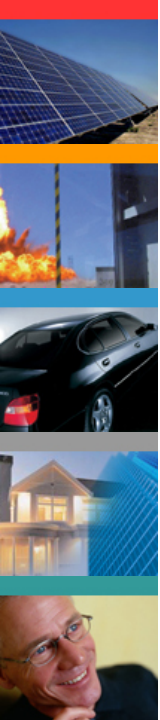


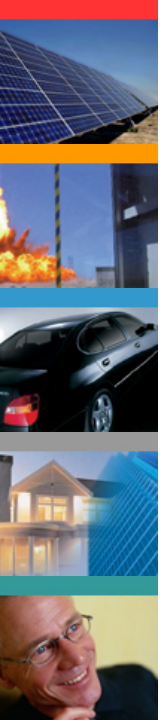
FAQs

- What is the difference between color-dyed, metal sputtered window films and how are they made differently?
- What are the different types of adhesives and why is one better for one type of installation than the other?
- How are window films made?
- What exactly is Ceramic window film?
- Why do you need an attachment system for certain safety and security applications?
- What are the different security attachment systems?
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- Why are Madico films better than the competition? What makes them better?
- What is difference between the films in the standard Madico line and the Sunscape Select lines?
- New Products on the horizon:
 - What is photovoltaic film? How does it work?
 - What is microbiobial (sp) film?
 - Fire resistant window films
 - Eavesdropping window films?



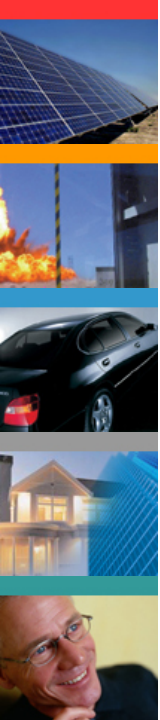
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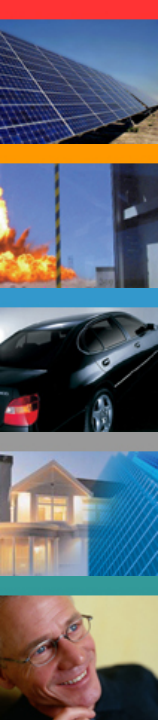
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Window Film Manufacturing

101





Most frequently asked question



How are window films made?

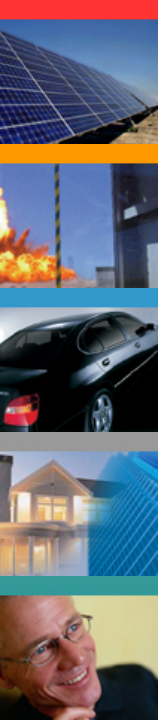


Most common answer:

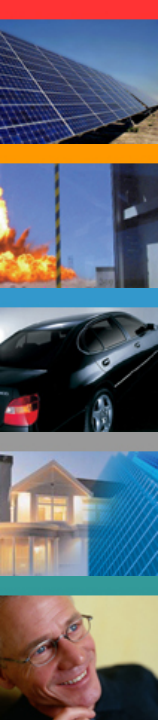
With Great Difficulty!

(not all films are created equal)

