Recommended Installation Procedures

IMPORTANT: DO NOT BEGIN INSTALLATION BEFORE REVIEWING PATTERN LAYOUT SHEET AT THE END OF THIS INSTALLATION GUIDE

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G.E.M. Inc. is the National Manufacturer & Distributor of Euroshield™ Rubber Roof Tile Roofing Systems manufactured in Calgary, Alberta, Canada.

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Corporate Profile

Calgary-based Global Environmental Manufacturing Inc. (GEM), founded by Henry Kamphuis in 1999, has developed innovative technology to produce competitively priced, premium quality building products using a minimum of 80% in recycled materials (e.g. recycled tires). GEM’s unique technology, insulation properties and product design is capable of producing significant energy benefits and savings. The product is competitively priced while being Ultra-environmentally friendly. GEM’s proprietary, unique Reinforced Rubber Based Compound forms the basis of all of GEM’s products.

GEM has completed research and development and is currently manufacturing and selling its rubber tile roofing system. GEM’s EuroShield™ Roof, is an interlocking, pitched roofing system using rubber-based panels. Its unique selling features include unsurpassed durability and protection against all the elements and a simple installation resulting in a reduction in labour costs of up to 50 percent. GEM’s roofing system also provides an enhanced aesthetic appeal while providing superior long lasting protection and value for money.

**THE FEATURES & BENEFITS:**

- Long Lasting Durable
- Aesthetically Pleasing
- Flexible & Versatile
- Weather Resistant
- Environmentally Friendly
- Easy to Install
- Hail Resistant
- Lightweight (4.1 lbs. per sq./ft.)
- Affordable
- Discount on Homeowners Policy
- Maintenance Free
- Keeps your house cooler in the summer, warmer in the winter
- Fire Resistant
- Increases the Value of your Home

EuroShield™ is the Most Advanced Roofing System in the Market Today.
## Components:

### Spec Data Sheets

#### Tile

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight/pc</td>
<td>11 lb.</td>
<td></td>
</tr>
<tr>
<td>Pieces/sq.</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Lb./sq.</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>36”</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>24”</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>2.7 sq./ft.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Pricing is based on 37 pcs per square.

#### Ridge Cap

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight/pc</td>
<td>3.6 lb.</td>
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</tr>
<tr>
<td>Length</td>
<td>26”</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>2 angles each 5.5”</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>12”</td>
<td></td>
</tr>
</tbody>
</table>

#### Hip Cap

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Approx.</th>
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</thead>
<tbody>
<tr>
<td>Weight/pc</td>
<td>3.8 lb.</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>24”</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>2 angles each 6”</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>12”</td>
<td></td>
</tr>
</tbody>
</table>
Left & Right Gable Caps (Rakes)

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight/pc</th>
<th>Length</th>
<th>Width</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight/pc</td>
<td>2.5 lb.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>17”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>2 angles each 5.5”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>12”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starter Strip

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight/pc</th>
<th>Length</th>
<th>Width</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight/pc</td>
<td>6.0 lb.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>36”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>13”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>1.25”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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Packaging & Handling:

Tiles

- 6 pcs per bundle
- 16 bundles per pallet
- 96 Tiles per pallet
- 2.6 square per pallet
- 1180 lbs. per pallet – Approx.
- 40 pallets per truck *
- 104 square per truck *

Ridge

- 10 pcs. per bundle
- 20 bundles per pallet
- 200 pieces per pallet
- 770 lbs. Per pallet – Approx.
**Hip**

10 pcs. per bundle
24 bundles per pallet
240 pieces per pallet
965 lbs. Per pallet – Approx.

**Left & Right Gable (Rake)**

10 pcs. per bundle
20 bundles per pallet
200 pieces per pallet
550 lbs. Per pallet – Approx.

**Starter Strip**

10 pcs. per bundle
14 bundles per pallet
140 pieces per pallet
890 lbs. Per pallet – Approx.

Note: Hip, Ridge, Gable, & Starter Strip can be ordered per job need.

* May vary with size and weight of truck.
**System Introduction:**

This manual contains the minimum acceptable requirements for the G.E.M. EuroTile™ Roofing System. Installation specifications and details are designed for slopes 4/12 or steeper. Low slope applications of 3/12 or less may warrant extra precautions, please contact us at G.E.M. to qualify your particular circumstances and conditions.

The contained information establishes a standard for the EuroTile™ System that meets or exceeds the requirements of CMHC and Alberta Building Standards. This manual also assures the homeowner of the best possible installation for the type of building ensuring the EuroTile™ system will perform for many years into the future.

Installers should familiarize themselves with the contained data and details to be comfortable in applying the EuroTile™ system to its uncompromising standard. Failure to install the EuroSlate system to these standards could cause the G.E.M. EuroShield™ Warranty to become void.

G.E.M. reserves the right to limit or cancel the sale of EuroShield™ products should construction or installation of the products not meet or exceed our standards. These recommended installation procedures may be amended as required from time to time.

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**Note:** These products are manufactured and tested to the maximum by exposing them to conditions that only exist as freak acts of nature. Installation practices and procedures may deviate and our preferred installers will install to standards that are best suited and economically viable for their area and application. Roofs that are installed by our preferred applicators to the best suited application will still carry the full Euroshield™ Warranty.

