

OPPORTUNITIES FOR GOVERNMENT PROCUREMENT OF NEW AND  
INNOVATIVE RECYCLED CONTENT PRODUCTS

Prepared For:  
Cynthia L. Greene  
Environmental Scientist  
Solid Waste Section  
U.S. Environmental Protection Agency  
Region I

Prepared by:  
Stacy F. Ritter  
National Network of Environmental Management Studies  
Yale University, School of Forestry and Environmental Studies  
August 1995

## TABLE OF CONTENTS

I.	INTRODUCTION	
	Background	1
	Scope	1
	Methodology	2
	Format	3
	Recent Development and Recycled Content Product Design	4
II.	INNOVATIVE RECYCLED CONTENT PRODUCT DESCRIPTIONS	
	PLASTIC PRODUCTS	
	Benderboard	5
	Boardwalk/Decking Materials (Plastic Lumber)	5
	Carpet	6
	Computer Disks	6
	Delineators for Roadways	6
	Drums	6
	Fence Posts	6
	Geoblocks	6
	Marine Pilings	7
	Marine Timber (Plastic Lumber)	7
	Offset Blocks	7
	Pallets	7
	Pallets - Slip Sheet	7
	Marine Pilings	8
	Protection for Marine Pilings	8
	Protective Wear	8
	Reinforcement Bar Supports	8
	Soap	8
	Soap Pads	9
	Sound Barriers	9
	Spill Container - Drum	9
	Spill Container -	
	Portable Tank/Intermediate Bulk Container	9
	Spill Tray	9
	Spill Tub	9
	Toilet Rim Cage	9
	Transparencies	9
	Transportation Spill Kit	9
	Tree Grate	10
	Urinal Screens	10
	Videocassettes	10
	GLASS PRODUCTS	
	Construction Aggregates	10
	Drainage Aggregate	10
	Drain Pipe Bedding and Backfill	10
	Tile	11
	SCRAP TIRE PRODUCTS	
	Backfill for Retaining Walls	11
	EcoBlok	11
	Manhole Rings	11
	Mats - Roadbuilding	11

SCRAP TIRE PRODUCTS (continued)	
Playground Bedding	11
Resilient Flooring	12
Soil Amendment	12
Sound Barriers	12
Subgrade Insulation for Gravel Roads	12
Tires - Remolded	12
Valve Box Cushions	13
Safety Ring Weights for Road Cones	13
PRODUCTS USING CONSTRUCTION AND DEMOLITION DEBRIS	
Car Stops	13
Gypsum Boards	13
Hydromulch	14
Pothole Patch	14
COMPOSITE/OTHER RECYCLED MATERIALS PRODUCTS	
Asbestos Replacement Fibers	14
Carpet Underlay	14
Corrugated Cardboard Pallets	14
Environ™	14
Fence Posts	15
Gridcore	15
Industrial Flooring	15
Wall Panel - Interior	15
III. INNOVATIVE PRODUCTS IN THE PIPELINE	
GLASS	
Sandblasting Abrasive	15
Septic Tank Treatment System	16
Water Treatment System	16
SCRAP TIRES	
Lightweight Fill	16
Drainage Layer in Landfill Cover	16
CONSTRUCTION AND DEMOLITION DEBRIS	
Roofing Tar	17
Soil Amendment	17
COMPOST	17
IV. TABLES WITH VENDOR INFORMATION ON PRODUCTS -	
BY COMMODITIES	
Recycled Content Plastic Products	20
Recycled Content Glass Products	24
Recycled Content Scrap Tire Products	25
Products Made From Construction and Demolition Debris	26
Composite and Other Recycled Materials Products	27
Recycled Content Products in the Pipeline	28
Glass	
Scrap Tires	
Construction and Demolition Debris	
V. TABLES WITH VENDOR INFORMATION ON PRODUCTS - BY USE	
Products for Use in Landscaping	30
Products for Use in Construction	32
Products for Use in the Office	35
Products for Use in Transportation	37

VI. VENDORS	40
VII. BIBLIOGRAPHY	43
VIII. APPENDICES	
Appendix 1 - Copy of Survey Letter and Results	50
Appendix 2 - Recycling and Procurement Contacts- NERC States	51
Appendix 3 - Contacts with National Organizations	54
Appendix 4 - Additional Sources for Recycled Content Products	56

## ACKNOWLEDGEMENTS

The author would like to acknowledge Fred Friedman of Garcia Consulting, Inc. contract staff for the Environmental Protection Agency - New England, who provided assistance in researching the universe of recycled content products, past and present, for this project.

## DISCLAIMER

The following report has been prepared by Stacy F. Ritter under the National Network of Environmental Management Studies program funded by the United States Environmental Protection Agency (EPA) New England. Inclusion of, reference to, or evaluation of any specific organization, product, trade name or service does not represent an implied or actual endorsement or recommendation for use by EPA. The report does not represent EPA opinion, policy or guidance unless specifically indicated. Any views expressed in the report do not necessarily represent the views of EPA or of the United States government.

## EXECUTIVE SUMMARY

This report identifies and describes 64 new or innovative recycled content products which are available for government procurement. The report focuses on products that use four recycled commodities - plastics, glass, scrap tires, and construction and demolition debris. Each product's description includes information on recycled content, post consumer content, performance, product life, cost, testing and use where available, as well as a list of vendors and contacts for the products.

In this report a new and innovative recycled content product is defined as a product that has been developed in the last five years, or within the last ten years if it has not been widely procured. Some of these products absorb large amounts of recycled commodities (i.e. a 10 ft. high, mile long sound barrier wall filled with tire crumb uses up to 250,000 lb. of scrap tires) and are not frequently purchased, while others use smaller amounts of recycled commodities per unit (i.e. transparencies used with overhead projectors) but are more commonly purchased. Purchases of each product will bring incremental success to recycling by stimulating demand for recycled products, hence closing the recycling loop.

Most of the 64 products in this report are of equal or lower cost in comparison to their virgin materials counterparts when product life is considered. Some recycled content products perform better (i.e. plastic lumber does not rot or leach toxins). Finally, all of these products contribute to a reduction in waste disposal and extend the life of the raw materials originally extracted from the environment.

Recycling, state economic development, and procurement program staff in governments around the country are enthusiastically and energetically supporting the development of recycled content products. However, in spite of this support and commitment most staff involved in the promotion and procurement of recycled content products are not able to extensively research new products. Therefore it is essential to share knowledge of the recycled content products among programs to eliminate duplication of testing and development of specifications, and to enhance opportunities for further recycled content product market development.

The Environmental Protection Agency is actively involved in promoting the use of products containing recycled content and communicating information that assists in developing these markets. The dissemination of this report with information about 64 new recycled content products to government recycling and procurement officials in the Northeast is one piece of the EPA's effort to facilitate stronger recycled content product markets and, simultaneously, to provide the tools to make purchasing more cost-effective.

## I. INTRODUCTION

### Background

Opportunities for the Federal and state governments to procure recycled content products exist throughout the country. Some states and agencies have pushed more aggressively for the procurement of these products, while other states and agencies have pursued limited recycled content product procurement. Collection rates for recycled commodities have increased dramatically as recycling awareness and resources have expanded, thus making a large supply of recycled materials available for production purposes. This availability of recycled commodities has stimulated efforts to create new products using recycled materials.

The Federal government and individual state government agencies have shown an interest in supporting the development of recycled content product markets by procuring recycled content products. Recent efforts to increase federal procurement of recycled content products include the issuance of guidelines for 24 products with recycled content<sup>1</sup>. The procurement guidelines were issued under RCRA section 6002 which requires EPA to designate items that are or can be produced with recovered materials, and to recommend practices for the procurement of designated items by procuring agencies. Once EPA designates an item, RCRA section 6002 requires that any procuring agency, when using appropriated Federal funds to procure that item, shall purchase it with the highest percentage of recovered materials practicable. This project is part of the effort to make the Federal and state governments aware of new recycled content products that are available for procurement. The question on which the project is based is "What innovative uses of recycled products should State and Federal environmental agencies promote to other agencies for procurement, and how can this information be most effectively disseminated?"

### Scope

The research and compilation of this report have focused on new and innovative recycled content products available for government procurement in ten northeastern states (CT, DE, MA, ME, NH, NJ, NY, PA, RI, and VT). These states are all members of the

---

<sup>1</sup> On May 1, 1995, 40 CFR Part 247 (Comprehensive Guideline for Procurement of Products Containing Recovered Materials) was issued to designate 19 items that are or can be made with recycled materials and to consolidate designations for 5 earlier procurement guidelines.

Northeast Recycling Council (NERC)<sup>2</sup>. Defining what is meant by "new and innovative recycled content product" has proved to be a difficult and non-conclusive task. Each of the ten northeastern states has a unique history of recycled content procurement, thus what is new and innovative varies substantially from state to state. What is new to one state will be old news to a second state, and impractical to a third. For purposes of this project a new and innovative recycled content product is defined as a product that has been developed in the last five years, or within the last ten years if the product has not been widely procured. This definition appears to be rather arbitrary on its face, yet it has the advantage of a tangible parameter - the year in which a product entered the marketplace.

Inclusion of some products described in this report may appear arbitrary; other products that fit the project question are not found in this report. This is a result of limited research time and an accompanying inability to locate every product, or that the producers/vendors of the product were not responsive to inquiries. Additionally, there are new and innovative recycled content products which did not seem appropriate for government procurement; for example, scrap tire handbags or PET fleece jackets. The project as defined does exclude several products which have had a longer presence within the market and have proven themselves reliable and efficient products, yet with which all of the states may not yet be acquainted. Thus it is suggested that this report be complemented by the many recycled content product guides available (see Appendix 4 for a partial listing of guide books).

### Methodology

While undertaking the research leading to this report a large number of informants (see Appendices 2-4) were approached. Information about products and procurement issues was solicited from the Environmental Protection Agency-New England and the Northeast Recycling Council (NERC). In an attempt to narrow the focus of research the NERC states were surveyed to determine commodities on which research should concentrate based upon the states' market development priorities. A copy of the survey and

---

<sup>2</sup> The Northeast Recycling Council (NERC) was established in 1987 by the Eastern Regional Conference of the Council of State Governments. NERC is a non-profit, non-partisan organization, created, directed and supported by its member states. NERC membership is comprised of state recycling and solid waste directors, economic development officials, and representatives from CT, DE, MA, ME, NH, NJ, NY, PA, RI, and VT. NERC's mission is to ensure the long-term viability of recycling in the Northeast while maximizing its full environmental and economic benefits.

responses to it are found in Appendix 1. As a result of the survey this report focuses on plastic, glass, scrap tires, construction and demolition debris and compost.

Information was also gathered through conversations with the recycling and procurement officials in the NERC states, as well as states in other regions, national trade associations for the commodities, state economic development organizations, academic institutions, nationally recognized recycled products procurement experts, and professional associations. Environmental product newsletters and periodicals in hard copy, Internet Home Pages dealing with recycling and green design, recycled content product catalogs from a number of states and the information from the vendors/producers of these products was carefully read (See Bibliography for detailed information).

An attempt was made to obtain all information that would be relevant and helpful to a procurement official. Some of the specific details of recycled content products vary by purchaser or by product batch number. For example, some products have both user and distributor prices as opposed to a single price for all purchasers - user prices indicate that the purchaser will be the end user, while distributor prices indicate that procured products are distributed through a central warehouse to a network of users. For many of the plastic lumber products, the glass products and some of the construction and demolition debris products the amount of recycled content varies by end use and materials availability. This allows a purchaser to alter the product specifications to better meet an end use need or it may render a product inappropriate or less desirable if it does not contain certain amounts of recycled content material.

#### **Format**

The report is organized in several separate, yet complementary, sections which are designed to allow each reader to receive a level of information desired.

Section III contains brief product descriptions and use information which is applicable to the product regardless of its producer. Section IV has information on innovative products in the pipeline. Section V is a series of tables containing samples of the producers/vendors who market the recycled content products described in Section III and IV. Tables contain information about the products, and are included to make this report user-friendly. A "?" on the table indicates that information regarding recycled content, post consumer content, or in the rare case an SPI # was not available. All of the products listed in the tables do contain recycled content. This is not a comprehensive list of vendors, nor does it in any way represent an endorsement by EPA of these producers (See disclaimer on page iv). Many of the products have a large number of producers and

an attempt has been made to select a sampling of vendors that operate in the northeastern region of the country where possible (to find more comprehensive vendor listings see the list of Recycled Product Guides in Appendix 4). Section VI is a series of tables organized by product use - transportation, construction, landscaping and office supplies. This section supplies the same information as Section V. Sections III-VI are organized by commodity (plastics, glass, scrap tires, and construction and demolition debris) and alphabetized by products within commodities. Section VII is an alphabetized list of vendors addresses for products listed in this report.

### **Recent Development and Recycled Content Product Design**

There is a tremendous amount of movement in recycled content product development beyond the commodities upon which this research was concentrated. One area of intense activity is in the development of replacements for wood products. While this report describes some alternatives to traditional wood-based products such as pallets and marine timber, much of the wood replacement activity centers around natural fiber or paper materials. For example, a hardwood replacement called Environ™ is produced using approximately 45% newsprint and soy-based material; this sheet material is used for furniture, countertops, award plaques and more. The U.S. Forest Service's Forest Products Lab is conducting research on this product.

New processes are also being developed which enhance production opportunities using recycled materials. For example, Johnson Controls recently received approval for a PET recycling process which allows food contact with recycled PET, and Dr. Benjamin Mosier of the Institute for Research, Inc., developed the ENCAP™ process "that will remove expanded polystyrene and other expanded plastics from the waste stream and reprocess them into a variety of strong, light-weight, energy efficient, flame-retardant, water-resistant and termite-proof thermal insulation products."

The design community has started to plan and use recycled materials in their work. Last year's Design Resource Awards contest in Seattle showcased some of the results. Two examples are a compact disc (c.d.) player made out of old c.d.s, and a Tyvek® hospital gown that has a left side and a right side and fastens with velcro. The contest was so successful that several of the products are travelling in a nationwide exhibit, and some are in negotiations for production opportunities. The contest has become an annual affair with the second call for products opening this September <sup>3</sup>.

---

<sup>3</sup> For further information about this international design contest contact Barbara Johnson at (206)789-0949, or look in *International Design's* September 1995 issue.

