



TPO INTERNAL ULTRAPLY

Technical Guidelines

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ROOFING SYSTEMS

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2 Roofing systems

In this chapter, we present the Firestone UltraPly™ TPO roofing systems, including a brief description of each system with its main characteristics and advantages.

To avoid all misunderstandings, in this document we define 'roofing system' as a roof build-up with a specific method of membrane attachment. Roofing projects where the membrane is attached using a combination of methods are therefore, in this context, considered as 'hybrid roofing systems'.

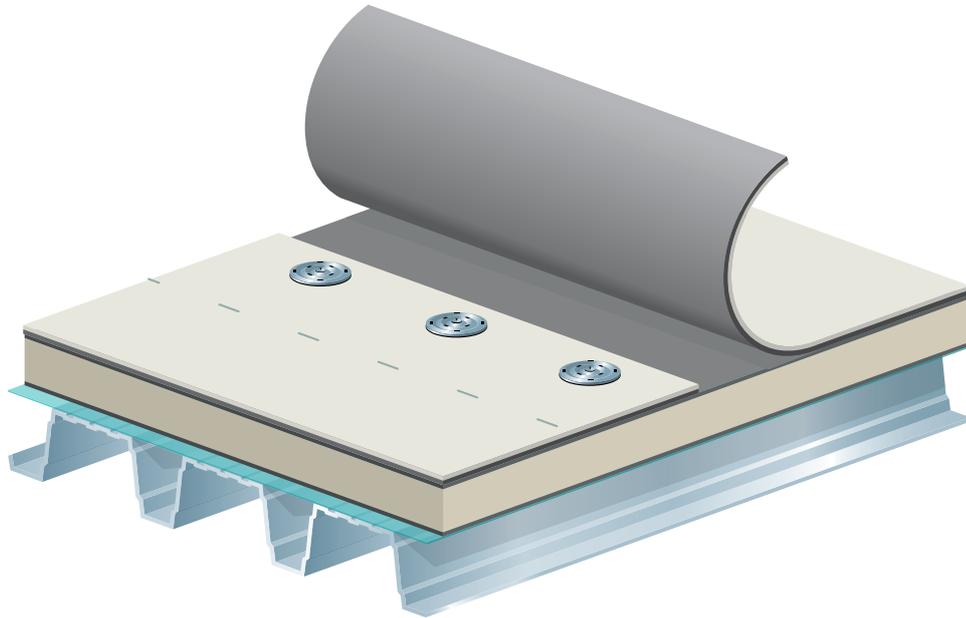
For this reason, green roofs and roofs covered with photovoltaic installations are not identified here as 'roofing systems' but need to be considered as 'roof applications'. These type of applications are usually installed using a fully adhered UltraPly™ TPO roofing system.

In the following pages you will find a brief description of the following roofing systems:

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2.1 UltraPly™ TPO mechanically fastened system



The UltraPly™ TPO mechanically fastened system is a lightweight system that is commonly used on buildings where the deck is suitable for mechanical attachment.

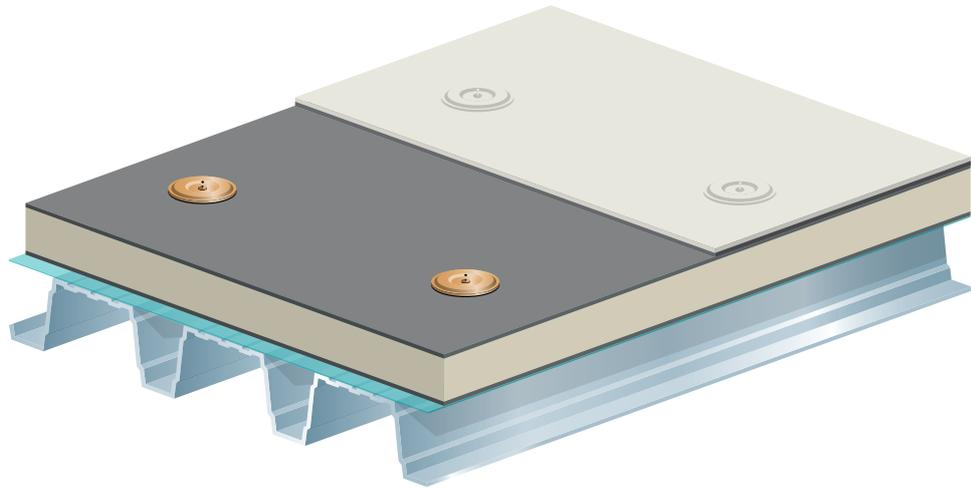
Prior to selecting this system, the specifier should determine whether the roof deck will provide sufficient pullout resistance for the fastening system.

The width of the UltraPly™ TPO panels is determined by wind uplift requirements. Membrane panels are mechanically attached with plates and fasteners that are installed in the overlaps of adjoining sheets. Adjoining panels should overlap a minimum of 120 to 150 mm at seams with mechanical fixings (side laps) and 75 mm at seams without mechanical fixings (end laps). The seams are heat welded to form a continuous, watertight membrane.

