PARAGON NORDIC

MATERIAL AND PACKAGING GUIDE PLASTICS

HOW DO YOU SAVE THE WORLD?

Are you a consumer, a brand owner or maybe a designer? Or maybe a fire manager? Packaging is something we encounter every day, whether professionally or as private individuals. Packaging has great environmental impact and today we are in the midst of an environmental crisis where every decision needs to be imbued with sustainability. In other words, we have the opportunity to be part of the solution both in everyday life and in our professional life.

We hope that this material will give you greater understanding of how you can contribute to a better environment in your choices!

ABOUT PARAGON NORDIC

To renew products and realise product ideas which improve people's lives and create a more sustainable world... that is our vision.

Paragon Nordic develops and produces consumer products for our customers' brands. We are a contract development and manufacturing partner who develop, produce and realize product concepts within personal care & styling, industry, car care, household, pharmaceuticals and food. With more than 60 years of experience, we develop and produce hundreds of thousands of high quality products every day that strengthen our customers' brands and give added value to consumers.

Customers and consumers place high demands on us and our products, something that challenges us to surpass ourselves every day. Together with our customers we develop products that give value and a positive experience for the end consumer. Sustainability and quality are important keywords in terms of how we produce and develop our products, as well as how they are used by end consumers. This gives us the opportunity to, together with our customers and suppliers, contribute to a more sustainable world.

Paragon Nordic

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PLASTICS

Plastic is a material we use more and more in the world. It is a smooth, inexpensive and practical material used for a variety of goods - but it is mostly made of fossil oil, often contains toxins and is not broken down in nature. If you have a product in plastic packaging, your choice of plastic type is therefore important!

On the following pages, we will tell you more about different types of plastics, recycling and helping you in your choice!

HDPE & LDPE

Polyethylene is created by polymerisation of ethylene. The monomer does not meet the Swedsih Environmental Protection Agencies selection criteria for hazardous chemicals.

PE is a versatile plastic material, transparent to semi-transparent, and it can be processed both for soft and hard products. Depending on the density of the material, PE is divided into different groups; LDPE or HDPE. LDPE / PE-LD is low density PE and is used in, for example, plastic films. HDPE or PE-HD (high-density PE) is used, for example, in storage containers for food and chemicals. PE is the plastic that globally has the largest annual volumes.

PLA

PLA is a polyester made from lactic acid. Like many other thermoplastics, it can be formed into both film and fibres. It is biodegradable. PLA is used primarily for food packaging, plastic bags, disposable plastic glass and plastic film for agricultural purposes.

PLA plastics is a non-hazardous plastic that is also biodegradable. However, some studies have shown that products made of PLA release plastic chemicals when in contact with food.

PET

Polyethylene terephthalate (PET) is one of the most widely used plastics and is present in products such as jars and plastic bottles. The characteristics of PET is that it hardly weighs anything and that it is impact resistant. PET is also used in textiles and packaging.

PET materials may contain colour pigments.

PP

Polypropylene is a thermoplastic used in products such as food containers, packaging, toys, furniture and textiles. Polypropylene is characterised by being durable, transparent and resistant to chemical stress.

Polypropylene can sometimes contain dyes, antioxidants and, in some cases, flame retardants.

PS

Polystyrene is a common and cheap thermoplastic of styrene that occurs in many different types of plastic products. The styrene monomer is suspected of being endocrine disruptive.

Areas of use include covers for household appliances, food packaging, laboratory plastics, for example petri dishes, as well as building and construction materials. Polystyrene plastic is available in a quality called expandable polystyrene (EPS; informally known as styrofoam). **Polystyrene plastic is one of the five most important plastic types in terms of production volume in Europe.**

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RECYCLING

A piece of plastic packaging only disappears if burnt. Since the majority of all packaging is not burnt or recycled, there is today plastic waste in both the sea and nature. For example, a PET bottle takes 450-1 000 years to break down in nature and a plastic bag takes 50-100 years. Studies show that if we continue as we are today, there will be more plastic than fish in the sea in 2050.

