



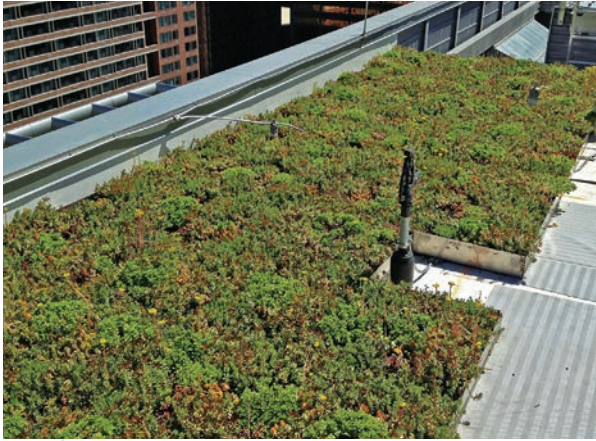
GREEN ROOF

SYSTEMS



OUR STANDARDS. YOUR PEACE-OF-MIND.

GREENSCAPES[™]
Green Roof Systems by **CETCO**[®]



GREEN ROOFS MADE EASY

Proven system assemblies, job specific growing media and a comprehensive offering of accessories to construct any green roof design

GreenScapes™ Green Roof Solutions combines the performance of proven waterproofing systems with modern green roof technology and design. Customized to meet your building requirements, CETCO will work with you to develop a green roof solution that is specific to you, taking into account aesthetic, functional and structural requirements. CETCO offers a variety of systems, components and accessories that can create a solution for any scenario. Whether it's a low maintenance extensive assembly, a more comprehensive intensive assembly or a high-slope condition, CETCO GreenScapes™ offers our customers unique green roof solutions—from the plants to the waterproofing—all from a single source.

SINGLE-SOURCE PROVIDER OF GREEN ROOF SOLUTIONS—FROM THE PLANTS TO THE WATERPROOFING



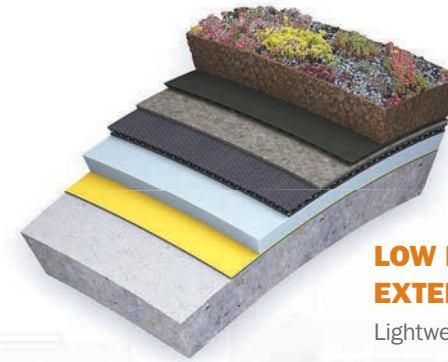
VISUALLY APPEALING INTENSIVE SYSTEMS

A more dynamic system with increased planting possibilities for outdoor amenity space, stormwater management and rooftop agriculture



PLANTER ASSEMBLIES

Variable configurations to meet aesthetic and functional needs of both new and restoration applications



LOW MAINTENANCE EXTENSIVE SYSTEMS

Lightweight systems for stormwater management, aesthetic appeal and energy efficiency



PLAZA DECK ASSEMBLIES

New construction and restoration applications.