In areas where heavy snowfall is a frequent occurrence, snow guards may be required to help prevent slides from the roof surface to the ground below. If snow guards are to be used with the Euroshield™ product, they must be applied at the time of installation. It is the responsibility of the installation contractor, in conjunction with the homeowner, to determine the suitability of installing snow guards on the roof, unless specified in the local building code. GEM Inc. assumes no responsibility for the supply or install of these devices on the roof.
ROOF DECK

The roof area shall be sheathed with plywood, OSB or equivalent, minimum 10 mm (3/8”) thick satisfying the requirements of National Building Code, cut flush with fascia at both eaves and gable. Distance between support trusses or joist should not exceed 600 mm (24”). Our technical department for individual attention should qualify distances exceeding 600 mm. Sheathing shall be fastened and clipped according to local Building Code.

STRUCTURE AND LOAD REQUIREMENTS

There are no special structural changes or enhancements to make or special load requirements necessary for the G.E.M. EuroSlate Roof. The roof structure and load requirements must meet the requirements of National Building Code (or corresponding state building code where applicable).

EAVE PROTECTION

Eave protection materials must conform to National Building Code. Install protection membrane material along all eaves overhanging fascia 25 mm (1”). End laps of material are to be 150 mm (6”) and bonded together, rolled and sealed according to manufacturers’ instructions. Only film surfaced material should be used so a separation exists between the Bitumen and EuroTile™ panels.

Roof structures will sometimes fail due to the formation of ice dams. Ice dams are formed by the continuous melting and freezing of snow due to heat escaping from the house or by the backing up of frozen slush from the gutters. The melted water flows under the snow and freezes as it reaches the unheated soffit, thus creating the ice dam. When this occurs, water can be forced under the panels and into the attic, causing damage to the home’s ceilings, walls, insulation, gutters, eaves and roof.

TO REDUCE ICE DAM FORMATION AND PREVENT ICE DAM PROBLEMS;

1. Keep the attic space cold by insulating it from the warm house interior, thus reducing or eliminating snowmelt.
2. Use high heel trusses, insulate to the outside of the plates, and install cardboard baffles to ensure ventilation at the eaves.
3. Ensure that the outer edges of the gutters or eavestroughs are lower than the slope line to allow snow and ice to slide clear. Also ensure gutters are free of debris.

Reference: Canadian Mortgage and House Corporation, Roofing and Flashing Problems, publication NHA 6076.

In high snow areas with a ground snow load greater than 3.5 kPa as identified in Chapter 1 of the supplement to the National Building Code of Canada, the eaves protection must extend from the edge of the roof a minimum distance of 1700 mm (67”) up the roof to a line not less than 1100 mm (43 1/2”) inside the inner beam.
Fasten and adhere the protection material to the sheathing sufficiently to prevent wind up lift and damage with hot galvanized or coated fasteners. Valleys utilize the same materials as eaves protection. Material is applied parallel to valley centerline with half roll width on each side of the centerline and overhanging fascia and eaves 25 mm (1”). In areas with high snowfall combined with freeze thaw conditions use double roll width extending 860 mm (34”) to both sides including 100 mm (4”) lap at centreline.

![Diagram of eave protection](image)

**RE-ROOFING**

It is imperative that the existing roof and the underlying roof structure are inspected to determine whether (i) the substrate has not rotted and is of enduring quality; and (ii) the roof covering (asphalt shingles, shakes etc.) has not curled and the leading edge is securely fastened. If either of the aforementioned conditions exist, EuroTile™ should not be installed over an existing roof covering, asphalt shingles or shakes. Remove existing roof covering to ensure trusses, sheathing fascia and other components including masonry, plumbing and mechanical are in good repair to support the EuroTile™ System through its durable lifetime.

**SLOPE**

EuroTile™ was designed to be installed on roofs with a slope exceeding 3/12 as described National Building Code. Lowslope application (2/12 and 3/12) requires a full application of materials described under EAVE PROTECTION due to windblown precipitation and lack of vertical drainage slope.

Vertical wall applications are made possible through G.E.M.’s unique interlocking capability allowing for design considerations on different surfaces and mansards. The rugged stone look of EuroTile™ compliments any slope.
UNDERLAY

In standard applications whether installing on new sheathing or on existing sheathing install ice dam protection and underlay of minimum #15 standard felt paper, as described in the National Building Code (or corresponding state building code where applicable). Note that though your building codes may not require underlay on the entire roof, G.E.M.’s warranty does require it.

There are many reasons why the use of underlayment prior to applying EuroTile™ makes good roofing sense.

* Underlayment protects the wooden deck from the moisture penetration until the EuroSlate is applied, thus greatly reducing problems to structure.

* Installing underlayment helps to minimize “picture farming”, i.e. the visible outline of deck panels caused by irregularities in roof construction or trusses.

* The water resistance of underlayment provides secondary protection by helping to shield the deck from wind-driven rain.

* Underlayment offers protection to the EuroTile™ from the resins that can be released by the wood decking.

* The underlayment material should meet at least one of the following industry standards:
  a) CSA 123.3-M-No.15 / ASTM D226 Type 1 (No.15 felt)
  b) CSA A 220.1 Section 4.5.2.1

The proper application techniques recommended by the manufacturers should be followed to ensure optimum performance of underlayment. The underlayment above the eaves protection should be installed in minimum 900 mm (36”) widths, parallel to eaves lines with a minimum 100 mm (4”) head lap and 150 mm (6”) side lap. Fasten felt to roof deck with galvanized nails or staples sufficient to prevent wind lift and damage prior to EuroTile™ installation. Extend underlayment a minimum 150-mm (6”) up all walls, chimneys, skylights etc. and seal corners with G.E.M. Sealant. Underlayment must overlap valley protection 18” past centerline. Any underlayment damage must be repaired or replaced prior to EuroTile™ application. For low slope underlay requirements see manual sections on Slope and Eave Protection.
VENTILATION

The proper ventilation of the attic area is an essential factor in attaining the maximum service life available from the building materials used in the roof assembly, in addition to improving heating and cooling costs. Overlooking this consideration may result in premature failure of the roofing system due to:

1. Accelerated aging of the EuroTile™ System.
2. Rotting of the wood structure, wet insulation due to condensation.
3. Buckling of the roof deck.

