

GUIDELINES

for product design that
comes from marine plastic litter



Glossary

Environmental pollution

Alteration or contamination of the balance of an ecosystem.

Pollutant

Any substance, of natural or anthropogenic origin, which is not part of the composition of the matrix of interest or is present in it in concentrations significantly higher than natural values, consequently exerting an effect deemed harmful to the environment and human health.

Hydrosphere

The sum of all terrestrial waters: oceans, seas, lakes, rivers, flowing waters and groundwater.

Plastic materials

High molecular weight organic materials, called polymers. They are made up of macromolecules, which determine the properties and characteristics of the materials themselves.

**Plastic pollution
in the hydrosphere**

An environmental crisis characterised by the dispersion and accumulation of plastics in rivers, lakes and oceans, with devastating effects on ecosystems and human health.

Marine litter

Any persistent anthropogenic solid material produced or processed, discarded, disposed of or abandoned in the marine and coastal environment. Objects that have been manufactured or used by people and deliberately discarded at sea, in rivers, or on beaches; carried indirectly to the sea by rivers, sewers, rainwater, or wind; or accidentally lost, including material lost at sea due to severe weather.

Ocean plastic

Plastic waste recovered from the ocean. In its broader usage, the term also refers to plastic recovered from or near rivers, seas, and coasts.

Current market

Certifications and standards

These are technical standards, third-party verifications or voluntary labels that certify the origin and **traceability** of recycled plastic throughout the entire production chain and verify compliance with ethical practices by the parties involved.



Recycling marine plastic litter

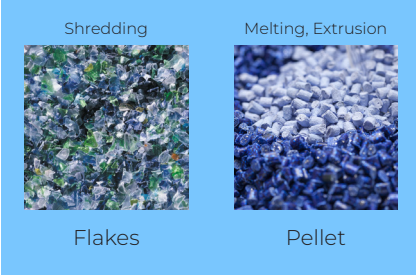
Mechanical recycling	Chemical recycling
Plastic to clean and sort	Mixed contaminated plastic
Low/medium energy	Medium/high energy
Production of new products	Production of new polymers

Sustainable material brands

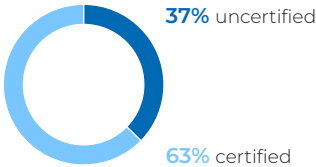
These are brands that produce materials regenerated from marine waste, whose environmental reputation serves as proof of **transparency** to the fight against plastic pollution for manufacturers of end products. They are also the main **suppliers**.



SRM from mechanical recycling

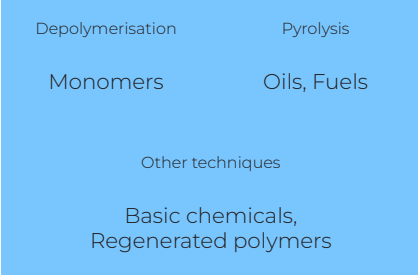


Case study analysis



Since secondary raw materials (SRM) obtained from marine plastic litter may have **non-uniform** characteristics, it is preferable to use homogeneous waste, such as fishing nets and gear, or ocean-bound plastic, which is usually less degraded than that recovered from the water.

SRM from chemical recycling



1. CHOICE OF MATERIAL

certifications
credibility
supply
consistency



01.

Prefer the use of certified plastic that complies with officially recognized standards.

02.

Select qualified suppliers of marine plastic litter with experience in the sector and high rates of waste collection and recovery.

03.

Prefer materials recovered near the production site to minimise the environmental impact associated with logistics.

04.

Prefer homogeneous categories of plastic waste.

Case studies

Sinful
Ohhcean
Denmark, 2022



01.

Chipolo
One Ocean Edition
Slovenia, 2020



02.



03.

Ecotribo
Devon&Cornwall
UK, 2021



04.

