

# [Polyethylene different types of containers. films-glad wrap and](https://assignbuster.com/polyethylene-different-types-of-containers-films-glad-wrap-and/)

Polyethylene also known as polyethylene or polythene, was the first of thepolymers to be discovered.

Polyethene is a polymer produced by reacting oxygenand ethene, in this reaction the small ethene molecules attach together to formlong chain polymer molecules. This process is known as addition polymerisation. Polyethene in our world today has many uses, some of these are: mouldings-plasticbottles, lids and caps, different types of containers. films-glad wrap andvarious plastic bags. cable coverings-various pipes and insulating wire andcables As you can see polyethene has a huge variety of both domestic andindustrial uses, this is fairly impressive when you see that polyethene has onlybeen around sense 1933. Polyethene is a thermoplastic material which is oftendescribed as wax-like it is extremely tough and is has an excellent chemicalresistance. It is also less dense than water and is the simplest polymer, theseattributes lead to polythene being an extremely useful substance.

Ethene (C2H4), is a simple hydrocarbon molecule which consists of 2 carbon atoms and 4 hydrogenatoms. Ethene’s main use is in the production of polythene yet it is one of themost widely used petrochemicals in the world. Ethene is an unsaturatedcolourless gas which can be ignited in the presence of oxygen. Below is adiagram of ethene: Polyethene is produced by allowing the free roaming ethenegas molecules to bond together to form long chain polyethene molecules.

In orderfor this to work a catalyst must be used, a catalyst is a substance that canalter the rate of a chemical reaction without undergoing any chemical changeitself. During this process thousands of ethene molecules bond to from eachmolecule of polyethene. Polyethene is simply a set of ethene molecules bondedtogether to form a chain, these chains can often stretch up to many many timeslonger than the original ethene molecule. Below is a diagram of polyethene: Although normally ethene monomers have little attraction for one another, yetthe polyethene molecules have a strong attraction for one another. Whenpolyethene molecules are attracted and bond high-density polyethene is formed, thus polyethene is either formed by low-density or high-density polymerisation. Ethene can undergo the process called polymerisation due to the fact that it isunsaturated and because it has a double bond between its two carbon atoms. BothHigh-density and low-density polyethene have different uses.

Low-densitypolyethene is used in the production of products such as various bags, plasticbottles, cling wraps, and insulating cables. Low pressure polymerisation withthe use of certain catalysts; has meant that the process of polymerization canbe achieved at fairly low pressure (20 atmospheres or 2000 kPa) and attemperatures of approximately 100C. The reactor itself contains a polyethenebed placed on a perforated plate. It works by allowing the recycled gas to enternear its base, the gas then passes through the plate and pushes up through thebed causing it to bubble. Finally the catalyst converts the ethene to polyethene, once the polyethene is cooled it forms a fine powder called ‘ fluff’ which isthen collected and transported to a storage bin.

Any ethene gas which has notreacted passes through a compressor and then a cooler, and is processed again. High-density polyethene is used to produce items such as lids, caps, baskets, bowls and large containers such as garbage bins. These polyethene products arecreated in what is know as high-pressure polymerisation, this is a process thatwas originally used before low-pressure polymerisation was discovered and thusit is a fairly simple process. Firstly Ethene gas is compressed and liquefied, from here it is pumped into a large reactor at a pressure of up to 2660atmospheres(266 Mpa). Amongst this oxygen and peroxides are pumped in toinitiate the polymerisation reaction.

This process generates a huge amount ofheat so the most complex part of the system is the cooling facilities. The manyproducts of polyethene which are most commonly used are generally manufacturedusing any of these five different techniques Extrusion – film, this technique isused for the production of items such as plastic bags such as garbage bags andglad wrap. These are the most common applications, while there are many othersthese are the best examples of this technique. This final product is achieved byblowing air into a tube of molten plastic this allows for extremely fine layersof the plastic to form. Blow moulding, this is used to make plastic bottles andsome motor oils.

This technique is much like the previous one but rather