In recent times, energy conservation measures have produced a situation where heat and moisture move into the attic and are retained there. Improved insulation and better weather stripping are the two major factors bringing about this effect.

To correct this problem, one needs to provide proper ventilation to ensure free and unobstructed air movement beneath the roof surface.

The National Building Code requires that all roof and attic spaces above an insulated ceiling shall be ventilated with openings to the exterior to provide unobstructed vent areas of not less than 1 sq.ft./300 sq.ft. of insulated ceiling area. For low slope roofs or those with cathedral ceilings, the ratio is 1 sq.ft./150 sq.ft. The vents shall be uniformly distributed on opposite sides of the building, in such a way that approximately 50% are near the lower part of the roof (inflow) and approximately 50% near the ridge (outflow).

Cathedral ceilings covered with the EuroTile™ System require adequate ventilation like any other roof to prevent damage to the products or structure. There should be a minimum space of 2 inches between the roof sheathing and the insulation to allow for the unobstructed air movement.

When vapour barrier is used, cathedral ceilings require a minimum total net area for the inlet and outlet vents equivalent to 1/300 of the total ceiling area. Cross ventilation should be ensured by locating half the required vent area at the eaves and the other half at the ridge.

If vapour barrier is used, then the vent area should be doubled to 1/150 of the total ceiling area.

Vent manufacturers should be consulted on the proper use of their products.
ATTIC SPACE

IMPROPER VENTILATION  PROPER VENTILATION

SUMMER  WINTER

UNDER-EAVE OR SOFFIT VENTILATION

CATHEDRAL CEILINGS.

Roofguard
covered roof with acceptable roof deck

Min. 2" air space

polyethylene vapour barrier

Continuous soffit vent to supply air to each joist

A continuous ridge vent to exhaust air from each joist space

Ceiling Wallboard

Insulation
FASTENING

The tile is attached using five (5) 1 3/4” galvanized nails or galvanized staples .5 inches (1.27 centimetres) above the groove of the tile. This will ensure that there are 10 attachment points in each slate, as these five (5) nails or staples will go through the top of the slate below. In addition, a 1 ¾” galvanized nail must be applied on the front right ridge portion of the tile.

Each starter strip is fastened using five (5) 1 3/4” galvanized roofing nails or galvanized staples .5 inches (1.27 centimetres) above the groove. Do not nail the starter strip on the drip edge, as the fascia must be fitted under it, and the eavestroughs over it.

Each gable end (rake) is fastened using four (4) 3” galvanized deck screws, two on each side and above the interlock.

Each hip cap is fastened using four (4) 3” galvanized deck screws, two on each side, placed so that the next hip cap covers the exposed fastener heads.

Each ridge cap is fastened using four (4) 3” galvanized deck screws, two on each side and above the interlock.
IMPACT AND HAIL RESISTANCE

EuroTile™ demonstrates excellent resistance to mechanical impact and hail. The rugged and elastic nature of the rubber base material should weather the heaviest of storms.

SHADING

As a roof is viewed from different angles, and/or different lighting conditions, certain areas may appear darker or lighter. This inconsistency in colour has been designed to achieve the authentic look of slate.

FADE

All products exposed to UV and IR rays will fade. The EuroTile™ System will fade, slightly, as time passes, and is unavoidable. Fade is aesthetic and does not affect the performance or durability of the EuroTile™ System.
Installation Instructions:

1. **ROOF DECK**

   See pre-installation and preparation section regarding material requirements and codes applicable. Check all roof gables for squareness. Check eave edge for squareness. Before work begins, the work of all other trades on the roof should be complete.

2. **EAVE PROTECTION AND UNDERLAY**

   See pre-installation and preparation section regarding material requirements and codes applicable.
   Check and repair if necessary any damage to eave protection or underlayment, be sure the underlayment overhangs 25 mm (1”), that head laps and side laps are sufficient to code and underlay extends up walls, chimneys, skylights etc. sufficiently.

3. **LOADING**

   Always load EuroTile™ Products toward the peak in such a manner as to not overload any one section of the roof, keeping in mind that the application will start on the left side, and bottom of the roof.
   Distribute materials to allow for close proximity during installation, allowing extra room on the left side to start each course.

