

PROMEG® & Corflute® Environmental Impact Report

Reduce – Reuse – Recycle.

Where do we fit?

Over the past decade there has been an increasing emphasis on recycling plastics - and rightly so. The growth in consumption of plastic, like all materials, creates waste. Recycling results in less waste going to landfill and should also result in less resource and energy use.

Polypropylene (PP) is one of the most commonly used plastics in the world. PP is easily recyclable and recycling saves most of the energy in manufacture. PROMEG® and Corflute® are made of PP, further demonstrating its versatility and applicability in various products. Unlike other recycled materials such as paper, PP can be recycled without “downcycling.” Thus, PP is considered highly useful in many industries because it can be heated, cooled, and reheated without causing significant degradation to its base composition¹. Corex Group has a purpose-built recycling facility Corex Recycling and recycles all its own waste and materials returned to us from customers. We also manufacture the **ecorange®** of sheet products, which is between 50-100% recycled PP sheet. It's commonly estimated that using 1 kg of recycled PP instead of 1 kg of virgin PP can lead to a reduction in carbon emissions of approximately 50-75%. This estimate considers the energy savings, reduced resource extraction, and waste diversion associated with recycling².

Another benefit of PROMEG® and Corflute® is that it is often substituted for other materials such as paperboard. Because they are so durable, PROMEG® and Corflute® items rarely need to be replaced. This results in lower whole-of-life costs both financially and environmentally. The strength and low weight of PROMEG® and Corflute® also means that there is a reduction in the amount of material used & transported, further reducing its environmental impact. Using a durable material also encourages re-use. This is perhaps the best way to decrease our environmental footprint. To focus on recycling is to concern ourselves only with what happens after consumption. If we can reduce consumption and our reliance on a “throwaway society” we instead focus on the other end of the Waste Reduction Pyramid, which is where we can have the greatest positive environmental impact: Reduce and Reuse.

Is PROMEG and Corflute a renewable resource?

All conventional plastics come from oil, gas or coal, which are fossil fuels and therefore finite resources. Whether or not we ascribe to the Peak Oil theory there have been

concerns over the rapid rise in demand for plastics, and the effect that this is having on reserves. Though it is not a renewable resource, only 4% of the world's fossil resources are used in plastics production³.

The origin of PROMEG® and Corflute® PP is propylene gas, which is a waste by-product of petroleum refining. If not converted into other compounds this gas would otherwise be flared off or burned, thus releasing CO₂ into the atmosphere⁴. Whilst there is a demand for petrol it may be argued that manufacturing PP itself is not depleting oil reserves. However, as an organisation we are cognisant of our responsibility to use finite resources wisely, as well as our responsibility to decrease our impact on the environment wherever possible.

Does its production use or pollute water?

The extrusion system for manufacturing PROMEG® and Corflute® relies on water for cooling through a closed-loop cooling tower system. It is worth noting that paper requires three times the amount of water and four times as much energy to produce compared to plastic (Paper is also heavier and bulkier, so more fuel and trucks are needed for transport)⁵. The majority of water use in manufacturing PROMEG® and Corflute®, as with many industrial processes, comes from the use of cooling towers. Corex Group was the first company to work with PACIA on third party auditing to optimise performance of our cooling tower. One way that we could decrease water evaporation would be to install a chiller system. Unfortunately, this system requires much more energy to run (thus contributing to greenhouse gas emissions) and we have determined that the environmental impact of this change would be negative.

What is the carbon footprint?

There is a public perception that plastics in general have a poor environmental profile. However, it is worth remembering that so-called “natural” products with an eco-friendly image, such as cotton or wool, actually have significant environmental impacts. According to PACIA⁶, plastics manufacturing uses 2.7% of the total energy consumed in Australia, but contributes only 1.4% of carbon emissions⁷. PROMEG® and Corflute® sheet is energy efficient to manufacture, requiring much less energy than other materials such as paper or glass⁸. Recycling plastic saves an average of 2.5 kg of CO₂ per kilogram of plastic produced. Therefore, unlike new plastic creation that emits around 6 kilograms of waste, recycled plastic only generates roughly 3.5 kg for incineration and production⁹. We have implemented sustainability projects over the past few years including plant improvements to reduce our energy use in

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manufacture, installing energy efficient lighting and minimising landfill through maximising recycling of waste.

