



2018

# ROOFING SYSTEMS

Guide To Commercial Roofing Systems: Pros and Cons



# Guide To Commercial Roofing Systems: Pros and Cons

---

With all the different types of commercial roofing systems available today, how do you decide which is the best for your building?

Your roof is a significant investment and your property's first line of defense against the elements. Installing a new roof or managing the one you have is not something to take lightly. It's important to think about your unique building, priorities, usage, goals, and finances as you weigh your options with your roofing professional. Each system has its pros and cons but, fortunately, mostly pros — roofing systems have come a long way.

**This overview of today's most popular commercial roofing systems includes:**

- TPO
- EPDM
- PVC
- METAL
- ASPHALT
- SLATE AND TILE
- VEGETATIVE



## TPO COMMERCIAL ROOFS

**Thermoplastic Polyolefin (TPO) commercial roofs** are the most popular commercial roofs in use today. First installed in the late 1980's, a TPO commercial roof is a flexible, single-ply membrane that is either fully adhered (glued down) or mechanically attached. It's smooth, made of a polymer/filler blend (a rubber compound) and is usually white.

TPO membranes are available in several different thicknesses and some models include a fleece backing for installation over abrasive surfaces. TPO technology continues to improve — some new TPO systems are warranted for up to 35 years.

### The Pros

TPO commercial roofs are reflective so they keep your building cooler during the summer, which can decrease your energy use and carbon emissions. The flexible quality allows it to be easily shaped around the details of any roof the roof and to maintain its integrity during building movement. Other benefits include:

- Easy to install
- Non-toxic

**During installation, membranes are heat-welded together at an extremely high temperature to create a fused seam. Fused seams are up to six times stronger than glued seams.**

- Economical
- Sustainable (membranes can be recycled)
- Long-lasting performance

During installation, membranes are heat-welded together at an extremely high temperature to create a fused seam. Fused seams are up to six times stronger than glued seams yet also flexible, which contributes to their longer-lasting performance.

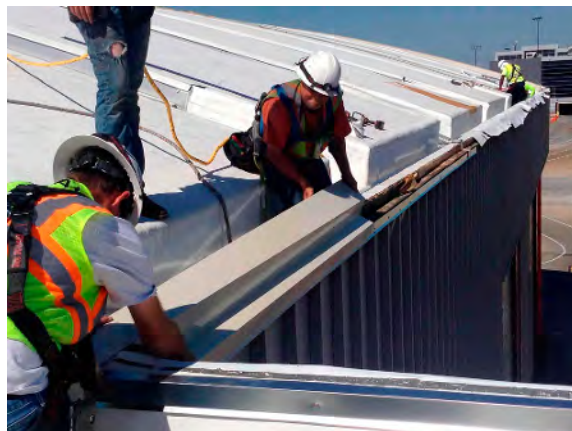
## The Cons

Since it's a single-ply membrane, TPO is more vulnerable to punctures and abuse from rooftop activity, which puts the underlying layers at risk. Inexpensive TPO can be especially vulnerable. If there's a puncture in an area where water ponds, you could experience a severe leak into your property.

However, newer, improved materials, such as thicker membranes and specialized work pads, alleviate a lot of the drawbacks.

## Warranties

New TPO roofs have 10, 15, 20, 25 and 30-year warranty configurations.



# EPDM COMMERCIAL ROOFS

**Ethylene Propylene Diene Terpolymer (EPDM) commercial roofs** are highly resilient and popular for low-slope roofs, although they're being installed less frequently lately. They're made of a durable synthetic rubber membrane that typically consists of two main ingredients — ethylene and propylene. The membrane is either black or white, available in different thicknesses, and comes in widths ranging from ten to 50 feet.

An EPDM system may be fully adhered (glued), attached mechanically, or ballasted (held in place by gravel or another heavy material). The seams are sealed with a liquid adhesive or specialty tape.

## The Pros

EPDM is resilient — these systems can last 30 years when properly installed and maintained. They are also:

- Available in ultra-wide sheets
- Resistant to thermal shock — effective in most climates
- Resistant to hail damage
- Ability to withstand damage from UV radiation
- Adaptive to structural movement
- Can be recycled when re-roofing

## The Cons

EPDM roofing systems require clean, dry conditions to properly seal the seams or they may leak, and they should not be installed over asphalt-based materials containing petroleum to prevent exposure of the rubber membrane to solvents. Other chemical reactions between materials and adhesives can result in blistering from insufficient adhesive curing. Black EPDM roofs also absorb heat.