## II. INNOVATIVE RECYCLED CONTENT PRODUCT DESCRIPTIONS

### PLASTIC PRODUCTS

Each product mentioned in this section lists the plastics resin code in parentheses immediately following the product name. If a resin type was not available from the producer it is categorized as "unavailable". If different producers use different resins for one product then each of the potential resins will be listed in the section of product descriptions. However, the specific resin by vendor is listed in the vendor tables.

There are seven major resin categories used to identify post consumer plastics for recycling. Each resin has been assigned a number 1 through 7. The most commonly recycled plastic resins are

- #1 - polyethylene terephthalate (PET), and
- #2 - high density polyethylene (HDPE).

The recycling rates for the remaining plastics is lower.

- #3 - polyvinyl chloride (PVC)
- #4 - low density polyethylene (LDPE)
- #5 - polypropylene (PP),
- #6 - polystyrene (PS), and
- #7 - others.

BENDERBOARD (#2, #3, or #4) is a thin strip of plastic which is inserted into the ground between a lawn and a garden, or any other landscape area where a crisp border is desired. The plastic product replaces wooden strips that need to be replaced periodically due to rot. This is a low maintenance product and easy to install.

BOARDWALK/DECKING MATERIALS (#2 or #4) are made out of plastic lumber. It provides an alternative to traditional wooden materials and does not rot or splinter, and is not damaged by moisture, insects or ultra-violet rays. Additionally it is slip-resistant when wet, easily cleaned of graffiti, requires virtually no maintenance, and its weight discourages theft. It can be custom-designed to virtually any length as long as it is transportable. Unlike prices for wood products, the price for extruded plastic lumber rises at a constant increment, not an increasing increment, as the desired length of product increases. Plastic lumber is thought to have a useful life span of 35-50 years which, if certified, would compensate for initial costs which are higher than wood. Plastic lumber can be installed with standard wood-working tools. It should not be used for structural support, and situations involving extreme heat (creating potential problems of melting or bending) or heavy

salting (which makes the surface slimy).

CARPET (#1) made from recycled PET fiber is resistant to static, stain and abrasive wear, and has a low rate of moisture absorption. This carpet costs approximately the same amount as a carpet manufactured from virgin materials.

COMPUTER DISKS <sup>4</sup> that were initially formatted for software which has become obsolete are processed for resale. These disks have a lower failure ratio than most conventional disks as they must be of premium quality to meet software standards. "Green disks" are pre-formatted and pre-labelled and typically priced at, or below, comparable, branded, non-recycled disks.

DELINEATORS FOR ROADWAYS (#2) are marking posts tipped with reflective surfaces that line roads and guide motorists at night. Plastic delineators provide an alternative to steel or wooden delineators. They are durable in all weather conditions and do not rot or crack in weather extremes. They can withstand several vehicle impacts and provide some rebound factor for cars that hit them, rather than damaging both car and delineator as a steel delineator may do. Plastic delineators require minimum maintenance. Used by MA Department of Transportation.

DRUMS (#2) are a barrel-like container able to hold 55 gallons. This recycled content product has a ribbed surface which allows transport via forklift.

FENCE POSTS (#1-#7) with plastic content can be used for highway, residential, or playground projects. They can replace traditional wooden or concrete fence posts. The advantages of plastic fence posts are that they won't split or rot, are not damaged by moisture or insects, and are low maintenance. (See description of boardwalk/decking materials for further advantages/disadvantages of plastic lumbers.)

GEOBLOCKS (#2, #4) are the component parts of an interlocking, high-strength plastic grid system which is installed below the ground surface to support heavy or concentrated loads on a grass base instead of the asphalt pad that would otherwise be required. This system is designed for areas that will have inconsistent but occasional vehicle use demands. A geoblocks system reduces

---

<sup>4</sup> This remanufactured product is included as it does prevent a significant amount of materials from entering the waste stream.

stormwater runoff, protects against over-compaction of the soil, and is resistant to chemicals, fertilizers, temperature extremes, and freeze-thaw cycles. Applications for a geoblocks system may include emergency and utility access lanes, auxiliary parking areas, highway medians, and approaches to monuments and fountains.

MARINE PILINGS (unavailable) provide support for marine structures such as bridges and piers. Traditionally they have been made from wood products, however, plastic pilings have the advantages that they are resistant to ultraviolet light and chipping, and impervious to marine borers (the major cause of traditional timber pile failure). Plastic pilings are structurally reinforced with steel or fiberglass. When reinforced with fiberglass the piling is non-corrosive and non-magnetic. The tough plastic outer skin on the piling provides maximum protection against weathering and the marine environment.

MARINE TIMBER (#2, #4, #5) a plastic lumber that is impervious to rot and wood boring organisms, resistant to corrosion from gas or oil, does not leach and is significantly less toxic than the treated lumber which is commonly used in marine applications. It is splinter free, slip-resistant when wet, and requires minimal maintenance. The long life of plastic lumber (thought to have a useful life span of 35-50 years) would compensate for initial plastic lumber costs which are higher than wood.

OFFSET BLOCKS (#2, #4) are those blocks lying between guardrails and the posts to which guardrails are attached. Plastic offset blocks are cheaper to install than steel offsets, and have low rates of water absorbency thus avoiding problems of structural weakening brought about by weather fluctuations.

PALLETS (#2, #4) are for storing and transporting products. Pallets have traditionally been manufactured from wood. Plastic pallets will not split, rot or warp, can be cleaned and sanitized, and are fully recyclable. The non-absorbent nature of plastic means that these pallets will resist water, chemicals, and insects; however, this also means that they are more prone to be slippery. The high cost of pallet disposal following product delivery can also be avoided by the reuse or recycling option of plastic pallets.

SLIP SHEET PALLETS (#2, #4) are pallets manufactured out of thin sheets of plastic with upturned edges which are layered in between products. Slip sheets are arranged so that a thicker mill gauge is on the bottom layer of the stack, and a thinner

mill gauge is found near the top product layers. Layers of product can be stacked as high as they are handleable and shrink-wrappable; a fork lift with a flat blade is used to move the loaded pallets. The narrow width of the pallet allows more product to be stacked than with other wider pallets if the products characteristics are appropriate (i.e. not crushable) A slip-sheet pallet weighs 1 1/2 to 3 pounds as opposed to a 70 pound wooden pallet. It can be used many times, and reground to produce another slip sheet if it is damaged.

TIDAL ZONE CORROSION PROTECTION FOR MARINE PILINGS (unavailable) is a configuration of sacrificial zinc anodes which were built to protect steel reinforced concrete pilings. Perforated zinc sheets (a scrap product of the manufacturing of U.S. pennies) are held against the concrete surface of the pilings by four recycled wood/plastic panels; the sheets are mechanically connected to the corroding reinforced steel. The reaction and energy flow produced by this arrangement effectively protects the concrete structures from erosion. To implement this product requires only limited technical resources and funds (estimate \$725 for materials and direct labor) due to the system's simplicity.

PROTECTIVE WEAR (#2) is lightweight clothing fabricated out of Tyvek®. It provides an effective barrier against dry particulates, and resists punctures, tears, and liquid absorption. It is thin and breathable for worker comfort. Although the material, Tyvek®, is well-established, this product represents a new use that capitalizes on its unique characteristics.

REINFORCEMENT BAR SUPPORTS (#6) are the forms used in concrete construction - commonly found in the shape of a chair or bolster. Plastic chairs and bolsters provide an alternative to the conventional metal chairs and bolsters around which concrete is poured. While specifications traditionally require that steel chairs tolerate 300 pounds of load, a polystyrene foam chair can tolerate 1000 pounds of load. It takes approximately 66 1/2 million 12 ounce beverage cups to make one polystyrene reinforcement bar support chair.

SOAP (#4) product called Microbrush contains plastic scrubbers to remove ink, paint, grease, adhesives, and tar. Microbrush contains a strong detergent and has a consistency similar to lava soap. All of the active ingredients are biodegradable, non-polluting, and non-toxic. Commonly used in printshops and by painters.

SOAP PADS (unavailable) manufactured from recycled plastic fibers replace steel wool soap pads. The fiber pads are saturated with biodegradable and phosphate-free detergents for cleaning either heavy duty or delicate surfaces.

SOUND BARRIERS (unavailable) made of plastic have a working lifetime estimated to be approximately 50 years, as opposed to the 10 year lifespan of a wooden sound barrier, due to their ability to withstand extreme weather conditions. Plastic sound barriers are easy to install.

SPILL CONTAINERS FOR DRUMS (#2) are designed to contain spills and leaks from 55 gallon drums during transportation, storage, filling or dispensing. A locator ring is molded into the container to assure the secure placing of the drums.

SPILL CONTAINERS FOR PORTABLE TANKS/INTERMEDIATE BULK CONTAINERS(IBCs) (#2) are designed to contain spills and leaks from containers holding up to 430 gallons of liquid. This product is particularly useful for container filling operations.

SPILL TRAYS (#2) are placed under barrels and containers (similar to plant saucers) to help protect work areas. This is not a secondary containment system, but helps to prevent spills.

SPILL TUBS (#2) are tubs with a 45 gallon capacity which are used for spill containment.

TOILET RIM CAGES (#3) hold detergent blocks in the toilet bowl to keep public toilets clean. This product replaces a product using virgin material at a price close to virgin materials product price.

TRANSPARENCIES (unavailable) are clear plastic sheets used with overhead projectors. A recycled content product now replaces a virgin materials product and can be used in photo-copy machines.

TRANSPORTATION SPILL KIT (#2) is a small spill container with a 40 gallon capacity that is attached to trucks to contain leaking fluids (e.g. oil) while the truck is in operation. The kit contains a 40 gallon container, a plastic cover seal, mounting hardware and lever lock ring. The kit can be mounted on truck trailers, barges and ships. This kit enables drivers/crew to clean up their own anti-freeze, oil, etc. saving on spills, fees

and fines.

TREE GRATES (#2) surround trees on busy sidewalk/boardwalk areas. Plastic tree grates are more lightweight than the metal alternative, and will not leave rust streaks on the grate or surrounding pavement. Additionally, the grate hole can be enlarged on site to accommodate tree growth.

URINAL SCREENS (#3) are filters that prevent non-liquid materials from entering urinal pipes. They are available as flat scented urinal screens or urinal screens with detergent blocks. This product replaces a product using virgin material at a price close to, or less than, the competitor.

VIDEOCASSETTES (#5) made with recycled plastics are 30% lighter than conventional videocassettes, require 50% less energy to manufacture, and are capable of being completely recycled without any disassembly of the product. Recycled videocassettes cause fewer blips than conventional cassettes, and are not limited-play cassettes.

#### **GLASS PRODUCTS**

CONSTRUCTION AGGREGATE can incorporate glass as a replacement for conventional aggregates. Glass is competitive in price or less expensive than conventional aggregates. It does not appear to leach or contain harmful contaminants, and tends to be cleaner than soil. From an engineering standpoint the benefits of glass for construction applications include permeability, good compaction characteristics, and compatibility with conventional construction equipment.

DRAINAGE AGGREGATE is aggregate fill used to quickly drain moisture out of an area, or to filter or treat water from non-point sources. Cullet's capability to remove solids and improve the turbidity of waste water is equal to or better than natural aggregates because of its particulate angularity. The permeability of cullet is approximately the same as conventional aggregates; however, the permeability does decrease when glass is subjected to repeated loading.

DRAIN PIPE BEDDING AND BACKFILL is aggregate fill under, around, and on top of perforated drain pipes carrying ground water. The permeability of crushed glass is equal to or better than the

traditional 50/50 mix of pea gravel and sand often used for this purpose. Cullet has the additional advantage that it compacts easily to the required density.

TILE manufactured from recycled glass is produced specifically for high-traffic areas due to its soil resistant qualities and low maintenance needs. This tile is used in floors and walls for interior or exterior applications.

#### PRODUCTS USING SCRAP TIRES

BACKFILL FOR RETAINING WALLS makes effective use of tire chips as they are durable, coarse-grained, free-draining, good thermal insulators, and have a low compacted density. This combination of qualities, particularly the low density, can result in lower pressures on retaining walls and lower foundation settlements. Lower wall pressures mean that a less expensive wall could be used. The use of tire chips eliminates the need for clean granular backfill as chips are free-draining. Each cubic meter of fill contains about 100 waste tires.

ECOBLOK is a large cement block with a hollow central chamber that is filled with compressed waste tires or other waste. A tongue and groove design allows the blocks to slide and lock into one another to form a 4 foot high wall of any length. Potential uses include traffic diversion, seawalls, firewalls, or erosion control dikes. These blocks, filled with 100-150 scrap tires are much lighter than a solid concrete block.

MANHOLE RINGS are rubber borders that surround manholes and stop water inflow and infiltration problems as well as allowing for adjustments to grade for pavement overlay projects and manhole rehabilitations. Manhole rings protect a manhole's structure by cushioning traffic impact.

MATS - ROADBUILDING provide portable access roads for vehicles over soft ground and landscaped terrain, and can be transferred up the road as construction proceeds. Reusable roadbuilding mats manufactured from recycled truck tires reduce rutting and erosion caused by rain and heavy traffic, and provide traction on wet, unstable soil.

PLAYGROUND BEDDING made from shredded tires make a groundcover that is non-abrasive, shock-absorbing, and cushions falls from

playground equipment more effectively than sand or gravel. The rubber nuggets do not decompose, absorb moisture, or get into clothing the way that standard sand bedding does.

RESILIENT FLOORING is a rubber layer that can be laid under all types of flooring (carpet, wood flooring, etc.) to increase comfort and absorb noise.

SOIL AMENDMENT is composed of a mixture of organic compost and ground up rubber tire; it should be installed within the top 6" of soil. This type of soil amendment improves the porosity of soil, and allows for better water movement, root growth, and root depth. Turf becomes more quickly established with this soil amendment, resistance to disease is added, and irrigation needs decrease. Compost material provides nutrients to the soil, while the tire bits add soil resiliency and improve the soil structure. A magnetic separator used in the manufacture of the soil amendment pulls out 99.9% of the steel pieces from the tires and any remaining bits are quickly oxidized.

SOUND BARRIERS constructed using recycled tire crumb interior with a composite outer shell make a durable barrier with an expected lifetime of at least 50 years. The product is more lightweight than barriers constructed with wood, steel or concrete materials. A wall 10 feet high can use 250,000 lbs. of scrap tires per mile. These barriers are graffiti resistant and easily installed.

SUBGRADE INSULATION FOR GRAVEL ROADS using tire chips provide a high thermal resistivity and they are durable, free draining and low-cost. Tests <sup>5</sup> demonstrate that tire chips can have a beneficial effect on reducing the depth of frost penetration and the resulting frost heaves. Road surfaces where tire chips have been used for subgrade insulation have remained stable throughout the spring thaw while adjacent sections where the chips were not used exhibited significant rutting.