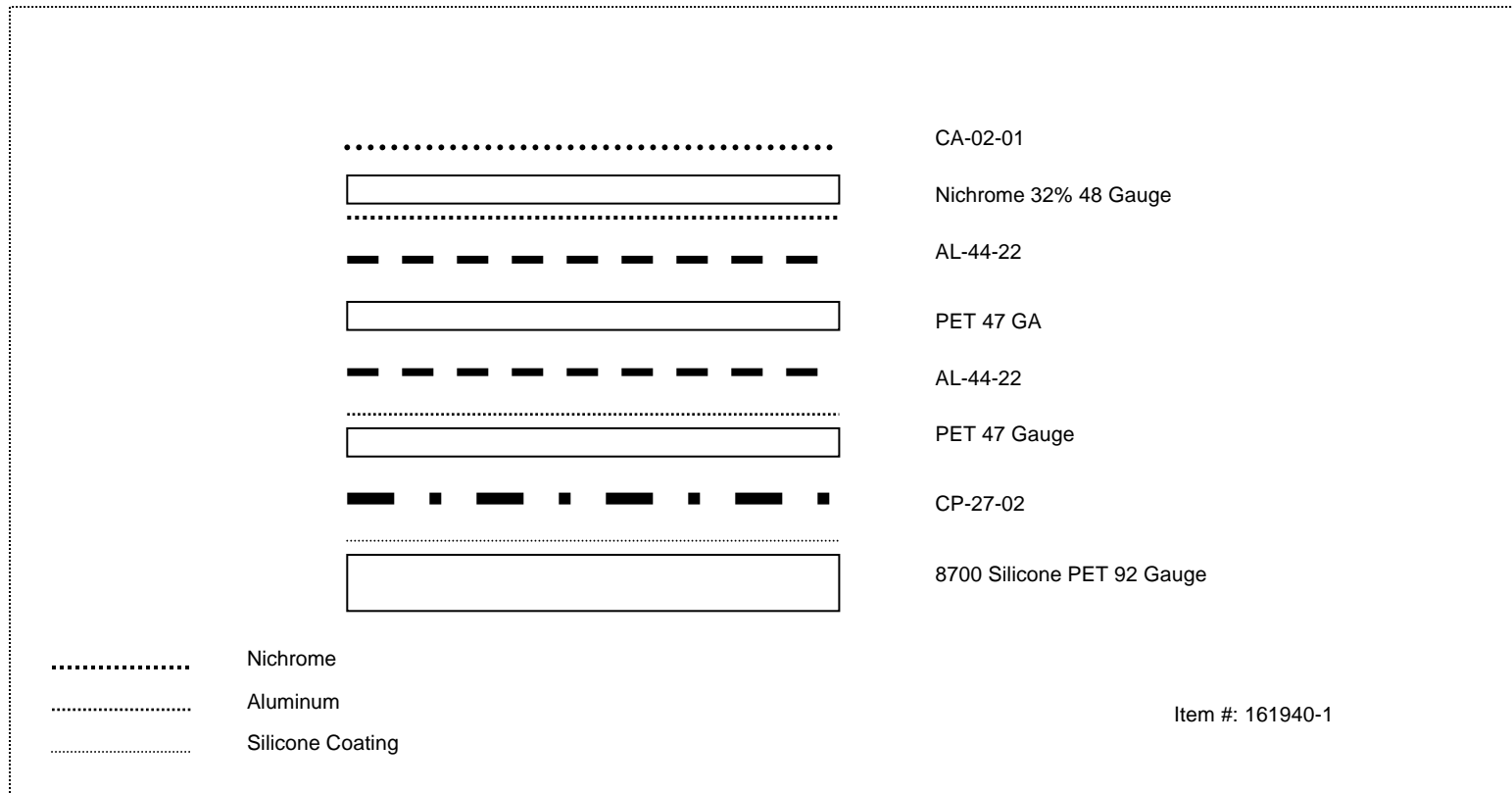
Don't you just put glue on Saran Wrap®?



Not Exactly

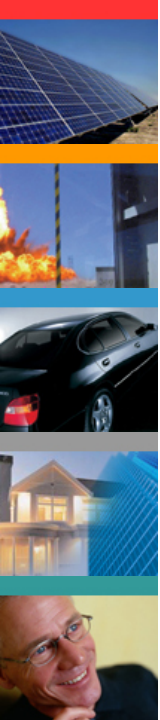


Typical Product Construction
11 separate layers



Window Film Components

- Polyester Film (PET) Clear **Polyethylene terephthalate**
- Solution Dyed PET
- Extrusion Dyed PET
- Vacuum Metalized PET
- Sputtered PET
- Laminating Adhesives (Clear, Dyed, Pigmented)
- Scratch Resistant Coatings
- Mounting Adhesives
- Silicone Coated Release Liners



