

Appendix D. Material Categories for the 2002 waste composition study

Field Sorting Categories

The individual material categories as sorted and weighed in the field are underlined, are preceded by numbers below, and are followed by descriptions. Groups of categories as used throughout this report are shown in bold, and are followed by numbers in parentheses that indicate the individual material categories included in the group category.

PAPER

Paper Packaging (1-5)

1. Corrugated cardboard and kraft paper (OCC). Kraft linerboard and containerboard cartons and shipping boxes with corrugated paper medium (unwaxed). This category also includes Kraft (brown) paper bags. Excludes waxed and plastic-coated cardboard, solid boxboard, multi-walled bags that are not pure unbleached kraft.
2. Low-grade packaging paper. Other low-grade recyclable papers used in packaging, includes chipboard and other solid boxboard (not poly-coated), bags (without poly liners and not pure unbleached kraft), clothing forms, egg cartons (molded pulp), boxes with small plastic windows.
3. Bleached boxboard. Milk, juice cartons & white freezer/ refrigerator boxes. Poly-coated bleached paperboard used for milk, ice cream, juice (including aseptic packaging), frozen TV dinners, and many other frozen food boxes. Boxes are printed or unprinted white fiber, but currently have limited markets due to polyethylene coating. Does not include uncoated paperboard (either bleached or unbleached), as uncoated boxboard is included in "other recyclable packaging" below. Does not include cups or non-food poly-coated packages.
4. Non-recyclable packaging paper. Paper for which no significant recycling opportunities currently exist in Oregon, including waxed cardboard, poly-lined chipboard, foil-lined papers, Christmas wrapping paper, and paper cups, plates, and other paper containers used for takeout food.
5. Mixed paper/other materials. Includes juice cans, oil cans, paper with thick foil laminates or large thick plastic windows.

Other Paper (6-11) (includes printing, writing, and other non-packaging paper)

6. Newspaper (ONP). Printed ground-wood newsprint (minimally bleached fiber); referred to as #1 news. This category also includes glossy paper typically used in newspaper insert advertisements, if believed to be distributed with newspapers.
7. Magazines. Includes glossy publications such as some catalogs, but excludes newspaper glossy inserts
8. Hi-Grade office/printing/writing paper (uncoated high-grades). Printing, writing and computer papers, including mainly thermo-chemical pulps. Both virgin pulp substitutes and high-grade de-ink fibers are included. This category is composed of high-grade paper, which includes white ledger, colored ledger, computer printouts, computer tab cards, bond, copy machine, and carbonless paper. Excludes glossy coated paper such as magazines and pure groundwood publications such as catalogs, and glue-bound publications.
9. Hard-covered books. Books with hard covers, and excluding paperbacks..
10. Other low-grade recyclable printing paper. Phone books, junk mail (including stray sheets of ledger-grade paper commonly included in junk mail), used envelopes other material with sticky labels, construction paper, blueprint and thermal copy & fax paper, bright-dyed paper (fiesta or neon colors), paperback books, uncoated (non-glossy) groundwood catalogues (glue bindings).
11. Other non-recyclable paper. Printing or other non-packaging paper not included above that is not easily recyclable in the United States. Includes paper towels and tissue, carbon paper, photographs, and paper normally soiled through use (paper plates and cups for home use).

PLASTICS (12-17)