TIRES - REMOLDED use a different process than retreading tires as

---

<sup>5</sup> Tests were performed by Dana N. Humphrey of the Dept. of Civil Engineering at Univ. of Maine, and Robert A. Eaton, US Army Cold Regions Research and Engineering Laboratory. Reference "Tire Chips as Insulation Beneath Gravel Surfaced Roads", 1993, and "Field Performance of Tire Chips as Subgrade Insulation for Rural Roads," 1995. For further information call Dana Humphrey at (207)581-2176.

they actually remold the tire at a deeper layer than the application of retreading would go. These tires have an ozone resistant sidewall which have been remolded through a process which removes and replaces the worn tread, shoulder and sidewall from bead-to-bead. The casing is reused after being ultrasonically tested for integrity, and the rest of the tire is recycled for use in other products. These tires are designed to meet the performance and safety ratings of premium new tires. Remolded tires cost up to 30 percent less than equivalent premium new tires. There is a product warranty against failure or defect in workmanship or materials for the life of the tire, as well as a limited road hazard warranty.

VALVE BOX CUSHIONS are solid molded rubber pads with removable rubber lids designed to surround valve locations (i.e. water valve) in streets to protect the valve and the road surface around the valve from traffic's impact. The product is designed to last at least 20 years and can be quickly and easily installed.

SAFETY RING WEIGHTS FOR ROAD CONES are rings made from recycled tires that anchors road cones and safety markers. It is flexible, easy to handle, and a virtually indestructible product which is not affected by extreme weather. Safety Rings eliminate the costly need for refilling sand bags, and requires less time and fuel for transportation due to easy stacking. Cones are not blown over by passing trucks when this product is used, thus not wasting a worker's efforts to constantly set up knocked over cones.

#### **PRODUCTS USING CONSTRUCTION AND DEMOLITION DEBRIS**

CAR STOPS are made from a composite of chopped and granulated reclaimed carpet products and post-consumer plastics. This car stop is lighter than traditional concrete or plastic parking stops and will not crack or split. It is stronger and more durable than a concrete car stop, and the material's ability to resist water alleviates freeze/thaw problems.

GYPSUM BOARD is made using some portion of recycled gypsum. It possesses essentially the same characteristics as virgin gypsum board, including excellent fire resistive and sound resistance properties. Gypsum board is easy to install and decorate, comparatively low cost, non-toxic and environmentally safe.

HYDROMULCH is a wood mulch applied via a hydraulic seeding method for erosion protection. Hydromulch protects seeds and soil from extreme weather (wind and rain) while gradually decomposing and contributing to stable slopes and vegetation.

POTHOLE PATCH is a patented cold mix comprised of recycled asphalt roofing material, crushed aggregate and performance enhancing additives formulated to provide a high performance bituminous patching compound. This product is used for pothole patching, driveway repair, utility cuts, bridge and ramp repairs, parking lot maintenance, and overlay applications. It bonds to wet and dry surfaces, requires no preparation prior to use, and has an extended shelflife. With one application a road can be immediately opened to traffic. A pothole patched with this product retains its fixed state for several times the duration of a pothole repaired with the traditional mix. This all-weather material is available in dense or coarse gradations.

#### COMPOSITE PRODUCTS AND OTHER RECYCLED MATERIALS PRODUCTS

ASBESTOS REPLACEMENT FIBERS are composed of a cellulose fiber product combined with liquid or dry powdered chemicals to a mix that will meet customer specifications. Fibers are available in four grinds - extra-coarse to fine. The cellulose components are made out of old newspapers, magazine stock, corrugated cardboard, and urban wood waste.

CARPET UNDERLAY is a thin sheet of compressed old newspapers designed to be applied over concrete slabs or floors as an underlayment for carpet or flooring. This product increases the floor surface temperature and makes concrete floor softer. This is not a new material, but it is a new use for the material.

CORRUGATED CARDBOARD PALLETS are a replacement for the use of wooden or plastic pallets or other types of shipping packages for many goods. These pallets produce no splinters, and require no nails. They can only be used for loads that do not exceed 2,000 pounds. Their lightweight features reduce handling and freight costs. They are 100% recyclable.

ENVIRON™ is a sheet material hardwood replacement. It is made with 45% newsprint and soy-base. It is used in furniture, countertops, and award plaques. Environ™ has three times better abrasion resistance and wearability than the most commonly used woods.

FENCE POSTS made from a mix of recycled tires, glass, plastic and cement provide an alternative to fence posts made with only wood or concrete or plastic. The mix of materials in the product can be altered given desired specifications and materials available. These fence posts won't split or rot, are not damaged by moisture or insects, have low maintenance needs and a long life-span.

GRIDCORE is a fiberboard composed of corrugated cardboard, old newspaper and wood waste which replaces particleboard, hardwoods and other wood products for non-structural uses. Gridcore is commonly used as a core product for interior design - shelves, interior walls. Product can be painted, laminated, covered with fabric, or otherwise surficially amended. A fiberboard panel with a honeycomb core which has the equivalent strength of forest products but only half of their weight.

INDUSTRIAL FLOORING in the form of floor blocks manufactured from milled carpet pieces and plastics can replace concrete, wood-grain or other composite flooring blocks. This product does not chip or crack, it is not affected by moisture as wood floors are, and is more comfortable than concrete. Although this product is more expensive than a similar amount of wood-grain, it requires a thinner layer of flooring to obtain the same qualities and has a life expectancy of at least 40-50 years. This industrial flooring can be cut with a saw, and holds nails or screws.

WALL PANELS are a pre-finished interior panelling product composed of fabric laminated to a recycled fibreboard made out of recycled newsprint. The panels conceal tack holes, reduce sound, can be easily cut, and are free of asbestos and formaldehyde additives. This is a new use for this material.

### **III. INNOVATIVE RECYCLED CONTENT PRODUCTS IN THE PIPELINE**

#### **GLASS PRODUCTS**

SANDBLASTING ABRASIVE is a fine particle abrasive made from glass cullet. It is being tested as a replacement for sand. Sand is readily available and inexpensive, but there are worker health and safety concerns with silicosis associated with the use of sand. Cullet removes paint from steel and concrete. Subjective trials have been done by the Clean Washington Center, and negotiations for laboratory testing will be conducted in March 1995.

SEPTIC TANK TREATMENT SYSTEMS use a bed of coarse aggregate around seeping septic distribution pipes. The Clean Washington Center is studying the use of cullet as a replacement for C-33 cement sand which is commonly used as an aggregate with intermittent sand septic treatment systems. Glass has a higher permeability than sand and the lack of colloidal solids in the glass may mean that a system using glass could be smaller than the equivalent system with sand. One installation is estimated to require about 20 tons of cullet. An initial year of testing ended in the spring of 1995 with positive results.

WATER TREATMENT SYSTEMS used to clean water often use sand as a water filtration medium. The Clean Washington Center is sponsoring bench flow tests on a slow sand water treatment system installed in a municipal water treatment system using cullet and 5 types of sand. The cullet ranks second out of the group, at this point, for desired working characteristics, and there have been no problems associated with the cullet. Determining the most appropriate filtration medium for a community depends on local sources for filtration materials, but if it continues to test well large amounts of cullet could be used in municipal water treatment systems. Testing will continue.

#### **PRODUCTS USING SCRAP TIRES**

LIGHTWEIGHT FILL made of tire chips. The fill is the lowest constructed layer in the road, and is topped by a gravel layer and then the pavement. An ongoing project is monitoring the use of tire chips as lightweight fill. At this point visual pavement surveys have not revealed any unusual cracking or rutting. Tests are being conducted by Dana Humphrey of Dept. of Civil Engineering at Univ. of Maine.

DRAINAGE LAYER IN LANDFILL COVER (the second layer of a typical three-layer landfill cover which consists of a surficial layer to support vegetation, a granular drainage layer, and a geomembrane) may potentially be replaced with tire chips. It costs the landfill less to chip the tires it takes in than most landfills charge to take in a tire (\$0.25 to \$1.00), thus this process is no net cost to the landfill. In contrast, creating a drainage layer with granular soil costs between \$6.50 and \$13 per cubic meter. In addition, tire chips have hydraulic conductivities which exceed the values typical for granular soils. The high thermal resistivity of tire chips would limit frost damage to underlying clay barriers. Studies indicate that water quality is not contaminated by the tires presence if the ground is not

permanently saturated. Research and testing<sup>6</sup> on this product is being conducted by Dana Humphrey at the Dept. of Civil Engineering at the Univ. of Maine and is ongoing. Studies are also considering the possibility that steel belts protruding from the cut edge of the tire chips could puncture the geomembrane.

## PRODUCTS USING CONSTRUCTION AND DEMOLITION DEBRIS

ROOFING TAR extracted from nylon carpet recycling is being researched. This research is to develop a new process to recycle nylon carpets and gain two useful products - caprolactum to make new nylon fibers and modifiers for industrial tar products, particularly roofing membranes.

SOIL AMENDMENT made from gypsum drywall mixed with very sandy soil and mulched tree stump to create a topsoil. The gypsum adds pH to the mix. Research is ongoing.

## COMPOST

Responses to the survey of NERC member states indicated that compost was a commodity for which the northeastern states would particularly like to find product uses. An initial search of the compost products in the marketplace did not find innovative new uses. However, there does appear to be an increasing interest in traditional and established uses for compost including integration along roadways as landscaping for the roadway main or the median, weed abatement, and landscaping and redevelopment.

Compost products are a bit different than conventional products since compost is often combined with other materials to create a mix specific to a purpose or site. If a compost mix is brought to a site with different characteristics than the site for which the compost was designed, the results may be dramatically different on a second site. Each compost product should be designed in a site-specific manner to best meet the demands of the site at hand.

---

<sup>6</sup> For further product and testing information see "Interface Strength Between Tire Chips and Geomembrane for Use as a Drainage Layer in a Landfill Cover" by T.A. Cosgrove in Geosynthetics '95, vol.3, pp. 1157-1168. Or contact Dana Humphrey at (207)581-2176 for further information.

The Coalition of Northeast Governors (CONEG) is engaged in a project writing specifications for compost and is considering uses in this context. CONEG's work should be concluded in autumn of 1995. Contact Ann Mathius at CONEG at (202)624-8450 for further information.

The Composting Council is another good source for information about vendors, uses, etc. The Composting Council can be contacted at 114 South Pitt St., Alexandria, VA 22314 or (703)739-2407 to obtain further information.

IV. TABLES WITH VENDOR INFORMATION ON PRODUCTS - BY COMMODITIES

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING PLASTICS

Product	Vendors/Producers	Phone	Contact	SP1#	Recycled Content %	Post Consumer Content %	Comments
Benderboard	Enviroedge Products Co.	(800)549-3343	Rick Pontz	#2/#4	97	25	
Benderboard	Environmental Specialty Prod.	(909)390-8800	Elizabeth Heed	#2	100	15	
Benderboard	Trim-Tex Inc.	(708)679-3000	Joseph Koenig	#3	100	100	
Boardwalk/Decking Materials	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	100	Colors: Cedar, Weathered Redwood. Non-slip surface. Customization available.
Boardwalk/Decking Materials	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	100	50-100	Special Order. Customization Available
Boardwalk/Decking Materials	Mobil-Composite Products	(203)778-3306	Frank Lazano	#4	100	?	Not intended for primary structural members. Competitive w/ redwood & cedar. Colors: natural, brown. Many sizes available.
Boardwalk/Decking Materials	Phoenix Recycled Plastics	(610)940-1590	Mark Siemon	#2	30-70	30-70	Stock Item. Available in DE, MD, NJ, and PA. Colors: teak, grey, redwood. Standard sizes
Carpet	Image Carpets	(800)722-2504		#1	100	90	
Carpet	Iowa Plastics Company	(712)722-3709	Norlyn Ban Beek	#1	100		
Carpet	Talisman Mills	(800)482-5466	Dennis Daniels	#1	100	62	
Computer Disks	Green Disk	(206)489-2550	Avery Pahls	a)	a)	a)	
Computer Disks	Peripherals	(800)468-6888	Ron Carboy	a)	a)	a)	
Computer Disks	Recycled Office Products	(508)977-4851	Jack Weitz	a)	a)	a)	Available in MAC or IBM, 5.35" or 3.5". Available in MAC or IBM. \$6.99 for box of 10 discs. Discounts for quantity.
Delineators for Roads	Carsonite International	(800)648-7916	Ralph Lundregan	?	up to 75	25	Highly visible w/ wide-angle reflectivity. Colors: white, yellow. Tested by NASHTO, SASHTO, and several state DOTs.
Delineators for Roads	L & C Marketing Group	(800)257-5707	Pat Shea	?	up to 75	25	Highly visible w/ wide-angle reflectivity. Tested by SASHTO, NASHTO, and several state DOTs
Delineators for Roads	Roads Environmental Specialty Prod.	(909)390-8800	Elizabeth Heed	#2	?	?	
Drum	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Also avail. in orange w/ 15% post industrial content. Cost \$119.
Drum	US COEXCELL Inc.	(419)897-9110	Bob Huebner	#2	25	25	Multi-layer drum w/ recycled core sandwiched between virgin layers.
Fence Posts	Envirowood, Inc.	(800)323-0830	Dan Pastor	#1-7	100	100	Customization Available.

