This installation guide presents guidelines for installing Sapphire Metal Tile Roofing. These panels are manufactured from 26 gauge steel, coated with a Galvanized substrate, primer, and finally a high quality baked on enamel Kynar 500® paint system.

These panels are cut to your specified lengths, from 33-7/8" to 20' long.

Application, range and conditions of use.

Sapphire metal tile roofing is most commonly used in residential applications, although it also lend themselves to light commercial projects, providing an authentic Spanish tile look with the strength of steel.

Sapphire panels require a minimum 3:12 slope for proper rain runoff.
Application and installation method of Sapphire panels as mentioned above should comply with technical design of the building developed pursuant to valid standards and technical-building regulations and recommendations resulting from this instruction manual.

### Transportation and storage

The transportation of roofing panels should be carried out using special delivery truck with open platform to facilitate loading and unloading. The sheets should not protrude from the vehicle contour because of risk of sheets damage and in consequence guarantee loss. During transportation sheets should be secured against displacements and getting wet.

Unloading should be carried out using special equipment or by a suitable number of people, i.e. at sheet length of 20 linear feet there should be 6 people or 3 people on each side. It is forbidden to shift one sheet on the other or pulling it on the ground. In case of any scratches or friction traces on the sheet, it is necessary to clean immediately the damaged place and then to coat it with a touch up paint.

Unloading sheets in original packaging with mechanical devices such as lift trucks is the most suitable. Special attention should be paid when unloading in winter and storing in heated warehouses. Sheets should be stored in dry and airy rooms. The packages are not to be put directly on the ground, but on blocks about 8" high. Sheets for longer storage should be inspected and then individual sheets separated by spacers to provide free air circulation.

ATTENTION!
Sheet metal roofing tiles should be installed on the roof no later then 6 months from the manufacture date to avoid guarantee loss. The manufacturing facility shall not be liable for any damages of coating of sheets stored against this installation manual. Before assembly of sheet metal roofing tiles please check color shades.
There are two methods of installing Sapphire.

**METHOD A** - on wood battens, where no plywood decking is required.

**METHOD B** - on plywood decking or over existing shingle roof.

It is important to remember when following METHOD B, that the roof should be inspected for any trapped moisture or structural damage such as warped or loose roof decking. These areas should be repaired installing new metal panels. Also before installation please make sure that there are no nails or fasteners protruding from the plywood decking or existing shingle roof which could damage the panels and impede the installation process.

**METHOD A**
We recommend:
High steam permeability roof paper thermal insulation layer installed to the rafters, counterbattens, battens.

Low steam permeability roof paper, installed with overhang (such solution is allowable where thermal insulation is laid on the floor without counterbattens), battens.

**METHOD B**
We recommend:
Any underlayment recommended for metal roofing, including but not limited to 30 lb felt, synthetic underlayment, or ice & water shield.
1. Wooden framework:
   - counterbattens: dimensions: 1 x 2
   - battens: dimensions: 2 x 2 - 2 x 3 (depending on spacing of rafters). The wood should be impregnated, at least class 2.

2. Metal framework:
   - counterbattens and battens are most often made of steel, zinc plated thin-walled shapes of thickness more than 0.7 mm (.028) with channel, z, or hat cross-section

The counterbattens are used for fastening of roof foil (PCF) to rafters. Roofing sheets are fastened directly to battens.

**ATTENTION!** The distance between battens depend on lateral overpress imitating tile (fig. 2), with the exception of the distance between 1st and 2nd batten, which is determined in practice and which depends on eaves construction, roof slope, and roof gutter system.

**METHOD A - Direct backing under Sapphire - no plywood required.**

In general the batten No. 1 must be higher than other battens, because the roofing sheet supported in this place is of a higher overpress.

In case of sheet fastening before overdress, the first batten remains the same as the other battens.

The use of counter battens guarantees air space by which water vapour (moisture) is carried away from the inside of the object, which is necessary for the proper functioning of the metal roofing.

The size of gap at the eaves and at the roof ridge (upper space above PCF) should be min. 200 cm²/rm
Due to broad use of PCF of low steam permeability, Fig. 3 presents the roof design at the eaves and at the roof ridge.

