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# Plastic

## A short history lesson on PLASTIC

The first natural plastic was invented by Leonardo da Vinci during the renaissance period. The plastic da Vinci created was made from animal or vegetable glues, sometimes adding organic fibers. He would use the mixture to coat the leaves of cabbage; letter and paper, when the substance dried da Vinci had what today would be described as a plastic like substance.

Alexander Parkes unveiled the first man made plastic at the 1862 Great International Exhibition in London. This material nicknamed "Parkesine" was an organic cellulose material that once heated could be molded and retains the shape when it was cooled. The phenomenon of "Parkesine" soon died down when the realization of how high the production cost of raw materials would be.

What could possibly be considered one of the greatest inventions of the 20th century happened in 1907 while Leo Baekeland was trying to find a better insulator for electrical energy the Shellac which was becoming more expensive and the demand grew and the supply shrunk. The result came after years of hard work with the invention of "Bakelite." With use of another of his inventions the "bakelizer" a heavy iron vessel that was part pressure cooker and part basement boiler, this allowed him to control heat and pressure precisely so as to control the reaction of the chemicals. Once hardened the resin would keep the shape of the mold, as well the material would not burn, boil. Melt or dissolve in any common acid or solvent.

The invention of "Bakelite" led the way for other additions to the world of plastics including

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## **SKS Services**

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**Bottle Molds**

Rayon, Cellophane, Nylon, PVC, Saran, Teflon, Polyethylene, and Velcro.

### **A Short Chemistry Lesson**

The idea of plastic came from naturally accruing substances known as polymer. Polymers can be found existing in nature in the form of tar, shellac, tortoise shells, horns, tree saps such as amber and latex.

Though what is a polymer? A substance made of many repeating chemical units or molecules. A simpler way to think of polymers is as a paper clip chain. The paper clips are all made out of the same things, as they are linked together it illustrates the concept of polymers chemical unit repeating themselves. Depending on the substances used depends on the polymer created. Most polymers contain carbon and hydrogen, though they can also have oxygen, chlorine, fluorine, nitrogen, silicon, phosphorous and sulfur. PVC contains chlorine, Nylon contains nitrogen, Teflon contains fluorine, and as well Polyester and polycarbonates contain oxygen.

Polymers each have distinct traits but most polymers tend to have the same characteristic. Polymers tend to be resistant to chemicals, can be thermal and electrical insulators, for the most part light weight with varying degrees of strength, as well they are able to be made into a heavy walled jar, or a thin fiber.

### **A World of Plastic**

Plastics have evolved immensely as throughout the course of the century. Plastic are found pretty much everywhere in today's world. From the grocery store to automobiles, modern medicine to home construction. The great thing about plastic is many of them can be recycled and reused to make great new products. Plastic are a renewable source if taken care of properly.

Recycling plastic is easy to do many plastic containers will have a recycling code found on

the product. The codes are three arrows in the shape of a triangle with a number in the middle. Each of the numbers corresponds to a specific plastic. For more information regarding plastic recycling code see our recycle codes page.

**A plastic bottle is a plastic bottle, or is it?  
What you should be considering when  
selecting plastic for your products packaging.**

There are many things you should consider when selecting what type of plastic container you will use. The factors range from color, shape and size to the ability of the plastic to resist damage from extreme heat, extreme cold, or chemical breakdown.

Things to think about when selecting a container:

- Permeation/Barrier
  - Does the container resist content from escaping, or allowing anything into the bottle that may harm the contents?
- Sorption Characteristics
  - The action of soaking up or attracting substances
- Chemical Resistance
  - Are the contents of the bottle going to break down the plastic?
- Stress Crack Resistance
  - How likely is the bottle going to break?
- Rigidity/ Flexibility
  - Should the packaging be stiff or bendable
- Impact Resistance
  - The likelihood the package will break
- Sterilize
  - Can the packaging withstand sterilization process?
- Recyclable
  - Can the package be recycled?
- Temperature Resistance
  - Is the packaging going to breakdown if exposed to extreme heat or extreme cold?

Decided which factors are the most important to you and your product? Some of these factors may not apply to you at all, or there maybe other things you want to consider beyond these listed. Each product is unique, so testing the product in the packaging is the only way to truly know if it is the best packaging choice for your product.