"?" indicates that this information was not available

a) This remanufactured product is included as it does prevent a significant amount of materials from entering the waste stream.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING PLASTICS

Product	Vendors/Producers	Phone	Contact	SP1#	Recycled Content %	Post Consumer Content %	Comments
Fence Posts	Obex, Inc.	(203)975-9094	Celeste Johnson	#1-7	100	100	Color: Seasoned cedar. Special order. 3 1/2" round.
Fence Posts	Refuse/Environmental Systems	(800)443-1924	Bruce Jordan	#2, #4	30-60	40-70	Stock item. Colors: Yellow, gray. Avail. in DE, MA, ME, NH, NJ, NY, and VT.
Geoblocks	Invisible Structures, Inc.	(800)233-1510		#2, #4	100	100	Size: 20"x20"x1" per unit. Color: Black. Injection molded.
Geoblocks	Presto Products Co.	(800)548-3424	June Gerhardt	?	?	50 and up	Size: .3m x .91m x 32mm. Color: black.
Marine Timber	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	50	50	Customization Available.
Marine Timber	Seaward International, Inc.	(800)828-5360	Robert Taylor	#2,4,5	100	?	Avail. in 12"x12", 10"x12", 10"x10", 8"x12" and 8"x10".
Offset Blocks	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	100	100	Stock item.
Offset Blocks	Mobil-Composite Products Division	(203)778-3306	Frank Lazano	#4	100	?	VT has tested blocks. VT & CT have approved use of blocks. FL has designed procurement specs. FHA has approved for highway use.
Pallets - plastic	Phoenix Recycled Plastics	(610)940-1590		#2	100	70	Sizes: 42"x42", 40"x48", and 48"x48". Price-unassembled \$29, \$35, and \$40. Many styles.
Pallets - plastic	Presto Products Co.	(800)558-3521		#2, #4	50+	50+	
Pallets - Slip Sheet	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2, #4	100	100	Customization avail. Many sizes and thicknesses.
Pallets - Slip Sheet	St. Jude Polymer Corporation	(717)874-1220	John Guers	?	100	100	Stock item.
Pillings - Marine	Seaward International, Inc.	(800)828-5360	Robert B. Taylor	?	100	?	Avail. w/ fiberglass or steel reinforced. Color: black. Pile dia. is 13". Recent installation for Coast Guard.
Pillings Protection	Florida Department of Transportation	(904)372-5304	Ivan Lasa	?	?	?	Extensive tests, inclu. field tests by FL DOT. Estimated cost for materials & direct labor is \$725. Service life greater than 15 yrs w/ life of repair being 7 yrs. Conventional repair costs \$1250 w/ life of repairs lasting 7 years.
Protective Wear	DuPont Nonnovens - Tyvek	(800)448-9835	Mary Anne Maguir	#2	?	25	Tested for: Basic weight - 1.2 oz./sq. yd. Thickness- 5.3 mils. Strip Tensile- 7.0/9.9 Flammability - Class 1
Reinforcement Bar Supports	Engineered Construction Products	(813)441-1813	Larry Smith	#6	100	?	FL DOT has done extensive research and written procurement specs. Strength far exceeds requirements in tests.

7" indicates that this information was not available..

"?" indicates that this information was not available..

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING PLASTICS

Product	Vendors/Producers	Phone	Contact	SPI#	Recycled Content	Post Consumer Content %	Comments
Soap	ProSoap	(800)PRO-SOAP		#4	?	?	Prices: 3 lb. tub + dispenser, \$25. Three 3 lb. tubs + dispenser, \$50. Seven 3 lb. tubs + dispenser, \$76.
Soap Pads	3M	(612)736-3691	Deborah Johnson	#1	?	?	Never Rust Wool Soap Pads are for heavy duty cleaning. Never Scratch Wool Soap Pads are for delicate surfaces (cookware, bathroom fixtures, etc.
Sound Barriers	Environmental Specialty Prod.	(909)390-8800	Elizabeth Head	?	100	100	OR has done fairly extensive testing and recommends use with mixed reviews.
Spill Container - Drums	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Reinforced design and one-piece seamless construction. Meets or exceeds all EPA requirements for secondary containment. Containers for 1(\$132), 2(\$261, or 4(\$301) drums. Color: black. Spill line used by Tinker Air Force Base in OK.
Spill Containers Portable Tanks/ Intermediate Bulk Containers	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Meets or exceeds all EPA reg. requirements for secondary containment. Color: black. Cost: \$867.
Spill Tray	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	15	?	Avail. in several sizes for drums, buckets, and table tops. Color: yellow. Packaged in units of 10. Cost: 12" @ \$169, 16" @ \$216, 22" dia. @ \$205, and 25" dia. @ \$324
Spill Tub	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Avail. in yellow w/ 15% post industrial. Cost: \$49.
Toilet Rim Cage with Detergent Block	Legacy Plastics	(216)791-7117	Mark Norton	#3	100	100	Co. has program whereby they will negotiate w/ state to take in state's iv bags, swimming pool liners as credit towards their purchases and use in their products.
Transparencies	Xerox Corp.	(800)822-2200		?	?	25	Prices for boxes w/ 100 transparencies: 1-2 boxes @ \$68 ea., 3-9 boxes @ \$56 ea., and 10-49 boxes @ \$47 ea.
Transportation Spill Kit	Amazing Recycled Prod.	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Avail. in yellow or orange w/ 15% post industrial content. Cost \$164.
Tree Grates	National Diversified Sales	(800)726-1994		#2	?	?	Comply w/ ADA standards for wheelchair access. Avail. in round or square grate. Cost: 48"x48" @ \$196, 60"x60" @ \$253, 36" round @ \$207, 48" round @ \$207, 60" round @ \$265. Ave. weight less than 40 lb. Color:

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING PLASTICS

Product	Vendors/Producers	Phone	Contact	SPI#	Recycled Content %	Post Consumer Content %	Comments
Urinal Screens	Legacy Plastics	(216)421-8856	Mark Morton	#3	100	100	Co. has program whereby they will negotiate w/ state to take back state's iv bags, swimming pool liners as credit twds. their purchases and use in their products
Videocassettes	Discas Recycled Products Co.	(203)755-3123	Whilly O'Leary	#5	80	50	
Videocassettes	Global Zero	(317)577-4853		#5	78	20+	Colors: 7 avail. Avail. in 60, 120, or 180 minutes.

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING GLASS

Product	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Construction Aggregate	Information from Clean Washington Center	(206)389-2808	John Yeasting	up to 15	up to 15	Comprehensive testing performed in a Glass Feedstock Study by the Clean Washington Center and Office of Recycling Market Development, New York State Dept. of Economic Development
Drainage Aggregate	Information from Clean Washington Center	(206)389-2808	John Yeasting	up to 15	up to 15	NYS study recommends a max. cullet content of 100%, max. debris level of 5%, and 90% min. compaction level for foundation drainage.
Drain Pipe Bedding and Backfill	Information from Clean Washington Center	(206)389-2808	John Yeasting	up to 15	up to 15	Successfully used by King Co. drain pipe bedding project
Tile	Stoneware Tile Co.	(317)935-4760		72	18	Color: 15 contemporary colors. Available with abrasive grain to provide slip-resistance. Meets or exceeds all industrial standards for commercial tiles.
Tile	Oceanside Glass Tile	(619)434-0051	Boyce Lundstrom	75-95	70-90	Graffiti/paint does not stick to tile-easily cleaned. Often combined w/ other tiles, i.e. porcelain Avail. w/ irridiscent surface. Also 1x1 and 2x2 mosaic tile.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING SCRAP TIRES

Product	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Backfill for Retaining Walls	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	100	100	Max. size for tire chips is 76mm
Ecoblok	Rural Collection & Tire Recycling	(504)344-8298	Glenda Gates	50	50	Block dimensions are 4'x4'x8'. Weight is approximately 10,000 lbs.
Munhale Rings	Grappler Specialty Products	(612)934-1108	Jeff Donaldson	80	80	Avail. in thicknesses of 1/4", 1/2", 1", and 2". Currently avail. w/ 27" inner diameter and 37" outer diameter. Soon avail. in 24" inner diameter and 34" outer diameter. Price: 1/4" @ \$15, 1/2" @ \$30, 1" @ \$45, 2" @ \$60.
Mats - Roadbuilding	TerraMats	(216)759-9412	Jerry Goldberg	100	100	1000 lb. bag covers 120 sq. ft. @ 3" depth. Costs \$170
Playground Bedding	Redi-Gro Corporation	(800)654-4358		100	100	Performed well on tests at 4" & 6" depths using Nat'l Operating Committee on Stds. for Athletic Eqpt. Head Model
Resilient Flooring	Dodge-Regupol	(717)295-3400	John Aten			
Soil Amendment	Max Recycling, Inc.	(409)823-2588	Cheryl Quinn	100	100	
Soil Amendment	Jaitire Industries, Inc.	(303)322-7887	Tom Lincoln	100	100	
Sound Barrier	Carsonite, Inc.	(916)725-1373	Paul Schubring	92	92	Meets and exceeds ASHTO and state DOT guidelines for noise reduction coefficient and wind loads. Received MA DOT approval. Panels avail. up to 15" wide and 7" tall.
Subgrade Road Insulation	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	100	100	Mix of steel & glass-belted tires uniformly graded in irreg. shapes. Several tests in ME demonstrate effectiveness of chips for purpose and chips effect on groundwater quality - there appear to be no negative effects.
Tires - Remolded	Ecology Tire Co.	(800)597-3342	Harry King	?	?	These tires are based on Eur. technology which supplies 20-30% of Eur. motorists who purchase remolded replacement tire
Valve Box Cushions	Omni Products Inc.	(800)203-8034	Andy Davis	98	98	Size: 24" sq., 8 1/4" thick. Weight: 155lbs. (cushion), and 14 lbs. (lid).
Weights for Road Cones	Yanco Inc.	(301)229-7250	Yaacov Nagler	100	100	TX DOT, MD State Highway Admin. and VA DOT have expressed satisfaction over experimental performance. Dimensions: outer diameter @ 18"-24", inner diameter @ 12"-14". Weight: 3 layers=8-12 lbs., Height: 3 layers= 3"

"?" indicates that this information was not available.

Comments column includes testing and use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING CONSTRUCTION AND DEMOLITION DEBRIS

Product	Recycled Material	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Car Stops	carpets & plastics	Collins & Aikman Floor Coverings	(706)259-9711	Larry Umstadter	100	100	Avail. in 3', 4', 5', and 6'. Cross section is 5.75"x3.5". Produced w/ chopped and granulated reclaimed carpet products and post consumer, post-industrial plastics.
Gypsum Board	gypsum	Dontar Gypsum	(313)930-4715	George Shortreed	15	10	
Gypsum Board	gypsum	Celotex Corporation	(419)734-3153	Bob Carroll	?	4	In addition to recycled gypsum content, surface is recycled paper and core is recycled newsprint in part.
Gypsum Board	gypsum	U.S. Gypsum Co.	(312)606-4000	Ray McCleary	4-12	?	Recycled content varies by plant in northeast.
Hydromulch	wood	Wood Recycling Inc.	(800)982-8732	Jim McElvenny	100	?	University tests show that Refiber Wood allows significantly less soil runoff and produces greater plant size and bulk than competitors. Sold in 40 lb. bags. Also avail. w/ newspaper or cellulose in mix, and as flower seed/fertilizer/mulch mix.
Pothole Patch	asphalt roofing	Reclaim, Inc.	(800)448-5307	Sharon McCrorey	20	20	Dark black color. 75-85% aggregates. 3-6% reinforcing fibers. 2-7% adhesion & workability blend. 6-8% petroleum asphalt.

"?" indicates that this information was not available.

Comments column includes testing and use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS USING OTHER MATERIALS AND COMPOSITE PRODUCTS

## FIBERS

Product	Recycled Materials	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Asbestos Replacement fibers	newsprint, magazines, corrugated containers, telephone directories	Wood Recycling Inc.	(800)982-8732	Jim McElvenny	100	100	Cost competitive products. Common uses include filter medium, filler, asphalt cements, sealants and adhesives. TX and MD use in Stonemastic mix for asphalt emulsion. Packaged in high-density bales or low-density bags.
Carpet Underlay	newsprint	Homasote	(800)257-9491	Tom Petrino	100	100	ComfortBase is 1/2" thick. Standard size is 4'x4'
Environ Biocomposite	newsprint	Phenix Biocomposites	(507)931-9787	Chris Dunker	45		Standard size is 36"x72". Custom-cutting available. Thickness is 1/8", 1/2", 3/4" and 1". Colors: midnight, emerald, sunset, imperial. Only for interior use.
Gridcore	wood, paper	Gridcore Systems, Int'l	(310)901-1492	Michelle	100	100	Product lasts as long as alternative wood product. Slightly more expensive at \$.75 per square foot for 3/4" sheet, but cost is slated to drop as production expands. Used in GAP stores and for IKEA furniture core.
Pallet-Corrugated Cardboard	corrugated cardboard	Corrugated Pallet Co.	(713)370-1307	Stanley Lee	40	?	Avail. in variety of sizes. Commonly used for up to 2000 lbs. Tests performed by Package Testing Center for random vibration, pallet compression and pallet drop showed no signs of damage.
Wall Panel - Interior	newsprint	Homasote	(800)257-9491	Tom Petrino	100	100	DesignWall is 1/2" thick. Panels are 4'x8'. Colors: quartz, cherry, blue and grey.

## COMPOSITE

Product	Recycled Material	Vendor/Producer	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Fence Post	plastic, tires, glass	Envirocrete 2000	(206)734-1526	Jerry Nevin	90+	90	Specific product mix altered by use. Withstands loads in excess of 7000 lbs. Used by some WA counties, and US Border Patrol has expressed interest. 50 year warranty on posts. Rebar or breakaway can be added.
Industrial Flooring	plastic, carpet	Kaswell & Co., Inc.	(508)879-1120	Norman Kaswell	100	100	35% plastic and 65% carpet scrap. FIBERBLOCK is manufactured to 4"x6" surface dimensions, and 2", 2 1/2", and 3" depths.

"?" indicates that this information was not available.

Comments column includes testing and use, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS IN THE PIPELINE

## GLASS

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Sandblasting Abrasive	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Testing is ongoing.
Septic Tank Treatment System	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Research is ongoing
Water Filtration Medium	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Research ongoing.

## SCRAP TIRES

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Drainage Layer - Landfill	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	tires	Tire chips range between 25mm and 75 mm size.
Lightweight Fill	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	tires	Tests used two sized chips - 76mm and 305mm max- of a steel and glass-belt mix.

## CONSTRUCTION AND DEMOLITION DEBRIS

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Roofing Tar	AlliedSignal Research	(708)391-3168	Inara Brubaker	waste carpet	Research is in fairly early stages.
Soil Amendment	Winzinger, Inc.	(609)267-8600	Audrey Winzinger	gypsum	Varying opinions on merits of product. Applied at proper ratios it is claimed that it can increase soil fertility, nutrient status, and the yield of certain crops. Some claim that agricultural applications may pose environmental hazards.

Comments column includes testing and use, price (which is rounded to the nearest dollar), and ordering information where available.

