FACT SHEET: WHAT IS PVC?

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PVC is one of the most widely used plastic materials in the world. The first products of PVC were produced in in the 1930s and several of the products that were developed back then are still being in use, such as PVC pipes and PVC cables. More recent areas for PVC are for example in wind turbines. The plastic PVC consists of the actual PVC molecule combined with a small amount of additives that gives the plastic special characteristics, such as flexibility or durable at higher temperature.

WHERE PVC IS USED

PVC is very useful for the society in a number of areas, for example the construction sector, healthcare, transport and electronics. PVC has unique properties that make the material useful in a wide variety of applications, ranging from extremely flexible products such as hoses and blood bags in the health care sector to rigid products such as water and sewage pipes.

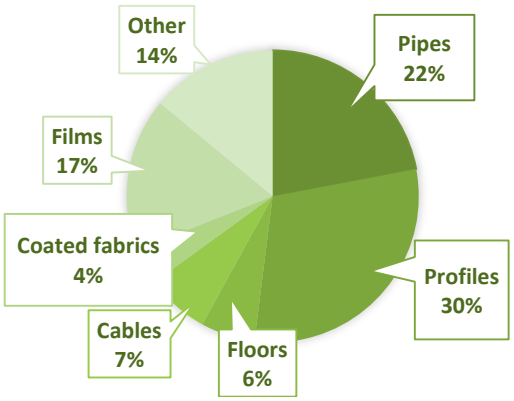

Diagram showing the manufacturing of PVC products in the EU (data from 2014)

PVC ensures products a long service life. Around 80% of the PVC products are used in the construction sector where the products require a long service life. The global demand for PVC is increasing by around five per cent per year.

MANUFACTURING

PVC is made from chlorine (57%) and ethylene (43%). Ethylene can be made from renewable raw materials or from fossil natural gas and oil, and chlorine is produced from sodium chloride. Chlorine combined with ethylene make the vinyl chloride monomer (the building block of the PVC polymer). The vinyl chloride monomer is then coupled together during polymerization to long chains, which constitute the finished PVC polymer.

PVC is a climate-smart plastic. It's the plastic that has the lowest emissions of carbon dioxide during the manufacturing process, according to the European plastic industry statistics. PVC is also the plastic that consumes the least energy.

For PVC, emissions of carbon dioxide will decrease further as the use of bio-based raw materials increases and the use of fossil based energy decreases. During their life time plastics also reduce emissions of carbon dioxide more than what was released during manufacturing.

The energy consumption for PVC will also decrease ahead. When more European manufacturers will use the most modern manufacturing process, the average value will be even lower.

Read more at http://www.ikem.se/vi-arbetarmed_1/plastfragor/pvc/om-pvc/hur-tillverkas-pvc

ADDITIVES

Through the use of additives, the PVC products can be customized for special requirements. This leads to more efficient products and more efficient use of resources.

Additives are used to modify properties in all plastic raw materials. For example to give the plastic different colors, ability to sustain weather and wind better and to be easier to manufacture. The most common additives in plastics are stabilizers, lubricants, antioxidants, fillers, pigments and flame retardants.

Stabilizers, antioxidants and lubricants are always added to PVC. The stabilizers and the antioxidants prevent degradation during processing and use. The lubricant facilitates processing. In addition, plasticizers, fillers and pigments may be mixed in when needed. PVC has in general very good fire properties and therefore do not need any additives of flame retardants. However, in some applications of flexible PVC that have special fire requirements flame retardants could be needed.

Some of the stabilizers and plasticizers have been discussed from an environmental point of view. Read more at http://www.ikem.se/vi-arbetarmed_1/plastfragor/pvc/om-pvc/tillsatser

ENVIRONMENTAL COMMITMENTS

The European PVC industry decided early on to make a joint effort in order to make PVC a part of the sustainable society. The first volunteer commitment, Vinyl 2010, was presented in 2000 for the period 2000-2010. Strengthened by success with Vinyl 2010, the industry continued with a new and even more ambitious commitment, VinylPlus.

VinylPlus have even more challenging sub-goals for sustainability than Vinyl 2010. The industry is now focusing on innovation and adds even greater emphasis on the dialogue with involved co-workers to ensure that the efforts made by the industry also translates into concrete and far-reaching benefits for society as a whole.

VinylPlus contains 30 measurable and concrete goals that are focusing on five challenges, which are based on The Natural Step's system conditions for sustainable development.

RECYCLING

PVC is recyclable, and the industry has as a goal that all PVC should be recycled. That PVC can be recycled is shown by the fact that recycling in Europe is increasing significantly.

PVC can be recycled to new products or to energy. The material can be melted several times without deteriorating the properties. PVC can also be mixed with other materials and still provide very good products.

That PVC is well suited for material recycling is shown by the rapidly increasing volumes in Europe. Thanks to the PVC industry's voluntary commitments, Vinyl 2010 and VinylPlus, the material recycling now amounts to 480,000 tons per year, to be compared with the 20,000 tons which was recycled in 2003. The industry's aim is that recycling should have increased to 800,000 tons in the year of 2020, by the latest. Read more about the recycling of PVC products: http://www.ikem.se/vi-arbetarmed_1/plastfragor/pvc/hallbarutveckling/atervinning

FIRE PROPERTIES

PVC produces smoke and toxic gases when burning, like all other natural and synthetic materials. By using special additives, the smoke and hydrochloric acid emissions can be significantly reduced. Independent investigations have shown that PVC does not produce more toxic gases than other common building materials. Unlike other commodity plastics within the construction industry, rigid PVC increases the fire protection compared to wood materials. The reason is the high content of chlorine that makes PVC the most fire resistant of all commodity plastics.

In an evaluation of a material's fire properties, it is necessary to take into account a number of different factors such as: flammability, combustibility, emitted heat output, flame spread and smoke generation.