

Corrugated Cardboard



Corrugated cardboard has a corrugated (wavy) inside layer, sandwiched between layers of linerboard. It is used to make containers for shipping products to factories, warehouses, retail stores, offices and homes.

Corrugated cardboard is good to use for transporting these products because it is light, strong and easily custom-sized for the product.

Recycled corrugated boxes are used to make new corrugated containers, giftwrap, boxboard cartons, roofing felt, flower pots and biodegradable gardening supplies. (Source: Resource Integration Systems)

How is corrugated cardboard made?

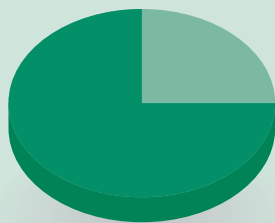
- New linerboard and corrugating medium is made from old corrugated boxes and wood chips, shavings and sawdust left over from wood-processing operations.
- These left-overs are pulped and made into new linerboard or corrugating medium on a board machine.
- Linerboard and corrugating medium are formed into various container shapes. (Source: PPEC)

How is corrugated cardboard recycled?

- Corrugated boxes are dumped into a pulper where moisture is added to create a 'slush'.
- To remove staples, broken glass and plastics, the slush is pumped through small holes at the bottom of the pulper and passed through spinning cleaners.
- Fibres are broken down, and water is drained from the 'slush' to produce a smooth 'stock'.
- Waxes, adhesives, fine plastic particles, grit and glass are removed from the stock by passing it through pressure screens.
- The final screened stock is pressed to remove water and then dried. (Source: Norampak Mississauga Linerboard Mill Fact Sheet)

Fast Facts

- One major Ontario supermarket chain recycles four times as many old corrugated boxes as all the municipalities of Ontario put together. (Source: PPEC, 1999)
- Corrugated boxes contain up to 100% recycled old corrugated boxes. (Source: PPEC)
- Almost 90% of the fibre in a Canadian-made corrugated box comes from recycled used boxes and/or chips, shavings and sawdust left over from logging and wood processing operations. On average, the recycled content of a corrugated box shipped domestically is now 59%. (Source: PPEC, 1998)
- The corrugated box is one of the most widely recycled of all packaging materials. According to the Canadian Council of Ministers of the Environment National Packaging Survey (1996) the recovery rate of corrugated boxes is 80% and the national recycling rate is 77%.



In 1997, 74% of Ontario's population had access to corrugated cardboard recycling. (Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How much corrugated cardboard do Ontario households recycle?

Amount of old corrugated cardboard that was sold for recycling by Ontario municipalities in 1998: 38,852 tonnes plus a portion of the 32,218 tonnes that is corrugated cardboard mixed with other paper such as boxboard.

(Source: Municipal 3Rs 1998 Database, 3Rs Information Partnership)



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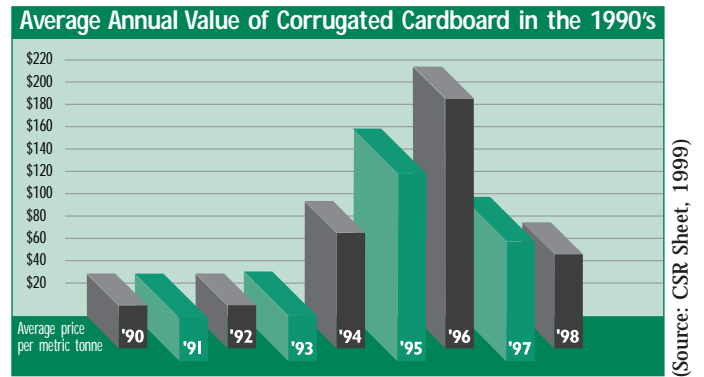


How much is old corrugated cardboard worth?

- Since 1990, old corrugated materials have sold for as much as \$214 per metric tonne and for as little as \$28 per metric tonne on the spot market. (Source: CSR Sheet, 1999)

What about the first R?

- The linerboard used in OCC has been reduced by 10% to 15% in the last decade. Further reductions are limited by loss of strength. (Source: Waste Age Magazine, March '99, pg. 81)



For more information....

- Canadian Pulp and Paper Association
www.cppa.org
- Paper & Paperboard Packaging Environmental Council (PPEC)
www.ppec-paper.com
- Recycling Council of Ontario
www.rco.on.ca

Fine Paper



Fine paper is used as writing paper, photocopier paper and printer paper.