Scratch Resistant Coating

UV Cured Acrylic Coating

Benefits:

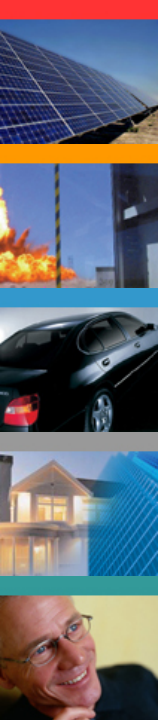
Extremely Hard (Scratch resistant)

Exceptional Clarity

Flexible at low coat weights (2-4 μm)

Almost unlimited chemical resistance

Allows cleaning with most common household cleaners



PET Polyethylene terephthalate (clear polyester)

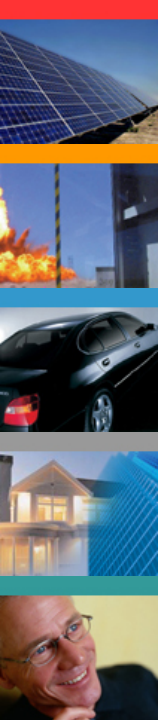
High Clarity (<1% Haze)

Extremely Strong

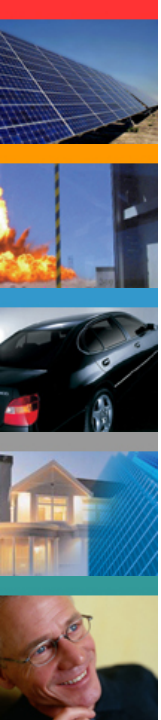
Safety Film PET's tensile strength up to
36,000 PSI

Good dimensional stability

Good chemical resistance



Color



Solution Dyed PET

Dyed via a pass through a chemical bath



Benefits:

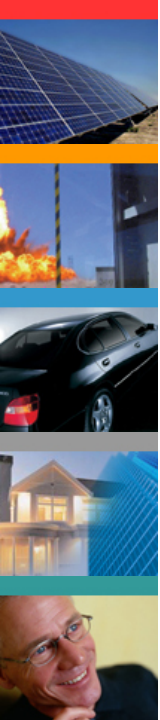
Cost Effective

Heat Shapeable

Limitations:

Longevity

Dye only penetrates outer surface



Extrusion Dyed PET



Benefits:

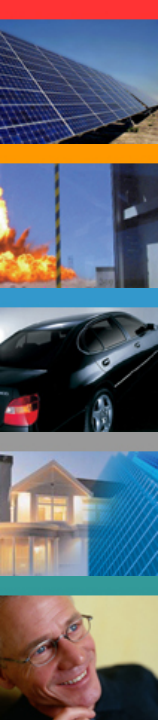
Longevity

Color consistency

Dye Concentration

Limitations:

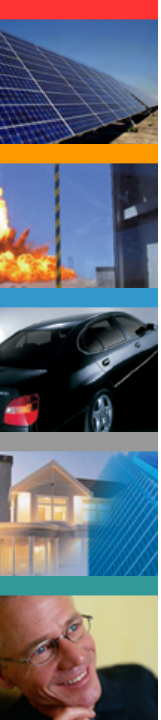
Color availability (Limited variety)



Other Methods to Impart Color

Dyed Laminating Adhesive

Nano-Pigmentation



Dyed Laminating Adhesive

Benefits:

Wide color selection

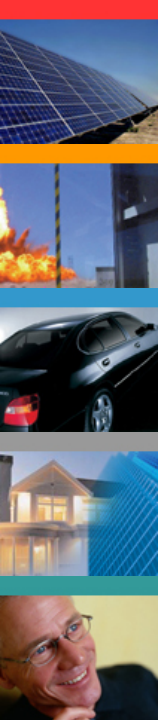
Excellent density control

Economical

Limitations:

Longevity

Concentration





Nano-Pigmentation

Nano simply means one billionth!