Recycling is one of the keys to a future with circular economy. However, recycling also has its limitations. Plastic can only be recycled 2-3 times because plastic breaks down a little during each recycling cycle. After that it loses strength, stability and quality. As we have shown earlier, there are many different types of plastics used in the packaging industry and in order to recover the material, these plastic types must be separated from each other. The recycling system can handle small amounts of mixed plastics, but large quantities can cause problems.

As consumers we can recycle but as brands, producers and developers we also have a responsibility to make it easier for consumers to recycle. We can do so by ensuring that the packaging we choose for our product is recyclable and by minimising size and packaging material.

RECYCLING - HOW DOES IT WORK?

STEP ONE - SORTING & RECYCLING

1. ROUGH SEPARATION

The plastic is unloaded on a hard surface. Large and mis-sorted items are removed with a grab.

2. SORTING WITH AIR, NIR, DENSITY & MANUALLY

Smaller plastic objects are sorted using air, NIR (Near Infra Red) technology, density differences and manual sorting. Soft plastic is removed from the hard plastic by air and the hard plastic is further sorted in NIR. The plastic is spread on a conveyor belt that passes an NIR detector. If the detector identifies the plastic as one of the selected plastics, the object is blown off from the belt. If the NIR detector cannot identify the plastic, the object remains on the conveyor belt.

3. CRUSHING, WASHING MILLING

The sorted plastic is crushed, washed and grounded. The washing takes place in the form of a density bath where polyolefins (PP and PE) that float are removed from other types of plastic (PVC, PET and PS) that sink.

4. PACKAGE & DELIVERY

The grounded plastic is packed and delivered to the customer/packaging manufacturer.

NEW PACKAGING AND MATERIALS

Plastic packaging represents the largest portion of virgin plastic that we use today. Only in the past year, more packaging choices and packaging suppliers that work with recycled plastic packaging has emerged. The packaging offered ranges from material where a proportion is made of recycled raw material to packaging made of 100% recycled plastic. There is also plastic marketed as Ocean waste plastics, i.e. plastic collected from the sea, as well as social plastic, i.e. plastic collected by people in countries with high poverty who are paid for this work.
The market for recycled plastic is continuously developing. Talk to us, your supplier or producer about the options available on the market that are best suited for your product.

HELP THE CONSUMER

SORT RIGHT

One simple thing to do to contribute to a better environment is to label your packaging with the recycling symbol and tell the consumer how the packaging should be sorted. For example, a HDPE bottle with PP lid: "*Remove the cap from the bottle and recycle both as plastic packaging*".

HOW MUCH IS RECYCLED?

SVEDEN

In Sweden, FTI (Förpacknings- och Tidningsinsamlingen) is responsible for collecting recycled household waste. The packaging can be sorted at recycling stations in different places in your municipality and in some municipalities there are property-related pick-ups. On FTI:s homepage you can see the addresses of the recycling stations.

In 2017, 44% of all collected plastic went to material recycling.

NORWAY

In Norway, Green Point Norway is responsible for the collection of plastic waste. Collection of plastic is available to 95% of Norway's population. It is the municipalities that offer collection.

In 2016, 97 957 tons of plastic packaging were put on the Norwegian market for consumers. 25% was recycled and 73.7% was used for energy.

