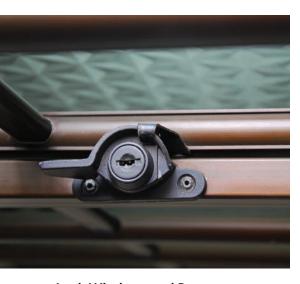
This is not necessarily the case.

Why? There are several factors that contribute to performance and strength once a film is applied to a window.

Factor #1: The quality of the adhesives used. Good quality adhesives will stick better and hold the window together longer when under attack. The best quality adhesives such as pressure sensitive adhesives bond best to the glass and actually absorb and distribute kinetic energy.

Factor #2: The quality of the polyester (PET) used in the film. Simply put, the best quality PET will combine all of the best aspects of clarity, flexibility and strength. Often, there is a trade-off between flexibility and strength. The trick is to find the best balance of these two performance factors.





Lock Windows and Doors

Simple and easy but often forgotten in Spring and Fall when the nice weather makes opening the window irresistible.

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Contact www.usace.com 1888-607-0000 **Factor #3:** The laminate is designed to absorb and disperse energy. A true window security laminate will be comprised of multiple plies of PET. Each of these plies will be aligned in a manner that best optimizes the absorption and disbursement of kinetic energy. While unseen to the naked eye, this alignment is a critical performance factor.

All of these factors work together to optimize performance. Just because a window film is thick does not mean it is architected and assembled with these other design considerations.





Lock Garage Doors

Unlocked garage doors are also a leading source of unforced entry.

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Misconception #2 THE BROCHURE SAYS THE BREAK-STRENGTH IS THE SAME

Most window films sold for safety or security applications will have a break-strength quoted on their product specifications or brochure. Consumers reasonably assume that this figure is indicative of performance and security. The problem is, this is not the case.

The break strength quoted in product specs and brochures is the beak strength of the raw polyester substrate used in the construction of the window film or laminate. Because the polyester used in films and laminates is often highly similar, the break strengths of the raw substrate will be similar. But this does not mean all films and laminates will perform the same once applied to glass.

Why?

For the reasons provided above, there are other factors that ultimately determine performance and the ability to protect glass once applied. The entire assembly of window film or laminate has to be taken into consideration. Ultimately, performance is a factor of: quality of the adhesives, quality of the polyester and, in a true laminate, the orientation of the individual plies of polyester.





Keep Spare Keys with Neighbors

Burglars know to check flowerpots and ledges for spare keys. If you must, keep spares with the neighbor.

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Misconception #3 WINDOW FILMS ARE ALL THE SAME; ONE IS JUST AS GOOD AS THE OTHER

A consumer could be reasonably expected to believe that window companies know how to secure windows. Most often, this is actually not the case. Window companies specialize in installing windows. Window companies (and window salesmen) don't think like security professionals.

As in any industry, there is a set way of doing things. Things tend to be done the way they have always been done. And even though technology changes, practices, mindsets and supplier relationships don't change anywhere near as fast.

Most window companies have their supplier and partner relationships already established. They call the window film companies they have always called and see no need to change even though the security environment may have changed in fundamental ways. Their suppliers of window films and tints spread the perception that all products are the same for the simple reason that the window film and tint manufacturers have not evolved their products to meet the new security environment.

Again, window companies sell windows; they are not security companies. By reading just this section of this Consumers Guide, you know significantly more about how security films and laminates work than the salesperson at your local window company.





Remove Rocks and Bricks

Keep your yard free of bricks and heavy rocks. Yes, burglars will use the implements you leave them to smash into your own home.

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Misconception #4 HAVING THE RIGHT PRODUCT IS ALL YOU NEED TO SECURE A WINDOW

Not true. Many window tinting companies can source good quality safety and security film from their suppliers. The problem is, they don't teach their employees how to install these higher-strength products properly.

The result: you get a quality window film installed on your window incorrectly.

Window tint companies tend to make most of their money installing window tint. Safety and security films and especially a high-strength laminate are much more difficult to install than everyday window tint. They are thicker, stronger and their adhesives tend to be much more aggressive. All of this means more effort is require to install these products.

Before choosing a window tint or film company, ask them about their experience installing high-strength safety films and security laminates. If they don't have any or if their claims sound vague, don't use them.





Install Quality Door Locks
Knob locks are easily jimmied.
Dead-bolts aren't.