System features:

- Lightweight
- Fast installation
- High wind uplift performance
- Use of TPO panels up to 2.44 m
- Adaptable to unusual roof configurations
- Economical and efficient

2.2 UltraPly™ TPO induction welding system



The UltraPly™ TPO induction welding system is a variation of the conventional mechanically fastened system. It is commonly used on buildings where the deck is suitable for mechanical attachment and where the application of a mechanically attached system is not practical due to high wind uplift requirements.

Prior to selecting this system, the specifier should determine whether the roof deck will provide sufficient pullout resistance for the fastening system and evaluate the compatibility of the roof substrate.

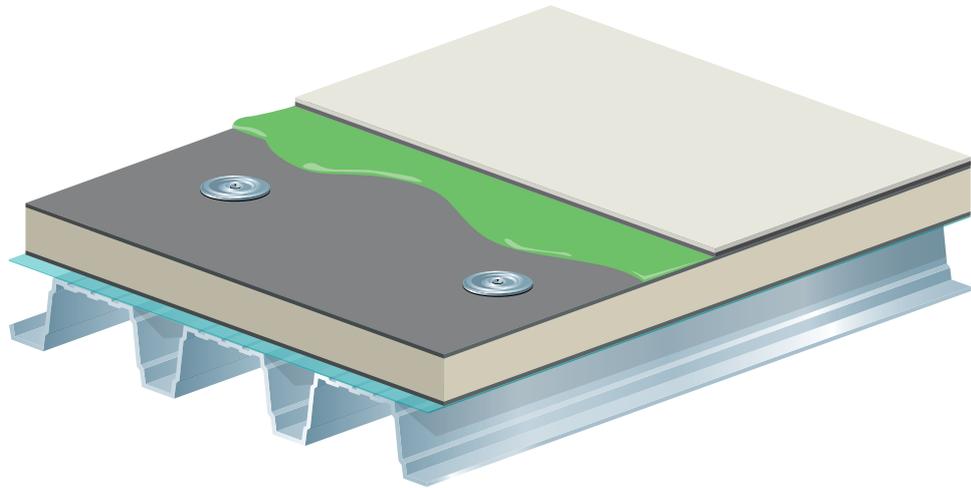
The system typically applies 3.05 m wide UltraPly™ TPO panels which are loosely laid over an acceptable substrate. Membrane panels are welded on a grid of TPO induction welding plates that are positioned in a symmetrical way over the roof to anchor underlying layers of cover board and/or insulation to the deck. The grid is determined by wind uplift requirements. Adjoining sheets should overlap a minimum of 75 mm at side and end laps. Seams are heat welded to form a continuous, watertight membrane.

System features:

- Lightweight
- High wind uplift performance
- Fast installation
- Optimum use of panels up to 3.05 m
- Design flexibility
- Aesthetics
- Insulation and membrane are attached using common fastening system



2.3 Ultraply™ TPO fully adhered system



The Ultraply™ TPO fully adhered system is a lightweight system with outstanding design flexibility. It is suitable for roofs that are designed with a need for aesthetics, roofs with irregular shape, contoured roofs and any roof with limited load bearing capacity, provided the substrate is compatible with adhesive. It is the preferred system for green roofs, parking decks and roofs with photovoltaic installations.

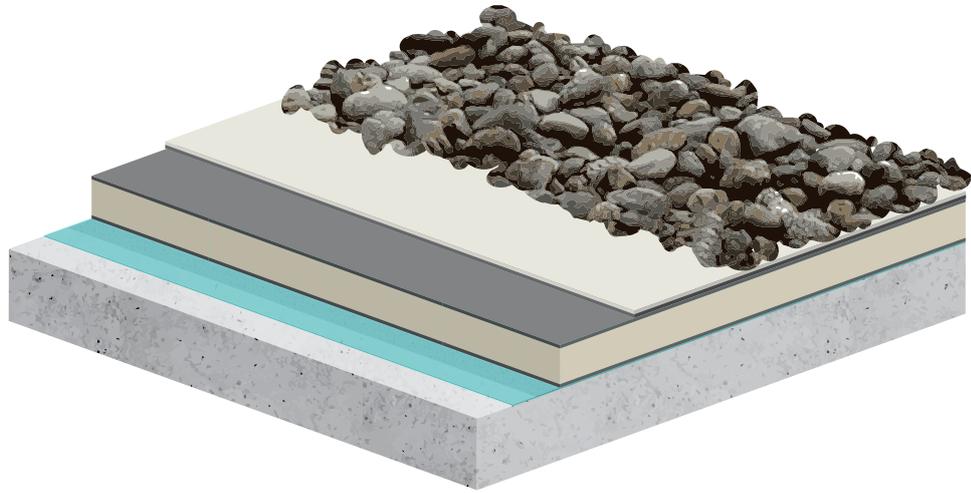
Prior to selecting this system, the specifier should determine whether the roof deck will provide sufficient pullout resistance for the fastening system and evaluate the substrate conditions.