The following disadvantages of designs with the use of PCF of low steam permeability:
- decrease of insulating power of thermal insulation layer as a result of its aeration
- worse utilization of rafter height in relation to reduced insulation thickness
- necessity of using ventilation chimneys or air grates at the top of the buildings
- necessity of using the stem isolation with additional layer of aluminium foil on the “warm” side
- difficulties of creating gap at eaves.

**Fastening roof foils**

When fastening roof foils/papers (PCF) it is necessary to follow manufacturer recommendations, paying special attention to the proceedings concerning holes for roof windows and chimneys. Roof foils can be fastened to the eaves as follows:
1. Onto the gutter, where possible condensate can flow down into it.
2. Under the gutter, where possible condensate can flow down under it, but snow or ice caps will not choke the air gap at the eaves.

**ATTENTION!** Roof foils should be glued to the flashing with double sided adhesive tape, so it will not be pulled by the wind.
Regardless of installation methods of thermal insulation layers, steam-proof foil should be fastened from the "warm" side, while its joints should be glued by self-adhesive tapes. In principle, that steam-proof polyethylene (PE) foils should be used with PCF with high steam permeability, however, foil with additional metal (Al) layer be used as steam insulation should with PCF with low steam permeability.

### Installation of Sapphire – Fig. 6.

Before installation work it is necessary to check roof geometry. In case of rectangular roof slope it is necessary to measure diagonals, which should be equal. All errors of roof slope should be localized on base of roof side edges and roof ridge, because these places will later be covered by flashing.

Eaves line is always the base of sheet metal roofing tiles installation.

Special care should be taken during backing installation concerning mainly battens. They must be installed (using zinc plated screw nails) in parallel to the eaves with equal spacing.

Installing from left to right is more convenient (if the sheets have capillary groove on the left side). Then, after preliminary installation of the first sheet, the next sheet is put under the previous one and its position is checked in relation to the eaves.

The ideal connection is made on lengthwise overlap and on overpresses imitating tile shape.

After preliminary installation of the next sheet, the previous one can be fastened.

The chosen method depends mostly on rafter framing and the choice of roofing installers.
To secure roofing panels use wood screws provided by Best Buy Metals.

Screws should be secured in the lowest place of the tile wave by driller with continuous power regulation. The estimated screw consumption is 70-80 pcs / SQ of the roof slope and depends on the quantity of flashings.

Sheet metals are to be secured on each wave in places:
- at eaves,
- at roof ridge,
- at lengthwise overlap
- at roof side edges
- on valley gutter.

**ATTENTION!** The roofing sheets in around chimneys and skylights should be longer at minimum by one overpress imitating tile.

All errors of roof slope are to be eliminated by flashing of all roof edges.

### 5.3. Making flashings.

Fig. 7 shows typical flashings made of the same grade, color, and coat type roofing sheets. Flashings are also made of flat sheet metals directly on the building site by roofing installers.

**ATTENTION!** Do not use any flashings (including chimney caps, gutter gargoyles etc.) made of copper plates on roofs covered with zinc plated or lacquered sheets.

The flashings should fulfill two basic functions:
1. assure the coverage tightness on breaks and edges of roof surface,
2. assure the coverage aesthetics by covering mistakes made by previous building teams.

### 5.3.1. Flashing – fig. 5 and 5a.

The aim of this flashing is as follows:
1. to direct rainwater to the gutter (when sheet metals are laid on the belt and finish before their edge)
2. to direct condensate flowing down PCF laying on belt to the gutters
3. to cover the backing (counterbattens and battens)

Flashing with its edges is placed into the gutter at 1/3 of its width and is installed after installation of gutter system. After mounting of on-gutter belts, the roofing assembly may begin.

### 5.3.2. Fascia – fig. 5 and 5a.

They are decorative and protect vertical eaves boards which is used for gutter system fixing. They are to be mounted before installation of gutter system.
**Chimney flashing.** – Fig. 8 and 9.

It is especially important because incorrect construction at chimneys is the most common cause of roof leaks. Fig. 8 shows an example of flashing of chimney located at a distance of less than 1.5m (5’) from roof ridge. In such case the belt of flashing behind chimney is covered with roofing sheet.

**ATTENTION!** The sheet in this place should be longer at minimum by one overpress imitating tile to achieve connection with lateral lock on the cut sheet (behind chimney).

The side aprons of flashing should overlap beyond the whole wave crest of the roofing sheet.