Fine paper is good to use for these purposes because it has longer fibres and is brighter than other paper grades.

Recycled fine paper is used to make tissue paper, printing and writing paper, or paperboard packaging.

How is fine paper made?

- Fine paper is made from woodchips and sawmill residues, a by-product of the forest product industry.
- These materials are pulped and pressed into sheets.

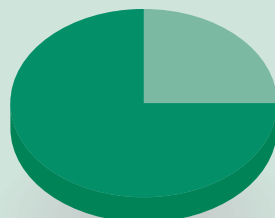
How is fine paper recycled?

- Waste fine paper is mixed with water and caustic soda to create a pulp.
- The pulp is heated to disperse the ink.
- Wood, plastic, metal and other contaminants are removed from the pulp with screens.
- The pulp is washed thoroughly with water to remove ink, clay, starch and small fibres.
- Bleach is sometimes added to remove colours.
- Additional filtering and cleaning removes ink specs and other impurities.
- Pulp is thickened and combined with new wood fibre where necessary.
- Pulp is pressed into paper.

(Source: A Proud Tradition of Papermaking, Noranda Forest)

Fast Facts

- Fine paper's contribution to the Ontario waste stream: 3.65% (Source: RCO)
- Maximum recycled content of high-quality fine papers: 100%
- Average amount of fine paper waste an office worker generates yearly: 73 kg (Source: Pollution Probe)
- Percentage of office waste that is paper: 80% (Source: RCO)
- Percentage of office paper that is not recycled: 70% (Source: CPPA)
- Amount of paper waste the average household produces yearly: 13.16 kg (Source: RCO)



In 1997, 73% of Ontario's population had access to fine paper recycling. (Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How much fine paper do Ontario households recycle?

- Amount of fine paper that was sold for recycling by Ontario municipalities in 1998: 820 tonnes (Source: Municipal 3Rs 1998 Database, 3Rs Information Partnership)
- Average number of sheets of fine paper per tonne of paper manufactured: 100,000 to 200,000 sheets
- Number of sheets of fine paper that could be made using Ontario's recyclable fine paper from 1998: From 82,000,000 to 164,000,000 (depending on grade and thickness)



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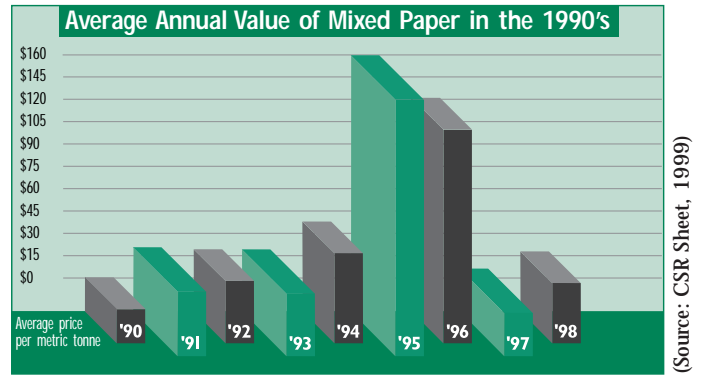
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How much is old fine paper worth?

- When fine paper is collected in the blue box it is not generally sorted from other paper. Thus, it is sold for recycling as mixed paper. Since 1990, mixed paper has sold for as much as \$159 per metric tonne and for as little as \$0 per metric tonne on the spot market.



For more information....

• Canadian Pulp and Paper Association
www.cppa.org

• Recycling Council of Ontario
www.rco.on.ca

Boxboard



Boxboard is a multi-layer rigid paper material that is used to make boxes of various colours, shapes and sizes, including cereal, shoe and candy boxes. Old boxboard is one of the materials used to make new boxboard.

Boxboard usually has from six to eight layers. The upper layer is often made from a deinked pulp or other high-quality recovered paper. Inner layers are made with a lower-quality paper stock (e.g., old newsprint and mixed papers with some old corrugated containers added for strength). The lower layer can be made from old newsprint or corrugated cardboard pulp.

(Source: "Composition, Supply and Markets for Magazines, Mail and Boxboard", Environmental Defense Fund, 1990)

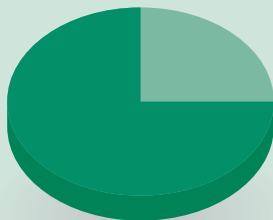
How is boxboard made?