4. **VALLEYS, PROTRUSIONS AND OPENINGS**

   Take extra care to make sure underlayment and eave protection is sealed and watertight at all valleys, chimneys, protrusions and openings.
   Apply two (2) strips of Butyl tape 1/8” thick up the valley, one (1) strip four (4”) inches from the valley centerline on each side. This seals the tile should water enter under the cut edge of the valley.
   Prepare valleys with a flashing not less than 900 mm (3’) in width of 0.33 mm thick galvanized steel. Flashing should terminate 1 ¼” up from the edge of the starter.
   Flashing should be fastened on each side 450 mm (18”) O.C. located 25mm (1”) away from edges.
   If a chimney is more than 750mm (30’’) wide, building code demands a saddle be built for better drainage. A saddle need not be installed if a sheet metal flashing is used that extends up the chimney to a height equal to not less than one sixth the width of the chimney, but not less 150mm (6”), and up the slope to a point equal in height to the flashing on the chimney, but not less than 1.5 times the slate exposure. Provincial Building Code demands flashing installation on all roof/wall intersections, thickness described previously.
Circular chimneys are flashed using a metal flashing (provided by mechanical contractor). Flange of flashing is to be woven into EuroSlate courses at top of slope and sealed around complete flange with G.E.M. Sealant. Plumbing vent stacks are flashed using a metal vent pipe flashing metal or a flexible rubber flashing (normally supplied by mechanical contractor, or available from G.E.M.) and woven into the EuroTile™ courses at the top of the slope. Note-if mechanical contractor is supplying flashing, be sure they are on site before commencing EuroTile™ application. Ensure all other protrusions are properly flashed and woven into the EuroTile™ courses and sealed in a lightweight manner. For unique circumstances contact G.E.M.’s technical department.

5. **EAVE STARTER STRIP**

Starting at the left side of the roof eave edge, chalk a straight line 32cm (12 5/8”) from the lower most point of the eave edge. Starting at the left side of the roof, install EuroSlate starter strip panels, utilizing five (5) 1 ¾” galvanized roofing nails or galvanized staples per panel, 1.27 cm (.5”) above the groove in the panel. At the right gable end of the roof, the last panel must be cut flush with the edge of the roof. The “Tongue and Groove” fitting of the panels ensures a straight row, and must be installed left to right. Do not nail the face of the panel as the fascia will have to be installed under the drip edge. Cut slate on the angle for the center of the valley.

6. **FIELD TILE PANELS**

Field tile panels can now be installed by sliding the tongue of each piece into the groove of the starter strip panel or field panel below. As with the starter strip panels, installation must start at the left side of the roof, staggering the panel joints while proceeding. The overlap on each piece is fitted into the overlap of the preceding one. At the ends of the courses trim panels (using a power saw or knife), to be flush with the edges. Panels are installed using five (5) 1 ¾” galvanized roofing nails or galvanized staples, 1.27 cm (.5”) above the groove of the panel. This will ensure that there are ten (10) attachment points in each panel as the fasteners will go through the top of the panel below. Upon reaching the peak of the roof the last row of panels may have to be trimmed along the upper edge, flush with the ridge. Walls, chimneys, plumbing vents, attic vents, skylights etc. must be flashed and sealed as described in other sections of this manual, and woven into the EuroTile™ as the field tile panels are progressively installed up the slope of the roof.
7. **RIDGE CAP**

When the field panels are completely installed the ridge cap panels can be added. Ridge caps are installed starting from east or south side so they do not face prevailing winds. Each cap is fastened using two (2) 3” galvanized deck screws, 1 on either side above interlock. The last cap must be face fastened and exposed, fastener heads must be sealed using G.E.M. Sealant.

8. **GABLE CAPS (RAKES)**

There are two (2) types of gable (rake) caps specific to the side of the roof they are covering (one for the left side, the other for the right) which can be applied after the field panels and ridge caps have been fastened into position. These panels are attached starting at the bottom of the gable and continuing to the ridge, by fastening with two (2) 3” galvanized deck screws, 1 on either side above the interlock. The top gable cap should be trimmed (with saw or knife) at an angle (depending on roof pitch) that will allow the gable cap to meet the ridge cap. Seal with G.E.M. Sealant.

9. **HIP CAPS**

The hip caps are installed starting at the bottom of the hip and continuing to the top at the ridge. The bottom hip cap can be trimmed to desired length at eave edge. If the top cap must be faced nailed, ensure exposed heads are sealed with G.E.M. Sealant. Each cap must be fastened using (2) 4” galvanized deck screws, one on each side, placed so that the next hip cap covers the exposed fastener heads.

10. **VALLEYS**

Minimum Width – 36” for Open Types of Metal:
- Copper
- Galvanized – 28 ga – minimum
- Stainless Steel
- Color Clad Steel
- Color Clad Aluminum

Note: If galvanized valley metals are used we recommend a space of 4” to 6” for the open area.

Note: If galvanize valley metal is used, it should be colored similar to color of tiles.

Note: Fastening tiles onto valley areas nail as far away from the center of the valley as possible to avoid penetrating into the valley metal.
11. **GABLE COOKIE**

The Gable cookie is simply a small piece of a waste panel, cut to the proper slope of the roof and installed under the last ridge cap at the gable for a finished appearance. Exposed fastener heads must be sealed with G.E.M. Sealant. Consult Gable detail drawing should confusion exist.

12. **DETAIL FINISHING**

The above instructions should conclude the application of the EuroSlate System, excepting the completion of the details on walls, chimneys, skylights, vents etc. They should be sealed with G.E.M. Sealant and be flashed appropriately utilizing C.R.C.A. Standard specifications, and with G.E.M. detail drawings. Plumbing vents must be sealed to the pipes with G.E.M. Sealant and clamped according to pipe flashing manufacturers’ instructions.