V. TABLES WITH VENDOR INFORMATION ON PRODUCTS - BY USE

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN LANDSCAPING

## PLASTICS

Product	Vendors/Producers	Phone	Contact	SP#	Recycled Content %	Post Consumer Content %	Comments
Benderboard	Enviroedge Products Co.	(800)549-3343	Rick Pontz	#2/#4	97	25	
Benderboard	Environmental Specialty Prod.	(909)390-8800	Elizabeth Head	#2	100	15	
Benderboard	Trim-Tex Inc.	(708)679-3000	Joseph Koenig	#3	100	100	
Boardwalk	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	100	Colors: Cedar, Weathered Redwood. Non-slip surface. Customization available.
Boardwalk	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	100	50-100	Special Order. Customization Available
Boardwalk	Mobil-Composite Products	(203)778-3306	Frank Lazaro	#4	100	?	Not intended for primary structural members. Competitive w/ redwood & cedar. Colors: natural, brown. Many sizes available.
Boardwalk	Phoenix Recycled Plastics	(610)940-1590	Mark Siemon	#2	30-70	30-70	Stock item. Available in DE, MD, NJ, and PA. Colors: teal, grey, redwood. Standard sizes.
Fence Posts	Envirowood, Inc.	(800)323-0830	Dan Pastor	#1-7	100	100	Customization Available.
Fence Posts	Obex, Inc.	(203)975-9094	Celeste Johnson	#1-7	100	100	Color: Seasoned cedar. Special order. 3 1/2" round.
Fence Posts	Refuse/Environmental Systems, Inc.	(800)443-1924	Bruce Jordan	#2, #4	30-60	40-70	Stock item. Colors: Yellow, gray. Avail. in DE, MA, ME, NH, NJ, NY, and VT.
Geoblocks	Invisible Structures, Inc.	(800)233-1510		#2, #4	100	100	Size: 20"x20"x1" per unit. Color: Black. Injection molded.
Geoblocks	Presto Products Co.	(800)548-3424	June Gerhardt	?	?	50 and up	Size: .3m x .91m x 32mm. Color: black.
Tree Guards	National Diversified Sales	(800)726-1994		#2	?	?	Comply w/ ADA standards for wheelchair access. Avail. in round or square grate. Cost: 48"x48" @ \$196, 60"x60" @ \$253, 36" round @ \$207, 48" round @ \$207, 60" round @ \$265. Ave. weight less than 40 lb. Color: black
SCRAP TIRES							
Product	Vendors/Producers	Phone	Contact		Recycled Content %	Post Consumer Content %	Comments
Playground Bedding	Redi-Gro Corporation	(800)654-4358			100	100	1000 lb. bag covers 120 sq. ft. @ 3" depth. Cost performed well on tests at 4" & 6" depths using Operating Committee on stds. for Athletic Eqpt.
Soil Amendment	Max Recycling, Inc.	(409)823-2588	Cheryl Quinn		100	100	
Soil Amendment	Jaitire Industries, Inc.	(303)322-7887	Tom Lincoln		100	100	

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN LANDSCAPING

## CONSTRUCTION AND DEMOLITION DEBRIS

Product	Vendors/Producers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Hydromulch	Wood Recycling Inc.	(800)982-8732	Jim McElvermy	wood	100		University tests show that Refiber Wood allows significantly less soil runoff and produces greater plant size and bulk than competitors.

## COMPOSITE

Product	Vendor/Producer	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Fence Post	Envirocrete 2000	(206)734-1526	Jerry Nevin	plastic, tires, glass	90+	90	Specific product mix altered by use. Withstands loads in excess of 7000 lbs. Used by some WA counties, and US Border Patrol has expressed interest. 50 year warranty on posts. Rebar or breakaway can be added.

## IN THE PIPELINE

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Soil Amendment	Winzinger, Inc.	(609)267-8600	Audrey Winzinger	gypsum			Varying opinions on merits of product. Applied at proper ratios it is claimed that it can increase soil fertility, nutrient status, and the yield of certain crops. Some claim that agricultural applications may pose environmental hazards.

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN CONSTRUCTION

## PLASTICS

Product	Vendors/Producers	Phone	Contact	SPI#	Recycled Content %	Post Consumer Content %	Comments
Boardwalk/Decking Materials	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	100	Colors: Cedar, Weathered Redwood. Customization Available. Non-slip surface.
Boardwalk/Decking Materials	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	100	50-100	Special Order. Customization Available
Boardwalk/Decking Materials	Mobil-Composite Products	(203)778-3306	Frank Lazano	#4	100	?	Not intended for primary structural members. Competitive w/ redwood & cedar. Colors: natural, brown. Many sizes available.
Boardwalk/Decking Materials	Phoenix Recycled Plastics	(610)940-1590	Mark Siemon	#2	30-70	30-70	Stock item. Available in DE, MD, NJ, and PA. Colors: teak, grey, redwood. Standard sizes.
Marine Timber	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	50	50	Customization Available.
Marine Timber	Seaward International, Inc.	(800)828-5360	Robert Taylor	#2,4,5	100	?	Avail. in 12"x12", 10"x12", 10"x10", 8"x12" and 8"x10".
Pilings - Marine	Seaward International, Inc.	(800)828-5360	Robert B. Taylor	?	100	?	Avail. w/ fiberglass or steel reinforced. Color: black. Pile dia. is 13". Recent installation for Coast Guard.
Pilings Protection	Florida Department of Transportation	(904)372-5304	Ivan Lusa	?	?	?	Extensive tests, incl. field tests by FL DOT. Estimated cost for materials & direct labor is \$725. Service life greater than 15 yrs w/ life of repair being 7 yrs. Conventional repair costs \$1250 w/ life of repairs lasting 7 years.
Reinforcement Bar Supports	Engineered Construction Products	(813)441-1813	Larry Smith	#6	100	?	FL DOT has done extensive research and written procurement specs. Strength far exceeds requirements in tests.
GLASS							
Product	Vendors/Producers	Phone	Contact		Recycled Content %	Post Consumer Content %	Comments
Construction Aggregate	Information from Clean Washington Center	(206)389-2808	John Yeasting		up to 15	up to 15	Comprehensive testing performed in a Glass Feedstock Study by the Clean Washington Center and Office of Recycling Market Development, New York State Dept. of Economic Development
Drainage Aggregate	Information from Clean Washington Center	(206)389-2808	John Yeasting		up to 15	up to 15	NYS study recommends a max. cullet content of 100%, max. debris level of 5%, and 90% min. compaction level for foundation drainage.
Drain Pipe Bedding and Backfill	Information from Clean Washington Center	(206)389-2808	John Yeasting		up to 100	up to 15	Successfully used by King Co. drain pipe bedding project.

"?" indicates that this information was not available.

Comments column includes testing and use, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN CONSTRUCTION

## GLASS (continued)

Product	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Tile	Stoneware Tile Co.	(317)935-4760		72	18	Available in 15 contemporary colors with abrasive grain to provide spill-resistance. Meets or exceeds all industrial standards for commercial tiles.
Tile	Oceanside Glass Tile	(619)434-0051	Boyce Lundstrom	75-95	70-90	Graffiti/paint does not stick to tile - easily cleaned. Often combined with other tiles, i.e. porcelain. Avail. w/ iridescent surface. Also 1"x1" and 2"x2" mosaic tiles.
SCRAP TIRES						
Product	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Backfill for Retaining Walls	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	100	100	Max. size for tire chips is 76mm
Ecoblok	Rural Collection & Tire Recycling	(504)344-8298	Glenda Gates	50	50	Block dimensions are 4'x4'x8'. Weight is approximately 10,000 lbs.
Resilient Flooring	Dodge-Regupol	(717)295-3400	John Aten			

## CONSTRUCTION AND DEMOLITION DEBRIS

Product	Vendors/Producers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Gypsum Board	Domtar Gypsum	(313)930-4715	George Shortreed	gypsum	15	10	
Gypsum Board	Celotex Corporation	(419)734-3153	Bob Carroll	gypsum	?	4	In addition to recycled gypsum content, surface is recycled paper and core is recycled newsprint in part.
Gypsum Board	U.S. Gypsum Co.	(312)606-4000	Ray McCleary	gypsum	4-12	?	Recycled content varies by plant in northeast.

## FIBERS

Product	Vendors/Producers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Asbestos Replacement Fibers	Wood Recycling Inc.	(800)982-8732	Jim McElvenny	newsprint magazine corrugated containers	100	100	Cost competitive products. Common uses include filter medium, filler, asphalt cements, sealants and adhesives. TX and MD use in Stonemastic mix for asphalt emulsion. Packaged in high-density bales or low-density bags.
Carpet Underlay	Homasote	(800)257-9491	Tom Petrino	newsprint	100	100	ComfortBase is 1/2" thick. Standard size is 4'x
Environ Biocomposite	Phenix Biocomposite	(507)931-9787	Chris Dunker	newsprint	45	?	Appearance of granite, but easy workability of wood products

"?" indicates that this information was not available.

Comments column includes testing and use, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN CONSTRUCTION

## FIBERS (continued)

Product	Vendor/Producer	Phone	Contact	Recycled Materials	Recycled Content %	Post Consumer Content %	Comments
Gridcore	Gridcore Systems, Int'l	(310)901-1492	Michelle	wood, paper products	100	100	Product lasts as long as alternative wood product. Slightly more expensive at \$.75 per square foot for 3/4" sheet, but cost is slated to drop as production expands. Used in GAP store and for IKEA furniture core.

Wall Panel - Interior	Homasote	(800)257-9491	Tom Petrino	newsprint	100	100	Designwell is 1/2" thick. Panels are 4'x8'. Colors: quartz, cherry, blue and grey.
-----------------------	----------	---------------	-------------	-----------	-----	-----	--

## COMPOSITE

Product	Vendor/Producer	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Industrial flooring	Kaswell & Co., Inc.	(508)879-1120	Norman Kaswell	plastic, carpet	100	100	35% plastic and 65% carpet scrap. FIBERBLOCK is manufactured to 4"x6" surface dimensions, and 2", 2 1/2", and 3" depths.

## IN THE PIPELINE

### GLASS

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Sandblasting Abrasive	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Testing and research are ongoing.
Septic Tank Treatment System	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Testing and research are ongoing.
Water Filtration Medium	Clean Washington Center	(206)389-2549	Bob Kirby	glass	Testing and research are ongoing.

### SCRAP TIRES

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Drainage Layer - Landfill	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	tires	Tire chips range between 25mm and 75 mm size.

## CONSTRUCTION AND DEMOLITION DEBRIS

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Roofing Tar	AlliedSignal Research	(708)391-3168	Inara Brubaker	waste carpet	Research is in fairly early stages.

"?" indicates that this information was not available.

Comments column includes testing and use, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN THE OFFICE

## PLASTICS

Product	Vendors/Producers	Phone	Contact	SP#	Recycled Content %	Post Consumer Content %	Comments
Carpet	Image Carpets	(800)722-2504		#1	100	90	
Carpet	Iowa Plastics Company	(712)722-3709	Norlyn Ban Beek	#1	100	?	
Carpet	Talisman Mills	(800)482-5466	Dennis Daniels	#1	100	62	
Computer Disks	Green Disk	(206)489-2550	Avery Pahls	a)	a)	a)	
Computer Disks	Peripherals	(800)468-6888	Ron Carboy	a)	a)	a)	
Computer Disks	Recycled Office Products	(508)977-4851	Jack Weiz	a)	a)	a)	Available in MAC or IBM, 5.35" or 3.5".
Pallets - plastic	Phoenix Recycled Plastics	(610)940-1590		#2	100	70	Available in MAC or IBM. \$6.99 for box of 10 discs. Discounts for quantity.
Pallets - plastic	Presto Products Co.	(800)558-3521		#2, #4	50+	50+	Sizes: 42"x42", 40"x48", and 48"x48". Price-unassembled \$29, \$35, and \$40. Many styles.
Pallets - Slip Sheet	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2, #4	100	100	Customization avail. Many sizes and thicknesses.
Pallets - Slip Sheet	St. Jude Polymer Corporation	(717)874-1220	John Guers		100	100	Stock item.
Protective Wear	DuPont Nonwovens - Tyvek	(800)448-9835	Mary Ann Maguire	#2	?	25	Tested for: Basic Weight - 1.2 oz./sq. yd. Thickness- 5.3 mils. Strip Tensile- 7.0/9.9 lb/in Flammability - Class 1
Soap	ProSoap	(800)PRO-SOAP		#4	?	?	Prices: 3 lb. tub + dispenser, \$25. Three 3 lb. tubs + dispenser, \$50. Seven 3 lb. tubs + dispenser, \$76.
Soap Pads	3M	(612)736-3691	Deborah Johnson	#1	?	?	Never Rust Wool Soap Pads are for heavy duty cleaning. Never Scratch Wool Soap pads are for delicate surfaces (cookware, bathroom fixtures, etc.
Toilet Rim Cage With Detergent Block	Legacy Plastics	(216)791-7117	Mark Norton	#3	100	100	Co. has program whereby they will negotiate w/ state to take in state's iv bags, swimming pool liners as credit towards their purchases and use in their products.
Transparencies	Xerox Corp.	(800)822-2200		?	?	25	Prices for boxes w/ 100 transparencies: 1-2 boxes @ \$68 ea., 3-9 boxes @ \$56 ea., and 10-49 boxes @ \$47 ea.

"?" indicates that this information was not available.

a) This remanufactured product is included as it does prevent a significant amount of materials from entering the waste stream.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN THE OFFICE

## PLASTICS (continued)

Product	Vendors/Producers	Phone	Contact	SPI #	Recycled Content %	Post Consumer Content %	Comments
Urinal Screens	Legacy Plastics	(216)421-8856	Mark Norton	#3	100	100	Co. has program whereby they will negotiate w/ state to take back state's iv bags, swimming pool liners as credit tlds. their purchases and use in their products
Videocassettes	Discas Recycled Products Co.	(203)755-3123	Whilly O'Leary	#5	80	50	
Videocassettes	Global Zero	(317)577-4853		#5	78	20+	Colors: 7 avail. Avail. in 60, 120, or 180 minutes.

## FIBERS

Product	Vendors/Producers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Pallet-Corrugated Cardboard	Corrugated Pallet Co.	(713)370-1307	Stanley Lee	corrugated cardboard	40	?	Avail. in variety of sizes. Commonly used for up to 2000 lbs. Tests performed by Package Testing Center for random vibration, pallet compression and pallet drop showed no sign of damage.