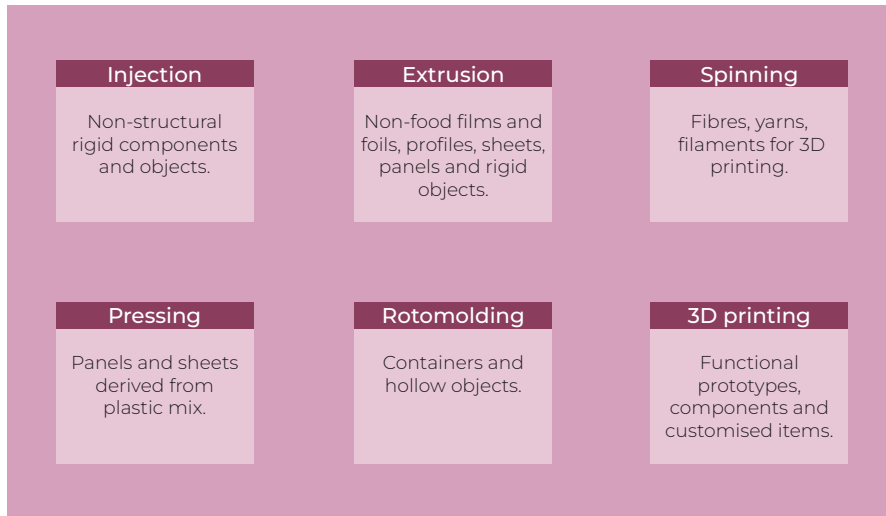
Sungai Design
Ombak Lounger
Indonesia, 2024

Current market

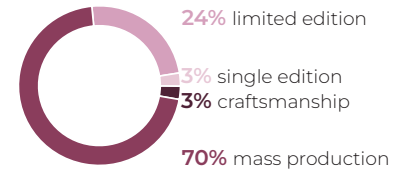
Most common industrial production techniques

Once the certified material has been obtained from suppliers, the production of marine plastic litter products uses equipment and processing techniques similar to those used for post-consumer plastics. However, unlike the latter, marine plastic is **heterogeneous** and has inferior properties. This is why it is important to know how to choose the best production technique.

The techniques that allow for a reduction in material waste and guarantee a good quality end product are:



Case study analysis



Small-scale production and limited editions serve to raise **awareness** and encourage **experimentation**, while serial processes and collaborations allow products to reach a wider audience and lower production costs.

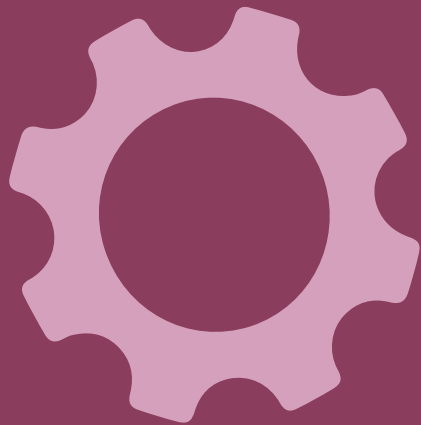
Waste reduction strategies

- Design for components
- Avoid undercuts
- Simplify shapes
- Optimise geometry and thicknesses
- Consider recycling and disassembly
- Prototype before production

Reducing **waste** means making the production process more economically and environmentally advantageous.

2. PRODUCTION CHOICES

compatibility
flexibility
collaboration



01.

Choose shapes and production techniques that tolerate the differences between plastic marine litter and virgin material and minimize plastic waste.

02.

Maximise positive environmental impact by adopting a supply chain in which every stage — from material recovery to processing, finished product manufacturing and end-of-life management — is handled within the company.

03.

Leverage strategic external partnerships to increase efficiency, competitiveness and product accessibility on the market.

Case studies

S-1500
Snøhetta x NCP
Norway, 2019

01.



Musselblomma
IKEA x Seaqual
Sweden, 2020

03.



01.

Seaflex
West Paw
USA, 2021

Muara Stool
Sungai Design
Indonesia, 2024

02.



01.

Second Nature
BlueCycle
Greece, 2020

Current market

Consumer perception

The perception of products made from marine plastic litter depends on the material's ability to communicate its origin through **imperfections**, **textures** and **unique colours**. These elements give the product a distinctive aesthetic value, but above all a narrative one.

However, consumers often view these products as inferior to those made from virgin plastic, due to preconceptions about recycled materials. It is therefore essential to find a **balance** between **familiarity** and **innovation**, enhancing the uniqueness of ocean plastic without compromising the product's durability and functionality.