- There are 14 mill sites in Canada that produce boxboard packaging. Ten of them use 100% recycled content; two use 100% wood chips, shavings and sawdust left over from logging and saw milling operations, and two use a blend of recycled fibre and wood residues.
- On average, boxboard packaging is 93% recycled fibre (including corrugated boxes, old newspapers and fine paper) and 7% wood chips, shavings and sawdust.

(Source: PPEC, 1999)

How is boxboard recycled?

- Bales of recovered paper are separated into individual fibres in a hydropulper.
- The resulting slurry is passed through a centrifugal cleaner to remove heavy objects.
- The slurry is passed through three screens: the first to separate out polystyrene and plastic bags, the second to separate out sand and staples, and the third to remove stickies and other latex contaminants.
- Water is added to the slurry in a machine that has wire mesh on each end.
- The machine is tipped so that water drains out and the fibres lay flat against the screen to form a sheet.
- The sheet is transferred to a felt where it is pressed and dried.



In 1997, 73% of Ontario's population had access to boxboard recycling. (Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How much boxboard do Ontario households recycle?

- Amount of boxboard that was sold for recycling by Ontario municipalities in 1998: 28,839 tonnes
- (Source: Municipal 3Rs 1998 Database, 3Rs Information Partnership)



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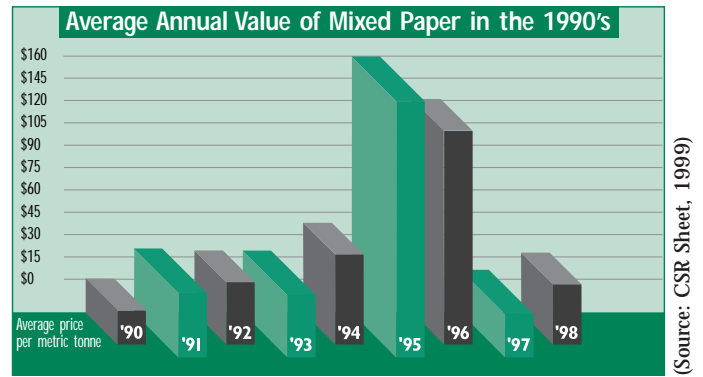
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How much is old boxboard worth?

- When boxboard is collected in the blue box it is not generally sorted from other paper. Thus, it is sold for recycling as mixed paper. Since 1990, mixed paper has sold for as much as \$159 per metric tonne and for as little as \$0 per metric tonne on the spot market. (Source: CSR Sheet, 1999)



For more information....

- Paper & Paperboard Packaging Environmental Council (PPEC)
www.ppec-paper.com

- Recycling Council of Ontario
www.rco.on.ca

Aseptic Containers



An aseptic container is a multi-layered package, made of paper, plastic and aluminum. Commonly known as the "drink box", aseptic containers block out light and air so that an unopened package can be left out of the refrigerator for months and the nutrients and flavor of its contents will be preserved.

(Source: Aseptic Packaging Council, 1997, www.aseptic.org)

Aseptic containers include containers for milk, juices, tomatoes, soups, tofu, wines, liquid eggs, whipping cream and iced teas.

(Source: Aseptic Packaging Council, 1997, www.aseptic.org)

The paper from recycled aseptic containers is used to make hand towels, pencils, popcorn tubs, paper plates and cups. The aluminum and plastic is also recovered for use in new products.

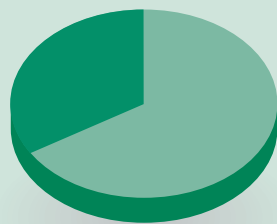
How are aseptic containers made?

- Aseptic containers are made with 70% paper, 24% polyethylene and 6% foil.
- The paper provides stiffness, strength and shape to the package.
- Polyethylene is used as an inner layer to make the package liquid-tight and as an outer layer to keep the package dry and to provide a printing surface.
- A thin layer of aluminum is used on the inside as a barrier against light and oxygen. This layer prevents the need for refrigeration before the container is opened.

