

Green Way Pavements™

“Sustaining Our Green Planet, One EcoRaster at a Time.”

ECORASTER

Information and Application

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Purus Plastics Manufacturer



ECORASTER®
WORLDWIDE No.1



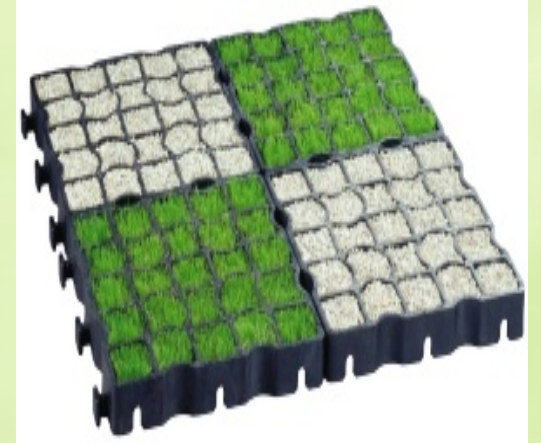
Product- ECORASTER

- ✿ **Soil Stabilization System**
- ✿ **Made of 100% recycled plastic**
- ✿ **LEED point-eligible**
- ✿ ***Fillers:* grass, sod, gravel, rubber, wood chips, or colored stone**
- ✿ **Make our surroundings “Green”**



Features of ECORASTER

- ✿ **Long-time product life**
- ✿ Simple one-time, **quick and effortless installation**
- ✿ **Lightweight** to easily handle and install
- ✿ **Easily cut-to-fit**
- ✿ **High compressive strength**
- ✿ **Stability** is excellent
- ✿ Designed with perforations to quickly allow **drainage of liquid** through paver system





More Features...

- ✿ **Expansion and contraction** due to weather changes are minimal
- ✿ Percolate over **10” of water per hour** with the appropriate aggregate fill
- ✿ **Run-off coefficient of 1.2%**, as compared to asphalt and concrete that has a minimum run-off coefficient of 95%+
- ✿ Realistic economical and environmental benefit relates **to reduced delivery and installation cost.**
- ✿ Installation requires **less intrusive tasks and equipment** providing savings on fuel and equipment usage: less labor and equipment installation

Fillers for Pavers



Applications

Civil Engineering



- ✿ Car park reinforcement - fire service access - erosion protection – curb reinforcement - drives - building site access - loading bays - helipads - industrial and commercial applications - military uses

Gardening and Landscaping



- ❁ Car parking - parks - embankment reinforcement - slope reinforcement - airstrips - garage access - DIY requirements - garden paths

Equestrian Sports



- ❁ Outdoor riding ring and indoor riding arena - paddock and open stable - horse walker and lunging ring, tethering and loading area - paddock access

Golf Course



- ✿ Holes - greens - driving range - putting green - pitching green - fairway

Agriculture



- ✿ Storage area - chicken and cattle run - paddock and grazing pasture access - drive and path reinforcement

Water Engineering



- ✿ Bank reinforcement - dike building - moorings - stream bed stabilization

Green Roof



ECORASTER® E50 - the perfect solution for heavy duty applications



Technical data for the ECORASTER E50

- * Dimensions: **13 in x 13 in x 2 in**
- * Wall thickness/wall height: **0.2 in / 2 in**
- * Weight per unit: 2.34 lbs
- * Weight per m²/10.8 sq ft: 21.05 lbs
- * Material: **100 % recycling material PE** (polyethylene)
- * Compression strength: up to 20 tons axle load
- * Carrying load per m²/10.8 sq ft: up to 350 tons
- * Dimensional stability: **temperature range -58° to 194° F**
- * Environmental compatibility: **Environmentally neutral UV and frost resistant**
- * Solubility: **resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain etc.)**

E50 Suitable applications:

Car park reinforcement
Outdoor riding rings
Fire service access
Curb reinforcement
Connecting paths, drives
Building site routes, loading areas
Gardening and landscaping
Slope and dike reinforcements
Helipads
Airstrip reinforcements
Industrial and commercial applications
Military applications



