



RECYCLING GUIDE FOR FILLERS MARKETING IN STEEL CANS

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1. Introduction

Steel cans are 100% recyclable. In addition, its magnetic properties allow it to be easily recovered from waste stream. According to the Australian Packaging Covenant, the recycling rate for steel cans was 34.2% in 2011¹.

In order to maximise the rate of steel recovery, product designers, manufacturers and recyclers should share the common understanding of the recycling and packaging processes. In addition, the co-operation between steel packaging and recycling industries is also a key to improve efficiency.

The aims of these guidelines are:

- To specify the recycling process for steel;
- To provide the steel packaging industry with a guide which outlines the requirements of the packaging design and the use of recycling logos; and,
- Ensure that changes in steel packaging are compatible with Australian recycling facilities and standards.

This document is a benchmark for steel manufacturers and packaging designers within the Australian recycling industry. ACOR welcomes any feedback on all specifications at any time to ensure it reflects the current industry practice. Individual buyers and sellers can use this as a workbook or a reference for trading and negotiation. It is not compulsory for buyers and sellers to comply with the standards. However, buyers and sellers are strongly encouraged to work together and reach an agreement regarding terms and conditions.

¹ The Australian Packaging Covenant, (2011).
http://www.packagingcovenant.org.au/data/Publications/STATEMENT_November_2011_-_2011_Recycling_Rate_FINAL.pdf

2. Benefits of these Guidelines

Companies benefit by adopting these guidelines in packaging manufacturing and recycling. These benefits include:

- Greater stakeholder confidence;
- Greater transparency within the industry regarding packaging design and recyclability;
- Stronger supply chain alignment between packaging manufacturers, fillers and the recycling industry to maximise recycling rates and sustainability objectives and;
- Higher standards of quality control.

3. How to use these Guidelines

These guidelines can be used as:

- An in- house working document which provides information for packaging designers, fillers and manufacturers to improve steel recyclability.
- A reference for brand owners to approve designs and uses of new steel cans.
- A benchmark for product designers, manufacturers and suppliers regarding steel cans that are produced and accepted within the recycling industry.

4. Glossary of Terms

- **Alloy (n.):** a substance that is composed by a mixture of metals;
(v.): to mix metals.
- **Ductility:** the ability of a solid material to deform under tensile stress
- **Flux:** a chemical cleaning or purifying agent, such as limestone and dolomite, which is used in extractive metallurgy or metal joining
- **Gauge:** a measuring unit that indicates the thickness of sheet metal.
- **Malleability:** the ability of a material to deform under compressive stress.

5. What is Steel

1. Components

Steel is an alloy made from a mixture of irons and other minerals.

| Ingredient | Description |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Iron ore | A rock that contains high content of iron oxides (FeO). |
| Coke | A solid carbonaceous material that is made from coal. |
| Flux | A term that describes minerals used to collect impurities during iron and steelmaking. |
| Molten iron | Essential component in the steelmaking process. It is made from iron ore and other ingredients in a blast furnace. |
| Scrap steel | Collected from different sources, such as old kerbside collections, households, building wastes and steel manufacturing industry. |
| Alloying materials | Usually used to give the steel special properties and make different types of steel. |

2. Properties

- Strong and high resistance to fracture
- High durability
- Excellent heat and electrical conductivity
- Shiny appearance
- High corrosion resistance
- High ductility and malleability

6. Steel for Packaging

The reasons of steel being successful in packaging are:

- 100% recyclable;
- Magnetic;
- High strength, formability and durability which allows steel to be used in packaging for a variety of products;
- Excellent barrier to protect and preserve its contents from oxygen, light and bacteria;
- Cost- effective and reliable material throughout the supply chain and provides exceptional resistance to severe transport and handling conditions;
- Continuous innovation improves the lightness and the durability of steel and;
- Essential component in primary steel manufacturing.

1. Steel packaging applications

- Paint cans
- Aerosol cans
- Other containers, such as chemicals additives, spices, lubricates, etc.