## Warranties

Warranty options for EPDM roofing systems range from 10 to 30 years depending on the thickness of materials used and the methods used for the flashing details. You can also purchase riders covering high wind, hail, and punctures.

**An EPDM system may be fully adhered (glued), attached mechanically, or ballasted (held in place by gravel or another heavy material). The seams are sealed with a liquid adhesive or specialty tape.**

**PVC roofs are excellent at resisting rooftop chemicals, oils, greases, and industrial byproducts – this is their most distinguishing feature when compared to other single-ply commercial roofing systems.**

## PVC COMMERCIAL ROOFS

**PVC (polyvinyl chloride) commercial roofs** are the original heat-welded single-ply roofing systems — they've been around for more than 50 years. They're durable, flexible, and either fully adhered or mechanically fastened. PVC roofs are excellent at resisting rooftop chemicals, oils, greases, and industrial byproducts — this is their most distinguishing feature when compared to other single-ply commercial roofing systems.

### The Pros

For buildings like restaurants with grease traps on the roof, PVC is preferred choice. PVC is also:

- Long-lasting — up to 35 years or longer
- Dimensionally stable
- Fire resistant
- Fungi and bacteria resistant
- Available in custom colors

PVC roofs are also highly reflective and recyclable, and can be easily cleaned when needed.

### The Cons

PVC roofs don't do as well with heat aging as newer TPO formulations. They are incompatible with asphalt so if all asphalt products are not completely removed when re-roofing you must install a separator sheet to prevent premature aging.

### Warranties

Five to 30-year warranties are available, as are warranties for high wind and hail.





# METAL COMMERCIAL ROOFS

**Metal commercial roofs** are insulating, attractive, and can be very durable. They're made from a variety of metals — including galvanized steel (the most popular), aluminum, zinc, copper, and stainless steel — either alone or in combination, and are covered with a coating to protect against the sun, weather, and corrosion.

The existing roof slope along with the roof penetrations and architectural features impact metal roof design options. Metal roofs generally require a minimum 1" in 12" fall to adequately perform well. They can be installed over a continuous substrate (architectural panel) or open framing (structural panel). Roof insulation can be added directly below the roof panels or in attic space to provide thermal resistance.

Light gauge metal framing packages are available to transform an existing flat roof to a sloped substrate for a new metal roofing system.

## The Pros

Properly designed and installed metal roofing systems can last up to 50 years. When combined with substrate insulation, they easily comply with today's more stringent energy code requirements.

**Metal roofs are also better for the environment because most are made from recycled materials, which means fewer new materials were sourced to create metal commercial roofs.**

Other advantages include:

- Lower life-cycle costs
- Minimal maintenance
- Vast array of systems and finishes
- Reduced carbon footprint

Metal roofs are also easy on the environment because most are made from recycled materials and most metal roofs can be recycled again as well. Light-colored metal roofs reflect heat.

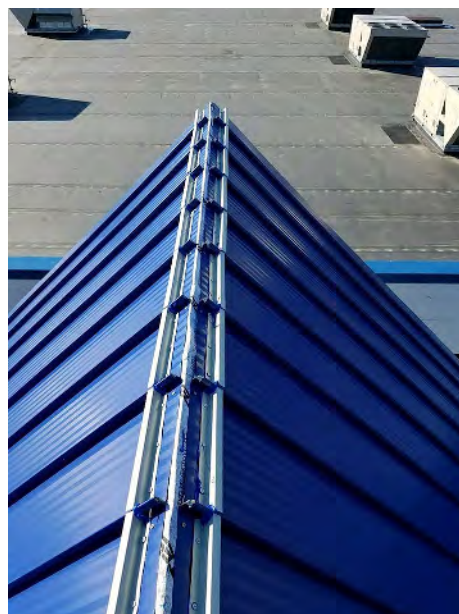
## The Cons

Problems usually relate to the combination of materials and design or the quality of the installation. Temperatures fluctuations can lead to oil canning, or bending, over time with certain panel widths. And if a metal roof includes a fastener system that's exposed, you could start seeing some leaks in just seven to ten years. However, good planning and a willingness to add to the complexity of the installation can prevent these problems and others.