ECORASTER® S50 - the universal ground reinforcement system

Technical data for the ECORASTER S50:

Dimensions: **13 in x 13 in x 2 in**

- * Wall thickness/wall height: **0.1 in / 2 in**
- * Weight per unit: 1.61 lbs
- * Weight per m²/10.8 sq ft: 14.48 lbs
- * Material: **100 % recycling material PE** (polyethylene)
- * Compression strength: up to 20 tons axle load
- * Carrying load per m²/10.8 sq ft: up to 120 tons
- * Dimensional stability: temperature range **-58° to 194° F**
- * Environmental compatibility: **Environmentally neutral**, UV and frost resistant
- * Solubility: **resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain etc.)**
- * Laying performance: **more than 1000 sq ft per person and hour**



S50 Suitable applications:



- Garage drives and carports**
- Fire service access**
- Gardening and landscaping**
- Bank and river bed reinforcements**
- Slope and dike reinforcements**
- Golf course paths**
- Lawn greening**

ECORASTER® E40

- ✱ Technical data for the ECORASTER E40:
Dimensions: **13 in 13 in x 1.6 in**
- ✱ Wall thickness/wall height: **0.14 in / 1.6 in**
- ✱ Weight per unit: 1.39 lbs
- ✱ Weight per m²/10.8 sq ft: 12.5 lbs
- ✱ Material: 100 % recycling material PE (polyethylene)
- ✱ Compression strength: up to 20 tons axle load
- ✱ Carrying load per m²/10.8 sq ft: up to 120 tons
- ✱ Dimensional stability: temperature range **-58° to 194° F**
- ✱ Dimensional change: 0.5 % (for a normal temperature +68° to 176° F)
- ✱ Absorption of humidity: 0,01 %
- ✱ Environmental compatibility: Environmentally neutral UV and frost resistant
- ✱ Solubility: resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain etc.)
- ✱ Laying performance: **more than 1000 sq ft** per person and hour



E40 Suitable applications:

Car park reinforcement

Outdoor riding rings

Fire service access

Raised verge reinforcement

Connecting paths, drives

Building site routes, loading bays

Gardening and landscaping

Slope and dike reinforcements

Helipads

Airstrip reinforcements

Industrial and commercial applications

Military applications



ECORASTER® E30 - a system for reliable ground reinforcement

- ✱ Technical data for the ECORASTER E30:
Dimensions: **13 in 13 in x 1.2 in**
- ✱ Wall thickness/wall height: 0.16 in / 1.2 in
- ✱ Weight per unit: 1.32 lbs
- ✱ Weight per m²/10.8 sq ft: 11.9 lbs
- ✱ Material: 100 % recycling material PE (polyethylene)
- ✱ Compression strength: up to 20 tons axle load
- ✱ Carrying load per m²/10.8 sq ft: up to 120 tons
- ✱ Dimensional stability: temperature range **-58° to 194° F**
- ✱ Dimensional change: 0.5 % (for a normal temperature +68° to 176°F)
- ✱ Absorption of humidity: 0,01 %
- ✱ Environmental compatibility: Environmentally neutral UV and frost resistant
- ✱ Solubility: resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain etc.)
- ✱ Laying performance: **more than 1000 sq ft** per person and hour



E30 Suitable applications:

- Paths and drives**
- Carports**
- Paddocks**
- Garden paths**
- Pasture access and drives**
- Parks**
- Campsites**
- Garage drives**
- Wood and storage areas**
- Container depots**
- Flat silos**
- Market gardening**
- Roof greening**