(Source: Aseptic Packaging Council, 1997, www.aseptic.org)

Fast Facts

- Number of aseptic containers purchased in Ontario each year: 350 million (Source: TetraPak)
- Percentage of the residential waste stream by weight: 0.10 (Source: TetraPak)
- Number of Ontario municipalities that collect aseptic containers for recycling: 11 (Source: TetraPak)
- Estimated percentage of aseptic containers sold (imports and domestics) in Ontario annually that is diverted from landfill by Ontario's blue box programs: 3



In 1997, 29% of Ontario's population had access to polycoat & aseptic container recycling. (Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How many aseptic containers do Ontario households recycle?

- Amount of aseptic containers that were sold for recycling by Ontario municipalities in 1998: 212 tonnes (Source: TetraPak, per mill receipts)



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Tetra Pak

How are aseptic containers recycled?

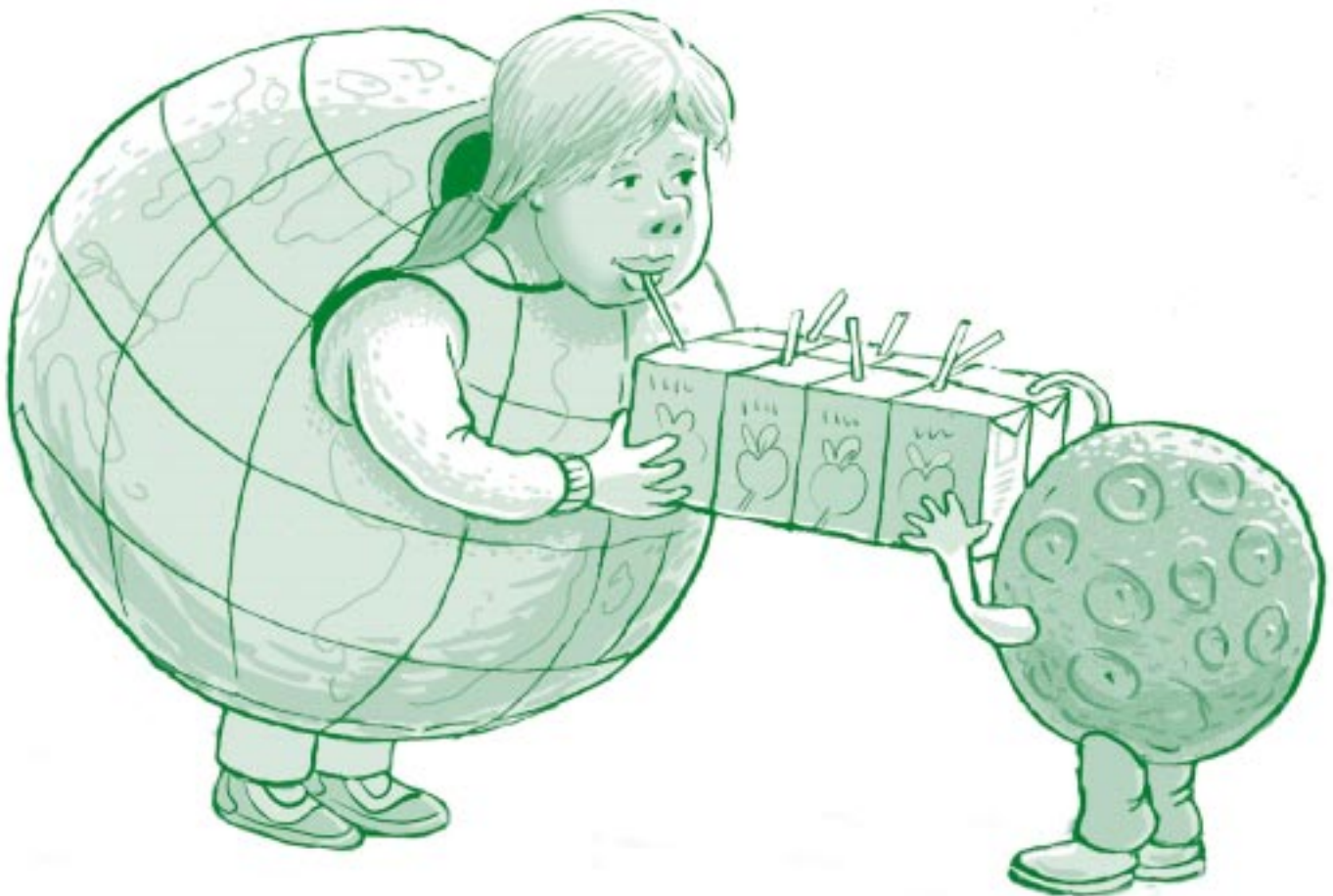
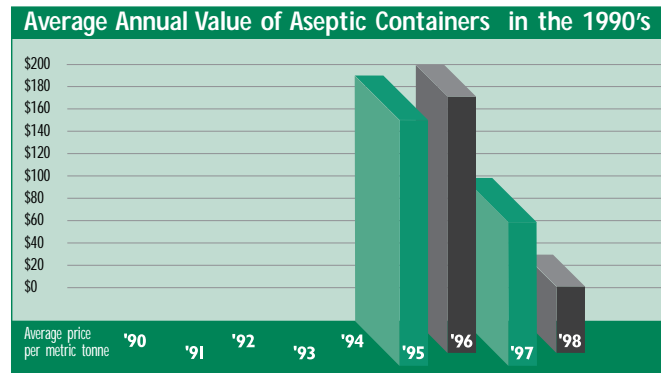
- Aseptic containers are recycled in a process called hydropulping.
- The boxes are agitated in a vat of water until the paper pulp is separated from the plastic and foil.
- Fibre is separated from the thin layers of aluminum and plastic by rinsing and passing the material through screens.
- After this process, the paper fibre, plastic and foil can all be recycled.

