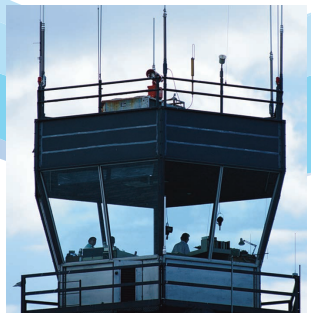
# Security

*Polymers, both transparent and opaque, are used in the construction of armor to protect people from physical assault, bullets and bomb blast attacks. In some cases, multiple layers of plastics and/or glass may be used.*

## Applications

- Bank windows
- Convenience store/gas station cashier glazing
- Courtroom/judge's bench shields
- Embassy windows
- Military/police face shields
- Military vehicle windows
- Prison/detention center glazing
- Riot shields
- VIP vehicle windows
- Weather rated windows (flying debris resistant)
- Security entryways
- Armored car construction



## Advantages May Include

- Optical transparency
- Impact resistance at high strain rates
- Lightweight for easy installation
- Easy to fabricate (drill holes, polish, etc.)
- Easy to laminate with multiple materials
- Ease of application and replacement

## Materials

- Acrylic (PMMA)
- Ionomer
- Kevlar® aramide fiber reinforced thermoplastics
- Polycarbonate (PC)
- Reinforced thermoset laminate shielding

## Did you know?

The window laminate that protects the President's limousine can withstand a 50 caliber bullet. New building codes require security-type laminated windows in areas prone to tornadoes and hurricanes. The plastic laminate structure works by converting kinetic energy into heat energy, allowing it to bend without shattering.

## Environmental and Safety

Considering the total carbon footprint, including costs of raw materials, manufacture, transport, fabricate, install, maintain, plastics compare favorably with more traditional materials. Also, plastics are safer to handle and install. When you consider that most plastics are readily recyclable, they can become the most environmentally responsible and safest choice for many demanding security applications.

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