ECORASTER® X30 our favorite for technical applications

- ✦ Technical data for the ECORASTER X30:
Dimensions: **13 in 13 in x 1.2 in**
- ✦ Wall thickness/wall height: **0.2 in / 1.2 in**
- ✦ Weight per unit: 1.7 lbs
- ✦ Weight per m²/10.8 sq ft: 15.28 lbs
- ✦ Material: 100 % recycling material PE (polyethylene)
- ✦ Compression strength: up to 20 tons axle load
- ✦ Carrying load per m²/10.8 sq ft: up to 150 tons
- ✦ Dimensional stability: temperature range **-58° to 194° F**
- ✦ Dimensional change: 0.5 % (for a normal temperature +68° to 176° F)
- ✦ Absorption of humidity: 0,01 %
- ✦ Environmental compatibility: Environmentally neutral UV and frost resistant
- ✦ Solubility: resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain etc.)
- ✦ Laying performance: **more than 1000 sq ft** per person and hour



X30 Suitable applications:

Roof greening

Technical applications (machine rooms)

Patios

Agricultural areas



Other Products...

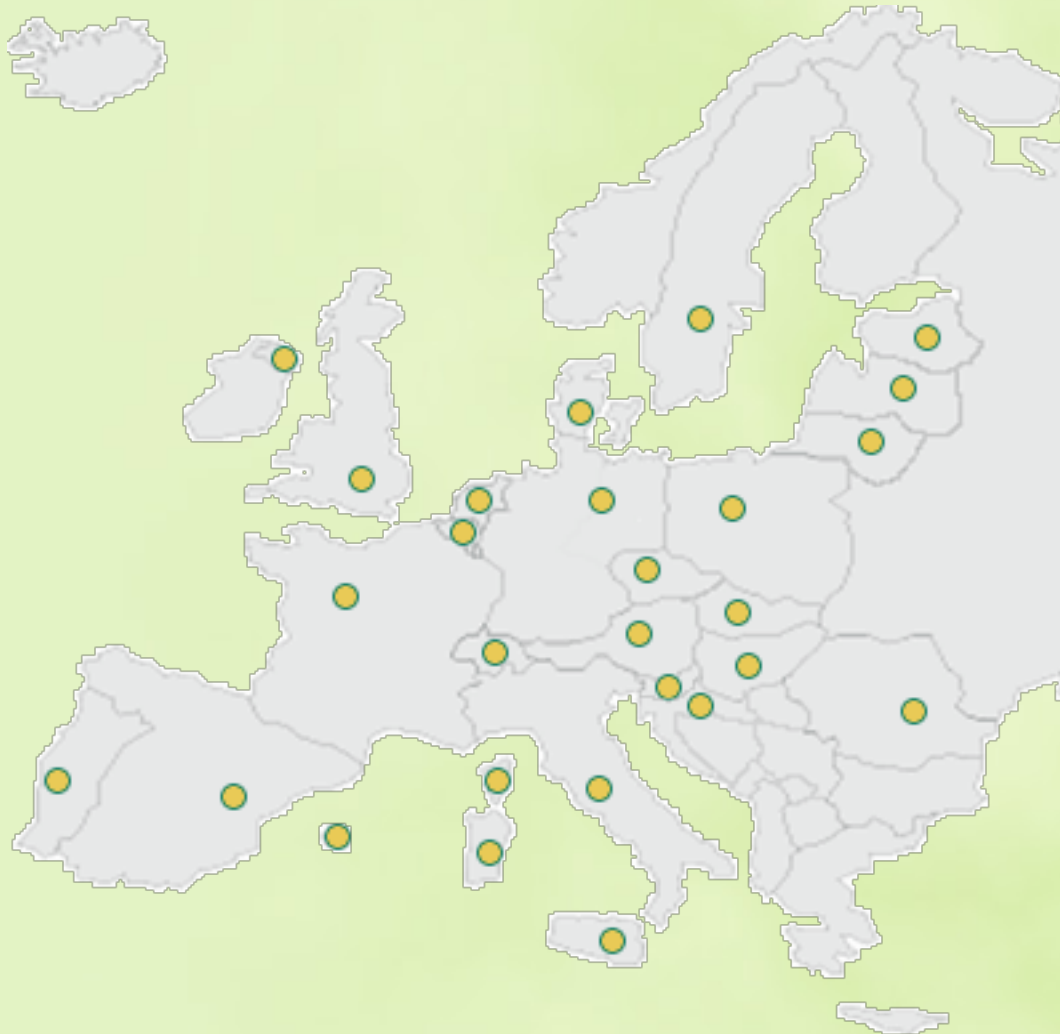


ECOSSEDUM



Euro-pallets,
industrial pallets and
display pallets

ECORASTER in Europe...