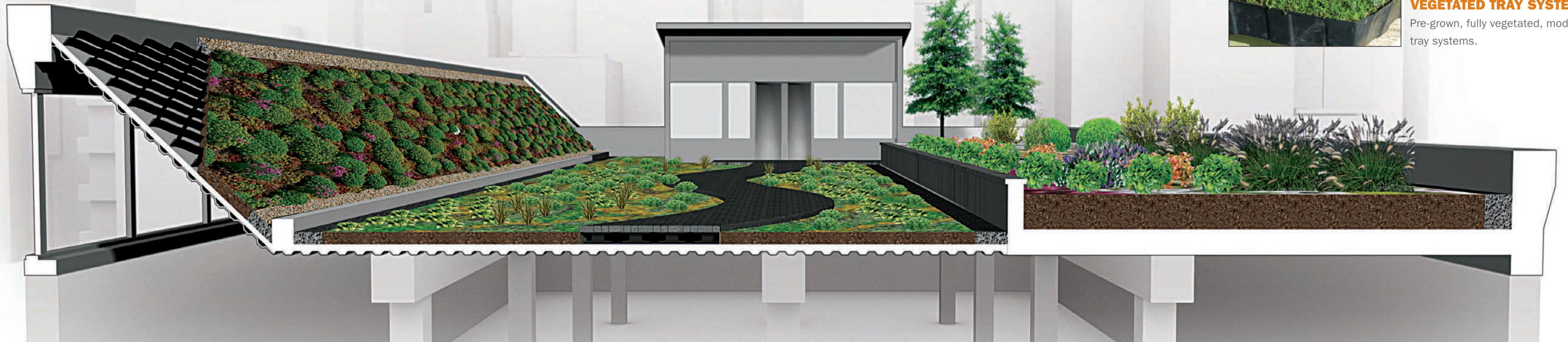
VEGETATED TRAY SYSTEMS

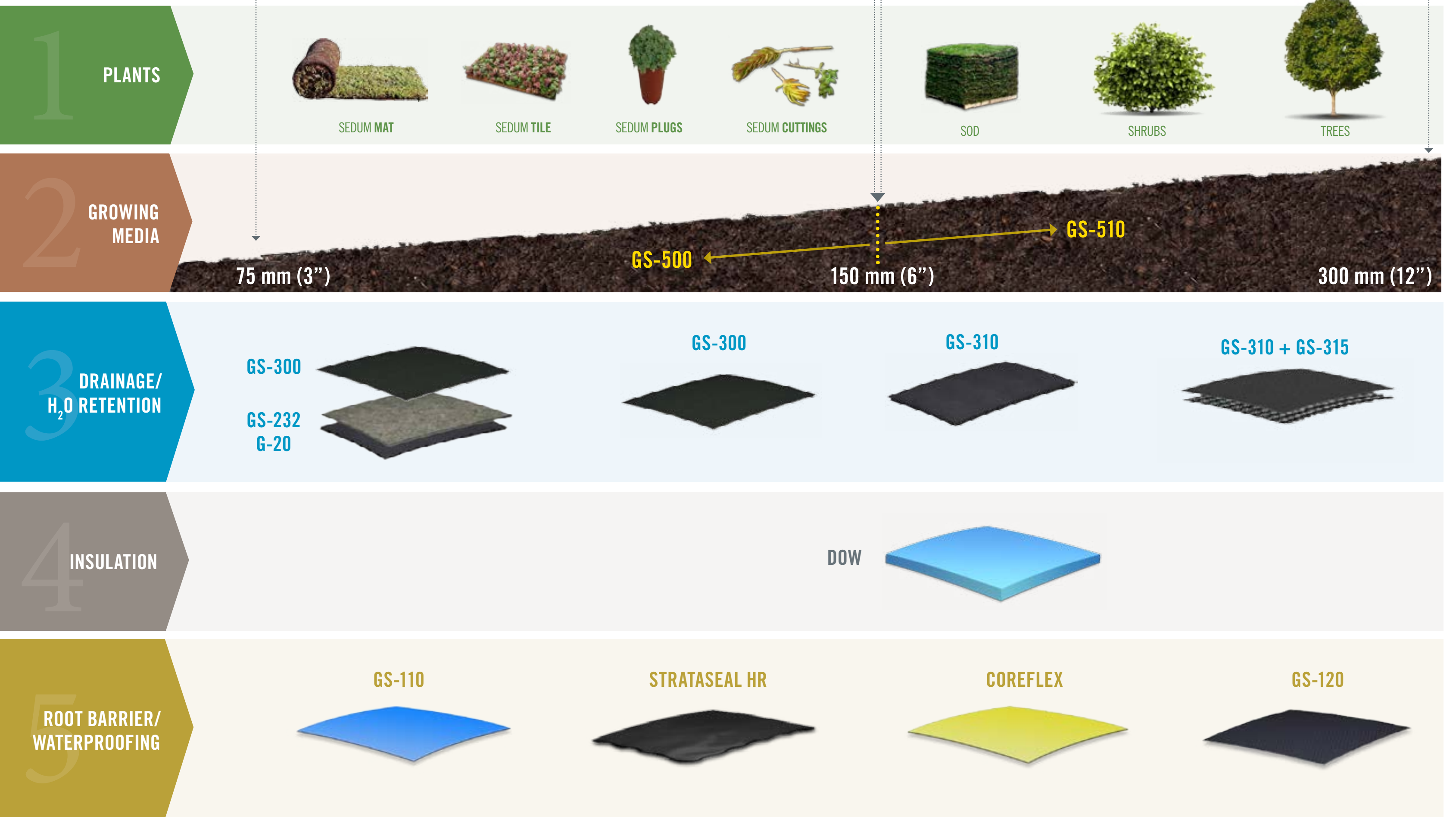
Pre-grown, fully vegetated, modular tray systems.



HIGH WIND/STEEP SLOPE ASSEMBLIES

Systems to accommodate specialty rooftop conditions.





PROJECT HIGHLIGHTS



RONALD McDONALD HOUSE Chicago, IL

CETCO provided the complete watertight green roof assembly for the nation's largest Ronald McDonald House. Protected by CETCO's COREFLEX® waterproofing membrane, three GreenScapes™ assemblies—intensive, extensive, and vegetated trays—were utilized to meet a challenging landscape design.



SANDPIPER, LITCHFIELD BY THE SEA Pawley's Island, SC

This restoration application used an extensive GreenScapes™ system with COREFLEX® waterproofing technology to create an ocean side lawn space for condo occupants. When used in restoration applications, CoreFlex® minimizes demolition, reduces building exposure and limits building down time.



THE ENCLAVE LUXURY APARTMENTS Wauwatosa, WI

An extensive GreenScapes™ Hot Rubber assembly created an open, recreational space for condo owners. GreenScapes™ offers building owners proven waterproofing technology and single-source green roof solutions.



COOK COUNTY CORRECTIONAL FACILITY Chicago, IL

CETCO provided this Chicago municipal building with a complete extensive GreenScapes™ green roof system—from the plants to the waterproofing. CETCO also provided the below-ground waterproofing, making CETCO a true single-source, HydroShield-eligible waterproofing solution.



BACKED BY HYDROSHIELD™ QUALITY ASSURANCE PROGRAM

Nothing threatens the structural integrity and interior environmental quality of a building like water ingress. Protect your structure with the industry's leading quality assurance program—Hydroshield. This proven, systematic approach ensures optimum, long-term waterproofing performance on every project. The Hydroshield Quality Assurance Program provides the following:

Design Assistance

System Review

Job-Specific CAD Details

Complete Product Offering

Trained, Licensed Applicators

Third-Party, Independent Inspection

Contractual Accountability

No-Dollar-Limit Warranty

If it's worth building, it's worth protecting.

GREENSCAPES™ GS-110

ROOT BARRIER

DESCRIPTION

GS-110 is a 10-mil (0.25 mm) thick, single ply polyethylene sheet used as a root barrier with an extensive GreenScapes Assembly. GS-110 can also be used in deeper assemblies where no woody species are to be planted. GS-110 is manufactured with polyethylene resins that provide high tensile strength, high puncture resistance, low moisture vapor permeability as well as excellent resistance to root penetration and decay.

APPLICATIONS

GS-110 is typically installed above the waterproofing protection course and below other components including insulation and drainage layers. GS-110 is primarily used in the Strataseal HR Protected Membrane Roof Assembly, Plaza Deck Assembly, Greenroof Assembly, or Landscaped Assembly as the root barrier protection layer. For applications that require a welded root barrier overlap seam use GS-120 Root Barrier.

INSTALLATION

Install GS-110 Root Barrier over the waterproofing membrane assembly. Unroll and install GS-110 over the waterproofing protection course with minimal wrinkles and air pockets. Overlap adjacent sheet edges a minimum 12" (600 mm) and tape with CETCO Seamtape. Extend GS-110 installation up all roofing termination points and flashing to provide total root protection to all roof/flashing surfaces that will be subsequently covered with growing media.

Cut as required to fit around all penetration and drainage details. As applicable, seal all cut edges and seal around detail with Seamtape. As GS-110 Root Barrier is installed loose-laid, temporary ballasting may be required prior to the installation of subsequent topping materials. Temporary ballast should be a material that will not puncture the root barrier such as sand bags and milled lumber. Upon completion of the root barrier layer

installation, install subsequent toppings as soon as possible within 30 days to avoid prolonged UV exposure.

PRECAUTIONS

GS-110 is not designed for extended UV exposure. GS-110 must be covered within 30 days to prevent deterioration to the sheet.