(Source: Aseptic Packaging Council, 1997, www.aseptic.org)

How much are old aseptic containers worth?

- Aseptic containers are valued the same as polycoat containers. Since 1995, aseptic and polycoat containers have sold for as much as \$198 per metric tonne and for as little as \$26 per metric tonne on the spot market.

(Source: CSR Sheet, 1999)



For more information....

- TetraPak www.tetrapak.com
- Aseptic Packaging Council www.aseptic.org
- Recycling Council of Ontario www.rco.on.ca

Newsprint



Newsprint is an uncoated groundwood (softwood) paper stock.

Recycled newsprint is used to make new newsprint, boxboard packaging (for cereals, shoes, etc.), kitty litter, absorbent used for oil spills, and insulation.

How is newsprint made?

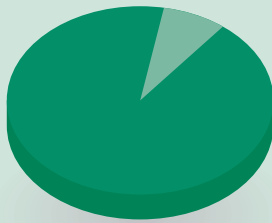
- Paper for newsprint is made from woodchips and sawmill residues, a by-product of the forest product industry.
- Wood pulp and other fibres are ground mechanically.
- Fresh wood stock is supplemented with de-inked old newspapers, magazines and telephone directories.

How is newsprint recycled?

- Newsprint is re-pulped, cleaned and de-inked using detergents, dispersants and foaming agents.

Fast Facts

- A 12" stack of newspapers weighs 35 pounds.
(Source: Waste Age Magazine, August 1998, pg. 80)
- Canada is the world's largest producer of newsprint, exporting approximately 10 million tonnes each year.
(Source: CPPA)
- More than 64.2 million newspapers are sold every day by the 1,664 daily newspapers in North America.
(Source: Waste Age Magazine, August 1998, pg. 80)
- The average recycled content of newsprint has risen from 1.4 percent in 1990 to 22 percent in 1997, reducing the industry's electricity consumption by over 2.5 million megawatt hours per year.
(Source: Canadian Pulp & Paper Association, www.cppa.org/english/wood/mil_ener.htm)



In 1997, 90% of Ontario's population had access to old newspaper recycling.
(Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How much newsprint do Ontario households recycle?

- Amount of newsprint that was sold for recycling by Ontario municipalities in 1998: 97,283 tonnes, plus a portion of the 164,075 tonnes of mixed paper that includes magazines.
(Source: Municipal 3Rs: 1998 Database, 3Rs Information Partnership)



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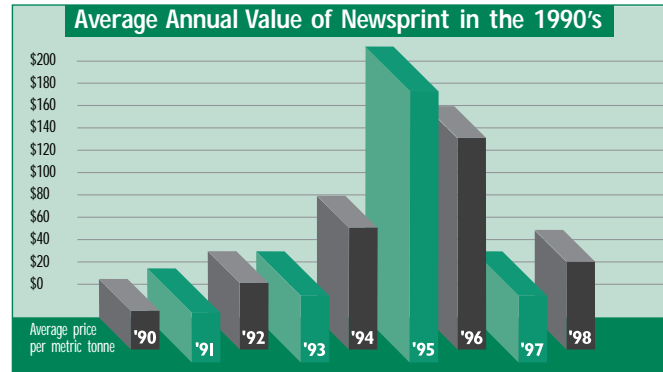
Why do we recycle newsprint?