Denmark, Sweden
Belgium, Luxembourg
Germany
France
Great Britain, Ireland
Italy
Netherlands
Austria, Slovakia, Croatia
Poland, Latvia, Litauen,
Estland
Switzerland
Spain, Portugal
Czech Republic, Slovakia
Hungary, Romania

...Worldwide

Ukraine
Australia
Canada
Russia
United States
Korea

Market Analysis

Pavement Comparison Chart

Considerations to be evaluated	Asphalt	Concrete	Concrete Pavers	Recycled Eco-Pavers
Appearance	Offers a basic black lifeless setting, better with borders or curbs to improve appeal	Offers a variety of appealing options and custom colors and designs	Very appealing and offers a variety of paver designs and colors	Natural looking non-intrusive décor and environmentally appealing
Materials	Mixture of tar and small aggregates 	Mixture of cement, stone, reinforcement bars 	Pre-casted concrete which vary in size and shapes 	Recycled consumer waste treated plastic 
Durability	4-8 yrs	15+yrs	10-15 yrs	25+yrs
Maintenance	High, needs top resealing about every 3 yrs, and becomes unlevelled	Low, but can crack and become unlevelled	Low, but can require some resetting	Very low , may require some quick resetting, grass or gravel maintaining

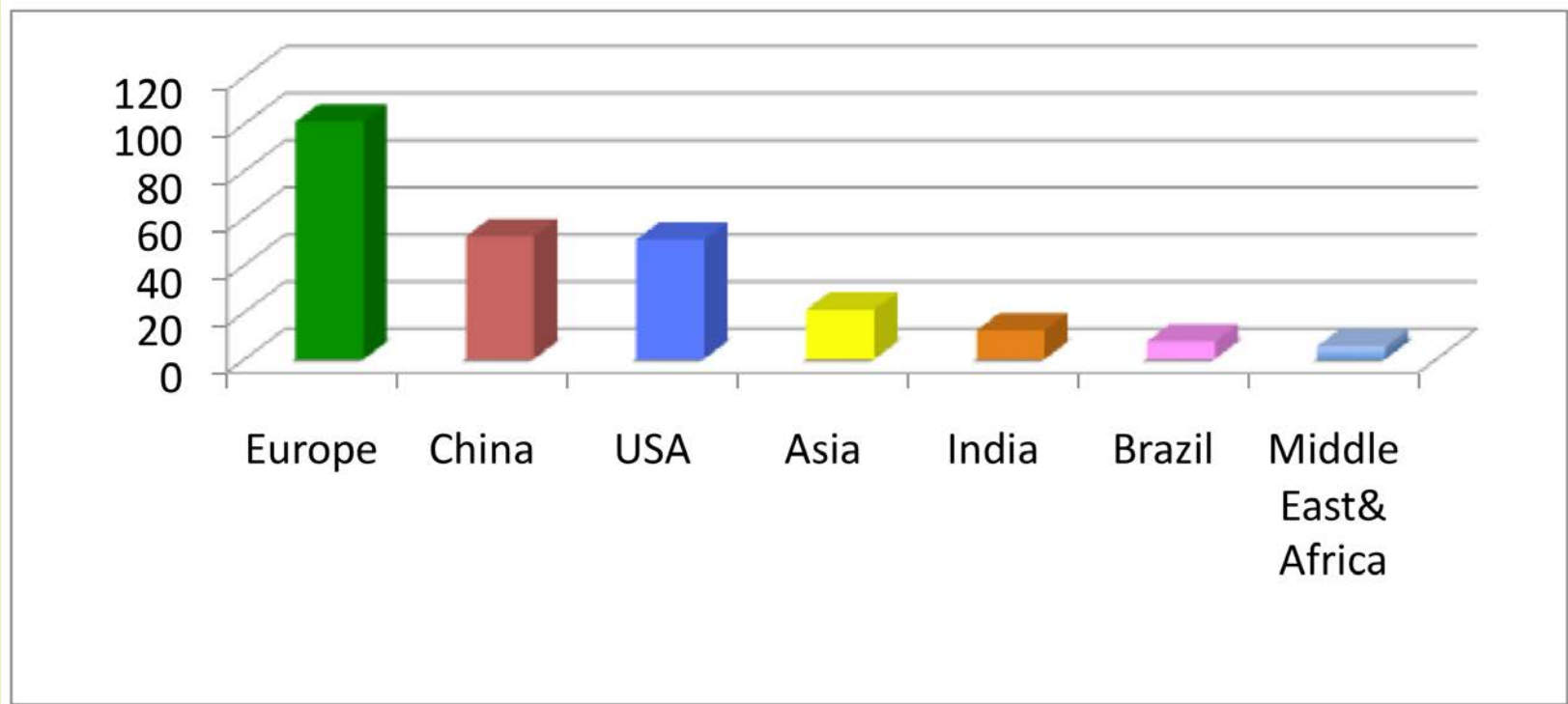
Considerations to be evaluated	Asphalt	Concrete	Concrete Pavers	Recycled Eco-Pavers
Drainage	Poor: 95% runoff	Poor: 95% runoff	Good: 15-30% depending on style, 70-85% runoff	Excellent: 97% drainage, <3% runoff
Depth or thickness	First layer about 2-3", second or top layer about 1--1-1/2"	Minimal 3" for walkways; 6-8" for driveways; 8-11" for heavy loads	Thickness varies based on driveway loads: minimum of 4-6"	Varies based on load: 1-2"