PACKAGING

GS-110 roll size is 15 feet (4.5 m) x 100' (30.5 m) - 1500 sq ft (139 sq m) per roll. Typical roll weight: 74 lbs (33.5 kg).

PHYSICAL PROPERTIES

PROPERTY	TEST STANDARD	TYPICAL VALUE
Tensile Strength	ASTM E154	10.5 N/mm
Permeance	ASTM E96B	0.036 Perms
Puncture Resistance	ASTM D1709B	2600 g

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
 UPDATED: JANUARY 2014

TDS_GREENSCAPESGS110_AM_EN_201401_V1



An AMCOL Company

www.CETCO.com

GREENSCAPES™ GS-120

ROOT BARRIER

DESCRIPTION

GS-120 Root Barrier is a 20-mil (0.50 mm) thick, thermoplastic weldable root barrier liner used within waterproofing and greenroof assemblies. GS-120 is manufactured with polyester woven fabric coated with a thermoplastic coating to provide high tensile strength, high puncture resistance, low moisture vapor permeability, as well as excellent resistance to roots and decay. The overlap seams of GS-120 are typically hot air fused together to form a seamless connection to impede root penetration.

APPLICATIONS

GS-120 is typically installed above the reinforced asphalt protection (RAP) sheet course and below other components including insulation and drainage layers. GS-120 is primarily used in the Strataseal HR Protected Membrane Roof Assembly, Plaza Deck Assembly, Greenroof Assembly,

or Landscaped Assembly as the root barrier protection layer. For applications that require a welded root barrier overlap seam use GS-120 Root Barrier.

INSTALLATION

Install GS-120 Root Barrier over the waterproofing membrane assembly. Unroll and install GS-120 over the waterproofing protection course with minimal wrinkles and air pockets. Overlap adjacent sheet edges a minimum 6" (150 mm) and construct all seams with a continuous thermoplastic weld. Extend GS-120 installation up all roofing termination points and flashing to provide total root protection to all roof/flashing surfaces that will be subsequently covered with growing media.

Cut as required to fit around all penetration and drainage details. As applicable, seal all cut edges and seal around detail

with a continuous thermoplastic weld. As GS-120 Root Barrier is installed loose-laid, temporary ballasting may be required prior to the installation of subsequent topping materials. Temporary ballast should be a material that will not puncture the root barrier such as sand bags and milled lumber. Upon completion of root barrier layer installation, install subsequent toppings as soon as possible within 30 days to prevent damage.

PACKAGING

GS-120 roll size is 61" (1.6 m) x 100' (30.5 m) - 508 sq ft (47 sq m) per roll. Typical roll weight: 65 lbs (79 kg).

PHYSICAL PROPERTIES

PROPERTY	TEST STANDARD	TYPICAL VALUE
Grab Tensile	ASTM D751 Procedure B	375/350 lb (1669/1557 N)
Strip Tensile	ASTM D751 Dielectric Weld	10 lb _f /in (9 daN/5 cm)
Hydrostatic Resistance	ASTM D751 Procedure A	500 psi (3.45 MPa)
Puncture	ASTM D4833	258 lbs (1.147 kN)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
 UPDATED: JANUARY 2014
 TDS_GREENSCAPESGS120_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ GS-232

MOISTURE RETENTION MAT

DESCRIPTION

GS-232 Protection and Retention Mat is a heavy weight, non-woven geotextile composed of recycled fibers designed to retain moisture thereby helping to sustain greenroof plant life. It also serves as a protection layer against garden tools penetrating the root barrier and waterproofing layers.

APPLICATIONS

GS-232 is a storm water retention layer as well as a protection layer for the root barrier. When insulation is installed in the greenroof, an air layer (AQUADRAIN G20) must be added to maintain the thermal properties of the insulation.

INSTALLATION

Install GS-232 Protection and Retention Mat over the root barrier or air layer, overlapping all seams and laps a minimum of 4" (100mm). Allow GS-232 to lay flat at perimeters.

PACKAGING

GS-232 is available in rolls 12' (3.6m) by 60' (18.3 m) 720 sq ft per roll; individually packaged in bags.

PHYSICAL PROPERTIES		
PROPERTY	TEST STANDARD	TYPICAL VALUE
Weight	ASTM D5261	32 oz/yd ² (758 g/m ²)
Weight per sq. ft. dry		0.22 lbs. (99.8 g)
Water Retention Capacity		0.18 gal/ft ² (7.33 l/m ²)
Weight (Saturated) per sq. ft.		1.72 lbs (780.2 g)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
 UPDATED: JANUARY 2014

TDS_GREENSCAPESGS232_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ GS-300

DRAINAGE COMPOSITE

DESCRIPTION

GREENSCAPES GS-300 Drainage Composite consists of a polypropylene drainage core of fused, entangled filaments and a non-woven polypropylene filter fabric bonded to the top side. The entangled filaments are molded into a square waffle pattern that maintains this flexible design. GS-300 is installed with the filter fabric side up to accept the placement of growing media. The material content of the product includes 40% post-industrial recycled polymer by weight.

APPLICATIONS

For use in:

- Greenroofs
- Exterior planters

FEATURES AND BENEFITS

- Excellent durability
- Conforms to irregular surfaces and corners
- Lays flat when unrolled – has very little to no roll memory
- Maintains continuous flow under high loads
- Long rolls reduce installation costs – fewer seams
- Recycled content contributes to LEED points
- 3-inch fabric overlap

PHYSICAL PROPERTIES

PROPERTY	TEST STANDARD	TYPICAL VALUE
Core Material		Recycled polypropylene
Thickness		0.45 in (11.43 mm)
Weight		20.5 oz./yd ² (695.2 g/m ²)
Compressive Load Test	ASTM 1621 mod. and ASTM D4716	30,000 psf (1,436 kN/m ²)

FLOW RATES

PRESSURE	1.0 GRADIENT	0.5 GRADIENT	0.2 GRADIENT
100 psf	22.5 gal/min/ft. width	15.5 gal/min/ft. width	9.2 gal/min/ft. width
250 psf	22.5 gal/min/ft width	15.5 gal/min/ft. width	9.2 gal/min/ft. width
500 psf	22.0 gal/min/ft width	15.2 gal/min/ft. width	8.7 gal/min/ft. width
1000 psf	19.0 gal/min/ft width	14.3 gal/min/ft. width	8.4 gal/min/ft. width