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN TRANSPORTATION

## PLASTICS

Product	Vendors/Producers	Phone	Contact	SPI#	Recycled Content %	Post Consumer Content %	Comments
Delineators for Roads	Carsonite International	(800)648-7916	Ralph Lundregan	?	up to 75	25	Highly visible w/ wide-angle reflectivity. Colors: white, yellow. Tested by NASHTO, SASHTO, and several state DOTs.
Delineators for Roads	L & C Marketing Group	(800)257-5707	Pat Shea	?	up to 75	25	Highly visible w/ wide-angle reflectivity. Tested by SASHTO, NASHTO, and several state DOTs
Delineators for Roads	Environmental Specialty Prod.	(909)390-8800	Elizabeth Head	#2	?	?	
Drum	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Also avail. in orange w/ 15% post ind. content. Cost: \$119.
Drum	US COEXCELL Inc.	(419)897-9110	Bob Huebner	#2	25	25	Multi-layer drum w/ recycled core sandwiched between virgin layers.
Fence Posts	Envirowood, Inc.	(800)323-0830	Dan Pastor	#1-7	100	100	Customization Available.
Fence Posts	Obex, Inc.	(203)975-9094	Celeste Johnson	#1-7	100	100	Color: Seasoned cedar. Special order. 3 1/2" round.
Fence Posts	Refuse/Environmental Systems I	(800)443-1924	Bruce Jordan	#2, #4	30-60	40-70	Stock item. Colors: Yellow, gray. Avail. in DE, MA, ME, NH, NJ, NY, and VT.
Offset Blocks	Envirosafe Products, Inc.	(718)984-7272	Stephen Lerman	#2	100	100	Stock item.
Offset Blocks	Mobil-Composite Products Division	(203)778-3306	Frank Lazano	#4	100	?	VT has tested blocks. VT & CT have approved use of blocks. FL has designed procurement specs. FHWA has approved for highway use.
Sound Barriers	Environmental Specialty Prod.	(909)390-8800	Elizabeth Head	?	100	100	OR has done fairly extensive testing and recommends use with mixed reviews.
Spill Container - Drums	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Reinforced design and one-piece seamless construction. Meets or exceeds all EPA requirements for secondary containment. Containers for 1(\$132), 2(\$261, or 4(\$301) drums. Color: black. Spill line used by Tinker Air Force Base in OK.
Spill Containers Portable Tanks/ Intermediate Bulk Containers	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Meets or exceeds all EPA reg. requirements for secondary containment. Color: black. Cost: \$867.
Spill Tray	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	15	?	Avail. in several sizes for drums, buckets, and table tops. Color: yellow. Packaged in units of 10. Cost: 12" @ \$169, 16" @ \$216, 22" dia. @ \$285, and 25" dia. @ \$324
Spill Tub "?"	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Avail. in yellow w/ 15% post industrial. Cost: \$49.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

# INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN TRANSPORTATION

## PLASTICS (cont.)

Product	Vendors/Producers	Phone	Contact	SP1#	Recycled Content %	Post Consumer Content %	Comments
Transportation Spill Kit	Amazing Recycled Products	(800)241-2174	Mary Jarrett	#2	100	?	Color: black. Avail. in yellow or orange w/ 15% post industrial content. Cost \$164.

## SCRAP TIRES

Product	Vendors/Producers	Phone	Contact	Recycled Content %	Post Consumer Content %	Comments
Manhole Rings	Grappler Specialty Products	(612)934-1108	Jeff Donaldson	80	80	Avail. in thicknesses of 1/4", 1/2", 1" and 2". Currently avail. w/ 27" inner diameter and 37" outer diameter. Soon avail. in 24" inner diameter and 34" outer diameter. Prices: 1/4" @ \$15, 1/2" @ \$30, 1" @ \$45, and 2" @ \$60.

Mats - Roadbuilding	TerraMats	(216)759-9412	Jerry Goldberg	100	100	
Sound Barrier	Carsonite, Inc.	(916)725-1373	Paul Schudring	92	92	Meets and exceeds AASHTO and state DOT guidelines for noise reduction coefficient and wind loads. Received MA DOT approval. Panels avail. up to 7' tall and 15' wide.

Subgrade Road Insulation	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	100	100	Mix of steel & glass-belted tires uniformly graded in irregular shapes. Several tests in ME demonstrated effectiveness of chips for purpose and chips effect on groundwater quality - there appears to be no negative effects.
--------------------------	--	---------------	---------------	-----	-----	--

Tires - Remolded	Ecology Tire Co.	(800)597-3342	Harry King	?	?	These tires are based on Eur. technology which supplies 20-30% of Eur. motorists who purchase remolded replacement tires.
------------------	------------------	---------------	------------	---	---	---

Valve Box Cushions	Omni Products Inc.	(800)203-8034	Andy Davis	98	98	Size: 24"sq., 8 1/4" thick. Weight: 155 lbs. (cushion) and 14 lbs. (lid).
--------------------	--------------------	---------------	------------	----	----	---

Weights for Road Cones	Yanco Inc.	(301)229-7250	Yaacov Nagler	100	100	TX DOT, MD State Highway Admin. and VA DOT have expressed satisfaction over experimental performance Dimensions: outer diameter @ 18"-24", inner diameter 12-14". Weight: 3 layers=8-12 lbs. Height: 3 layers
------------------------	------------	---------------	---------------	-----	-----	---

## CONSTRUCTION AND DEMOLITION DEBRIS

Product	Vendors/Producers	Phone	Contact	Recycled Material	Recycled Content %	Post Consumer Content %	Comments
Car Stops	Collins & Aikman Floor Coverings	(706)259-9711	Larry Umstadter	carpets, plastics	100	100	Avail. in 3', 4', 5', and 6'. Cross section is 5.75"x3.5". Produced w/ chopped and granulated reclaimed carpet products and post consumer, post-industrial plastics.
Pothole Patch	Reclaim, Inc.	(800)448-5307	Sharon McCrorey	asphalt roofing	20	20	Dark black color. 75-85% aggregates. 3-6% reinforcing fibers. 2-7% adhesion & workability blend. 6-8% petroleum asphalt.

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

INNOVATIVE RECYCLED CONTENT PRODUCTS FOR USE IN TRANSPORTATION

IN THE PIPELINE

SCRAP TIRES

Product	Vendors/Researchers	Phone	Contact	Recycled Material	Comments
Lightweight Fill	University of Maine Dept. of Civil Engineering	(207)581-2176	Dana Humphrey	tires	Tests used two sized chips - 76mm and 305mm max- of a steel and glass-belt mix.

"?" indicates that this information was not available.

Comments column includes testing or use information, price (which is rounded to the nearest dollar), and ordering information where available.

## VI. VENDORS

3M Home and Consumer Care Div.  
3M Center Building, 223-3NW-10  
St. Paul, MN 55144

Amazing Recycled Products  
PO Box 312  
Denver, CO 80201

AmerAgain  
D.R.P.C.. 567-1 S Leonard St  
Waterbury CT 06708

Carsonite International  
7307 Countryside Drive  
Middletown, MD 21769

Celotex Corporation  
795 South Plasterbed Road  
Port Clinton, OH 43452

Clean Washington Center  
2001 6th Ave.  
Ste. 2700  
Seattle, WA 98121

Collins & Aikman Floor  
Coverings, Inc.  
311 Smith Industrial Blvd.  
PO Box 1447  
Dalton, GA 30722-1447

Corrugated Pallet Corp  
21175 Tomball Parkway - 291  
Houston, TX 77070

Discas Recycled Products Co.  
567-1 South Leonard Street  
Waterbury, CT 06708

Dodge-Regupol  
715 Fountain Avenue  
PO Box 989  
Lancaster, PA 17608

Domtar Gypsum  
24 Frank Lloyd Wright Drive  
PO Box 543  
Ann Arbor, MI 48106

DuPont Nonwovens - Tyvek®  
Laurel Run Building  
PO Box 80, 705  
Wilmington, DE 19880-0705

Ecology Tire Co.  
297 Main Street  
Acton, MA 01720

Engineered Construction  
Products  
2075 Sunnydale Blvd.  
Unit C  
Clearwater, FL 34625

Envirocrete 2000 Inc.  
215 W. Holly  
Ste. B26  
Bellingham, WA 98225

Enviroedge Products  
3433 W. Harvard  
Santa Ana, CA 92704

Environmental Specialty  
Products  
2807-C Guasti Rd  
PO Box 1114  
Guasti, CA 91743-1114

Envirosafe Products, Inc.  
81 Winant Place  
Staten Island, NY 10309-1311

Envirowood, Inc.  
501 W. Algonquin  
Mt. Prospect, IL 60056

Florida Department of  
Transportation  
State Materials Office  
Corrosion Research Laboratory  
2006 N.E. Waldo Rd  
Gainesville, FL 32609

Global Zero  
6340 Castleplace Dr., Ste. 102  
Indianapolis, IN 46250

Grappler Specialty Products  
15229 Buchanan Court  
Eden Prairie, MN 55344

Great Northern Packaging Inc.  
1100 Maplewood Drive  
Itasca, IL 60143

Green Disk  
15530 Woodinville-Redmond Rd,  
#B-400  
PO Box 1546  
Woodinville, WA 98072

Gridcore  
1400 Canal Avenue  
Long Beach, CA 90813

Homasote  
Box 7240  
W. Trenton, NJ 08628

Image Carpets  
Post Office Box 5555  
Armuchess, GA 30105

Invisible Structures, Inc.  
14704-D East 33rd Place  
Aurora, CO 80011

Iowa Plastics Company  
322 North Main Avenue  
Sioux Center, IA 51250

Jaitire Industries, Inc.  
4591 Ivy Street  
Denver, CO 80216

Kaswell & Co., Inc.  
58 Pearl Street  
PO Box 549  
Framingham, MA 01701

L & C Marketing Group  
PO Box 251  
60 Walpole St  
Canton, MA 02021

Legacy Plastics  
2366 Woodhill Rd.  
Cleveland, OH 44106

Louisiana Pacific  
1 Woodfield Lake  
1000 Woodfield Road  
Suite 134  
Schaumburg, IL 60173

Max Recycling, Inc.  
1101 FM 2818 N  
Bryan, TX 77803

Mobil - Composite Products  
800 Connecticut Avenue  
PO Box 5445  
Norwalk, CT 06856

National Diversified Sales,  
Inc.  
PO Box 339  
Lindsay, CA 93247

Obex, Inc.  
PO Box 1253  
Stamford, CT 06904

Oceanside Glass Tile  
3235 Tyler St.  
Carlsbad, CA 92008

Omni Products Inc.  
PO Box 15319  
Portland, OR 97214

Peripherals  
4775 Paris Street  
Denver, CO 80239

Phenix™ Biocomposites  
1511 North Gault Street  
St. Peter, MN 56082

Phoenix Recycled Plastics  
Corporation  
225 Washington St.  
Conshohocken, PA 19428

Presto Products Company  
PO Box 2399  
Appleton, WI 54914

Pro-Soap  
1830 I-30  
Rockwall, TX 75087-6201

ReClaim, Inc.  
8001 N. Dale Mabry Hwy  
Suite 101A  
Tampa, FL 33614-3211

Recycled Office Products, Inc.  
27 Walnut Street  
Peabody, MA 01961

Redi-Gro Corporation  
8909 Elder Creek Road  
Sacramento, CA 95828

Refuse/Environmental Systems,  
Inc.  
PO Box 4670  
Springfield, MA 01101

Rural Collection & Tire  
Recycling  
P.O. Box 1254  
Port Allen, LA 70767

Seaward International, Inc.  
3470 Martinsburg Pike  
P.O. Box 98  
Clearbrook, VA 22624-0098

St. Jude Polymer Corporation  
1 Industrial Park  
Frackville, PA 17931

Stoneware Tile Company  
1650 Progress Drive  
Richmond, IN 47374

Talisman Mills  
6000 Executive Drive  
Mequon, WI 53092

Terra Mats  
462 Arbor Circle  
Youngstown, OH 44505

Trim-Tex Inc.  
3700 Pratt  
Lincolnwood, IL 60645

University of Maine  
Dept. of Civil Engineering  
5711 Boardman Hall  
Orono, ME 04469-5711

US COEXCELL Inc.  
400 Dussel Dr.  
Maumee, OH 43537

US Gypsum Company  
125 S. Franklin Street  
Chicago, IL 60606

Winzinger, Inc.  
1704 Marne Hwy.  
Hainesport, NJ 08036

Wood Recycling, Inc.  
3 Wheeling Ave.  
Woburn, MA 01801

Xerox Corp.  
800 Long Ridge Rd.  
Stamford, CT 06905

YANCO Inc.  
7300 Pyle Road  
Bethesda, MD 20817

## VII. BIBLIOGRAPHY

Center for Plastics Recycling Research. Research Projects Sponsored by the Plastics Recycling Foundation, 1985-1993, (New Jersey: Rutgers University, 1993).

Clean Washington Center. Glass Markets Information System: Application Summary Reports, (Washington: Clean Washington Center, December 1993).

Connecticut Department of Environmental Protection. How To Buy Recycled Conference and Vendor Show, June 20, 1995, Information Binder, June 1995.

Cosgrove, T.A. "Interface Strength Between Tire Chips and Geomembrane for Use as a Drainage Layer in a Landfill Cover", *Geosynthetics '95*, vol.3, p. 1157-1168.

DeGroot, Don. Progress Report for 'Use of Recycled Materials and Recycled Products in Highway Construction', (Amherst, MA: University of Massachusetts, May 1995).

DeGroot, Don. Encouraging the Use of Recycled Materials in Highway Construction: General Overview of Waste and Recycled Materials in Transportation Applications, (Amherst, MA: University of Massachusetts, June 1995).

DiModica, John, Dave Johnston and Yumiko Yasuda. Plastic Lumber Purchasing Initiative: Investigation of Current Uses and Potential Uses in Massachusetts", May 1995. Report for Massachusetts Department of Procurement and General Services.

The Gallup Organization for the Minnesota Office of Waste Management. Perceptions and Purchase of Products Made From Recycled Contents: An Assessment of Minnesota's Buy Recycled Campaign, (Princeton, NJ: Gallup Organization, October 1993).

Humphrey, Dana and Robert Eaton. "Tire Chips as Insulation Beneath Gravel Surfaced Roads", presented at 2nd International Symposium on Frost in Geotechnical Engineering, (Hanover, NH: Cold Regions Research and Engineering Laboratory, June 1993).

Humphrey, Dana and Thomas Sandford. "Tire Chips as Lightweight Subgrade Fill and Retaining Wall Backfill", from Recovery and Effective Reuse of Discarded Materials and By-Products for Construction of Highway Facilities Symposium Proceedings, (Orono, ME: University of Maine, October 1993).

Humphrey, Dana and William Nickels. "Tire Chips as Subgrade Insulation and Lightweight Fill", presented at 18th Annual Meeting of the Asphalt Recycling and Reclaiming Association, (Orono, ME: University of Maine, February 1994).