12. "Recyclable" polyethylene film plastic. Plastic grocery bags, retail bags, newspaper bags, dry cleaner bags, pallet-wrap, shrink wrap, clear and black polyethylene plastic sheeting, hay sleeves and silage bags, fertilizer, peat, and feed bags from nurseries/agricultural operations, furniture and mattress wrap, bubble wrap, woven lumber wrap, roofing material wrap, insulation wrap, commercial bags and liners, commercial parts packaging, and building wrap. Excludes any plastic film that is not polyethylene or other polyolefin, any plastic film that is laminated to other materials (tape/labels are OK), any bag used as a garbage bag (can liners and tied-off garbage bags), bags that are contaminated with food and other sticky/contaminating materials on the inside, food and household product packaging such as frozen vegetable bags, diaper packaging, bread bags, ziplock and similar household use bags, saran wrap, and plastic sheeting used for ground cloths or paint masking, if contaminated with paint.
 13. Other film plastic. All other plastic bags and flexible plastic film including garbage bags, plastic strapping, shower curtains, and other flexible plastic items. Any plastic bag used as a garbage bag goes here.
 14. Rigid plastic containers. Plastic packages of finite shape with a capacity of from eight ounces to five gallons. Does not include lids, unless the lid is attached or is itself a rigid plastic container. Includes plastic cups used commercially to package food, but not plastic cups sold as a product for home or office use (usually unmarked - included in "rigid plastic products").
 15. Other rigid plastic packaging. Includes expanded polystyrene packaging and food trays (holding less than 8 oz), urethane foam packaging, containers larger than 5 gallons, plastic bottle and container lids and lids from glass, metal, or paper containers. Amended in 2000 to include "small rigid plastic containers" - plastic containers such as yogurt cups that are under 8 ounces in size.
 16. Rigid plastic products. Dishware and utensils, including expanded polystyrene cups and plates when originally sold for home use (non-packaging), plastic household items, rigid vinyl products, all-plastic furniture, and toys. Includes thermoset plastic products and "fiberglass" (mainly plastic) boat parts, corrugated roofing, and similar products. Also includes polyurethane foam products, including urethane foam carpet padding.
 17. Mixed plastics/materials. Items whose predominant material is plastic, but is combined with other material, such as kitchen ware, toys, plastic pens, and car parts, with metal and wood components, vinyl and similar floor tiles and coverings that have canvas, paper, or other types of backing material or significant non-plastic components, etc.
- (see note at end regarding film plastic packaging and film plastic products)

OTHER ORGANIC WASTES. "Organic" used in the "carbon-containing" (or burnable) sense.

Yard Debris. (18-21) Natural vegetative material including the following:

18. Leaves and grass. Naturally occurring vegetative material and other fine organic waste from park, lawn and garden maintenance. Typically leaves, grass clippings, and herbaceous weeds. Excludes woody material greater than 1/4-inch diameter. Material can be home-composted without chipping.
19. Small prunings less than 2" diameter. Naturally occurring woody material from trees, plants, and shrubs. Could be chipped with a small chipper for home composting.
20. Large prunings more than 2" in diameter. This category is composed of trees and large branches greater than 2" diameter and small stumps/roots less than 1' in diameter and less than 100 pounds. This material cannot easily be home-composted due to its size, weight and composition.
21. Stumps. Stumps too large to be ground by most commercial composters due to size, without use of special stump-splitting devices. (greater than 1' diameter or 100 pounds).

Wood. (22-29) Manufactured wooden lumber and other items (excluding sawdust) including the following:

22. Untreated lumber. Unfinished or unpainted dimensional lumber or wood, including plywood and unpainted oriented strandboard used for construction or resulting from building demolition. Excludes cedar shakes, shingles.
23. Clean "hogged fuel" wood. Includes particleboard, medium density fiberboard, any plywood with a fiber/resin overlay (such as is common for concrete forms) cedar shakes and shingles and other cedar lumber, compressed sawdust waferboard, masonite (high-density fiberboard).
24. Painted lumber. Includes any lumber that is painted or primed, excluding furniture and mixed wood/materials (split from chemically-treated lumber in 2000).