Estimated Costs (includes installation)	\$3.50-\$6.00 /sq ft	\$6-\$15 /sq ft	\$4.50-\$12 /sq ft	\$4.50-\$6.25 /sq ft
"Green" ecological materials	Not friendly to environment and becomes messy if not maintained	Basically neutral though lime can generate acid	Basically neutral without any noticeable harm	Aids the environment by recycling consumer plastic waste
Environmental factors	Uses oil based derivatives, if replaced, require waste dump and impacts nature	Suffocates ground if replaced, require waste dump and impacts nature	Suffocates ground if replaced, require waste dump and impacts nature	Environmental, friendly to ground and allows 97% water permeation, can be restored, replaced grids can be reused elsewhere



Growing Market Share...

- ✿ **The *Green Movement* is “In”**, especially for environmental and efficiency demands.
- ✿ People are into practical **cost reduction** and desire **less maintenance** costs.
- ✿ As more marketing and consumer networking becomes common, **retails sales should merit positive growth** over the next decade.
- ✿ As far as the consumer is concerned, the **United States lags 20 years behind Europe and China who have made recycled pavers a multi-billion dollar a year business**. Just recently, Americans are waking up to this Greener and more natural methodology of pavement construction.

Who's funding the “green” energy revolution?



Billion \$: 101 52.2 50.8 21.1 12.3 7.5 5.5

Source: June 12, 2012 / Eoghan Macguire for CNN / http://edition.cnn.com/2012/06/12/world/renewables-finance-unep/index.html?hpt=hp_c4 CHART SHOWS YEAR 2011

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Basic Installation (DIY)