The system typically applies up to 3.05 m wide Ultraply™ TPO panels which are fully adhered to an acceptable substrate using Firestone TPO Bonding Adhesive or BA-2012 Bonding Adhesive. Adjoining sheets should overlap a minimum of 75 mm at side and end laps. Seams are heat welded to form a continuous, watertight membrane.

System features:

- Lightweight
- EnviroReady (suitable for green roofs and photovoltaic installations)
- Aesthetics
- Applicable on any slope and adaptable to unusual roof configurations
- Use of TPO panels up to 3.05 m
- High wind uplift performance

2.4 UltraPly™ TPO ballasted system



The UltraPly™ TPO ballasted system is an economical roofing system that is suitable for a wide variety of buildings where the deck and substructure provides a sufficient load bearing capacity.

Prior to selecting this system, the specifier should evaluate the structural conditions of the building, including the roof slope. Rough substrates need to be isolated with an acceptable protective layer.

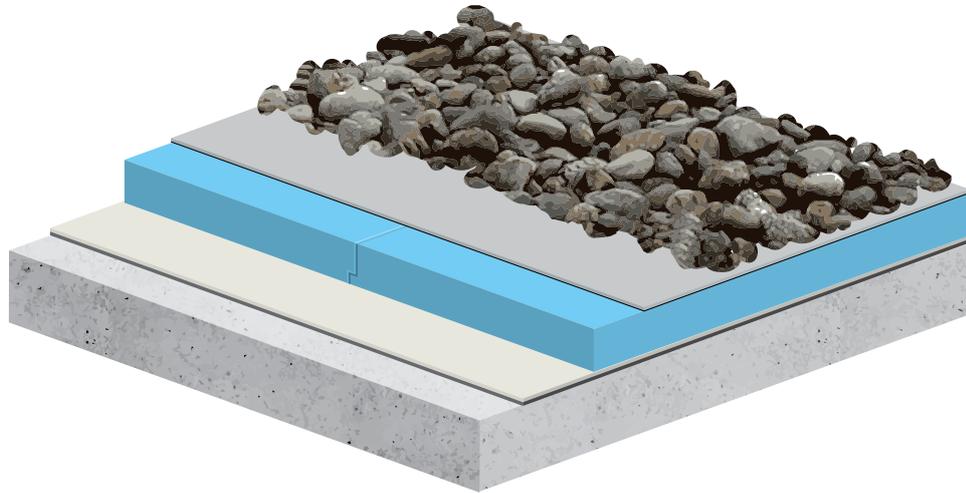
UltraPly™ TPO sheets are loosely laid over an acceptable substrate with adjoining panels overlapping a minimum of 75 mm at side and end laps. Once seams are heat welded and roof perimeters and penetrations are flashed in, the UltraPly™ TPO membranes are held in place using ballast with a minimum weight of 50 kg/m². Always refer to local codes and use one of the following materials as ballast:

- Gravel, in the form of round, smooth, river washed aggregate without broken pieces and of adequate size (nominal 16 to 32 mm)
- Concrete pavers (min. 50 mm thick) with smooth trowel finish
- Crushed gravel that must be graduated. The larger the gravel, the higher the weight
- Poured in-situ concrete

System features:

- Large choice of compatible substrates
- Optimum use of large TPO panels up to 3.05 m
- Excellent fire rating
- Fast installation
- Additional weathering resistance

2.5 Ultraply™ TPO inverted system



The Ultraply™ TPO inverted system is a variation of the conventional ballasted system. It is suitable for projects with regular traffic and for roofs that are vulnerable for internal condensation.

Prior to selecting this system, the specifier should evaluate the structural conditions of the building, including the roof slope. Rough substrates need to be isolated with an acceptable protective layer.

Ultraply™ TPO sheets are loosely laid over an acceptable substrate with adjoining panels overlapping a minimum of 75 mm at side and end laps. Once seams are heat welded and roof perimeters and penetrations are flashed in, the Ultraply™ TPO membranes are covered with a layer of extruded polystyrene (XPS). A protective mat is then installed over the insulation and the total roof system is held in place using ballast with a minimum weight of 50 kg/m². Always refer to local codes and use one of the following materials as ballast:

- Gravel, in the form of round, smooth, river washed aggregate without broken pieces and of adequate size (nominal 16 to 32 mm)
- Concrete pavers (min. 50 mm thick) with smooth trowel finish
- Crushed gravel that must be graduated. The larger the gravel, the higher the weight

System features:

- Fast installation
- Use of large TPO panels up to 3.05 m
- Few seams
- Large choice of compatible substrates
- Low installation cost
- Extra durability
- Superb weathering resistance
- Flexibility for upgrading of insulation in re-roofing

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