“Nano-Technology” widely used marketing phrase.
Used any time fine particles used in chemistry

Madico has used this technology for years!

Nano-Pigmentation

Benefits:

Longevity, virtually fade-free

Can color-match most colors

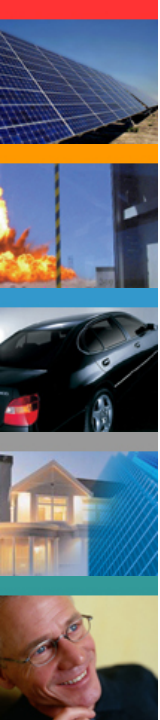
Color consistency

Density control

Limitations:

Cost

Available base colors





Sputtered vs. Vacuum Metalized

Vacuum Metalized

Molecular Level

Sputtered

Atomic Level



Vacuum Metalized PET

Benefits:

Aluminum Deposited on molecular level

Least expensive deposition method

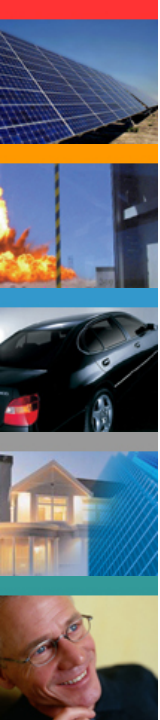
Greater density control

Product consistency

Limitations:

Metal Choices

Highly reflective



Sputtered PET

Benefits:

Aluminum Deposited on atomic level

Variety of metals

Multiple metals per pass

Low reflectivity

Limitations:

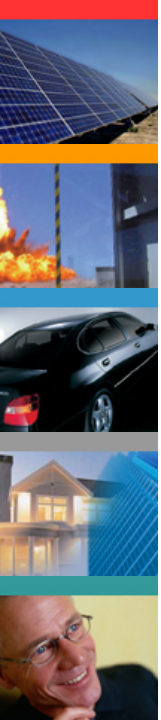
Cost

Low MVTR



Mounting Adhesives

“C” & “X”



“C”

Benefits/properties:

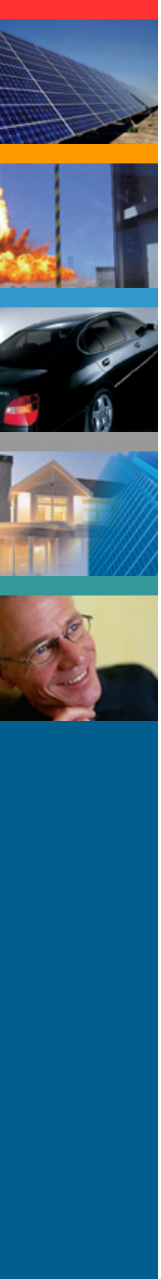
Water Activated

Permanent

Clarity

Limitations

Removeability



“X”

Benefits/Properties:

Pressure Sensitive Adhesive

Installability, more forgiving

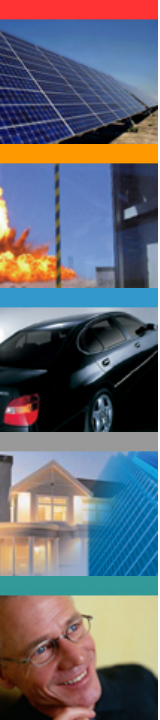
Energy absorbing (Safety considerations)

Infinitely removeable

Limitations:

Not Permanent (removeable)