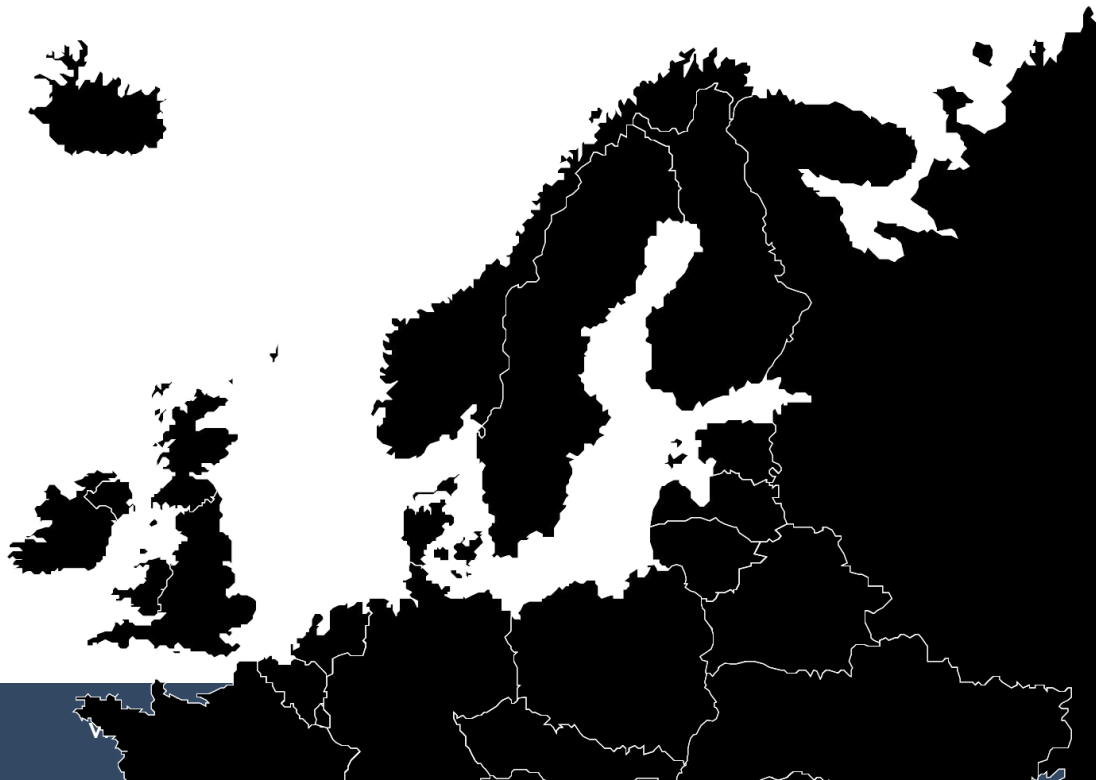
DENMARK

Denmark burns a lot of its waste for energy regeneration.Producer responsibility had not yet been introduced for plastic packaging in late 2018 but will as a result of an EU directive now be implemented. 34% of the plastic waste in Denmark in 2015 was recovered. Plastic in households is sorted in special containers that are collected by waste companies or at designated locations.

FINLAND

In Finland, producer responsibility for packaging was introduced in January 2016. Finlands Returplast is responsible for the collection. Finnish Packaging Recycling Rinki largely manages the collection while the recycling itself is done by Ekokem in Riihimäki. The plastic is collected at recycling points. Bring your waste and sort as instructed.