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ONE SIMPLE TEST TO TELL IF THEY KNOW WHAT THEY ARE TALKING ABOUT

Nothing is break-proof, bullet-proof or bomb-proof. Avoid anyone using these terms. They don't know what they are talking about.

Nothing is burglar-proof. Instead, windows can be made smash-resistant, burglar-resistant and even bullet-resistant or bomb-resistant.

Again, performance can be tested but it has to be done under controlled conditions and tested against standardized test methods that are recognized by industry.

Stay away from anyone talking about bullet-proofing. It doesn't exist.





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How to Protect Yourself From a Bait-and-switch Scam

In 2008, the Defense Department's Bureau of Industry and Security identified nearly 10,000 incidents of counterfeit goods entering the US military's defense supply chain. Counterfeiting and unauthorized product substitution bait-and-switch scams are a massive problem.

One of the best ways you can protect yourself as a consumer by being aware of this practice. Here's what you should know:

- **1.** Product substitution and counterfeiting is an international problem. It is a particular problem with window films and laminates which will tend to look the same to the lay-person
- 2. Counterfeits can be difficult to identify
- **3.** Ask your contractor about counterfeiting. Many companies are leading efforts to protect the public by providing tools, tips and information regarding this international problem.
- **4.** If you have suspicions, call the manufacturer. Find out if the contractor you are using is registered with the supplier.





Image: Underwriters Laboratories headquarters in Northbrook.

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Making Clams and Laboratory Testing. Do They Have It?

There are a lot of people making claims on the internet. An important part of your due-diligence is going to be finding out if they have independent third party testing. Eight questions you want to ask are:

Question #1: Do you have product testing?

Question #2: Was it done by an independent laboratory?

Question #3: Is the laboratory arms-length to the company? In other words, the company should not own the laboratory doing the testing. Many major

corporations have their own in-house laboratories.

Question #4: Does the test have an individual test report number which can be verified

by the lab?

Question #5: Can I get a copy of your test reports?

Question #6: If you are being supplied by another manufacturer, have they designed

the product for this use, do they endorse it for use against ballistic and bomb blast threats and do they have test documentation verifying its

efficacy? Can I speak with their engineers?

Question #7: How long have you been in business? It takes years and millions of dollars

to undertake ballistic and specifically bomb blast testing. Has the company been in business long enough to actually do what they claim to have done?

Question #8: Can I speak to your engineers?





Image: U.S. General Services Administration Building-E.

A reputable supplier, especially for a security product, should have third party product testing. This testing should be done by an independent, reputable laboratory. The report should be in the name of the company making the representation. It should be to a recognized standard established by an authority such as Underwriters Laboratory, American Society for Testing and Materials and others. For ballistic testing, standards such as those from the National Institute of Justice (NIJ) and UL are mostly referenced in North America. For bomb blasts, the test standard most often referenced in North America is the General Services Administration (GSA) standard.

Ask for these test reports. Scrutinize them. Ask guestions.

If the reports don't add up and if you're suspicious, follow your instinct.

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Secure Sliding Doors

Prevent sliding doors from opening by placing a rod in the tracks or installing a track lock.

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The Four Types of Burglars and What You Can do to Protect Yourself Against Them

Creating your three to four minute delay

Every year in the United States there are over 2,000,000 burglaries. 74% of all burglaries were on residential property and mostly during day-time hours. In over 100,000 of these burglaries, a family member suffered some form of violence. (Source: FBI and Bureau of Justice Statistics Special Report).

Sometimes, the simplest places are where you start. For instance, locking your doors and windows. It sounds simple but consider that almost 30% of burglaries were through unlocked doors and windows.

That's right; the thieves just walked in.

But this means that the other 70% of break-ins involved forced entry. Solidifying entry points – good locks and good window protection – is a critical first step in securing your home.

In fact, creating a three to four minute delay will deter most home burglaries.





Think About landscaping

Bushes and trees make great hiding spots. Preventing crime by creating an outdoor environment that makes it difficult to pull off is very effective.

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Think like a bad guy and refuse to be a good victim

Think like a bad guy and refuse to be a good victim

A bad guys wants four things:

- 1. he doesn't want to get caught,
- 2. he doesn't want to get hurt,
- 3. he wants things to be simple,
- **4.** he wants an easy victim.

Studies indicate repeatedly, predators choose their victims, consciously or unconsciously.

Refuse to be a good victim.