7. Steel Cans in Recycling Context

The benefits of steel can recycling include:

- Recyclable without any loss in quality
- 74% less energy consumption compared with primary steel manufacturing²
- Less greenhouse gas emissions compared with primary steel manufacturing
- Highly efficient as the recycling infrastructure in Australia is well- established
- Cost- effective as steel can be easily separated from other waste streams
- Reduced waste to landfill

In addition, recycled steel cans can be used in various applications, such as:

- Food containers,
- Personal care products,
- Household and industrial chemicals,
- Paint and solvents and;

² Environmental Protection Agency (2010). <http://www.epa.gov/osw/partnerships/wastewise/wrr/factpod.htm>

- Oils (automotive and edible)

8. Recovery and Recycling Process

The recycling process of post- consumer steel cans consists of six steps,

1. Collection,
2. Sorting and separation,
3. Crushing and baling,
4. Smelting,
5. Casting and rolling and;
6. End market

8.1. Collection

In Australia, a majority of the post- consumer steel cans are collected through the Kerbside Collection Program and drop- off facilities. Other sources of the post- consumer steel cans include:

- Direct collection from industrial users,
- Targeted collection programs for rural areas,
- Collections from steel-can makers and brand owner production facilities,
- Landfill separation for industrial applications and;
- Hazardous household collections

8.2. Sorting and separation

The collected cans are transported to a Material Recovery Facility (MRF) for sorting. At the MRF, steel cans are magnetically separated, then conveyed into a baler.

8.3. Crushed and baling

The sorted steel cans are crushed and baled. The bales are then transported to the steel manufacturer for reprocessing.

8.4. Smelting

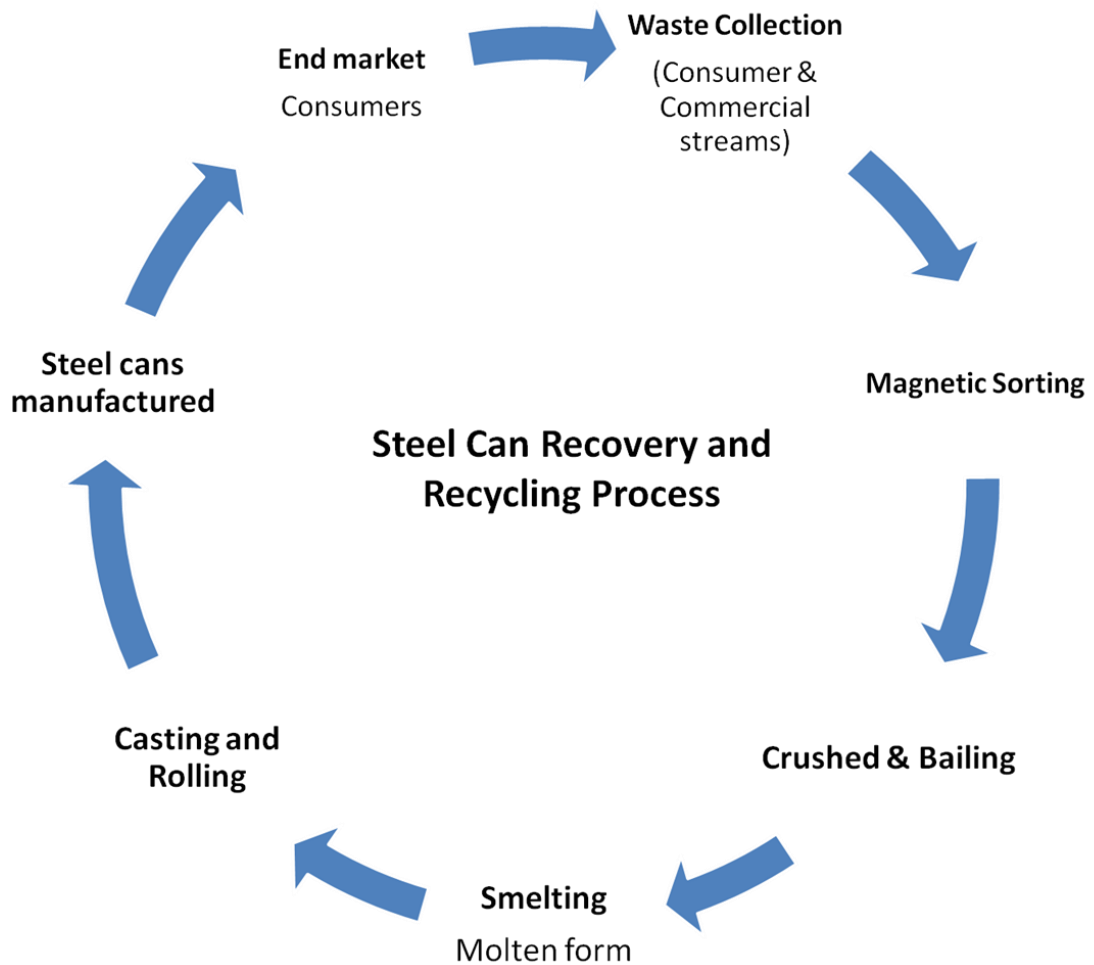
The bales are loaded into a high temperature furnace to produce molten steel for casting and rolling.