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25. Chemically treated lumber. Pressure-treated or creosoted lumber or wood.
26. Wood pallets and crates and similar packaging lumber. Dimension lumber material used in pallets and crates. Also includes wood/wire crates with thin slats, if not mixed with plastic and other materials.
27. Wood furniture. Includes desks, chairs, bureaus, and other furniture items made from wood.
28. Other wood products. Includes pencils, coat hangers, and other objects made of wood that are not used for packaging or construction or as furniture.
29. Mixed wood/materials. Mostly wood items combined with plastic, metal, or other materials. Excludes items that are better included in another category.
30. Food waste. Food trimmings, coffee grounds, bones, spoiled or otherwise discarded food.
31. Tires. Whole or partial rubber tires casings, including bicycle tires.
32. Other rubber. Includes toys, inner tubes, rubber mats, rubber carpet padding.
33. Disposable diapers. Disposable diapers, including fecal materials contained within. Cloth diapers are to be sorted under textiles.
34. Carpet and rugs. Includes fiber rug pads but does not include polyurethane foam carpet pad (rigid plastic product) or rubber padding (other rubber).
35. Other textiles. Fabric materials including natural and man-made textile materials such as cottons, wools, silks, woven nylon, rayon, polyesters, and other materials. This category includes clothing, rags, curtains, and other fabric materials.
36. Mixed textiles/materials. Include textiles that have significant amounts of non-textile components, plus shoes, belts, and similar clothing articles that may have insignificant amount of textile material.
37. Asphalt shingles and tar roofing paper. Includes all roofing that contains significant amounts of asphalt. Starting the second quarter of 2002, this category was split into two categories: recyclable asphalt roofing and non-recyclable asphalt roofing. "Recyclable" asphalt roofing includes tarpaper and regular 3-tab roofing architectural-grade composition shingles, and roll-roofing. "Nonrecyclable" asphalt roofing includes such things as built-up asphalt roofing commonly used on flat-roofed commercial buildings.
38. Furniture and furnishings (mixed materials). This includes reusable and non-reusable household items that are large such as chairs, tables, and mattresses. Excludes furniture made from single materials (all metal, all plastic, all wood)
39. Other organics. Carbon-containing wastes not otherwise categorized, including organic fines and other non-sortable combustibles, sawdust, cigarette butts, hair, wax, linoleum, dryer lint, vacuum bags, charcoal. Amended in 2000 to include "other disposable hygiene products" and "dead animals."

GLASS (40-46)

40. Deposit beverage glass (beer, soft drink, mineral water).

Other Container Glass (41-44)

41. Clear non-deposit beverage glass. All clear non-deposit beverage glass, including broken glass identified as non-deposit beverage glass. Included are wine bottles, wine cooler bottles, liquor bottles, juice bottles, and other non-deposit glass beverage containers.
42. Colored non-deposit beverage glass. Same as 41, except includes green, brown, and other colored glass.
43. Other clear container glass. Includes clear (unpigmented glass jars, ketchup/mustard bottles, baby food jars, pickle jars and mayonnaise jars, medicine and other non-beverage bottles, and other clear container glass that is not a beverage bottle.
44. Other colored container glass. Same as 43, but for green, brown, and other colored glass.

Window and Other Glass (45-48)

45. Flat window glass (not including mirrors).
46. Fluorescent light tubes. Includes just individual separate light tubes and not fluorescent light fixtures. This is a new category as of 2002. Formerly this material was included under "other glass".
47. Compact fluorescent lights. This includes small fluorescent fixtures that are sold as complete units, with both the ballast and tube attached. Does not include regular (full-sized) ballasts commonly used with full-sized fluorescent tubes.

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48. Other glass. This category includes products such as light bulbs, glass plates and cups, auto and cooking ware glass and mirrors, but excluding ceramics. This glass is not accepted by glass beverage container manufacturers for recycling, although some can be recycled into other uses. Fiberglass insulation is a separate category in the "other inorganics" group instead of here in the glass group.

METALS (and appliances)

49. Aluminum beverage cans. Used aluminum beverage cans (separate count of refundable vs no-deposit).
50. Other aluminum containers and foil. Aluminum pet food cans, foil-formed trays/containers, and foil
51. Other aluminum. All other aluminum materials including furniture, house siding, cookware, and scrap.

Tinned cans (52-53)

52. Tinned food cans. Predominantly steel cans (some with tin or enamel coatings) used to hold food items. Includes soup cans, vegetable cans, food tins etc.
53. Other "tinned" cans. Same as above, except originally made to hold non-food items such as paint thinner. Aerosol cans are listed separately below.

Other metal (54-63)

54. Other non-ferrous metals. Metals that are not materials derived from iron, including copper, brass, bronze, lead, pewter, zinc, "stainless steel", and other metals to which a magnet will not adhere. Metals that are significantly contaminated are not included.
55. Other ferrous metals. Ferrous and alloyed ferrous scrap materials derived from iron, including household, industrial and commercial products not containing significant contaminants. This category includes scrap iron and steel to which a magnet adheres. Includes all-steel furniture such as bed frames. Does not include appliances, food cans, or other ferrous metal items listed elsewhere. (separate estimate for percent recoverable post-collection).
56. White goods. This category is composed of discarded stoves, washer, dryers, refrigerators and other large household appliances.