*Typical flow vs. pressure ASTM D 4716. Sample configuration: plate/GS-300/plate. Values are average of machine direction and cross machine direction test results

GREENSCAPES GS-300 DRAINAGE COMPOSITE

PHYSICAL PROPERTIES		
PROPERTY	TEST STANDARD	TYPICAL VALUE
Polymer		Polypropylene
Fabric Color		Black
Weight	ASTM D 5261	4.5 oz/yd ² (152.6 g/m ²)
Grab Strength MD/CD	ASTM 4632	120.0 lbs (0.52 kN)
Grab Elongation	ASTM D 4632	50%
Trapezoid Tear	ASTM D 4533	50.0 lbs (0.22 kN)
Puncture Strength	ASTM D 4833	70.0 lbs (0.31 kN)
AOS (maximum average)	ASTM D4751	70 US Sieve (0.212 mm)
Flow Rate	ASTM D 4491	120 gal/min/ft ² (4,887 l/sec/m ²)
Permittivity	ASTM D 4491	1.8 sec ⁻¹
*Values are MARV Minimum Average Roll Value		

POLYMER PROPERTIES

Polypropylene has excellent resistance to organic solvents, degreasing agents, acids and alkalines. It has tensile strength superior to high density polyethylene. It has a low moisture absorption rate, is resistant to staining, and is very lightweight.

PACKAGING	
PROPERTY	TYPICAL VALUE
Roll Width	39.0 in (99.1 cm)
Roll Length	100.0 ft (30.5 m)
Area	324.0 Ft ² (30.1 m ²)
Roll Diameter	27.0 in (68.5 cm)
Gross Roll Weight	55.0 lbs (24.5 kg)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
UPDATED: JANUARY 2014

TDS_GREENSCAPESGS300_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ GS-310

STORMWATER MANAGEMENT

DESCRIPTION

GREENSCAPES GS-310 is a stormwater retention and drainage composite product used within GreenScapes greenroof systems. GS-310 consists of a 3-dimensional polystyrene formed dimple core providing compressive strength to support subsequent layers. The formed dimple core retains stormwater but allows excessive stormwater to drain through drainage holes in the top of the drain board. GREENSCAPES GS-310 is preassembled with a spunbonded, filter fabric made from 100% post-consumer recycled polyester geotextile adhered to the top of the core and a black nonwoven polypropylene filter fabric adhered to the bottom of the core. The spunbonded filter fabric may vary in color from tan to black depending on the color of the recycled fibers from which it is made.

APPLICATIONS

GREENSCAPES GS-310 provides storm water retention and drainage for CETCO GREENSCAPES Greenroof Systems. GREENSCAPES GS-310 allows for storage of up to 0.11 gallons of stormwater per square foot promoting irrigation through the plant roots and evapotranspiration into the GS-500 Series Growing Media.

INSTALLATION

Install GREENSCAPES GS-310 loose laid with the woven, spunbonded filter fabric facing up to maximize storm water retention. Do not mechanically fasten. Install adjacent rows butted together with filter fabric flap overlapping adjacent drainage panel ensuring the Growing Media does not pass through

gaps between adjacent drainage panels. Cut the GS-310 composite as required to fit around all penetration and drainage details.

Minimize direct traffic on the drainage material until placement of the Growing Media to avoid shifting of the installed drainage composite. Do not drive vehicles directly on drainage composite prior to installation of the Growing Media. Repair damaged or disrupted drainage composite prior to installing of the Growing Media. Do not leave exposed for prolonged time period.

PACKAGING

GREENSCAPES GS-310 is available in rolls 4' (1.2 M) by 50' (15.2 M) 200 sq-ft (18.5 sq m); per roll.

PHYSICAL PROPERTIES		
PROPERTY	TEST STANDARD	TYPICAL VALUE
<i>DRAINAGE CORE PROPERTIES</i>		
Panel Height	ASTM D1777	1" (25 mm)
Compressive Strength	ASTM D1621	9,500 psf (454 kPa)
Flow	ASTM D4716	30 gal/min/foot width (376 l/min/m)
<i>TOP SPUNBONDED FILTER FABRIC PROPERTIES</i>		
Weight	ASTM D3776	2.95 oz/yd ² (100 g/m ²)
Grab Tensile Strength	ASTM D4632	75 lbs. (33 kN)
Grab Elongation	ASTM D4632	40%
Trapezoidal Tear	ASTM D4533	20 lbs. (0.09kN)
<i>BOTTOM NON-WOVEN FILTER FABRIC PROPERTIES</i>		
Weight		4 oz/yd ² (94.8 g/m ²)
Grab Tensile Strength	ASTM D4632	100 lbs. (0.4 kN)
Puncture	ASTM D4833	65 lbs. (0.28 kN)
<i>TOTAL COMPOSITE PROPERTIES</i>		
Weight (Dry)		0.325 lbs/sq ft (1.59 kg/m ²)
Weight (Saturated - filled cups)		1.24 lbs/sq ft (6.05 kg/m ²)
Water Retention		0.11 gals/sq ft (0.54 l/m ²)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGS310_AM_EN_201401_V1



An AMCOL Company

www.CETCO.com

GREENSCAPES™ GS-315

DRAINAGE/RETENTION PANEL

DESCRIPTION

GREENSCAPES GS-315 is a 1.5 inch deep 3-dimensional drainage/retention panel that retains water for plant root uptake while allowing free flow of excess water over both the top surface and underneath the panel. The GS-315 is made of high density polyethylene that is very light in weight yet strong enough to support a high overburden load. The large, open, configuration of the GS-315 makes it an ideal choice for intensive greenroof applications with high overburden loads or in extensive greenroof applications where maximum water retention is desired as part of a storm water management program.