Humphrey, Dana and Robert Eaton. "Field Performance of Tire Chips as Subgrade Insulation for Rural Roads", presented at Sixth International Conference on Low-Volume Roads, (Orono, ME: University of Maine, June 1995).

Kessler, Richard, Rodney Powers, and Ivan Lasa. "Cathodic Protection Using Scrap and Recycled Materials", Paper number 555 at the National Association of Corrosion Engineers (NACE) Annual Conference and Corrosion Show 1991, (Houston, TX: NACE, 1991).

Kessler, Richard, Rodney Powers and Ivan Lasa. "Cathodic Protection Using Scrap and Recycled Materials", *Materials Performance*, June 1991.

Kessler, R.J., R.G. Powers, and I.R. Lasa. "Update on Sacrificial Anode Cathodic Protection on Steel Reinforced Concrete Structures in Seawater", Paper number 95516 at the National Association of Corrosion Engineers (NACE) Annual Conference and Corrosion Show 1995. (Houston, TX: NACE, 1995).

Millner, Patricia, ed. "Bioaerosols and Composting", *Biocycle*, January 1995, p. 48-54.

Minnesota Office of Environmental Assistance, Solid Waste Management Coordinating Board. *Environmentally Responsible Government Procurement Guide*, (St. Paul, MN: Office of Environmental Assistance, November 1994).

National Cooperative Highway Research Program, Transportation Research Board, and National Research Council. *The Use of Crumb Rubber in Highway Applications: Catalog and Database*, (Reno, NV: University of Nevada, August 1994).

New England Environmental Expo. *Official 1995 Expo Directory*, (Boston, MA: New England Environmental Expo, May 1995).

New York State Department of Environmental Conservation. "Current and Recent Contracts Incorporating Recycled Components", *Wasteline*, Spring 1995, p. 6-7.

Pennsylvania Department of Environmental Resources in cooperation with the Pennsylvania Newspaper Publishers Association. *Buy Recycled Guide*, (Harrisburg, PA: Department of Environmental Resources, May 1992).

Pratt, Ellen. Current Uses and Evaluation of Recycled Materials in Highway Construction: Overview of the Northeastern States, (Brattleboro, VT: Northeast Recycling Council, April 1993).

Rhode Island Department of Environmental Management and the League of Women Voters of West Bay. Right Buy: Buy Recycled Products Binder, October, 1994.

Riggle, David. "Finding Markets for Scrap Tires", *BioCycle*, March 1994, p. 41-55.

Riggle, David. "A Finer Grind for Rubber Recyclers", *BioCycle*, March 1995, p. 42-54.

Ruth, Byron E. for the Florida Dept. of Transportation. Evaluation of Ground Tire Rubber in Asphalt Concrete, (Gainesville, FL: University of Florida, January 1992).

Scientific Certification Systems. SCS Environmental Claims Certification Summary: Products & Packages, (Oakland, CA: Science Certification Systems, June 1995).

Steuteville, Robert. "Adding Value to Composted Manure", *BioCycle*, March 1995, p.3.

U.S. Department of Energy, Office of Industrial Technologies. Industrial Waste Program: Annual Report 1995, DOE/EE- 0053, March 1995.

U.S. Department of Transportation and Federal Highway Administration. A Study of the Use of Recycled Paving Material, FHWA-RD-93-147, June 1993.

U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Manufacturing from Recyclables: 24 Case Studies of Successful Recycling Enterprises, EPA530-R-95-001, February 1995.

U.S. Environmental Protection Agency. Manufacturers and Suppliers of Recovered Materials Products Mentioned in Comprehensive Procurement Guideline: Construction Products, Landscaping Products, Non-Paper Office Products, Transportation Products, Vehicular Products.

U.S. Environmental Protection Agency, Office of Solid Waste. Items Designated in the Comprehensive Procurement Guideline -- Supporting Analyses, April 1995.

U.S. Environmental Protection Agency, Office of Solid Waste. RMAN for Items Designated in the Comprehensive Procurement Guideline -- Supporting Analyses, April 1995.

U.S. Environmental Protection Agency. Comprehensive Guideline for Procurement of Products Containing Recovered Materials (40 CFR Part 247). May 1, 1995.

U.S. General Accounting Office. Solid Waste: Federal Program to Buy Products with Recovered Materials Proceeds Slowly, GAO/RCED-93-58, May 1993.

U.S. General Services Administration, Federal Supply Service. 1994 Environmental Products Guide, RCPG-0001.

Conversations with:

Michael Alexander, Northeast Recycling Council, VT  
Jean Arbour, Maine Waste Management Agency, ME  
Dana Arnold, United States Environmental Protection Agency, DC  
Phil Bailey, National Recycling Coalition, VA  
Sam Baker, National Wood Pallet Association, VA  
Rob Beaudoin, Center for Environmental Technology, MA  
Robert Bennett, College of Engineering, University of Toledo, OH  
Michael Blumenthal, Scrap Tire Management Council, DC  
Bernard Brill, Council for Textile Recycling, MD  
Wendy Brower, International Design Society of America, NY  
Dana Carter, National Assoc. of State Purchasing Officials, KY  
Randy Coburn, NY State Department of Economic Development, NY  
Andrea Cohen, Agency of Natural Resources, VT  
William Colden, Department of Environmental Protection, NY  
Peter Connolly, Department of Administrative Services, CT  
Peter Corr, Department of Administration, RI  
Dan Cramer, Industrial Designer, MN  
Marty Davy, Department of Environmental Management, RI  
Don DeGroot, University of Massachusetts at Amherst, MA  
Marcia Diegler, Division of Procurement and General Services, MA  
Resa Dimino, South Bronx 2000, NY  
David Doherty, Clean Washington Center, WA  
David Dunning, Recycling Technologies, DC  
John Fearncombe, Bottomline Consulting, IL  
William Ferretti, NY State Department of Economic Development, NY  
Greg Fisher, AZ Department of Commerce, AZ  
Mindy Fox, CA Integrated Waste Management Board, CA  
Eric Friedman, Div. of Procurement and General Services, MA  
Maggie Gainer, Gainer & Associates, CA  
Chris Gibbs, American Institute of Architects, DC  
Erica Guttman, Solid Waste Management Corporation, RI  
Jody Harris, Maine Waste Management Agency, ME  
Dana Hollish, Green Seal, DC  
Tom Houska, Solid Waste Authority, DE  
Dana Humphrey, Department of Civil Engineering, University of Maine, ME  
Carl Hursh, Department of Environmental Resources, PA  
Garrett Iannela, Department of Environmental Management, RI  
Henry Justus, Department of Transportation, NJ  
Barbara Johnson, Design Resource Awards, WA

Catherine Kasziba, Center for Plastics Recycling Research,  
 Rutgers University, NJ  
 Richard Keller, Northeast MD Waste Disposal Authority, MD  
 Bob Kirby, Clean Washington Center, WA  
 Daniel Klempner, Center of Excellence in Environmental  
 Engineering and Science, University of Detroit Mercy, MI  
 Richard Knox, Maine Waste Management Agency, ME  
 Dick Kochan, U.S. Conference of Mayors, DC  
 Frederick Kuhn, Industrial Design Professor, MA  
 Mark Lennon, Department of Environmental Services, NH  
 Reid Lifset, Industrial Environmental Management Program, Yale  
 University, CT  
 Jeff Lissack, Department of Environmental Protection, MA  
 Chris Lottspeich, Rocky Mountain Institute, CO  
 Soonie McDavid, National Paint and Coatings Association, DC  
 Jim McIlveney, Wood Recycling, Inc., MA  
 Sandy McKinley, Office of State Purchasing, DE  
 Ann Mathius, Coalition of Northeast Governors, DC  
 Janet Matthews, NY Legislative Commission on Solid Waste  
 Management, NY  
 Will Mebane, Office of Economic Development, WA  
 Sean Meyer, MA Buy Recycled Business Alliance, MA  
 Edgar Miller, National Recycling Coalition, DC  
 Paula Moskowitz, Office of General Services, NY  
 Eric Nelson, King County Recycled Product Procurement Officer, WA  
 Kim Newell, NE Department of Economic Development, NE  
 Tim Nolan, MN Office of Environmental Assistance, MN  
 Peter Noyes, Department of Administration, VT  
 Charles Pace, Center for Environmentally Appropriate Materials,  
 University of Massachusetts, MA  
 Amy Perlmutter, Chelsea Center, MA  
 Peter Petit, Department of Environmental Conservation, NY  
 David Pettijohn, Institute for Local Self-Reliance, MN  
 Tom Polk, Department of Economic and Employment Development, MD  
 Mary Beth Powell, Health and Natural Resources, NC  
 Jackie Prince Roberts, Environmental Defense Fund, MA  
 Lisa Purtell, Steel Recycling Institute, PA  
 Richard Ramer, Department of Transportation, FL  
 John Rarig, Department of General Services, PA  
 David Riggle, Biocycle, PA  
 John Rountree, American Institute of Architects, CT  
 Dennis Sabourine, Assoc. of Post Consumer Plastic Recyclers, NJ  
 Jen Seale, Green Development Services, CO  
 Rose Smyrski, Forest Products Lab, USDA, WI  
 Jim Sorenson, Federal Highway Administration, DC  
 Bill Starwood, Fundamental Action to Conserve Energy (FACE), MA  
 Ken Stern, Institute of Advanced Manufacturing Science, OH  
 Lawrence Swanson, Waste Management Institute, SUNY at Stony  
 Brook, NY  
 Kirk Targett, Center for Environmental Studies at Brown  
 University, RI  
 Richard Thompson, Department of Administration, ME

Kim Trella, Department of Environmental Protection, CT  
Nathan Tyler, Glass Packaging Institute, DC  
Nancy Vandenberg, Markets for Recycled Products, NY  
Guy Watson, Department of Environmental Protection & Energy, NJ  
Alex Wilson, Environmental Building News, VT  
Andrea Wood, American Plastics Council, DC  
John Yeasting, Clean Washington Center, WA

## VIII. APPENDICES

## Results of Survey Re: Innovative Recycled Content Product Research

1. For which recycled materials is your State most interested in finding a market? Please list the materials in the order of importance to your State, with that material for which you would most like to find a market first on the list.

Compost - NJ#2, VT#3, NH#2 (food), ME#4

C & D - VT#2, CT#4 (asphalt shingles), NH#1, PA#2

Glass - NJ#4, RI#2, CT#2, NH#3, ME#3

Gypsum Board - CT#3

Paint - RI#4

Paper-Mixed - DE#2

Plastic - NJ#3 (esp. 3-7), VT#1, RI#1, CT#1, NH#4, ME#2, NY#2

Tires - NJ#1, ME#1, NY#1, DE#1, PA#1

Wood - RI#3

2. Information currently being sought on innovative new products includes: commodity, specifications/content, testing, cost/benefit, price, product life, performance, consumer reports/satisfaction and case studies. Is there further information which would be desirable and useful for you to promote procurement?

Existing contracts. Contact names and numbers. Current market share (trend in market share). Prevalence of use. Manufacturing process used to manufacture the product. Regulations.

3. What do you believe would be the most effective medium for the dissemination of this information? Please draw on knowledge of any barriers or opportunities particular to your State as well as past experience.

Discreet packages for each material product. News alerts. Short bulletins. E-mail. Industry specific workshops. Hands-on. Touch-feel opportunities. NASPO. Construction trade organizations. State recycling and procurement folks working together. Municipal association newsletters. NERC. Quarterly bulletins. State Economic Development Offices. Computer diskettes.

4. Are you aware of any innovative new recycled content products, or producers that historically have been very active in this area, which would be useful in this research? If so, please list them below or call Stacy Ritter at (617)223-5509.

\* ReClaim, roofing shingles to cold patch. Contact: John Kraft @ (904)222-2001. \* Pedro's USA, milk jugs to bike tire levers, etc. Contact: Bruce Fina @ (401)849-2909. \* Domtar Gypsum, recycled gypsum board. (603)433-8000. \* Global Zero, plastics to videocassettes. (207)324-5200.

## APPENDIX 2

### RECYCLING AND PROCUREMENT CONTACTS - NERC STATES

#### Connecticut

Kim Trella  
State Recycling Coordinator  
Waste Planning & Standards  
Dept. of Environmental Protection  
79 Elm Street  
Hartford, CT 06106-5127  
(203)424-3365 tel

Peter Conolly, C.P.M.  
Director of Purchasing  
Bureau of Purchases  
Dept. of Administrative Services  
460 Silver Street  
Middletown, CT 06457  
(203)638-3267 tel

#### Delaware

Tom Houska  
Chief Planner  
Solid Waste Authority  
PO Box 455  
Dover, DE 19903-0455  
(302)739-5361 tel

Robert McWilliams  
Director  
Division of Purchasing  
Dept. of Administrative Services  
PO Box 299  
Delaware City, DE 19706  
(302)834-4550 tel

#### Maine

Richard Knox  
State Office of Planning  
State House, Station #154  
Augusta, ME 04333  
(207)287-5300 tel

Richard Thompson  
Director  
Division of Purchases  
Dept. of Administration  
State Office Bldg.  
State House Station #9  
Augusta, ME 04333  
(207)287-3521 tel

#### Massachusetts

Jeffrey Lissack  
Director  
Recycling Market Development  
Div. of Solid Waste Management  
1 Winter Street  
Boston, MA 02108  
(617)292-5583 tel

Gary Lambert  
Deputy Purchasing Agent  
Dept. of Procurement &  
General Services  
1 Ashburton Place  
Room 1017  
Boston, MA 02108  
(617)727-7500 tel

#### New Hampshire

Mark Lennon  
Supervisor  
Planning & Community Assistance  
Dept. of Environmental Services  
6 Hazen Drive  
Concord, NH 03301  
(603)271-3712 tel

Wayne Myer  
Administrator  
Bureau of Purchase & Property  
Dept. of Administrative Services  
State House Annex, Room 102  
Concord, NH 03301  
(603)271-3606 tel

### New Jersey

Guy Watson  
Bureau Chief  
Bureau of Recycling & Planning  
Dept. of Environmental Protection  
840 Bear Tavern Road CN 414  
Trenton, NJ 08625  
(609)530-8208 tel

Enrico Savelli  
Chief  
Procurement & Contracting  
NJ State Purchase Bureau  
33 West State St., CN230  
Trenton, NJ 08625  
(609)292-4751