Roofwork self-adhesive tapes are also used for chimney flashing. In such case chimney flashing serves only as a decoration which masks the roofwork tape.

**FIG. 8**

Example of flashing of chimney which is located at a distance of less than 1.5 m (5’) from roof ridge

**FIG. 9**

Example of flashing of chimney, which is located at a distance of more than 1.5 m (5’) from roof ridge

1 - roofwork self-adhesive tape  
2 - silicon sealing
Fenders should be installed on roof slopes inclined more than 30°, behind chimneys. They protect the back of chimney against the stream of rainwater which thus passes the chimney by.

5.3.5. Valley. – fig. 11.

They are located at the junction of the two roof slopes, at the so-called flow valley. Their task is to direct rainwater into gutter. They are mounted before assembly of roofing metals.

5.3.6. Gable Trim. – fig. 12.

Gable Trim protects and finishes the side edges of the roof. Fig. 12 shows how the gable trim is installed, with the panel then going over top of it.
Roof ridges. – fig. 13.

The ridge cap protects roof top and edges, where two roof slopes meet at salient angle.

FIG. 13  Example of Non-Vented Ridge

1 - Rounded ridge cap
2 - Taper roof ridge cap
3 - Closures to seal ridge
4 - Finishing of rounded ridge cap

FIG. 14  Example of Vented Ridge

1 - Ridge vent material
Installation of snow barriers depends on local weather conditions and experience in the surrounding houses exploitation. Depending on rain intensity and weather changes they can be installed in one row or in several rows in the distance of about 3'3" from the eaves, at the height of rafter support (rafter plate).

In case of installing of snow barriers, the increase of roof load from 20 to 40 % should be taken into account, caused by more quantity of snow in the barrier area.
ATTENTION! Roof edge flashings are subject to more wind uplift and should be fastened at a minimum spacing of 1’ 1”.

Round protrusions are sealed with EPDM metal roofing boots. These feature an aluminum base to conform to Sapphire® panels and are sealed with roof sealant and fastened with screws.

**FIG. 17**
Example of flashing of fire-proof brickwork and use of wall and fire-proof brickwork flashing

**Maintenance.**
Roofs made of tile formed roofing sheets in principle do not require special maintenance. However, it is necessary to carry out following operations:

- Removing leaves from roof surface, whose decaying causes discoloration of the organic coat of sheets
- Removing layers of industrial dust (e.g. originating from limestone processing plants, cement plants, steelworks and mines), which reacts with water and causes damages of the organic coat of sheets.
**METHOD B - Installation over existing shingle roof or on plywood decking.**

Method B is very similar to Method A with the difference of decking. In Method B, Sapphire tiles can be installed on plywood either existing shingle roof. Such solution simplifies the installation procedure. All of subsequent installation steps remain the same as in Method A.

**NEW CONSTRUCTION ON PLYWOOD DECKING**

If the sheet metal roofing tiles are installed on plywood decking, Best Buy Metals recommends to cover it with any underlayment recommended for metal roofing, such as 30 lb felt, synthetic underlayment, or ice & water shield.

It is recommended that valleys have 36" wide self-adhesive underlayment on both sides as additional protection. The recommended minimum pitch for Sapphire panels is 3:12.

**SAPPHIRE PANELS OVER EXISTING SHINGLE ROOF**

Sapphire panels can be installed directly over existing shingle roofs. However, complete inspection of existing roofing deck needs to be done prior to installing new metal panels. Also at least 3 rows of shingles should be removed in order to check for the water damage. If there is any damaged plywood, it needs to be replaced and covered with a metal roofing underlayment.
Final notes

1. For cutting sheets use shears, nibblers, or snips. Do not use tools which cause damage of the coatings as a result of heat generation, i.e. angular grinders.

2. Walk on the roof using footwear with soft soled shoes and placing feet only in the low portion of the tile. Screw down all screws before stepping on the roof.

3. Scratches during installation can be touched up with touch up paint. Surface should be cleaned from dirt and surfaces prior to touch up.

4. Steel chips, from cutting and drilling should be removed with a soft brush, to avoid damages of sheet surface when covered with rust.

5. Dirt can be removed with normal detergents.
Contact Information

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Speak to a friendly staff member who’s sole purpose is to take care of you, the customer.

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To send us drawings or lists to quote. Be sure to include your contact information, the product you are looking for, and the location the product is going.

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