APPLICATIONS

- For use in:
- Greenroofs
 - Exterior planters

FEATURES AND BENEFITS

- Excellent durability
- Large retention cups maximize storm water retention
- Flat 40 inch x 48 inch panels ship easily on a pallet and are easy to move and handle during installation.
- Maintains continuous flow under high loads
- Easy to cut to fit around penetrations, perimeters and drains
- Can be filled with lightweight aggregate (LWA) for added compressive strength when used with deeper growing media profiles

PHYSICAL PROPERTIES		
PROPERTY	TEST STANDARD	TYPICAL VALUE
Material		High Density Polyethylene
Size		40 in. x 48 in (1.02 m x 1.2 m)
Packaging		4,000 sq. ft. per pallet (371.6 sq. meters/pallet)
Height		1.5 in (3.8 cm)
Weight		
<i>Empty/dry</i>		0.26 lbs/sq. ft (1.27 kg/sq. m)
<i>Empty/water filled</i>		0.91lbs/sq. ft. (4.44 kg/sq. m)
<i>Filled with LWA/dry</i>		Approx.0.54 lbs/sq. ft (2.63 kg/sq. m)
<i>Filled with LWA/saturated</i>		Approx. 2.32 lbs/sq. ft (11.33 kg/sq. m)
Water Retention		
<i>Empty</i>		0.078 gal/sq. ft (3.18 L/sq. m)
<i>Filled with LWA</i>		0.20 gal/sq. ft (8.15 L/sq. m)
Flow Rate	ASTM D-4716*	23.5 gal/min/foot width (291.6 L/m width)
Lightweight Aggregate to fill		0.047 cubic ft./sq. ft (123.6 cubic cm/sq. m)
Compressive Strength	ASTM D-1621**	864 lbs/sq. ft (4,218.4 kg/sq. m)
*Test conditions of 1000 psf pressure and 0.1 gradient		
**Filling cups with lightweight aggregate greatly increases compressive strength		

North America: 847.851.1800 | 800.527.9948



An AMCOL Company

www.CETCO.com

GREENSCAPES™ GS-404

FILTER FABRIC

DESCRIPTION

GS-404 Filter Fabric is a non-woven geotextile allowing drainage of stormwater from the growing media to the water management layer. In addition to retaining the fines of the growing media, it provides excellent laminar flow. GS-404 maintains separation and provides a cushioning layer between the growing media from the water management layer. The geotextile is produced from a synthetic fabric that is chemically resistant to typical acid and alkali soil conditions and will not degrade over time from nutrients that may wash through the growing media.

INSTALLATION

Place GS-404 Filter Fabric over the GS-315 Stormwater Management layer. Overlap all edges 6" with a minimum of 6' between overlaps. Keep overlaps a minimum of 6' from all perimeters. Secure filter fabric under any perimeter metal counter flashings. Cut filter fabric around any drainage openings so to not restrict the water flow to the drain. Cut filter fabric around any penetrations in such a manner as to prevent any stone ballast from entering between penetration and insulation

GS-404 is also used with metal edging to prevent growing media fines from passing through the perforations of the edging.

PACKAGING

GS-404 Filter Fabric is available in rolls of 12'-6" (3.8 m) by 360 feet (109.8 m) packaged in bags.

PHYSICAL PROPERTIES

PROPERTY	TEST STANDARD	TYPICAL VALUE
Weight	ASTM D5261	4 oz/yd ² (94.8 g/m ²)
Trapezoid Tear Strength	ASTM D4533	50 lbs (0.22 kN)
Grab Tensile Elongation	ASTM D4632	50%
Grab Tensile Strength	ASTM D4632	115 lbs (0.51 kN)
Burst Strength	ASTM D3786	210 psi (1448 Kpa)
Apparent Opening Size	ASTM D4751	70 US Sieve (0.212 mm)
Flow Rate	ASTM D4491	140 GPM/ft ² (5704 l/min/m)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
 UPDATED: JANUARY 2014

TDS_GREENSCAPESGS404_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ GS-500 SERIES

GROWING MEDIA

DESCRIPTION

GS-500, GS-505 and GS-510 are light-weight engineered growing media blends for greenroofs. The GS-500 series consists of a uniform distribution of aggregate grain sizes and organic materials producing consistent color, structure and texture that allows the media to maintain specified aeration, water permeability, erosion resistance and root penetration. The GS-500 series promotes sustainability of the greenroof through it's compatibility with plant life; having the correct physical, chemical and biological properties to promote vegetative growth. GS-500 Series Growing Media provides plant roots with a stable base to anchor the plant while providing a matrix from which the plant can obtain air, water and nutrients to support life. GS-500

Series Growing Media is available in three general media types to meet the needs of a variety of greenroof designs; GS-500 for extensive plantings, GS-510 for intensive plant types and GS-505 that is custom designed to meet a range of project-specific parameters included very low load capacities or the demands of specialized plant palettes.

INSTALLATION

Place GS-500, 505 or 510 Growing Media on top of the greenroof drainage composite filter fabric layer avoiding damage to the drainage and other materials including walls, paving, drainage and roof. Apply growing media at a rate such that it does not exceed the project specific final grade when compacted using a 200-300 lb landscape roller or hand-held

mechanical compactor achieving a 50-60% compaction as determined by ASTM D1557. For deeper intensive applications, GS-510 Growing Media should be placed in lifts not to exceed 8 inches between compaction efforts.

PACKAGING

The GS-500 Growing Media Series is shipped by the cubic yard either bulk, in 1/2 to 1 cubic foot poly bags or in 1-2 cubic yard super sacks. Contact CETCO for packaging options available in your area.

PHYSICAL PROPERTIES

SPECIFICATION	GS-500 EXTENSIVE	GS-505 CUSTOM BLEND	GS-510 INTENSIVE
Density (cubic ft. dry weight)	36-60 lbs (16.3-27.2 kg)	36-72 lbs (16.3-32.6 kg)	42-72 lbs (19.1-32.6 kg)
Density (cubic ft. max water capacity)	56-90 lbs (25.4-40.8 kg)	56-98 (25.4-44.4 kg)	62-98 lbs (28.1-44.4 kg)
Minimum Air Capacity at Saturation	≥10%	≥8%	≥8%
Maximum Water Capacity	≥30%	30->40%	≥40%
Water Permeability	5.4-16.8 in/hr	2.9-16.8 in/hr	2.9-11.3 in/hr
Total Organic Matter, By Combustion (dry weight)	3-6 mass %	3-15 mass %	5-12 mass %

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGS500_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ GS-T

MODULAR GREEN ROOF TRAY SYSTEM

DESCRIPTION

A modular green roof is made up of a series of trays, which hold engineered growing media and plants. The green roof can go directly on existing roofs, assuming necessary support exists, without retrofit and the associated costs. It provides the important elements associated with green roofs, including stormwater retention, insulation and membrane protection.