**MAINTENANCE**

The EuroTile™ System requires very little ongoing maintenance. Renew G.E.M. Sealant on details and exposed fastener heads from time to time as required, maintain gutters, troughs, downpipes and drain to remain free of debris so drainage water flows away unrestricted. Should alterations be required involving the roof as time goes on, please contact G.E.M.’s technical department for assistance. Allowing alteration with non-EuroTile™ system components or incompatible materials would void the EuroShield™ warranty.
GEM EuroSlate Roofing has been subjected to the following tests:

<table>
<thead>
<tr>
<th>TEST</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic Impact</td>
<td>Pass</td>
</tr>
<tr>
<td>Dimensional Stability &amp;</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>Pass</td>
</tr>
<tr>
<td>Ozone Resistance</td>
<td>Pass</td>
</tr>
<tr>
<td>Traffic Load</td>
<td>Pass</td>
</tr>
<tr>
<td>Wind Uplift</td>
<td>Pass</td>
</tr>
<tr>
<td>Nail Pull</td>
<td>Pass</td>
</tr>
<tr>
<td>Accelerated Weathering</td>
<td></td>
</tr>
<tr>
<td>In tile direction:</td>
<td>Pass</td>
</tr>
<tr>
<td>Across tile direction:</td>
<td>Pass</td>
</tr>
<tr>
<td>Heat Aging</td>
<td></td>
</tr>
<tr>
<td>In tile direction:</td>
<td>Pass</td>
</tr>
<tr>
<td>Across tile direction:</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>No permeance after 1hr, 45 mins</td>
</tr>
<tr>
<td>Water Vapour Transmission:</td>
<td></td>
</tr>
<tr>
<td>(controlled samples)</td>
<td>Pass</td>
</tr>
<tr>
<td>(after acceleration aging)</td>
<td>Pass</td>
</tr>
<tr>
<td>Pliability</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Conclusion of test results from Intertek Testing Services Ltd. is:  
*The product as tested and reported herein, has met the CCMC Masterformat Section: 07318 Requirements, for a “Recycled Rubber Roofing Panels”.*
1.0 **Limited Warranty**

1.1 G.E.M. Inc. ("GEM") warrants to the original purchaser ("Customer") of its EuroShield™ manufactured roofing tiles ("Product"), installed at the property with the address indicated hereinafter ("the Property"), that the Product will be free from defects in workmanship and material for a period of Fifty (50) years from the date of the installation of the Product at the Property.

1.2 The warranty conferred under Section 1.1 does not cover any damage to or defect in the Product directly or indirectly, or wholly or partly attributable to:

a) the misuse, abuse or neglect of the Product, including any damage to the Product resulting from:
   i) the exposure of the Product to paint, coatings, solvents or cleaners; or
   ii) the failure by Customer to provide reasonable and necessary maintenance to prevent any accumulation of staining or mildew, or surface dirt;

b) uniform color change to the Product arising due to normal weathering. Normal weathering is defined as equal exposure to ultraviolet (sun) light, and the extremes of weather and atmosphere which will cause a colored or painted surface to fade, lighten, chalk, or acquire a surface accumulation of dirt or stains. The severity of these conditions depends on air quality, the geographic location of the Property, and other local conditions over which GEM has no control.

c) the failure of any surface or structure to which the Product is applied; or

d) accidental damage, or damage caused by lightning, fire, wind, hail, or acts of God, or as a result of vandalism or other deliberate act.

1.3 GEM shall not be liable to Customer:

a) for any loss or damage beyond the purchase price of any defective Product on any basis in contract, tort or otherwise, except as otherwise provided in Section 1.7; or

b) for any direct or indirect, special, incidental or consequential loss or damage attributable to faulty or negligent installation of the Product.

1.4 Subject to Sections 1.6, 1.7 and 4.0, repair or replacement of any defective Product or a refund in respect of the purchase price of any defective Product shall be the sole remedy of the Customer, and GEM shall not be liable for any other direct or indirect, special, incidental or consequential loss or damage suffered by Customer by reason of any defect in workmanship or material of the Product. Without limiting the generality of the foregoing, GEM shall not be liable to Customer for wasted expenses such as the cost of the initial installation of the Product or the cost of the removal of the Product, the cost of repairing or replacing underlayment, interlayment, flashings, vents, sheathing, fasteners, or similar items, water damage to the interior or exterior of a building or residence or to any property contained therein, loss of profits or damages for mental distress.

1.5 Subject to Section 1.6, this warranty is in lieu of all other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, and no person is authorized to give any further representation or warranty or assume any further obligation on behalf of GEM with respect to the Product.
Sections 1.4 and 1.5 do not apply to the extent that the applicable laws of a jurisdiction prohibit the limitation of a warranty.

In respect of the repair or replacement of any defective Product, GEM shall bear the costs of the removal of defective Product, the costs of the installation of replacement Product and the costs of repairing or replacing underlayment, interlayment, flashings, vents and sheeting fasteners if, but only if,

a) The Product proves defective in workmanship or material within five (5) years from the date of the installation of the Product at the Property; and

b) The defect is not attributable directly or indirectly or in whole or in part to any of the factors enumerated in Section 1.2.

Validity: This limited warranty becomes valid only if the purchase certificate attached hereto is filled in, signed by Customer and returned to GEM within Forty-Five (45) days of installation of the Product on the Property.

Transferability: This limited warranty may be transferred by the Customer to the next owner of the Property, provided GEM receives written notice, in the form attached hereto, together with a bank draft or money order in the sum of One Hundred ($100.00) Dollars, in Canadian currency, within Forty-Five (45) days after the date of transfer of the Property. Failure to follow this procedure shall result in the termination of any obligation on the part of GEM to the next owner of the Property with respect to this limited warranty. This limited warranty may not be transferred beyond the first subsequent owner of the Property.