It's also more difficult to walk on a metal roof and can be more dangerous — metal roof can be slippery. If your roof has a lot of equipment or penetrations like vents and skylights, it may not be a good candidate for a metal roof.

## Warranties

Metal roofing systems can be warranted from five to 30 years and cover materials including panels, underlayment, and even paint finish.





# ASPHALT COMMERCIAL ROOFS

**Asphalt commercial roofs** have been popular historically because they work well and are very durable. Typically used on low-slope structures, asphalt roofs consist of several layers — a weather-proofing layer, one or more reinforcement layers, and a protective surface layer.

Asphalt commercial roofs fit two broad categories:

- **Built-Up Roofing (BUR)** – Layers can include a vapor retarder, insulation, membrane (made of layered components adhered and waterproofed with asphalt) and surfacing material, all assembled at the job site.
- **Modified Bitumen Systems (MBS)** – A modified polymer adds strength to the system, which is assembled at the factory and can be installed in a single ply or in multiple plies similar to BUR. The MBS product often has a factory applied surfacing.

Other options for asphalt commercial roofs include integrating materials such as asphalt and gravel surfacing, fiberglass, aluminum, copper, minerals, and different grades of bitumen.

## The Pros

Asphalt roofing systems provide exceptional performance and are known for being a moderate-cost but durable option. They also offer:

- Multi-layer protection
- UV and fire protection
- Uplift protection
- Easy maintenance
- Many options and materials to choose from

Both categories of asphalt roofing system offer their own advantages.

BUR offers especially good water resistance by nature of its redundancy, uplift resistance, and resistance to daily wear and tear from foot traffic. Its strong insular qualities can also make your building more energy efficient. MBS offers increased

Typically used on low-slope structures, asphalt roofs consist of several layers — a weather-proofing layer, one or more reinforcement layers, and a protective surface layer.

strength and flexibility, application method options, and works well in all climates.

## The Cons

Asphalt commercial roofs aren't right for every building. Installation can be tricky to ensure proper performance, and specialized equipment and expertise are required.

BUR's are typically constructed on the roof surface with hot bitumen (asphalt) at or above 400 degrees. The crew must get the hot bitumen to the rooftop and install it at the application site before it cools. Today, cold adhesives are often used in lieu of hot asphalt, and some MBS systems use open-flame heat welding to adhere asphalt that was pre-applied at the factory.

If a roofing system requires hot asphalt or an open flame, your contractor will need to create a site-specific safety plan.

## Warranties

Warranties are available for 10 to 25 years, depending on the system, and coverage limits vary from manufacturer to manufacturer.





## SLATE AND TILE COMMERCIAL ROOFS

**Slate and tile commercial roofs** are often considered the best available — life expectancy is up to 150 years for slate and 100 years for tile.

- **Natural slate and tile** – Slate shingles are quarried from mines and clay tiles are fired, as with earthenware. Traditional slate comes in many varieties of colors, thicknesses, and grains. Clay tiles vary in finishes and color, with classic terracotta red being the most popular.
- **Synthetic materials** – Synthetic materials look, install and perform as natural materials but cost less. They also last about half as long (50 years). Synthetic (faux) slate shingles are made from composite materials (plastic or rubber) so they don't break easily, and synthetic tiles and faux cedar shakes are made from concrete or a polymer composite.

Shingles and tiles are hung in rows using nails attached to a framework underneath. The shingles overlap each other which hides the nails and allows rainwater to flow over the top.

### The Pros

Slate and tile roofing systems have worked well for more than 4,500 years and provide excellent value even though they're expensive to install. The materials are also sustainable. Other



**Slate shingles are fragile during installation and installers must be able to drive nails down to 1/8 inch above the shingle but no further.**

benefits include:

- High-performing, even during natural disasters
- Low maintenance
- Energy efficient — some shingles are Energy Star rated and can earn LEED points
- Fire and pest resistant
- Can be cleaned and reused
- Recyclable — some clay tiles are made with recycled post-industrial materials
- Can increase curb appeal and property value

## The Cons

Slate shingles are fragile during installation and installers must be able to drive nails down to 1/8 inch above the shingle but no further. If a shingle is hit with a hammer, the hairline crack that results will cause the shingle to fall apart within a few years.