Computers, Brown Goods, Other Small Appliances (55-61)

57. Computers CRT Monitors. The "Computers" category from 1998 and 2000 was split in 2002 into this and the following category. The category includes only cathode ray tube type computer monitors, and does not include liquid crystal or other flat monitors or computer laptops.
58. Other Computer equipment. Includes computers and their related components (hardware), such as printers, modems, scanners, flat monitors, laptop computers, and their parts. Excludes cathode ray tube type monitors
59. TVs and other cathode ray tube electronics. This and the following category was split in 2002 from the "Other brown goods" category used in the 1998 and 2000 waste composition study. Does not include computer monitors.
60. Other "brown goods". Other small appliances with significant electronic components, such as radios, microwaves, stereos, and telephones. Does not include computer equipment or any electronics consisting primarily of cathode ray tubes.
61. Non-electronic small appliances. Includes fans, hair blowers, can openers, kitchen blenders. These may contain small electronic components such as digital readouts and controls, and often will have electric motors, but do not have significant amounts of circuit-board electronics.
62. Empty or non-hazardous aerosol cans. Note - aerosol cans still containing hazardous materials such as paint are included in the "hazardous materials" categories.
63. Mixed metals/materials. Other composite metal products and metals combined with other materials, such as small gas engines, electrical motors, umbrellas, insulated wires.

OTHER INORGANICS

64. Rocks/concrete/bricks. Generally particle sizes of 1 cm and greater.
65. Soil, dirt, sod.
66. Pet litter, animal feces.

Gypsum wallboard (67,68)

67. New gypsum wallboard. Unpainted scrap and excess gypsum wallboard from new construction or remodeling.

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68. Old gypsum wallboard. Old painted or other demolition gypsum wallboard.
69. Fiberglass insulation.
70. Other inorganics, including plaster, ash, ceramics, china, and porcelain. Does not include items that contain significant amounts of carbon.

71. "MEDICAL WASTE". Includes syringes, tubing, gauze, blood-containing, and similar materials. Bags and containers with medical waste are not sorted further. Thus, other non-medical waste is weighed as medical waste if it is in a bag or container with other apparent medical waste.

HAZARDOUS MATERIALS

72. Latex paint.
73. Oil-based paints and oil thinner.
74. Pesticides/herbicides.
75. Used oil filters.
76. Motor oil
77. Fuels (diesel, gasoline, kerosene).
78. Adhesives/sealants.
79. Caustic cleaners.
80. Lead-acid batteries. Includes most car batteries as well as smaller lead-acid batteries sometimes used in camcorders and other electronic equipment.
81. Dry-cell batteries. Includes regular alkaline, nicad, lithium, and similar batteries excluding lead-acid batteries.
82. Asbestos.
83. Other hazardous chemicals. Includes only chemicals that show hazardous characteristics other than those specified above. Does not include non-hazardous chemicals such as detergents, vegetable oils, or non-hazardous inorganic salts.

Note - in tables in the body of the report and in Appendix A, we break out plastic film and plastics as a whole into "packaging" and "non-packaging" for consistency with our previous studies. However, we did not actually separate film plastic into "packaging" and "non-packaging" in the 2000 or 2002 studies. Instead, we estimated how much was packaging vs non-packaging by adding the two film plastic categories together and then by multiplying the sum by 0.649 for film plastic packaging and by 0.351 for film plastic products. These numbers are the ratio of film plastic packaging to film plastic products as determined statewide in the 1998 Oregon waste composition study. These estimates for film plastic packaging and products were then used in constructing the overall packaging vs. product composition results as well as the plastic packaging and product composition results.