Claims Process: Customer shall notify GEM forthwith in writing of any defects in Product detected at the time of delivery or during the warranty period, whereupon GEM shall have a reasonable time, in its sole discretion:

a) to correct those defects by repairing or replacing any defective Product; or

b) to make a refund to Customer in respect of the purchase price of any defective Product. During the warranty period the refund will be based upon the original purchase price of the Product as evidenced by a valid receipt or, if such a receipt is not available, as reasonably estimated by GEM.

Any notice under this limited warranty should be delivered to GEM at 9330 – 48 Street S.E., Calgary, Alberta, Canada T2C 2R2 and should describe the nature of the defects in the Product. Customers should not undertake repairs without receiving advice from GEM as improper repair work may aggravate the problem.

Product Changes: GEM reserves the right to discontinue or change its Product, including colors, shapes, designs or styles without giving notice to Customer or subsequent owner. In the event of such discontinuance or change, GEM reserves the right
in its sole discretion to substitute a product that is of equal quality or price for the repair or replacement of any defective Product.

__________________________________________________________ / ____________________________________________________________
Signature of Original Purchaser (Customer): (Print Name)

Date of Installation of the Product

__________________________________________________________
Address of Installation (Property)

City Province / State Postal Code / Zip Code

__________________________________________________________
Mailing Address (if different from Property Address)

City Province / State Postal Code / Zip Code

__________________________________________________________
Phone

Product Purchased: EuroTile [ ] EuroShake [ ] EuroSlate [ ]

Color of Product Purchased: Black [ ] Grey [ ] Brown [ ]
Weathered [ ] Redwood [ ] Driftwood [ ]
Riverstone [ ]

Version: 03/2010
Return Copy

EuroShield™
50 YEAR LIMITED & TRANSFERABLE WARRANTY
CERTIFICATE

___________________________________________ / _____________________________________________
Signature of Original Purchaser (Customer): (Print Name)

________________________________________________________________________
Date of Installation of the Product

________________________________________________________________________
Address of Installation (Property)

City Province/State Postal Code/Zip Code

________________________________________________________________________
Mailing Address (if different from Property Address)

City Province / State Postal Code / Zip Code

________________________________________________________________________
Phone

Product Purchased: EuroSlate [] EuroShake [] EuroTile []
Color of Product Purchased: Black [] Grey [] Brown [] Weathered []
Redwood [] Driftwood [] Riverstone []

Installer Stamp Supplier; Company Name & Address
( Roofing Company )


Please complete and return via fax or mail to:

Fax: 1-403-287-2012

G.E.M. Inc.
9330 - 48th Street SE,
Calgary, Alberta, Canada.
T2C 2R2
SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT: Euroshield™

SUPPLIER: G.E.M. Inc.
9330 – 48th Street SE,
Calgary, Alberta.
T2C 2R2
TEL: (403) 215-3333
FAX: (403) 287-2012

EMERGENCY CONTACT: (403) 215-3333 Henry Kamphuis

HMIS CD: HLTH 0  FLAM 0  REACT 0  PROTECT B

MATERIAL USE: SLOPED ROOFING

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENT: NONE
% BY WEIGHT: Not Applicable
CAS NUMBER: Not Applicable
LD50 SPECIES, ROUTE: Not Applicable
LD50 SPECIES, ROUTE: Not Applicable
LC50 INHALATION: Not Applicable
TLV: Not Applicable
WHMIS CLASS: NOT CONTROLLED

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE: SOLID
APPEARANCE AND ODOUR: VARIOUS COLOURED SOLID WITH SLIGHT ODOUR.
BOILING RANGE: Not Applicable
FREEZING POINT: Not Applicable
VAPOUR PRESSURE: NOT ESTABLISHED
VAPOUR DENSITY (AIR=1): NOT ESTABLISHED
SOLUBILITY IN WATER: NOT ESTABLISHED
PH RANGE: 7.5 - 8.5
COEFFICIENT OF OIL/WATER DISTRIBUTION: NOT ESTABLISHED
ODOUR THRESHOLD: NOT ESTABLISHED
SPECIFIC GRAVITY: 1.6 - 1.7  % VOLATILE BY VOLUME: 38 - 41%

SECTION 4 - FIRE AND EXPLOSION DATA

FLAMMABILITY: NOT FLAMMABLE
FLASH POINT: NOT APPLICABLE
FLAMMABLE LIMITS: LEL: NOT APPLICABLE
UEL: NOT APPLICABLE
AUTO IGNITION TEMPERATURE: NOT ESTABLISHED
EXTINGUISHING MEDIA: NOT COMBUSTIBLE
FIRE AND EXPLOSIVE HAZARDS: LIQUID PAINT WILL NOT BURN BUT MAY SPATTER ABOVE BOILING POINT. DRIED PAINT FILM WILL BURN.
FIRE FIGHTING EQUIPMENT: WEAR SELF-CONTAINED POSITIVE PRESSURE BREATHING APPARATUS.
HAZARDOUS DECOMPOSITION PRODUCTS: PRODUCTS OF INCOMPLETE COMBUSTION INCLUDE OXIDES OF CARBON AND NITROGEN AND TOXIC HYDROCARBONS, HEAVY FUMES AND SMOKE.
SENSITIVITY TO IMPACT: NONE KNOWN
SENSITIVITY TO STATIC DISCHARGE: NONE KNOWN