Notably, raw materials used are sourced locally wherever possible. This minimises potentially significant emissions from transport. Provenance of materials is very important to the environmental cost equation when considering where the sheet is manufactured and where the inputs come from. Almost all the inputs to PROMEG® start from the cradle in Australia.

Does it contain dangerous chemicals?

The propylene gas used to make PROMEG® and Corflute® is a hydrocarbon (carbon + hydrogen), and the carbon from the raw material is largely retained in PROMEG® and Corflute® sheet. Thus, it may be argued that using PROMEG® and Corflute® products effectively sequesters, or stores, carbon from the environment.

There are no toxic additives used at any stage to make the sheet. Other forms of plastic, and even some other manufacturers of PP, can use heavy metals such as lead (for stabilisation), or cadmium in colouring agents, for example.

All raw materials used in PROMEG® Corflute® are the highest standard available. To ensure safety, the components used are actually food grade and comply with Australian Standard 2070-1999, "Plastic Materials for Food Contact Use."¹⁰ Unlike PVC, PROMEG® and Corflute® contains no halogenated compounds, chlorine (vinyl chlorine is a known carcinogen¹¹) or phthalates (endocrine disruptors, used primarily as softening agents).

Is it biodegradable?

PROMEG® and Corflute® is not biodegradable. Although theoretically all plastics will eventually degrade through photo-oxidation, in practice this would take hundreds of years. If PROMEG® Corflute® ends up in landfill it won't degrade, but neither will it have any negative effects on the environment. This is because there are no toxins in PROMEG® and Corflute® and also because it is inert.

The different components of PROMEG® and Corflute® could not leach out into soil or aquifers; but this is not the case for some other plastics and many other items of household waste.

Corex Group encourages recycling our products so that they don't take up valuable space in landfills. One important thing to consider about standard landfills is that they are anaerobic. This means that they are designed not to let in light and oxygen, which are needed for the decomposition process. So despite the fact that it is regarded as "biodegradable," in practice, paper doesn't easily biodegrade in landfill. Who hasn't unearthed a 50 or even 100 year old newspaper in the wall or under the floor that can still be read quite easily?

Another issue with decomposition in landfills is that as the organic matter breaks down it releases methane gas (CH₄) into the atmosphere. Methane is a greenhouse gas which has 21 times the global warming potential (GWP) of carbon dioxide. It has been estimated that nearly half of GHG emissions from paper are comprised of methane emissions from paper in landfills¹¹. So "biodegradability" is not necessarily an environmental positive. PROMEG® and Corflute® does not break down, but this also means that it is not contributing any additional greenhouse gases at the end of life phase.

For further information, please contact hello@corex.com.au



References

¹ Environmental impacts of polypropylene (PP) production and prospects of its recycling in the GCC region. Alsabri, Tahir, Sami, in "Materials Today: Proceedings" Volume 56, Part 4, 2022.

² Life Cycle Assessment of a Plastic Part Injected with Recycled Polypropylene: A Comparison with Alternative Virgin Materials In. J. Precis Eng. Manuf. Technol. 2021.

³ Oil Consumption, British Plastics Federation (BPF), 2019.

⁴ http://www.sustain-ed.org/PAGES/Waste/basell_detail.html

⁵ Paper or plastic? Which is better for the environment? <https://www.cleanaway.com.au/>, 2018.

⁶ Plastic and Chemical Industries Association

⁷ As cited in <http://www.kesab.asn.au/uploads/File/Fact%20Sheets%20-%20Plastics.htm>

⁸ Packaging Advice, Plastic vs Paper Packaging: The Pros and Cons, <https://www.swiftpak.co.uk>, 2023.

⁹ Carbon Footprint: Recycling Compared to Not Recycling, <https://8billiontrees.com>, 2023.

¹⁰ In the manufacture of plastics items for food contact use it is essential to use only raw materials that are formulated to specifications suitable for food use or that are known to be safe for contact with food." AS 2070-1999, Standards Australia, 1999

¹¹ <http://archive.greenpeace.org/toxics/pvcdatabase/bad.html>