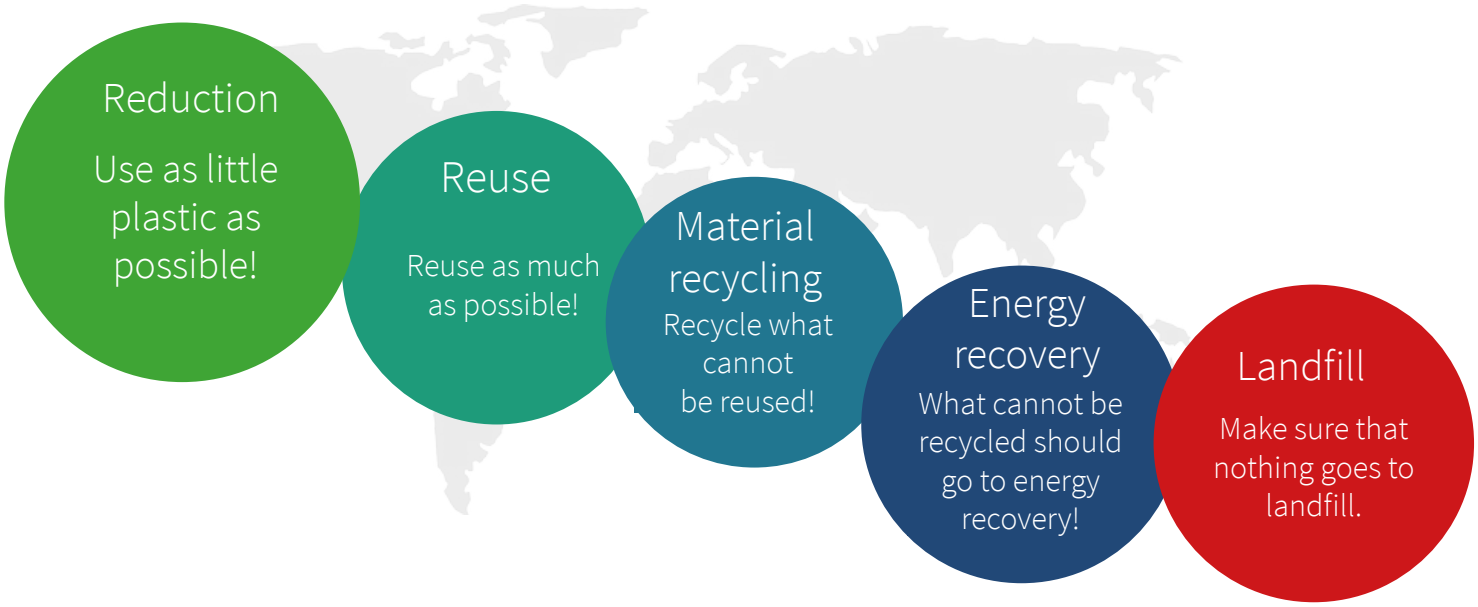
In 2017, 27.5 percent of all plastic packaging and plastic bottles were recycled in Finland.



HOW CAN YOU MAKE A DIFFER-

No one can do everything but everyone can do something. This also applies to packaging choices. When choosing packaging for a product, there is a decision hierarchy to keep in mind in order to make as good and sustainable a decision as possible.

- The best thing from an environmental perspective is, of course, to minimise the use of plastics, i.e. to use as little material as possible in your products.
- If possible, try designing the packaging so that it can be reused, e.g. as a refill.
- Choose materials that can be recycled and clearly state on the packaging what the consumer should do to recycle the product.



INCREASE THE RECYCLING CAPACITY OF PACKAGING - BE TRUE TO YOUR PLASTICS

We cannot stand next to the consumer and help them do that. What we can do, however, is influence them by smart design. The choice of materials, colours and additives influences how sought-after the recycled material will be and whether it is possible to sort and recycle the plastic.

In order for the entire packaging to be recycled in a good way, and to avoid contamination, the entire packaging should be made of the same type of plastic. An HDPE bottle should therefore have a cork of HDPE etc.

THE GOLDEN RULE ABOUT PLASTICS: USE THE SAME MATERIAL THROUGHOUT THE PACKAGING

HDPE BOTTLE + HDPE LID + HDPE LABEL
= EASIER RECYCLING

HDPE BOTTLE + PP-LID + PAPER LABEL
= HARDER TO RECYCLE

CHOOSE RIGHT FROM THE

	MATERIAL	ADHESIVE	PRINT	DYE	ADDITIVES	LABEL
BEST	• HDPE • LDPE • PP	• With-out ad-hesive	• Laser	• Un-dyed	Density under 1g/ cm^3 for PE and PP No barrier-material	The same material as the packaging
WORSE	• Un-dyed PET • PP film	• Water soluble <60 °C	• Ink that does not bleed in water	• Bright colours	<2% EVOH As few layers as possible	Press directly on the package
NOT GOOD	• Dyed PET	• Water soluble 60-80 °C		• Dark colours	<1% PET or PA <10% EVOH	Paper label Water soluble adhesive Cover more than 60% of the pack-aging surface if the label is not the same material as the packaging
WORST	• Other (PS, EPS, PLA)	• Not water -soluble	• Ink that bleeds in wa-ter	• Black • Pig-ment carbon black	• Metal • Alumini-um • PVC or PVdC • >1& PET or PA • <10% EVOH	Label in mate-rial other than the packaging

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