SECTION 5 - REACTIVITY DATA

STABILITY: STABLE UNDER NORMAL CONDITIONS
INCOMPATIBILITY: AVOID STRONG OXIDIZING AGENTS
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION 6 - HEALTH HAZARD DATA

EYE CONTACT: WILL NOT CAUSE EYE IRRITATION.
SKIN CONTACT: WILL NOT BE IRRITATING TO SKIN.
INGESTION: VERY LOW ORDER OF TOXICITY. NO HAZARDS ARE ANTICIPATED FROM INGESTION INCIDENTAL TO HANDLING.
INHALATION: NO HAZARDS ARE ANTICIPATED FROM INHALATION.
SYSTEMIC AND OTHER EFFECTS: NONE KNOWN
EXPOSURE LIMITS: NOT ESTABLISHED
CARCINOGENICITY: NOT INDICATED
TERATOGENICITY: NOT INDICATED
REPRODUCTIVE TOXICITY: NOT INDICATED
MUTAGENICITY: NOT INDICATED
SYNERGISTIC PRODUCTS: NONE KNOWN
SECTION 7 - PREVENTIVE MEASURES

VENTILATION: GOOD GENERAL VENTILATION IS SUFFICIENT FOR MOST CONDITIONS.
RESPIRATORY PROTECTION: NOT REQUIRED.
SKIN PROTECTION: NOT REQUIRED.
EYE PROTECTION: NOT REQUIRED.
LEAK AND SPILL PROCEDURE: NOT APPLICABLE
WASTE DISPOSAL: DISPOSE OF PRODUCT AND MATERIALS IN A MANNER WHICH IS APPROVED
BY FEDERAL, PROVINCIAL AND LOCAL REQUIREMENTS.
HANDLING AND STORAGE: USED BOTH INDOORS AND OUTDOORS.
KEEP FROM FREEZING: NOT APPLICABLE.

SECTION 8 - EMERGENCY FIRST AID MEASURES

EYES: NOT APPLICABLE
SKIN: WASH WITH SOAP AND PLENTY OF RUNNING WATER.
INGESTION: IF SWALLOWED INDUCE VOMITING. KEEP AT REST. CONSULT A PHYSICIAN
INHALATION: NOT APPLICABLE

SECTION 9 - PREPARATION DATE AND SOURCES

PREPARED BY: G.E.M. INC.
DATE: 11/01/2001

SOURCES: THE INFORMATION USED TO PREPARE THIS MATERIAL SAFETY DATA SHEET IS BASED
ON INFORMATION PROVIDED BY OUR RAW MATERIAL SUPPLIERS.

THE INFORMATION AND RECOMMENDATIONS ON THIS MATERIAL SAFETY DATA SHEET HAVE
BEEN COMPILED FROM THE SOURCES BELIEVED TO BE RELIABLE AND WHICH REPRESENT THE
MOST CURRENT DATA ON OUR POSSESSION ON THE SUBJECT AT THE DATE THAT THIS MSDS
WAS PREPARED. NO WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED, IS MADE AS TO THE
ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

THE USER SHOULD CONSIDER THE DATA ONLY AS A SUPPLEMENT TO OTHER INFORMATION
GATHERED BY THEM AND MUST MAKE INDEPENDENT DETERMINATIONS OF SUITABILITY AND
COMPLETENESS OF INFORMATION FROM ALL SOURCES TO ASSURE PROPER USE AND DISPOSAL
OF THESE MATERIALS AND THE SAFETY OF EMPLOYEES.
SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT: EuroShield™

SUPPLIER: G.E.M. Inc.
9330 – 48th Street SE,
Calgary, Alberta.
T2C 2R2
TEL: (403) 215-3333
FAX: (403) 287-2012

EMERGENCY CONTACT: (403) 215-3333 Henry Kamphuis

HMIS CD: HLTH 0 FLAM 0 REACT 0 PROTECT B

MATERIAL USE: SLOPED ROOFING

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CAS NUMBER: Not Applicable

LD50 SPECIES, ROUTE: Not Applicable
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THE USER SHOULD CONSIDER THE DATA ONLY AS A SUPPLEMENT TO OTHER INFORMATION GATHERED BY THEM AND MUST MAKE INDEPENDENT DETERMINATIONS OF SUITABILITY AND COMPLETENESS OF INFORMATION FROM ALL SOURCES TO ASSURE PROPER USE AND DISPOSAL OF THESE MATERIALS AND THE SAFETY OF EMPLOYEES.
Area of hip roof. The area of a plain hip roof is the same as the area of a gable roof of the same dimensions. The formula for finding the area of a plain hip roof is as follows:

Formula: Area of hip roof = \(2 \times \text{width of slope} \times \text{length of roof (at eave)}\).

Solution for hip roof in Fig. 3: \(2 \times 10' \times 30' = 600 \text{ sq. ft.}\)

Fig. 3. Hip Roof
Formula: Area of gable roof = $2 \times \text{width of roof} \times \text{length of roof (or ridges)}$.

Solution for gable roof in Fig. 2: $2 \times 10' \times 20' = 400 \text{ sq. ft.}$
Slope Conversion is necessary because the roof area over a ground area is larger than the ground area. A one-plus conversion factor for various roof pitches can be calculated so that a simple multiplication changes the ground area into the roof area desired.

Later, after roof area has been determined, it will also be necessary to estimate the length of hips, ridges and valleys. Ridges, being parallel to the ground are no problem. But hips and valleys also slope, and need conversion.