Artistic skill is also needed to create a shingle pattern that looks random and natural. Other cons include:

- Cost (initially)
- Finding experienced installation specialists
- Takes longer to repair and replace the roof
- Technician access for maintenance duties can be challenging
- Cracked shingles when walk boards or specialized rigging is not used when servicing the building

Crews also need to know how to install Heritage copper guttering systems, a 1/2 round gutter system that works in conjunction with slate and tile roofs and last just as long.

## Warranties

Warranties for slate and tile roofs are usually 50, 75, or even 100 years. Sometimes a labor warranty of 20 years or lifetime labor is included as well. Most synthetic slate roofs and concrete tile roofs have 50-year warranties.

# VEGETATIVE COMMERCIAL ROOFS

**Vegetative commercial roofs** have a living vegetative (plant) layer on top of a conventional flat or sloping roof. A vegetative roofing system also includes components like filters, a drainage system, and sometimes an irrigation system.

Modular systems include pre-planted trays that can be moved. Built-in-place systems are installed directly on the roof and can be lightweight or as heavy as 80-150 pounds per square foot, depending on the soil depth and types of plantings.

## The Pros

- Increased energy efficiency — plants keep roofs cooler in summer and warmer in winter
- Higher R-value (thermal resistance)
- Improved storm water management
- Protects roof membrane so membrane last longer
- Reduces airborne contaminants and urban heat island
- Adds visual interest

## The Cons

- Can cost twice as much to install
- Landscaping-type maintenance may be required
- Can be hard to find roof leaks under built-in-place systems
- Can lead to unwanted wildlife and insects
- Can be heavy

## Warranties

Warranties for vegetative roofs vary greatly, with single-source warranty will typically include the cost of removing the plantings to find the source of a roof leak.

**A vegetative roofing system also includes components like filters, a drainage system, and sometimes an irrigation system.**



# THE BEST ROOF FOR YOUR PROPERTY

**Whether it's a single-ply roof on an industrial building, a slate roof on a historic church, or anything in between, understanding your existing roof and your options for re-roofing is the place to start.**

An informed decision is best

Sentry Roof Services believes your roof is an asset that should be managed like your other business assets. Choosing the best roofing system for your needs and having it installed by an experienced contractor with skilled technicians is job one, but that's only part of the picture.

Even new roofs need regular maintenance to keep them performing at their best. A roofing technician should be present when you change or add rooftop equipment, and if you decide to renovate, add onto your building, or make other changes that could potentially impact your building envelope, an experienced roofing contractor can provide valuable insight.

If you have any questions about commercial roofing systems, please contact Sentry Roof Services at 687-301-5555 or [info@sentryroof.com](mailto:info@sentryroof.com). We have 35 years of experience, work on some of metro Atlanta's most notable properties, and are proud to have customer relationships that span decades.

**Please visit [sentryroof.com](http://sentryroof.com) or our blog for more information.**

©Sentry Roof Services, LLC, all copyrights reserved

©Photos: Cover: *Solace on Peachtree*; page 3: *Bass Lofts*; pages 4: *Concourse E at Hartfield-Jackson Atlanta International Airport*; page 6: *Riverdale Town Centre*; page 7: *Marietta High School*; page 8: *CarMax in Tinley Park, IL*; page 10: *Peachtree Presbyterian Church*; page 11: *Piedmont Driving Club*

Photo credits: Page 13: *Groffs Family Funeral Home in Lancaster, PA* (photo by Chesapeake Bay Program) and *Chicago City Hall* (Wikimedia Commons); page 14: *Air Force Space Command, Colorado* (photo by Thea Skinner)

2018



**SENTRY ROOF**  

---

**SERVICES, LLC**

**[www.sentryroof.com](http://www.sentryroof.com)**

4535 S. Berkeley Lake Rd. NW,  
Norcross, GA 30071  
(678) 301-5555