Categories for Contamination Analysis

The same categories were used for contamination analysis as were used for field sort, with the following exceptions:

- 1) Three material categories were combined into "Low-grade paper". These include:
 - #2 Low-grade paper packaging
 - #3 Bleached boxboard
 - #10 Other low-grade paper

- 2) Three material categories were combined into "Nonrecyclable Paper". These include:
 - #4 Non-recyclable paper packaging
 - #11 Other non-recyclable paper
 - #5 Mixed paper/materials

- 3) Two categories were combined into "Other rigid plastic". These include:

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- #15 Other rigid plastic packaging
 - #16 Rigid plastic products
- 4) #30 Food waste was split into two subcategories:
- "Vegetative food waste" includes plant parts such as fruit and vegetable peelings or parts, grains, coffee grounds, and crop residue, but excludes the items listed below.
 - "Non-vegetative food waste" includes oils, greases, dairy products, other animal products
- 5) #14 Rigid plastic containers was split into numerous categories, but by resin and by molding type. The following resin types were identified:
- PET - polyethylene terephthalate (#1 plastic)
 - HDPE - high density polyethylene (#2 plastic)
 - PVC - polyvinyl chloride (#3 plastic)
 - LDPE - low-density polyethylene (#4 plastic, rarely used in rigid plastic containers)
 - PP - polypropylene (#5 plastic)
 - PS foam - polystyrene foam (#6 expanded plastic)
 - PS solid - solid polystyrene (#6 solid)
 - Other resin or combined resin plastic (#7 plastic code)
 - Unknown (containers that are not marked and are not recognizable as #1- #6 plastic)

In addition, all of these resins were further divided into two groups:

- blow-mold plastic (for bottles and anything with a neck that is wider than its mouth)
- injection or other molded plastic (for tubes, pails or other types of plastics)

This gives a potential for 18 categories of rigid plastic containers, although some combinations do not exist in the marketplace or were not encountered in our study (such as foamed polystyrene bottles).

6) Although beginning the second quarter of 2002, we separated "recyclable" asphalt roofing from "non-recyclable" asphalt roofing, these two categories were always combined in contamination analysis.

Changes in Material Categories in 2002 from the 2000 Study

The only difference in material categories between 2000 and 2002 are the following:

- 1) "Other Glass" was separated into 3 categories:
 - fluorescent light tubes,
 - compact fluorescent lights
 - all other glass
- 2) "Computers" was separated into 2 categories:
 - Computer CRT Monitors
 - Other Computer Equipment
- 3) "TVs and Other Brown Goods" was separated into two categories:
 - TVs and other cathode-ray tube equipment (excluding computer monitors)
 - Other Electronics (Brown Goods) excluding TVs, cathode ray tube equipment, and computer equipment

In addition, starting the second quarter of 2002, "Asphalt Roofing" was separated into two categories for field sorting only: recyclable asphalt roofing and nonrecyclable asphalt roofing. However, throughout the 2002 waste composition report, these two categories were generally combined for analysis.

Changes in Material Categories in 2000 (and 2002) from the 1998 Study

The 1998 and 2000 Oregon waste composition studies used the same categories for sorting wastes at disposal sites, with the following exceptions:

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- 1) The "small plastic containers" category used in the 1998 study was combined into #15 above - "other rigid plastic packaging"
- 2) The 1998 study had categories called "other disposable hygiene products" (mainly tampons) and "dead animals" as well as "other organics". These were all combined into #39 "Other organics" above.
- 3) "Treated lumber" from the 1998 study was split into two categories (but see the note under untreated lumber below):
 - #24 Painted lumber
 - #25 Chemically treated lumber
- 4) Untreated lumber from the 1998 study was split into two categories:
 - #22 Untreated lumber (excluding the below), and
 - #23 Clean "hogged fuel" wood

Note - a few of the coated/laminated products that are included in #23 Clean "hogged fuel" wood were categorized in the "treated lumber" category in 1998.
- 5) Film plastic was split into completely different categories in 1998 and 2000. In 1998, the two categories were "film plastic packaging" and "film plastic products". In 2000, the two categories were "Recyclable polyethylene plastic" and "Other film plastic".

Major Group Category Definitions

The summary tables in Appendix A divide up each of the materials into 3 sets of groups, including:

- Packaging/Product/Non-manufactured
- Organic/Non-organic
- Compostable

Table D1, on the next page, shows the individual material categories that were included in each of these category groups. In some cases, the individual material category did not fit entirely in one group or the other. For example, "Mixed Paper/Materials" could include both packaging (such as cigarette packs) and products (such as spiral notebooks with metal or plastic). In each of these cases with one exception, the entire individual material category was included in whichever group included the majority of the material weight.