The conversion figures below provide factors for more common roof slopes. The horizontal ground area or distance is measured or estimated in square feet or length in feet; multiply that by the conversion factor for the appropriate roof pitch and you come up with the roof area or hip/valley length.

Adjustments to roof area calculations are needed for supplementary areas such as the single dormer in the example house or places where one roof area may project over another because of eave overhangs. There are also adjustments to be made where the overhangs, eave or rake, extend beyond exterior walls. Even a short overhang can mean a substantial area to be added with some homes.

In the example drawing, just a 4-inch eave overhang with duplications accounted for will add about 12 square feet of area for the duplicated portions, before conversion to roof area. After all roof areas have been calculated and the summation made to reach a total area, add about 10 percent more area to cover wasted material. Roofing shingles are sold by the square, that is per hundred square feet. Divide your total area by 100 to obtain the number of squares of material required.

Accessories need to be estimated in much the same way, beginning with the hip-valley-ridge lengths needed for hip-ridge shingles or flashings for valleys. Eave and rake lengths will be added to give the total lengths needed of metal edging. The amounts of nails and roofing cement required will depend upon the nature of the job, rather than the areas. Obtain guidance from your roofing supplier at the time that materials are ordered.

<table>
<thead>
<tr>
<th>Pitch Rise</th>
<th>Roof Area Factor</th>
<th>Hip/Valley Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 inches per foot</td>
<td>1.054</td>
<td>1.452</td>
</tr>
<tr>
<td>5 &quot; &quot; &quot;</td>
<td>1.083</td>
<td>1.474</td>
</tr>
<tr>
<td>6 &quot; &quot; &quot;</td>
<td>1.118</td>
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<tr>
<td>7 &quot; &quot; &quot;</td>
<td>1.157</td>
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<td>1.642</td>
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<tr>
<td>11 &quot; &quot; &quot;</td>
<td>1.356</td>
<td>1.684</td>
</tr>
<tr>
<td>12 &quot; &quot; &quot;</td>
<td>1.414</td>
<td>1.732</td>
</tr>
</tbody>
</table>
How to Estimate Quantities of Roofing

Computation of the roof area that needs covering is simple when you have a simple floor plan and uncomplicated roof. However, the method given here is suitable for all kinds of homes and roofs. It is the estimating procedure recommended in the application manual issued by the Asphalt Roofing Manufacturers Association. While the procedure may take longer than other estimating methods, it is accurate and allows an estimate from the ground without any roof climbing or roof measuring.

The method converts the house area at ground level to roof area, using conversion factors that depend upon the slope or pitch of the roof. First comes the determination of this slope or slopes. The span, rise and run of a roof can be represented by triangles. In an equilateral (all sides equal) triangle, the base leg represents the span, the height of the triangle represents the rise of the roof, the equilateral legs represent the roof slopes or pitch, and half the base leg or span is what is referred to as "run." For estimating purposes, the roof pitch or slope angle can be "measured" quite accurately using a carpenter's folding rule as shown in the drawing. One end of the rule is shaped into a triangle while standing away from the home. The rule is held at arm's length and the last two rule sections adjusted to parallel the roof slopes as indicated.

When the two sections have been adjusted so the view shows their angle is parallel to the two roof slopes, hold the overlapping end of the rule firmly on the base section. The reading point is shown by the arrow, sketch A. The reading is taken at the nearest eighth-inch point on the base section, as indicated in sketch B. From that eighth mark go down in the chart below to find the pitch fraction and the rise in inches per horizontal foot. Example: an end-of-the-rule reading of 23 3/16 inches means the roof slope has a 4-in-12 pitch.

### Ground Area of Home

Ground area of home is determined by on-ground measurements using a steel tape. The drawing on the facing page will be used as an example for the balance of the computations. This might be a typical dwelling with a few roof complications in the form of overhangs and dormers, plus ridges at varying heights. The projection below the perspective drawing shows the total ground area covered. In making the roof area computations, exterior wall measurements are taken at ground level but dormer and chimney measurements can be made in the attic space. Most dwellings can be measured up in this manner without need for climbing on the roof. After all measurements have been made and duly noted on paper along with a rough sketch and after the various roof pitches have been determined, you can proceed with the calculation of the different roof portions.

In the example home, the likely starting point is the main roof, whose slope is 8-in-12. This will be followed by the 6-in-12 portion. Then, allowances are made for the duplicated roof areas and for such additions or subtractions as those for chimneys and dormers.
G.E.M. Inc.
Global Environmental Manufacturing

GABLE CAP

GEM TILE

STARTER TILE

EAVESTROUGH

FASCIA

EAVE/GABLE
EG I
EAVE / GABLE EG 2
RIDGE CAP
GEM SEALANT
GABLE COOKIE
GABLE CAP
FACIA
GEM TILE

RIDGE / GABLE
RG 1
ATTIC VENT

GEM SEALANT

GEM TILE

ATTIC VENT
A1

G.E.M. Inc.
Global Environmental Manufacturing

EUROSHIELD
GEM ROOF GUARD

VENT PIPE
GEM SEALANT
PIPE CLAMP
PIPE FLASHING
GEM SEALANT FASTENER
GEM TILE

PLUMBING VENT
P1

G.E.M. Inc.
Global Environmental Manufacturing

EUROSHIELD
OPEN VALLEY

OV 1
EuroTile

Suggested Layout Pattern

Rows 1, 5, 9, 13, etc., should line up as per green highlighted panels in Photo Illustration