Benefits

Environmental benefits
Early awareness
Recognisability

Risks

Lower quality
Reduced functionality
Limited appeal
Perceived safety
Contamination
Value for money

Behavioural intentions

Purchase intention
Willingness to pay a premium

Common applications

- Clothing and footwear
- Prescription glasses and sunglasses
- Bags and backpacks
- Covers and tech accessories
- Indoor and outdoor furniture
- Watches and jewellery

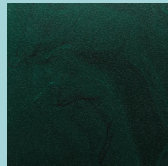
Restricted applications

- Food packaging
- Cosmetics and pharmaceuticals
- Medical and healthcare
- Structural applications

Most common colours



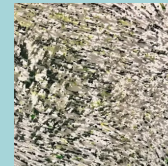
Most common textures



grainy



dotted



striated



veined

3. EXPRESSIVENESS OF THE MATERIAL

added value
recognisability
imperfection



01.

Proposing an aesthetic that enhances plastic marine litter for its unique characteristics, such as colour, texture and imperfections, transforming them into distinctive features.

02.

Give communicative relevance to the narrative value of the material, where possible.

03.

The product must not deviate from typical forms, so as not to cause confusion in consumers' perceptions.

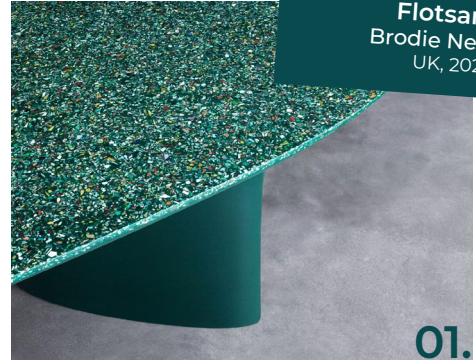
Case studies

Ocean Plastic Trainer
Adidas x Parley
USA, 2015



02.

Flotsam
Brodie Neill
UK, 2022



01.



01.

Oceanworks medal
SailGP
Australia, 2020



02.

WAKE
LifeProof
USA, 2020



03.

Ocean Plastic Knob
Spark&Burnish
Australia, 2018

Current market

Terminological ambiguity

A large proportion of the case study names include the word **Ocean**, used in the plural, as an adjective, in puns (*Ohhcean*) or in combinations of terms such as *Save the Ocean*, *Handy Fresh Ocean*, *Liberty Ocean* e *For Ocean*.

Other recurring terms are **Sea**, **Plastic**, **Waves** e **Coast**.

Greenwashing

Communication or marketing strategy whereby organisations, companies and institutions present their activities or products in a way that gives a **false impression** of their environmental impact or benefits, thereby misleading consumers.

How to communicate transparently?

1. Clearly specify the **origin** of the plastic, avoiding generic terms such as “ocean plastic” and misleading images or slogans;
2. Indicate the actual **percentage** of marine plastic litter contained in the product;
3. Refer to recognised environmental **certifications** that attest to the traceability of the recovery and recycling process;
4. Describe the plastic transformation **process**, highlighting its technical limitations and the challenges faced;
5. Show the environmental **impacts** and real benefits achieved.

Esempio di comunicazione trasparente

The Muara stool, produced by Sungai Design, is made from plastic collected from Indonesian rivers using barriers installed by Sungai Watch. Each stool uses the equivalent of around 500 plastic bags, which are recovered, washed, shredded and moulded into panels using CNC machining.

from Sungai Design

4. PRODUCT COMMUNICATION

transparency
trust
connection



01.

Offering consumers the opportunity to access additional information about the material the product is made of, through communication elements such as labels, engravings or QR codes, directly integrated into the product itself.

02.

Avoid stereotypical communication about the product and material (introducing, if necessary, a common glossary to avoid terminological ambiguity).

03.

Provide a comprehensive overview of the product supply chain, from recovery to processing to end of life, specifying origin, recovery methods, percentages of marine plastic litter and impacts generated.

Case studies

01.



Sea Chair
Studio Swine
UK, 2011

Sunglasses
The Ocean Cleanup
Netherlands, 2019



Zennor
Waterhaul
Italy, 2021

01.

Sungai Design
Kotak tissue box
Indonesia, 2024



03.



Kotak tissue box
Sungai Design
Indonesia, 2024

project created by
Chiara Sampò

inside the



**Politecnico
di Torino**

website