The exception is film plastic. In studies from 1998 and earlier, film plastic was split into "packaging" and "non-packaging" film plastic. In 2000, film plastic was instead split into "recyclable film plastic" and "other film plastic" (categories 12 and 13 on page D2). Based on the results of the 1998 composition study, it was estimated that 64.94% of the film plastic was packaging, and 35.06% was product.

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Table D1: Materials included in each major group category

Material	Packaging	Product	Non-manufactured	Organic	Non-organic	Compostable	Compost Target
Cardboard/Brown Bags	x			x		x	
Low Grade Packaging	x			x		x	
Bleached Polycoats	x			x		x	
Nonrecyc. Packaging Paper	x			x		x	
Mixed Paper / Materials	x			x		x	
Newspaper		x		x		x	
Magazines		x		x		x	
Hi Grade Paper		x		x		x	
Hardcover Books		x		x		x	
Low Grade Paper		x		x		x	
Other Nonrecyclable Paper		x		x		x	x
Rigid Plastic Containers	x			x			
Other Rigid Packaging	x			x			
Plastic Film Pkg Est. 2000*	x			x			
Rigid Plastic Products		x		x			
Plastic Film Prod. Est. 2000*		x		x			
Mixed Plastic / Materials		x		x			
Leaves / Grass			x	x		x	x
Small Prunings under 2"			x	x		x	x
Large Prunings over 2"			x	x		x	x
Stumps			x	x		x	x
Untreated Lumber		x		x		x	x
Clean HogFuel Lumber		x		x		x	
Painted Lumber		x		x			
Chemically-treated Lumber		x		x			
Wood Pallets / Crates	x			x		x	x
Wood Furniture		x		x		x	x
Other Wood Products		x		x			
Mixed Wood / Materials		x		x			
Food			x	x		x	x
Tires		x		x			
Rubber Products		x		x			
Disposable Diapers		x		x		x	
Carpet		x		x			
Textiles		x		x			
Mixed Textile / Material		x		x			
Roofing / Tarpaper		x		x			
Furniture		x		x			
Other Organics		x		x		x	x

Material	Packaging	Product	Non-manufactured	Organic	Non-organic	Compostable	Compost Target
Deposit Beverage Glass	x				x		
Other Clear Bottles	x				x		
Other Colored Bottles	x				x		
Clear Container Glass	x				x		
Colored Container Glass	x				x		
Flat Window Glass		x			x		
Other Nonrecyc. Glass		x			x		
Alum. Beverage Cans	x				x		
Alum. Foil / Food Trays	x				x		
Other Aluminum		x			x		
Tin Food Cans	x				x		
Other Tin Cans	x				x		
Other Nonferrous Metal		x			x		
Other Ferrous Metal		x			x		
White Goods		x			x		
Computers		x			x		
Brown Goods		x			x		
Small Appliances-non elec		x			x		
Empty Aerosol Cans	x				x		
Used Oil Filters		x			x		
Mixed Metal / Material		x			x		
Rock / Concrete / Brick			x		x		
Soil / Sand / Dirt			x		x		
Pet Litter / Animal Feces			x		x	x	
Gypsum Wallboard OLD		x			x		
Gypsum Wallboard NEW		x			x		
Fiberglass Insulation		x			x		
Other Inorganics			x		x		
"MEDICAL WASTES"		x			x		
Latex Paint		x			x		
Oil Paints / Thinners		x			x		
Pesticides / Herbicides		x			x		
Motor Oil		x			x		
Fuels (gas/kero/diesel)		x			x		
Adhesives / Sealants		x			x		
Caustic Cleaners		x			x		
Lead-Acid Batteries		x			x		
Dry-cell Batteries		x			x		
Asbestos		x			x		
Other Hazardous Chemicals		x			x		

* Plastic film packaging and plastic film product were not separately measured in 2000 and 2002. Packaging and product were estimated using 1998 study results that 64.94% of all film plastic was packaging and 35.06% was product.