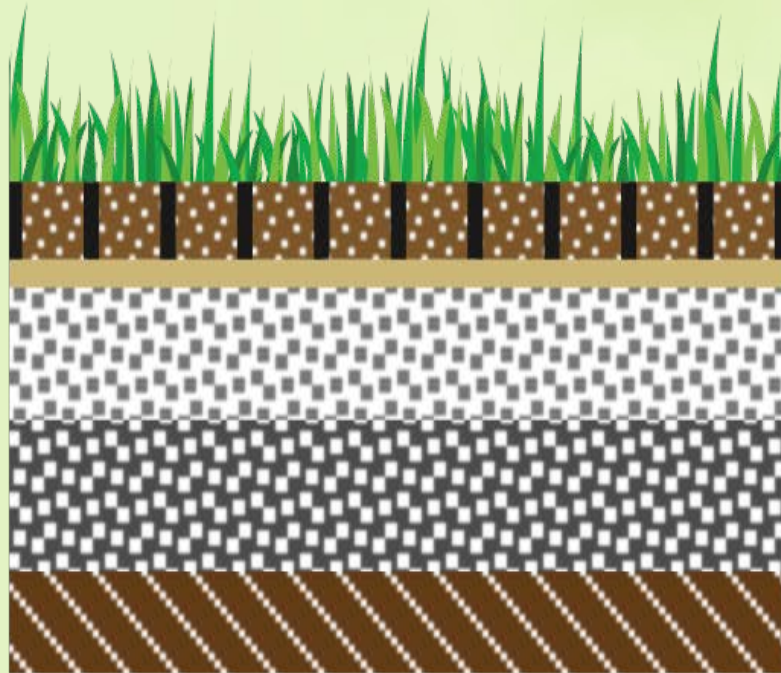
- ✿ **Choose a design** for your new pavement system
- ✿ Map out and **mark area** where pavers will be installed
- ✿ **Excavate** designated area to specifications
- ✿ Prep excavated area with **base material**
- ✿ **Install pavers and fill**

Materials and Guidelines for Basic Installation

Materials:

- ✱ **Porous road base:** Sandy gravel mixture (washed masonry sand). Aggregate should not exceed 3/4" in diameter
- ✱ **Bedding layer:** (OPTIONAL with aggregate fill application)
 - ✱ —washed masonry sand, depth 1-1.5"
- ✱ **Grassy paver (See assembly layout!)**
- ✱ **Fill Material**
 - ✱ GRASS: sandy topsoil (60/40 mix)
 - ✱ AGGREGATE: 3/16" crushed stone to 3/8"
 - ✱ Or, washed pea gravel
 - ✱ Grass seed, Sod or Aggregate

Installation chart



ECOGRID®

Filled with a mixture of sand, topsoil, humus, long-time fertilizer

Levelling course

Mixture from 50 % of humus and 50 % of quartz sand

Intermediate layer

Mixture from 30 % of humus and 70 % of gravel

Drainage layer

gravel

Natural soil

Ground with gradient of 1-1,5%

Before photo of a driveway...



170115

Excavation and Leveling



Leveling with Gravel...



Laying Pavers



Gravel or Topsoil Fill



Grass Seeding



7/8/13

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Finished Driveway



Grass fill in Pavers



Before...