FEATURES

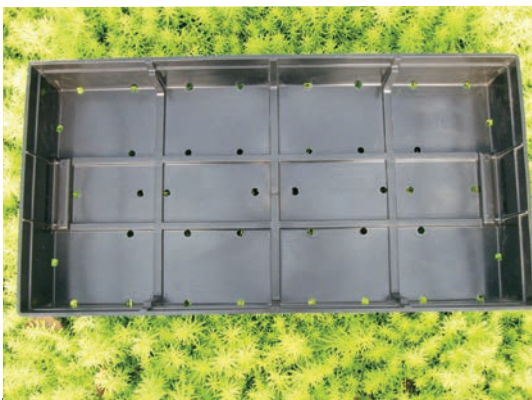
- ▶ Available for extensive and intensive applications
- ▶ Ideal for retrofit
- ▶ Manufactured in recycled high density polyethylene (HDPE), with 60% post-industrial recycled material
- ▶ Raised drain holes (on corners) allow for 3/4" of storm water retention and water reintroduction to water cycle
- ▶ Trays manufactured in black material with UV stabilizers
- ▶ Typical saturated weight of 3.3" (extensive) system: 20 lbs per square foot
- ▶ Typical saturated weight of 8" (intensive) system: 50 lbs per square foot

BENEFITS

- ▶ Easy roof repair & maintenance
- ▶ Quick & easy installation
- ▶ Easy green roof maintenance
- ▶ May be retrofitted to an existing roof
- ▶ Pre-engineered components mean less custom design
- ▶ Lightweight
- ▶ May be pre-planted and pre-grown - a mature roof planted without waiting

SIZES

12" x 24" x 3.3"
24" x 24" x 8"



GS-T Modular Green Roof Tray



A pre-planted, pre-grown tray

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGST_AM_EN_201401_V1

CETCO®

An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ PLANT PLUG TRAYS

FOR EXTENSIVE GREENROOFS

DESCRIPTION

Greenscapes Plant Plug Trays offer a wide variety of plants suitable for growing on extensive greenroofs. Over 50 sedum varieties and more than 25 other small herbaceous perennials are available in two sizes, standard 72-cell trays and custom grown in 24-cell size. Depending on site conditions, specific selections can be made to suit light to moderate shade, high wind, particularly hot and dry environments and very cold to more moderate growing zones. Design criteria such as maximum color, season long bloom and winter interest can be achieved with the proper selection of available varieties

APPLICATIONS

- Extensive greenroofs
- Exterior planters
- Ground Cover for Intensive greenroofs

BENEFITS

- Large variety of plants to choose from
- Affordable pricing allows designers to specify generous planting densities
- Year round availability of 72-cell size for early or late season installation
- Custom grown availability of 24-cell size (minimum 16 week lead time)
- Provides fast vegetation coverage with proper installation and care
- Robust on delivery, the well established root system will quickly root in
- Can be successfully grown in as little as 2.5 inches (63mm) of growing media

PRE-INSTALLATION STORAGE

Plug trays should be immediately removed from shipping cartons, placed in a cool shaded outdoor area and watered daily until installed.

INSTALLATION

Tap/shake trays to loosen plugs. Dump out the plugs or gently push out from the bottom of the trays to remove. Plugs should be planted in triangular staggered rows (like a "5" on dice) at the depth of the top of the root ball in a minimum of 2.5 inches of growing media and watered thoroughly to settle. See CETCO Greenscapes Vegetation Plug Tray Care Guidelines for more detailed information.

PHYSICAL PROPERTIES						
SUGGESTED PLUG SIZES	ON CENTER SPACING	SQ FT MULTIPLIER	100 SF	1,000 SF	10,000 SF	25,000 SF
72-cell	6" (152 mm)	4.619	462	4,619	46,190	115,475
72-cell	7" (177 mm)	3.394	340	3,394	33,940	84,850
72-cell	8" (203 mm)	2.598	260	2,598	25,980	64,950
72 or 24 cell	9" (228 mm)	2.053	205	2,053	20,530	51,325
24-cell	10" (279 mm)	1.663	166	1,663	16,630	41,575
24-cell	12" (304 mm)	1.155	116	1,155	11,550	28,875



72-Cell Plug

72-Cell Plugs

- ▶ 1 1/2" wide x 2" deep
- ▶ Most widely used size for greenroofs
- ▶ Good year round availability
- ▶ Best combination of rooftop viability and affordable price



24-Cell Plug

24-Cell Plugs

- ▶ 2 5/8" wide x 2 1/2" deep
- ▶ Affords fast rooftop coverage
- ▶ Large plug is ideal for planting in harsh conditions
- ▶ Custom grown only (16 weeks lead time)

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGPLANTPLUGTRAYS_AM_EN_201401_V1



An AMCOL Company

www.CETCO.com

GREENSCAPES™ BULK SEDUM CUTTINGS

FOR EXTENSIVE GREENROOFS

DESCRIPTION

Greenscapes Bulk Sedum Cuttings are ½ - 2 ½ inch long spontaneously rooting stems available in a wide variety of sedums suitable for growing on extensive greenroofs. Sedum Cuttings are a great choice for low-cost planting of extensive greenroofs, overplanting of plug installations, repair of damaged areas and filling in of sparse areas on extensive greenroofs.

APPLICATIONS

- Extensive greenroofs
- Exterior planters

BENEFITS

- Over 40 varieties to choose from
- Affordable pricing allows designers to specify generous planting densities
- Fast installation greatly reduces planting cost versus other methods
- Can be planted in mixes or by individual variety to allow design flexibility
- 3 season availability allows planting for most of the year
- Provides fast vegetation coverage with proper installation and care
- Can be successfully grown in as little as 2-1/2" (6 cm) of growing media

PRE-INSTALLATION STORAGE

Shipping boxes should be opened immediately upon arrival, stored out of the sun and planted within 24 hours. If planting is not possible within 24 hours opened boxes can be stored in a cooler at a temperature between 40°- 45° F for up to 1 week.