8.5. Casting and rolling

The molten steel is casted into ingots that vary in shapes, depending on the manufacturer’s needs. The ingots can either be directly used in production or rolled into sheets.

8.6. End market

Steel is sold in large coils to can- makers or packagers to be processed into food, aerosols and paint cans.



9. Guidance for Steel Can Packaging Design and Recovery

1. Recyclable Steel Logos

As steel cans are recyclable, it is suggested that packaging designers and manufacturers label all steel cans, including food, drink and aerosol cans for recycling.

Please refer to section 10 for more detail about the design for recyclable steel logos.

Further information for packaging design is available in the UK WRAP Packaging and Recyclability Guidelines:

<http://www.wrap.org.uk/sites/files/wrap/Packaging%20and%20Recyclability%20Nov%2009%20P%20RAG.pdf>.

10. Labelling Guide for Recyclable Steel Logos

The guidelines for the recyclable steel logos are listed below:

- The logo should be used as black or white, or white reversed out of solid colour.
- The logo should be used in a circle of solid white when it is used on a busy background (e.g. image and multi- coloured background).
- The logo should be black when it is used on a white background. If no black is available, it should be used as dark as possible.
- The logo size should be in the range between 9mm/ 11mm (minimum) and 18mm (maximum). However, 11mm is preferred except in cans 85g- 240g and 250ml paint cans where the preferred diameter is larger than the minimum diameter (see the details below).

1. Food and Pet Food Cans

Can size: 85g- 240g

| Can Size (g) | Can Dimension (mm) |
|--------------|--------------------|
| 85 | 67 x 38 |
| 105 | 75 x 37 |
| 120 | 52 x 72.5 |
| 215 | 73 x 61.5 |
| 240 | 65 x 76.5 |

Allowable range of diameter: 9mm- 18mm, 11mm preferred

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



9mm



11mm (preferred)



18mm

Recyclable steel logo in solid black

Application: white background



9mm



11mm (preferred)



18mm

2. Food and Pet food Cans, Aerosols

Can size: 400g- 850g

Can diameter:

| Can Size (g) | Can Dimension (mm) |
|--------------|--------------------|
| 400 | 72 x 110 |
| 450 | 83 x 90 |
| 810 | 99 x 118.5 |
| 850 | 83 x 177.5 |

Allowable range of diameter: 11mm- 18mm

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



11mm



18mm

Recyclable steel logo in solid black

Application: white background



11mm



18mm

3. A10 can used for fruit, vegetable and juices

Can size: 3000g/ 3L

Can dimension: 160mm x 185mm

Allowable range of diameter: 13mm- 24mm

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



13mm



24mm

Recyclable steel logo in solid black

Application: white background



13mm



24mm

4. Other Cans

Can size: 340g- 450g

Can diameter:

| Can Size (g) | Can Dimension (mm) |
|--------------|--------------------------------------------|
| 340 | 95 x 91 (square-shaped can used for ham) |
| 425 | 155 x 33 (dish- shaped can used for pies) |
| 450 | 145 x 47 (kidney- shaped can used for ham) |

Allowable range of diameter: 11mm- 18mm

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



11mm



18mm

Recyclable steel logo in solid black

Application: white background



11mm



18mm

5. Cooking oil

Can size: 4000g/ 4L

Can diameter: 163mm x 289mm

Allowable range of diameter: 13mm- 24mm

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



13mm



24mm

Recyclable steel logo in solid black

Application: white background



13mm



24mm

6. Small- sized Paint Cans

Can size: 250ml

Can diameter: 74mm x 79mm

Allowable range of diameter: 9mm- 18mm, 11mm preferred

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



9mm



11mm (preferred)



18mm

Recyclable steel logo in solid black

Application: white background



9mm



11mm (preferred)



18mm

7. Large- sized Paint Cans

Can size: 500ml- 20,000ml/ 20L

Can diameter:

| Can Size (g) | Can Dimension (mm) |
|--------------|--------------------|
| 500 | 89 x 104 |
| 1000 | 110 x 134 |
| 2000 | 180 x 192 |
| 6000 | 179 x 178 |
| 10, 000 | 227 x 290 |
| 15, 000 | 307 x 298 |
| 20, 000 | 307 x 387 |

Allowable range of diameter: 13mm- 24mm

Recyclable steel logo in solid white

Application: busy background, e.g. image and multi- coloured background



13mm

24mm

Recyclable steel logo in solid black

Application: white background



13mm



24mm