

## **BPA, Polycarbonate Plastic and Its Consumer Items**

What exactly is BPA? Why should I care about BPA? Why is BPA under such scrutiny? Everywhere you look these days, you will see articles related to the dangers of BPA. Indeed it seems that major news outlets and blogging sites run stories daily describing study after study exposing the dangers of this chemical on the human body.

*But what exactly is BPA?*

In the previous article, we explained to you the different categories of plastics, different types of them and their specific consumer applications. This article will further elaborate on a particular plastic, the Polycarbonate plastic and its basic building block, BPA.

### **Bisphenol A**

BPA, short for Bisphenol A, is a synthetic compound made out of Carbon derivatives. The scientific formula for BPA is  $(\text{CH}_3)_2\text{C}(\text{C}_6\text{H}_4\text{OH})_2$ . Soluble in only organic solvents and not water, BPA is a transparent solid. In simple terms, this compound is used to manufacture certain plastics (including Polycarbonate Plastic), Epoxy Resin (to coat inside of food and beverage cans) and thermal paper (used in sales receipts).<sup>1</sup>

The process of manufacturing plastic is complex. Different derivatives of carbon are used to determine the characteristic and properties of the desired plastic. The plastics manufactured with this process can be as hard as siding on your house or as soft as shrink-wrap. BPA based plastic is hard in texture and transparent in color.

### **Polycarbonate Plastic**

One of the most popular plastics made out of BPA, as mentioned earlier, is Polycarbonate plastic (PC). Do you know what PC is? It is the hard clear plastic drinking glasses you use at your picnics. It is the clear hard plastic disposable tableware we buy at the supermarket. It was

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<sup>1</sup> Bisphenol A. [http://en.wikipedia.org/wiki/Bisphenol\\_A#Identification\\_in\\_plastics](http://en.wikipedia.org/wiki/Bisphenol_A#Identification_in_plastics). Accessed 24 October 2013

previously used, but now the FDA has banned its use, in baby bottles and baby formula packaging.

PC is literally used in many consumer products – indeed it is very common and prevalent. It was first discovered in the 1950's and it soon gained the position of an inexpensive and durable glass substitute.

PC is manufactured by a chemical reaction between two ingredients, of which one of them is BPA. Polycarbonate plastic is transparent to light, usable over a wide range of temperature, rates high on impact resistance and low on scratch resistance. Although, the texture of this particular plastic is hard at room temperature, it can be molded at certain temperatures into different shapes without breaking or cracking. This property of polycarbonate plastic makes it a very valuable component of many products. The key thing to know is that PC plastics are marked with code 7 on the resin identification list for recognition.

## **Polycarbonate Consumer Items**

Research states that more than 6 billion pounds of BPA are produced and used each year for the production of polycarbonate plastic.<sup>2</sup> This just goes to show how important is polycarbonate plastic in the manufacture of numerous consumer items. Following are a few categories of consumer items, for which polycarbonate plastic is used<sup>34</sup>:

- Drinking bottles and sports water bottles – not baby bottles though
- Plastic Glasses, commonly used in bars to serve alcohol
- Food containers
- Sunglass/eyeglass lenses
- Safety goggles and visors
- Tea light candle containers

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<sup>2</sup> Betty Kovacs, MS, RD. Plastic Types, Danger of Bisphenol A (BPA) and Recycling Plastics. MedicineNet.com. <http://www.medicinenet.com/plastic/article.htm>. Accessed 24 October 2013.

<sup>3</sup> Polycarbonate. <http://en.wikipedia.org/wiki/Polycarbonate>. Accessed 24 October 2013

<sup>4</sup> Bisphenol A. Local Hazardous Waste Management Program. <http://www.lhwmp.org/home/chemtoxpesticides/bisphenola.aspx>. Accessed 24 October 2013.

- Lightweight luggage
- CDs and DVDs
- Blender jars

This is only the list of the more popular consumer items that use Polycarbonate plastic. Other manufacturing and industrial uses include automotive bulletproof screens (Lexan or plexiglass), electronic devices, construction materials, prototyping phones and lining water pipes.

The properties of polycarbonate make it an excellent replacement for glass in many applications. However, recent studies have shown and raised some serious controversy on the use polycarbonate plastic in consumer items especially food and beverage containers. This is due to the harmful effects of the main building block of polycarbonate plastic, BPA. However, some companies have found substitutes for the plastic, some still argue over the necessity of the alternate.

In subsequent articles we will look at why BPA is studied, considered a carcinogen by some and vilified by others.