INSTALLATION

Hand cast cuttings directly onto a minimum of 2-1/2" (6 cm) of freshly wetted Greenscapes GS-500 extensive growing media. Cuttings should be covered with either hydromulch, a 50/50 mixture of sand and topsoil or compost, or Greenscapes GS-612 Erosion Control Blanket for best results. See CETCO Greenscapes Vegetation Sedum Cuttings Care Guidelines for more detailed information.

AVAILABLE VARIETIES

Sedum acre 'Aurea'	Sedum kamtschaticum 'Variegatum'	Sedum spurium 'Dragon's Blood'
Sedum acre 'Gold Moss'	Sedum mexicanum	Sedum spurium 'Elizabeth'
Sedum album 'Chloroticum'	Sedum middendorffianum diffusum	Sedum spurium 'Green Mantle'
Sedum album 'Coral Carpet'	Sedum oreganum	Sedum spurium 'Fuldaglut'
Sedum album 'Green Ice'	Sedum pachyclados	Sedum spurium ' John Creech'
Sedum album 'Murale'	Sedum reflexum 'Blue Spruce'	Sedum spurium ' Red Carpet'
Sedum album 'Orange Ice'	Sedum reflexum 'Green Spruce'	Sedum spurium 'Roseum'
Sedum divergens	Sedum rupestre	Sedum spurium 'Summer Glory'
Sedum ellacombianum	Sedum rupestre 'Angelina'	Sedum spurium 'Tricolor'
Sedum floriferum	Sedum sexangulare	Sedum spurium 'Voodoo'
Sedum hispanicum 'Purple Form'	Sedum spurium sp.	Sedum stefco
Sedum hybridum 'Immergrunchen'	Sedum spurium 'Album Superbum'	Sedum takesimensis 'Golden Carpet'
Sedum hybridum 'Czar's Gold'	Sedum spurium 'Bronze Carpet'	Sedum tetractinum 'Coral Reef'
Sedum kamtschaticum	Sedum spurium 'Coccineum'	Sedum 'Weihenstephaner Gold'

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGSBULKSEDUM_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com

GREENSCAPES™ SEDUM MAT

PREVEGETATED SEDUM CARPET

DESCRIPTION

Greenscapes Sedum Mat consists of 8-11 mixed varieties of sedums planted over a coconut coir fiber base covered with approximately one inch of growing media. The sedum mat is planted and field grown to a minimum of 85% coverage prior to being shipped. It is harvested just prior to shipping, rolled into approximately 48-inch wide by 75 inch long rolls and placed on pallets for shipping.

BENEFITS

- Provides finished vegetation coverage on day of planting
- Reduces weed competition by reducing weed seed germination
- Provides protection from wind scour of growing media
- Large rolls reduce installation costs – faster coverage
- Established root system will quickly root in and produce healthy, robust plants



25 sq ft Roll

APPLICATIONS

- Extensive greenroofs
- Well-drained landscapes
- Exterior planters

PHYSICAL PROPERTIES	
PROPERTY	TYPICAL VALUE
Planted coverage When Shipped	85% Minimum
Dry Weight	3-4 lbs. per square foot
Wet Weight	5-6 lbs. per square foot
Thickness	1 - 1 ½ inches
Square Feet per Roll	25 square feet
Roll Width	48 inches (120 cm)
Roll Length	75 inches (196 cm)

SEDUM VARIETIES USED IN GREENSCAPES SEDUM MAT	
VARIETIES USED IN EVERY MAT	VARIETIES USED AS ACCENTS
Sedum album 'Coral Carpet' or 'Murale'	Sedum spurium 'Tricolor'
Sedum acre 'Gold Moss'	Sedum hispanicum 'Purple Form'
Sedum sexangulare	Sedum divergens
Sedum spurium 'John Creech'	
Sedum spurium 'Red Carpet'	
Sedum spurium 'Fuldaglut'	
Sedum rupestre 'Blue Spruce'	
Sedum floriferum 'Weinestephaner Gold'	
Sedum kamschaticum	

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice. UPDATED: JANUARY 2014

TDS_GREENSCAPESGSSSEDUMMAT_AM_EN_201401_V1



An AMCOL Company

www.CETCO.com

GREENSCAPES™ SEDUM TILE

PRE-VEGETATED SEDUM SOD

DESCRIPTION

Greenscapes Sedum Tile consists of a mixture of sedum varieties planted over a thin coconut coir fiber base covered with approximately one inch of growing media. The Sedum Tile is planted and greenhouse grown in controlled conditions resulting in a vibrant and beautiful sedum “sod” with a minimum of 95% coverage prior to being shipped. Sedum Tiles are shipped flat in either boxes or in special cardboard trays that are palletized to keep shipping costs low. Sedum Tiles are available as 4 standard types; 1) Color Max (maximum flower and foliage color varieties),

2) All Seasons (all non-deciduous varieties), 3) Shade Mix (low light tolerant varieties), and, 4) Tuff Stuff (the most hearty varieties). Plant information for the 4 Standard Sedum Tile blends is listed on the next page. Custom Sedum variety blends also available.

APPLICATIONS

- Extensive greenroofs
- Exterior planters
- As groundcover plants on Intensive greenroofs

BENEFITS

- Provides finished vegetation coverage on day of planting
- Reduces weed competition by reducing weed seed germination
- Provides protection from wind scour of growing media
- Ships flat to arrive in optimal condition
- Easy to handle 15 in. x 20 in. size makes installation very efficient
- Established root system will quickly root in and produce healthy, robust plants
- Can be successfully grown over as little as 2 inches (5 cm) of growing media

PHYSICAL PROPERTIES	
PROPERTY	TYPICAL VALUE
Planted Coverage When Shipped	95% Minimum
Dry Weight	2-3 lbs. per square foot
Saturated Weight	4-5 lbs. per square foot
Thickness – fiber/soil base	1 inch (2.5 cm)
Thickness – total with vegetation	2-3 inches (5.0 - 7.5 cm)
Size	15 in. x 20 in. (3.8 – 7.6 cm)
Coverage Area per Tile	2.08 sq. ft.(0.23 sq. meters)
Minimum growing media substrate required	2.0 inches (5.0 m)