### New York

William Colden  
Chief  
Waste Reduction & Recycling  
Dept. of Environmental Conservation  
50 Wolf Road, Rm. 228  
Albany, NY 12233  
(518)457-3711 tel

William Ferretti  
Director  
Recycling Market Development  
Dept. of Economic Development  
One Commerce Plaza  
Albany, NY 12245  
(518)486-6291 tel

Janet Matthews  
Program Director  
Legislative Commission on  
Solid Waste Management  
Agency 4 Bldg., 5th floor  
Empire State Plaza  
Albany, NY 12248  
(518)455-3711 tel

Paula Moskowitz  
Director  
Office of General Services  
Mayor E. Corning, 2nd Tower  
Room 3804  
Gov. Nelson Rockefeller Empire  
State Plaza Bldg.  
Albany, NY 12242  
(518)474-6710 tel

### Pennsylvania

Carl Hursh  
Chief  
Recycling & Markets  
Bureau of Waste Management  
Dept. of Environmental Resources  
PO Box 8472  
Harrisburg, PA 17105-8472  
(717)787-7382 tel

George C. Fields  
Deputy Secretary for Procurement  
Dept. of General Services  
414 North Office Building  
Harrisburg, PA 17125  
(717)787-5295

Rhode Island

Marty Davey  
Program Manager  
Office of Environmental Coordination  
Dept. of Environmental Management  
83 Park Street  
Providence, RI 02903-1037  
(401)277-3434 tel

Peter Corr  
Associate Director  
Div. of Procurement Materials  
and Information Management  
Dept. of Administration  
One Capitol Hill  
Providence, RI 02908-5855  
(401)277-2142 tel

Vermont

Andrea Cohen  
Chief  
Recycling & Resource Conservation  
Dept. of Environmental Conservation  
103 South Main St, Laundry Bldg.  
Waterbury, VT 05671-0407  
(802)241-3477 tel

Peter Noyes  
Director  
Division of Purchasing  
General Services Dept.  
128 State Street  
Montpelier, VT 05633-7410  
(802)828-2211 tel

### APPENDIX 3

#### NATIONAL RECYCLING ORGANIZATIONS AND TRADE ASSOCIATIONS

Agricultural Composting  
Association  
P.O. Box 608  
Belchertown, MA 01007  
(413)323-4531

Aluminum Recycling Association  
1000 16th St., NW  
Washington, DC 20036  
(202)785-0951

American Forest & Paper  
Products Association  
1250 Connecticut Ave., NW  
2nd floor  
Washington, DC 20036  
(800)878-8878

American Plastics Council  
1275 K Street, NW  
Suite 400  
Washington, DC 20005  
1-800-2-HELP-90

American Paper Institute (API)  
260 Madison Ave.  
New York, NY 10016  
(212)340-0654

American Retreaders  
Association  
Tire Retread Info. Bureau  
900 Weldon Grove  
Pacific Grove, CA 93950  
(408)372-1917

Asphalt Recycling and  
Reclaiming Association  
3 Church Circle, Suite 250  
Annapolis, MD 21401  
(410)267-0023

Association of Post-Consumer  
Plastic Recyclers  
c/o Wellman, Inc.  
1400 Broad St., Suite 302  
Shrewsbury, NJ 07702  
(908)542-7300

Buy Recycled Alliance  
National Recycling Coalition  
1727 King Street, Suite 105  
Alexandria, VA 22314-2720  
(703)683-9025

Buy Recycled Campaign  
United States Conference of  
Mayors  
1620 Eye Street, NW  
Washington, DC 20006  
(202)293-7330

The Composting Council  
114 South Pitt St.  
Alexandria, VA 22314  
(703)739-2501

The Council for Textile  
Recycling  
7910 Woodmont Ave., Suite 1212  
Bethesda, MA 20814  
(301)718-0671

Glass Packaging Institute  
1801 K St., NW  
Washington, DC 20006  
(202)887-4850

Institute of Scrap Recycling  
Industries (ISRI), Inc.  
1627 K St, NW  
Washington, DC 20006  
(202)466-4050

National Association for  
Plastic Container Recovery  
3770 Nations Bank Corp. Center  
100 North Tryon St.  
Charlotte, NC 28217  
(704)358-8882

National Association of  
Counties  
440 First Street, NW  
Washington, DC 20001  
(202)942-4662

National Association of State  
Purchasing Officials  
Council for State Governments  
Iron Works Pike  
P.O. Box 11910  
Lexington, KY 40578-1910  
(606)231-1877

National Association of  
Purchasing Managers  
P.O. Box 22160  
Tempe, AZ 85285  
(606)752-6276 ext. 3065

National Institute of  
Government Purchasers  
11800 Sunrise Valley Drive  
Reston, VA 22091  
(703)715-9400

National Paint and Coatings  
Association  
1500 Rhode Island Ave., NW  
Washington, DC 20005  
(202)462-6272

National Recycling Coalition  
1727 King Street, Suite 105  
Alexandria, VA 22314-2720  
(703)683-9025

National Wood Pallet  
Association  
1800 N. Kent Street, Suite 911  
Arlington, VA 22209  
(703)527-7667

Partnership for Plastics  
Program  
Society of the Plastics  
Industry, Inc.  
1275 K St., NW, Suite 400  
Washington, DC 20005  
(202)371-5319

Recycled Products  
International Trade  
Association  
2044 Oak Dr.  
St. Louis, MO 63131  
(314)966-7355

Recycled Paperboard Technical  
Association  
350 S. Kalamazoo Mall  
Suite 207  
Kalamazoo, MI 49007  
(616)344-0394

Recycling Industries Business  
Council  
Economic Innovation Center  
28 Jacome Way  
Newport, RI 02840  
(401)849-9889

Steel Recycling Institute  
Foster Plaza X  
680 Anderson Dr.  
Pittsburgh, PA 15220  
(800)937-1226

The Vinyl Institute  
155 Route 46 West  
Wayne Interchange Plaza II  
Wayne, NJ 07470  
1-800-969-8469

## APPENDIX 4

### ADDITIONAL SOURCES FOR RECYCLED CONTENT PRODUCTS

#### Recycled Product Guides

##### **Recycled Plastic Products Source Book**

American Plastics Council

1275 K Street, NW

Suite 400

Washington, DC 20005

(800)2-HELP-90

Price: free

Contents: Plastic products

##### **The Official Recycled Products Guide**

American Recycling Market, Inc.

P.O. Box 577

Ogdensburg, NY 13669

800-267-0707

Price: \$275/year for one issue of Guide plus updates, a monthly newsletter, and access to toll-free hotline.

Contents: Wide range of recycled products.

##### **The Sourcebook for Sustainable Design**

Boston Society of Architects

52 Broad Street

Boston, MA 02109

(617)951-1433

Price: \$25.

Contents: Products used in construction and design.

##### **Buy Recycled Guide**

Buy Recycled Business Alliance

National Recycling Coalition, Inc.

1101 30th St., NW Suite 305

Washington, DC 20007

(202)625-6406

Price: Free if you are a member of the Alliance. Membership is free and open to those who respond to a questionnaire and pledge to buy recycled.

Contents: The how to guide for a business joining the Buy Recycled Business Alliance.

##### **The Business and Government Buyer's Guide to Recycled Products**

Californians Against Waste Foundation Buy Recycled Campaign

926 J St., Suite 606

Sacramento, CA 95814

(916)443-8317

Price: \$24.95/year for a guide with semi-annual updates

Contents: Wide range of products available.

**Guide to Resource Efficient Building Elements**

Center for Resourceful Building Technology

P.O. Box 3866

Missoula, MT 59806

(406)549-7678

Price: \$25 including postage

Contents: Products used in construction applications.

**Directory of Recycled Content Building & Construction Products  
and Recycled Product Directory**

Clean Washington Center

Dept. of Trade and Economic Development

2001 Sixth Ave.

Seattle, WA 98121

(206)464-7040

Price: \$20 each

Contents: First directory listed contains products used for building, while the second directory contains a wide range of recycled products.

**The Business Recycling Handbook**

Connecticut Business Environmental Council, Inc.

17 Riverside Avenue

Bristol, CT 06010

(203)584-4725

Price: free

Contents: A how to guide for a CT business joining this program.

**Reuse/Recycling of Glass Cullet for Non-Container Uses**

Dane County Department of Public Works

115 W. Doty Street, Room 2144

Madison, WI 53703-3202

(608)266-4592

Price: free

Contents: Products using recycled glass cullet.

**Buy Recycled Indiana! How to find and where to buy recycled products in Indiana**

Indiana Department of Commerce

One North Capitol, Suite 700

Indianapolis, IN 46204-2288

(317)232-8800

Price: free

Contents: Buy recycled program tips, and range of recycled products.

**McRecycle USA Database**

McDonald's Corporation

Kroc Drive

Oak Brook, IL 60521

(708)575-5779

Contents: Wide range of products.

**Guide to Recycled Products: Building and Construction; Paper and Office Supplies; and Commercial and Industrial Products**

(3 separate guides)

METRO/Solid Waste Department

600 NE Grand Avenue

Portland, OR 97232-2736

(503)797-1700

Price: free for single copies

Contents: Products as described by specific title.

**Michigan Manufactured Recycled Products**

Michigan Departments of Commerce and Natural Resources

Environmental Services Division

Information Clearinghouse

P.O. Box 30004

Lansing, MI 48909-7504

(800)662-9278

Price: free

Contents: Wide range of products.

**Minnesota Recycled Products Directory**

Minnesota Office of Environmental Assistance

520 Lafayette Road N, 2nd floor

St. Paul, MN 55155-4100

(800)657-3843

Price: free

Contents: Wide range of products.

**Recycled Commodity Database**

National Association of State Purchasing Officials

Council for State Governments

Iron Works Pike

P.O. Box 11910

Lexington, KY 40578-1910

Contents: Wide range of products.

**North Carolina Manufacturers of Recycled Products**

North Carolina Office of Waste Reduction

Department of Environment, Health, and Natural Resources

3825 Barrett Drive

Raleigh, NC 27609

(800)763-0136

Price: free

Contents: Wide range of products.

**Buy Recycled Training Manual:**

**A Guidebook for Government Buyers and Using Agencies**

Northeast Maryland Waste Disposal Authority

25 South Charles Street, Suite 2105

Baltimore, MD 21201-3330

(410)333-2730

Price: \$20 including postage. Government discounts available.

**Buy Recycled! Directory of Ohio Vendors of Recycled Products**

Ohio Department of Natural Resources

Division of Litter Prevention & Recycling

1889 Fountain Square Court, Building F-2

Columbus, OH 43224-1331

(614)265-6333

Price: free

Contents: Wide range of products available.

**Recycled Rubber Products Catalog**

Scrap Tire Management Council

1400 K Street, NW

Washington, DC 20005

(202)682-4880

Price: free

Contents: Recycled rubber products.

**Construction Waste & Demolition Debris Recycling...A Primer**

The Solid Waste Association of North America

P.O. Box 7219

Silver Spring, MD 20907

(301)585-2898

Contents: Potential uses for construction and demolition debris.

**Harris Directory**

Stafford-Harris, Inc.

1916 Pike Place, #705

Seattle, WA 98101

(206)682-4042

Price: \$69

Contents: Products for construction and landscaping.

**Buy Recycled Campaign**

United States Conference of Mayors

1620 Eye Street, NW

Washington, DC 20006

(202)293-7330

Price: free to government entities

Contents: Range of recycled products, and procurement and bidding specifications.

**Recycled Products Guide**

U.S. General Services Administration

Centralized Mailing List Service

Box 6477

Fort Worth, TX 76115

(817)334-5215

Price: free

Contents: Wide range of products available.

**Directory of Companies Manufacturing Products from Recycled Vinyl**

The Vinyl Institute

One Cascade Plaza

19th Floor

Akron, OH 44308

(800)969-8469

Price: free

Contents: Products containing recycled vinyl.

**The Official Recycled Products Guide Condensed Edition for  
Members of the US EPA's Wastewise Program**

Wastewise (5306)

U.S. Environmental Protection Agency

401 M St., SW

Washington, DC 20460

(800)372-9473

Price: Available to participants in EPA's Wastewise program.

Contents: Wide range of products available.

**Newsletters with Recycled Product Information****Composting Council Quarterly Newsletter**

114 South Pitt St.

Alexandria, VA 22314

(703)739-2501

**Environmental Building News**

RR1 Box 161

Brattleboro, VT 05301

(802)257-7300

Price: \$95/year for 6 issues

**Recycled Paper News**

RP Publications

6732 Huntsman Blvd.

Springfield, VA 22152

(703)569-8670

Price: \$195/year for 10 issues

Recycled Products Business Letter  
11906 Paradise Lane  
Herndon, VA 22071-1519  
(703)758-8436  
Price: \$149/year for 12 issues

Periodicals

*BioCycle: Journal of Composting and Recycling*  
The JG Press Inc.  
419 State Avenue  
Emmaus, PA 18049  
(610)967-4135  
Price: \$63/year for 12 issues

*Recycling Times*  
PO Box 420168  
Palm Coast, FL 32142-9956

*Resource Recycling*  
P.O. Box 10540  
Portland, OR 97210  
(503)227-1319  
Published 7 times annually

*Scrap Tire News*  
Recycling Research Institute  
133 Mountain Road  
P.O. Box 714  
Suffield, CT 06078  
(203)668-5422  
Price: \$118/year for 12 issues

*Waste Dynamics of the Northeast*  
150 Dow Street  
Manchester, NH 03101  
(603)624-1442  
Price: \$42/year for 12 issues

## Databases

The following databases are available through Internet on the Worldwide Web. The address for each Homepage is listed.

Consortium on Green Design and Manufacturing at  
<http://euler.berkeley.edu/green/cgdm.html>

Global Network for Environmental Technology at  
<http://gnet.together.org>

Green Design Initiative (Carnegie Mellon) at  
<http://www.ce.cmu.edu:8000/GDI/>

Green Recycling Network at <http://grn.com/grn/>

Guide to Environmental Resources on the Net at  
anonymous ftp: [una.hh.lub.umich.edu](ftp://una.hh.lub.umich.edu), path/inetdirsstacks,  
file environment: murphy briggs

King County Recycled Product Procurement Program at  
<http://www.metrokc.gov>

Massachusetts Access to Government Network (including the  
Department of Procurement and General Services) at  
<http://www.magnet.state.ma.us>

National Technology Transfer Center (NTTC) at <http://www.nttc.edu>

Recycler's World: Post-consumer Plastic Recycling and more at  
<http://granite.sentex.net/recycle/rs000739.html>