- Energy saved by recycling a stack of newsprint 90 centimeters high: The equivalent of 14% of the average household electricity bill. (Source: Manitoba Product Stewardship Corporation, virtualrecycling.com/Student%20Files/Special/vrfact5-sp3.htm)
- Amount of landfill space that is taken up by one tonne of newsprint: 3 cubic metres. (Source: Manitoba Product Stewardship Corporation, www.virtualrecycling.com/St...%20Files/Fact%20Sheets/vrfact6.htm)

How much is old newsprint worth?

Since 1990, old newsprint has sold for as much as \$214 per metric tonne and for as little as \$5 per metric tonne on the spot market.

(Source: CSR Sheet, 1999)



For more information....

- Canadian Pulp and Paper Association
www.cppa.org
- Newsprint Publishers Assoc. of Ontario
home.inforamp.net/~biginc/enviroreport.html
- Recycling Council of Ontario
www.rco.on.ca

Telephone Directories and Magazines



Telephone directories and magazines are made from groundwood or softwood (the same kind of pulp as newsprint).

How are telephone directories and magazines made?

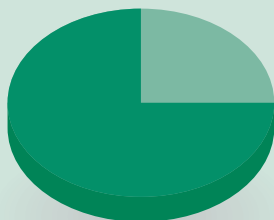
- Paper for telephone directories and magazines is made from woodchips and sawmill residues, a by-product of the forest product industry.
- Wood pulp and other fibres are ground mechanically.
- Fresh wood stock is supplemented with deinked old newspapers, magazines and telephone directories.

How are telephone directories and magazines recycled?

- Old telephone directories and magazines are re-pulped, cleaned and de-inked using detergents, dispersants and foaming agents.
- Re-pulped and de-inked old telephone directories and magazines are used in the production of newsprint to add strength to the fibre.

Fast Facts

- Recovery rate for old magazines: 10% (Source: CPPA)
- Number of pieces of direct mail delivered in Canada each year: 13 billion (between 1,000 and 2,000 pieces per home). (Source: RCO)
- Quantity of paper used to produce direct mail in Canada in 1989: Approximately 270,000 tonnes (Source: RCO)



In 1997, 73% of Ontario's population had access to old telephone directory and magazine recycling. (Source: Ontario Material Recovery System: Selected Programs, CSR, 1998)

How many magazines and old telephone directories do Ontario households recycle?

- Amount of old telephone directories that were sold for recycling by Ontario municipalities in 1998: 441 tonnes (Source: Municipal 3Rs in Ontario: 1998 Database, 3Rs Information Partnership)
- Amount of magazines that were sold for recycling by Ontario municipalities in 1998: 84 tonnes of old magazines and 53,391 tonnes of old newspapers and old magazines. (Source: Municipal 3Rs 1998 Database Fact Sheet, 3Rs Information Partnership)



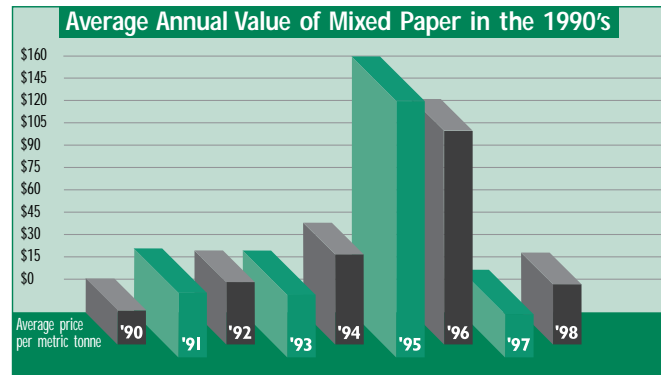
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How much are old telephone directories and magazines worth?

- When old telephone directories and magazines are collected in the blue box, they are not generally sorted from other paper. Thus, they are sold for recycling as mixed paper. Since 1990, mixed paper has sold for as much as \$159 per metric tonne and for as little as \$0 per metric tonne on the spot market. (Source: CSR Sheet, 1999)



For more information....

- Recycling Council of Ontario
www.rco.on.ca