...and After
Photos



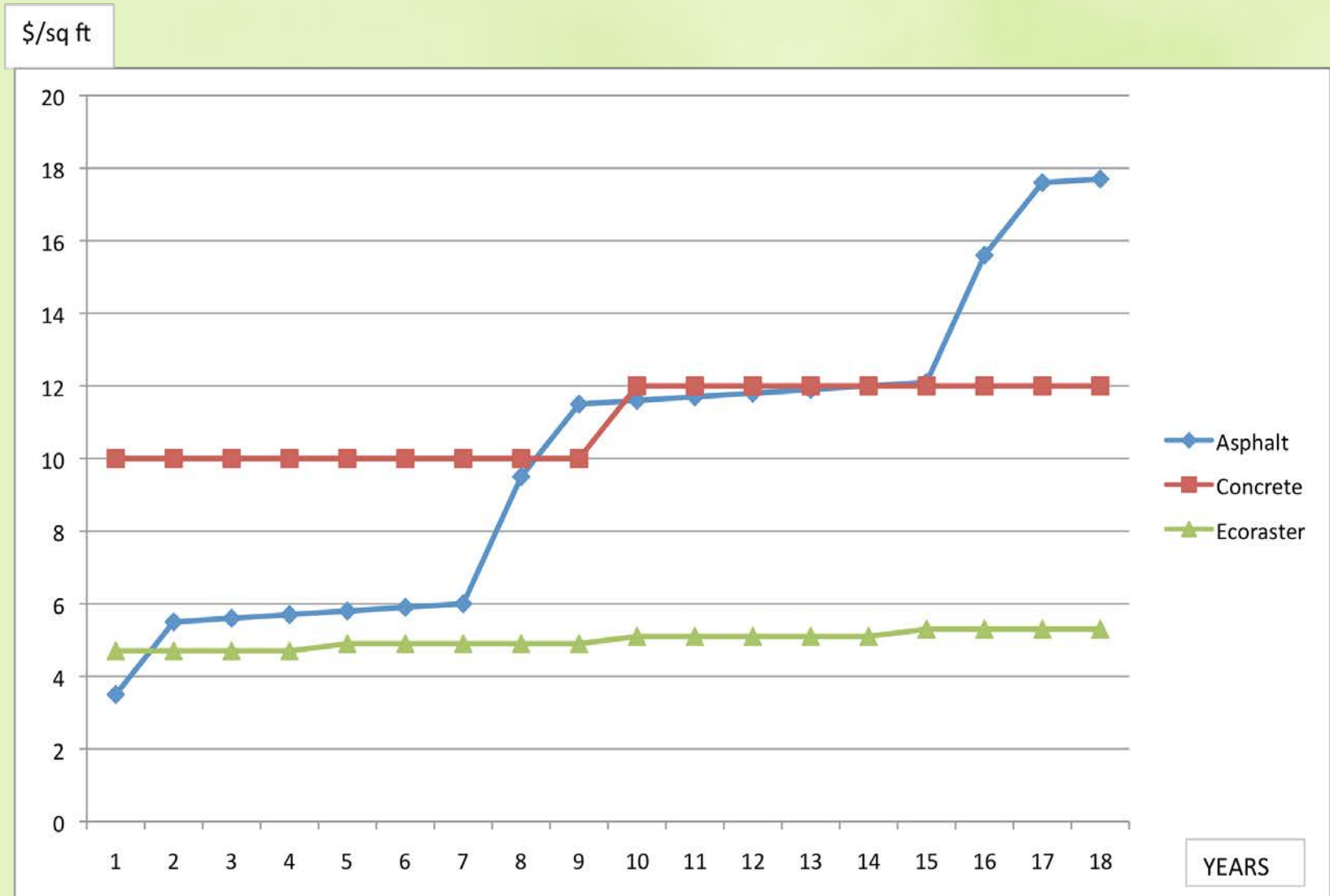


Advantages

- ✿ Both economically and ecologically friendly by **replacing asphalt and concrete** with a Green alternative
- ✿ **Weather resistant**
- ✿ Gives **the strength of conventional pavement**, while architecturally **beautifying your landscape**
- ✿ Successful in **storm water management** by allowing water to drain back into the soil
- ✿ **Reduces surface heat**, unlike standard asphalt applications
- ✿ Significant **reduction in maintenance costs** over the lifetime of the product

Asphalt, Concrete and ECORASTER® Pavers

Graphic of Cost \$/sq ft through 18 years



Consumer Benefits

Reasons to build a Green Driveway:

1. Recycled Plastic turns into an environmentally neutral product
2. Creating “Green” environment
3. To prevent/remedy erosion
4. Storm Water Control
5. Mud Control
6. Cost Savings
7. Optional DIY installation



Maintenance



- ✿ Relatively maintenance free
- ✿ For grass filled pavers - requiring only basic **lawn maintenance** (watering, fertilizer and mowing)
- ✿ **Snowplow at least 1 inch above the paver.**
- ✿ **Two-Stage Snow Blower** is recommended for snow removal on uneven or gravel surfaces because it has two augers involved in the snow removal process.

Snowplowing...





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Thank You for Your Support!

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