There's plenty of good quality locks, doors, alarms, motion detectors, cameras and monitoring services on the market. Glass is the weak link in any building.

25% of residential break-ins take place through un-secured glass. A high quality window security laminate creates an invisible barrier on your windows, resisting initial attacks, slowing the bad guys down and if you are home, giving you time to move to safety and respond.

The effects of a break-in go well beyond the financial losses. Most victims report that the psychological impacts – ranging from fear and anger to guilt resulting from their inability to protect their home and family – are worse than the loss of what was taken.

While nothing is burglar proof, some simple precautions and steps can keep you, hour family and your home much safer. Window security is often a primary strategy for "hardening" a home.





Install Motion detectors
Light is a great psychological deterrent.

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Four types of burglars

Security experts have identified Four Classes of Burglars². Briefly, they are:

- 1. Common and Simple (The Amateur Burglar): This thief seeks out easy fast targets, such as open windows and unlocked doors. Since the ease of the crime is the driving force rather than advanced knowledge of valuables, this burglar often ends up with "stuff" that can be exchanged for cash. Often categorized as Delinquents or Opportunists, this class of burglar has a low level of skill. However, this low level of skill makes them reckless and unpredictable which has the potential to make them dangerous. Amateur Burglars often use the proceeds of their crimes to purchase drugs, which contributes to the unpredictability of this class of criminal. Despite this, they are the easiest to defend against with simple, common sense precautions. The Amateur is looking to steal whatever he can get. The Amateur typically uses brute force to smash into a home. Typically the Amateur will look for an un-occupied home. 40% to 60% of burglars are Amateurs.
- 2. The Hunter (Professional Class III Burglar): This kind of burglar is premeditated, scouting around neighborhoods for valuables. The Hunter takes advantage of unlocked doors and windows, but is willing to be careless and will smash through windows or doors, then grab anything that they can stuff into pockets or a napsack Comprising 25% to 35% of Burglars, Professional Class III Burglars mostly seek out homes with minimal security measures such as a home security system. Generally their use of force is low and they will seek out homes with weaknesses or vulnerabilities such as open doors and windows, obscured entrance ways and no security devices. Strengthening doors and windows is a primary strategy for deterring this class of burglars.

² American Society of Industrial Security (ASIS)





Install a Quality Security System

Most burglars report staying away from
houses with lawn signs saying they are
monitored properties.

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- 3. The Prowler (Professional Class II Burglar): The Prowler is a smarter and more sophisticated version of the Hunter. Comprising 10% to 20% of Burglars, a Class II Burglar has the knowledge to avoid security systems and focus their entry on vulnerable areas such as windows accessed from rooftops and venting systems. While after the same valuables as The Hunter (money, jewels, guns, high-end appliances), deterrence measures will go beyond alarms systems and include door and window enhancements, motion activated lights and environmental security measures such as "security landscaping".
- 4. The Specialist (Professional Class I Burglar): This is the top-flight burglar, concentrating on wealthy estates, selecting targets very carefully, usually working within a crime ring. Only high-value items will suffice, and thus specialist burglars may also target businesses and warehouses. The Specialist or Professional Class I Burglar targets wealthy neighborhoods and has usually identified a specific target, often focusing on homes or individuals with known valuables such as art, jewellery and collectibles. With Burglars of this skill (fewer than 5% of burglars) more sophisticated security measures are required and you may wish to retain a security consultant to undertake a comprehensive and personalized assessment. However, unless you live in specific neighborhoods and fit a certain profile, the chance of being victimized by a Class I Burglar is rare.

² American Society of Industrial Security (ASIS)





Visual Inventory

Conduct your own nighttime visual inventory. What can be seen inside your home from the outside?

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12 Things You Can Do Right Now to Protect Your Home and Family from Burglars

- **1.** Make sure your windows and doors are locked. Simple and easy but often forgotten in Spring and Fall when the nice weather makes opening the window irresistible.
- **2.** Unlocked garage doors are also a leading source of unforced entry.
- **3.** Burglars know to check flowerpots and ledges for spare keys. If you must, keep spares with the neighbor.
- **4.** Keep your yard free of bricks and heavy rocks. Yes, burglars will use the implements you leave them to smash into your own home.
- **5.** Knob locks are easily jimmied. Dead-bolts aren't.
- **6.** Prevent sliding doors from opening by placing a rod in the tracks.
- 7. Think about landscaping. Bushes and trees make great hiding spots. In fact, there is an entire field of security called Crime Prevention Through Environmental Design (CEPTED). Preventing crime by creating an outdoor environment that makes it difficult to pull off is very effective.
- **8.** Motion detectors. Light is a great psychological deterrent.
- **9.** Install a high quality security system or alarm. Most burglars report staying away from houses with lawn signs saying they are monitored properties.
- **10.** Conduct your own nighttime visual inventory. What can be seen inside your home from the outside?
- **11.** Don't post your vacation itinerary on social media.