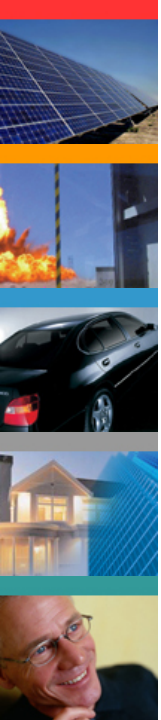
Heavy coating



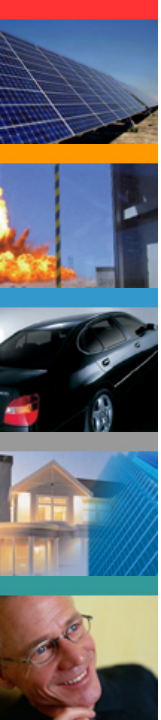
Silicone Release Liner

Silicone coated PET

Used to protect adhesive until installed



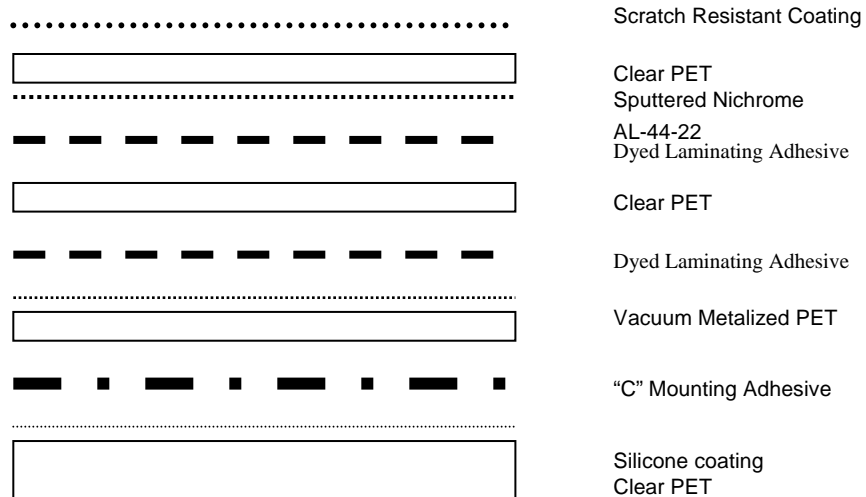
What does all this mean?



We don't just glue saran wrap

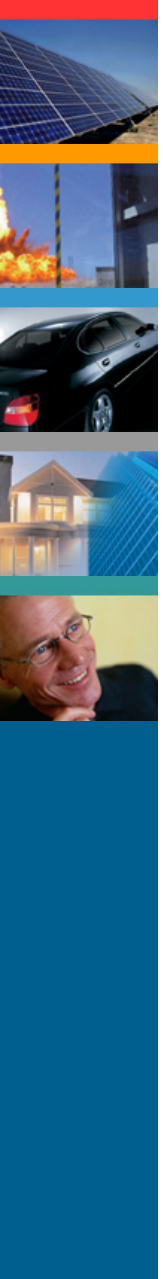
Product Construction

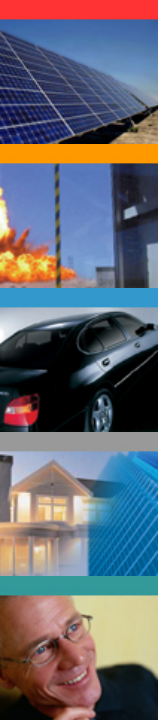
SL-180-CSR



- Nichrome
- Aluminum
- Silicone Coating

Item #: 161940-1

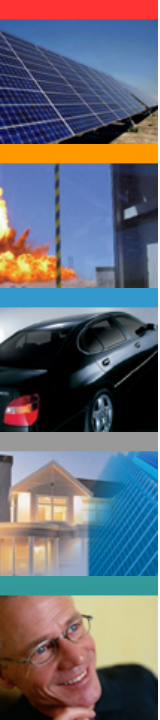




The construction shown actually
has 4 additional adhesion
promotion coatings not shown.

15 individual layers!

What determines what films can be used on dual-pane glass? What films can be used on laminated glass?



- Why are Madico films better than the competition? What makes them better?
 - Best raw materials
 - Clearer PET
 - Proprietary adhesive technology
 - Years of manufacturing experience
 - Highly trained workforce
 - Six sigma and ISO 9001:2000
 - Nano pigmentation
 - More Industry firsts (SR coat for example)
 - Products made for global market in USA (Woburn)