COLOR MAX TILES (EACH TILE INCLUDES 6-8 OF LISTED VARIETIES)				
PLANT NAME	FLOWERING TIME	FLOWER COLOR	WINTER INTEREST	GROWING ZONES
Sedum acre ‘Aurea’	Late Spring	Yellow	Yes	4 - 7
Sedum album ‘Coral Carpet’	Mid Summer	White	Yes	4 - 8
Sedum album ‘Orange Ice’	Mid Summer	White	Yes	4 - 8
Sedum floriferum ‘Weihenstephaner Gold’	Late Spring	Gold	Yes	3 - 7
Sedum kamtschaticum ‘Variegatum’	Mid Summer	Yellow	No	4 - 7
Sedum reflexum ‘Blue Spruce’	Late Spring	Yellow	Yes	5 - 7
Sedum rupestre ‘Angelina’	Mid Summer	Yellow	Yes	4 - 7
Sedum spurium ‘Green Mantle’	Early Summer	Yellow	Yes	3 - 7
Sedum spurium ‘John Creech’	Mid Summer	Pink	Yes	3 - 8
Sedum spurium ‘Red Carpet’	Mid Summer	Red	Yes	3 - 7
Sedum spurium ‘Summer Glory’	Mid Summer	Pink	Yes	4 - 7
Sedum spurium ‘Tricolor’	Early Summer	Pink	Yes	4 - 7

GREENSCAPES™ SEDUM TILE

PRE-VEGETATED SEDUM SOD

ALL SEASONS BLEND (EACH TILE INCLUDES 6-8 OF LISTED VARIETIES)

PLANT NAME	FLOWERING TIME	FLOWER COLOR	WINTER INTEREST	GROWING ZONES
Sedum album 'Coral Carpet'	Mid Summer	White	Yes	4 - 8
Sedum hybridum 'Immergrunchen'	Summer - Fall	Yellow	Yes	4 - 7
Sedum floriferum 'Weihenstephaner Gold'	Late Spring	Gold	Yes	3 - 7
Sedum middendorffianum diffusum	Mid Summer	Yellow	Yes	5 - 8
Sedum reflexum 'Green Spruce'	Early Summer	Yellow	Yes	4 - 7
Sedum spurium 'Coccineum'	Mid Summer	Red	Yes	3 - 7
Sedum spurium 'Fuldaglut'	Early Summer	Red	Yes	5 - 8
Sedum spurium 'John Creech'	Mid Summer	Pink	Yes	3 - 8
Sedum spurium 'Red Carpet'	Mid Summer	Red	Yes	3 - 7
Sedum spurium 'Roseum'	Early Summer	Rose Pink	Yes	4 - 7
Sedum stefco	Mid Summer	White	Yes	5 - 8
Sedum takesimensis 'Golden Carpet'	Mid Summer	Yellow	Yes	4 - 8
Sedum tetractinum 'Coral Reef'	Late Spring	Yellow	Yes	6 - 9

SHADE MIX (EACH TILE INCLUDES 6-8 OF LISTED VARIETIES)

PLANT NAME	FLOWERING TIME	FLOWER COLOR	WINTER INTEREST	GROWING ZONES
Sedum acre 'Aurea'	Late Spring	Yellow	Yes	4 - 7
Sedum hybridum 'Immergrunchen'	Summer - Fall	Yellow	Yes	4 - 7
Sedum pachyclados	Mid Summer	White	Yes	4 - 7
Sedum sexangulare	Mid Summer	Yellow	Yes	4 - 7
Sedum spurium 'Album Superbum'	Mid Summer	White	Yes	5 - 8
Sedum spurium 'Eco Mt. Emei'	Early Summer	Yellow	Yes	4 - 7
Sedum spurium 'Fuldaglut'	Early Summer	Red	Yes	5 - 8
Sedum spurium 'Green Mantle'	Early Summer	Yellow	Yes	3 - 7
Sedum spurium 'John Creech'	Mid Summer	Pink	Yes	3 - 8
Sedum ternatum	Early Summer	White	Yes	4 - 7

GREENSCAPES™ SEDUM TILE
PRE-VEGETATED SEDUM SOD

TUFF STUFF (EACH TILE INCLUDES 6-8 OF LISTED VARIETIES)				
PLANT NAME	FLOWERING TIME	FLOWER COLOR	WINTER INTEREST	GROWING ZONES
Sedum album 'Coral Carpet'	Mid Summer	White	Yes	4 - 8
Sedum caucolicum	Mid Summer	Pink	No	3 - 7
Sedum ellacombianum	Early Summer	Yellow	No	3 - 7
Sedum hybridum 'Czar's Gold'	Mid Summer	Gold	Yes	4 - 7
Sedum kamtschaticum	Early Summer	Yellow	Yes	4 - 7
Sedum middedorffianum diffusum	Mid Summer	Yellow	Yes	5 - 8
Sedum rupestre	Mid Summer	Yellow	Yes	4 - 7
Sedum sexangulare	Mid Summer	Yellow	Yes	4 - 7
Sedum spurium sp.	Mid Summer	Pink	Yes	4 - 7
Sedum spurium 'Roseum'	Early Summer	Pink	Yes	4 - 7
Sedum spurium 'Voodoo'	Summer - Fall	Rose	Yes	4 - 8
Sedum stefco	Late Summer	White	Yes	5 - 8

North America: 847.851.1800 | 800.527.9948

© 2014 CETCO. IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please visit www.CETCO.com. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.
 UPDATED: JANUARY 2014

TDS_GREENSCAPESGS110_AM_EN_201401_V1



An **AMCOL** Company

www.CETCO.com



CETCO, a wholly owned subsidiary of AMCOL International Corporation

1.800.527.9948 | www.cetco.com



ABOUT AMCOL INTERNATIONAL CORPORATION

Founded in 1927, AMCOL International Corporation is a leading producer and marketer of diverse specialty materials with a core expertise in minerals and polymer science. Through four business segments—Performance Materials, Construction Technologies, Energy Services, and Transportation—AMCOL creates solutions that enhance the quality, efficiency and sustainability of our customers' products and services in a growing global marketplace.

Amcol holds more than 375 worldwide patents, and our focus on research and development empowers us to be industry leaders. Technical expertise, coupled with unparalleled customer relationships and supported by more than 2,400 employees in more than 26 countries, makes us trusted partners in major end markets.



www.AMCOL.com