Finally, we might be biased, but, protecting your windows with ACE[™] security laminates is a great way to protect your home from one of the most common forms of entry, broken and smashed windows.





Keep Travel Plans Private

Don't post your vacation itinerary on social media.

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WHY ACE™ SECURITY LAMINATES ARE DIFFERENT

Founded in 1991, Advanced Coatings Engineering LLC (ACE) has designed and developed window security laminates that are recognized as the best and strongest in the world.

Since our founding as a company, ongoing R&D and product testing have been cornerstones of our strength, marketplace strategy and competitive advantage. Since introducing the first bullet-resistant laminate in the industry in 1994, we retain our global leadership in 2012, being the only company in our industry to test our products regularly in front of live audiences and resisting multiple shots of small arms fire on auto glass.

All ACE laminates meet standards established by ANSI (America National Standards Institute) and UL (Underwriters Laboratory) and our high-threat products meet recognized international standards for protection against small arms fire and blast mitigation. ACE tests its products against recognized performance standards and this testing is done by credible and leading third party agencies. These written reports are available to all our clients upon request.





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CONSTRUCTION OF ACE SECURITY LAMINATES

All ACE security laminates are constructed of two or three ply's (200 Series or 300 Series) of premium grade polyester, known as Biaxially-oriented polyethylene terephthalate (BoPET).

By using BoPET and assembling the layers of BoPET to create a true laminate, ACE creates a product in which the various layers never have the same fibre directional orientation. Unlike less expensive window films, the material used in ACE laminates have multiple "closing angles".

This is achieved using technologically advanced equipment which allows for ACE to control the directional orientation of the polyester. This effectively results in ACE's three ply laminate being a six directional product which increases the ultimate elongation at break point by 25%. Shear forces cannot simply "crack" the laminate thereby letting a projectile through.

Further, ACE treats each laminate with a co-polymerized UV cured scratch resistant coating. Co-polymerisation gives the laminate a self-healing effect. If the scratch-resistant coating is scored with a sharp object, the scratch will tend to close along the scar line minimizing its visibility.

Holding the assembly together are pressure-sensitive mounting adhesives.

ACE laminates have two physical layers of adhesive, the first being a permanent layer which is bonded to the BoPET and a second pressure sensitive layer that compresses with application on glass. Using a cheap and generic adhesive would reduce production costs but also dramatically reduce performance.





Contact www.usace.com 1888-607-0000 Finally, the resin used to produce the BoPET used in ACE security laminates has several additives that enhance performance. First, additives are used to make the laminates fire resistant. Second certain additives are used to prevent repetitive post-curing reactions which make lower quality BoPET fade, yellow and lose transparency.

ACE laminates are available in 100, 200 and 300 Series products.

100 Series

The ACE 100 Series is designed for safety applications and lower-threat smash-and-grab attempts.

200 Series

The ACE 200 Series is designed for burglary resistance and preventing smash-and-grab type crimes. ACE's SL9 laminate is a two-ply security laminate and it has been tested for bomb-blast resistance against the US government's General Services Administration standard for bomb-blast resistance.

300 Series

ACE's 300 Series laminates are:

- Comprised of 3 layers of Bo-PET (biaxially oriented polyethylene terephthalate)
- Designed for bullet and bomb resistance
- Are designed to be an intelligent solution. That is, the application of the laminate can be customized to meet the threat being faced.





THANKS AGAIN

for reviewing our CONSUMERS GUIDE TO SECURING YOUR WINDOWS. I hope you found this information helpful.

If you have any questions or comments – or if you would like to buy ACE security laminates – please call us at 1+888-601-0000.

We've dedicated our company to protecting people and property worldwide we'll be pleased to discuss your window security needs and seeing how we can be of assistance. We look forward to your call.

Sincerely

Peter Fabian
Founder and CEO
Advanced Coatings Engineering LLC.

Visit us at youtube.com/ACEtvnews

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