

# Polyvinyl chloride (PVC) is one of many materials playing a part in the Olympics.

## Eoin Redahan reports.

There is something in the water, and it is feminising boys. Is this what the world is coming to: multi-tasking, emotionally intelligent males? Apparently, according to popular media and some campaigners, this is what could happen if the phthalates from PVC enter the water table and seep into the blood stream – that, cancer and fertility problems.

So, when the Olympic Development Authority (ODA) conceived various structures for the 2012 Olympics, it decided to be careful about material selection. Not only was there pressure to use sustainable, reusable materials, the ODA also had to be aware of potential health risks.

Despite the debate surrounding PVC, when cost and intended use were analysed, it was found to be the best material in several areas, due to its strength, malleability and light weight. It was also cheaper than alternatives such as ethylene tetrafluoroethylene (ETFE). At a recent talk given to the South East Plastics and Rubber Group in London, UK, the ODA's Noah Bold explained, "We decided we'd use PVC, but to a strict environmental specification". The intention was to source PVC with non-phthalate plasticisers.

This proved more difficult than expected. A French company called Serge Ferrari produced a phthalate-free version, but it failed the fire safety test in the first trial run,



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noted Bold. As such, the PVC used in the Olympic Stadium and the temporary Basketball Arena contain phthalates.

When the time came to build temporary wings to extend the capacity of the aquatic centre, Serge Ferrari produced a phthalate-free membrane that passed the fire tests. Similarly, for the Shooting venue, a phthalate-free perfect PVC was stretched over the frame to create a temporary arena. The Water Polo arena also employed a similar fabric in its roof.

In total, 142,638m<sup>2</sup> of PVC fabric wrap was used, 98,038m<sup>2</sup> of which was phthalate-free. According to the organisers, suppliers or manufacturers are requested to provide takeback schemes to ensure materials will be re-used or recycled after the Games. By the time the Olympic torch has moved on, much of the material could be on a boat bound for a second life in South America.

Other plastics have been used in Olympic construction. Polypropylene seats with reinforced nylon parts, for example, will be used to catch thousands of backsides in the Olympic Stadium. The Olympic track is also made using natural rubber.

According to Bold, shorter distance athletes prefer the surface to long-distance runners due to its hardness. So, if Usain Bolt whizzes over the line in world record time, as well as thanking years of dedication and his mother,

he should also thank the materials that made it all happen.

### MORE ABOUT PHTHALATES

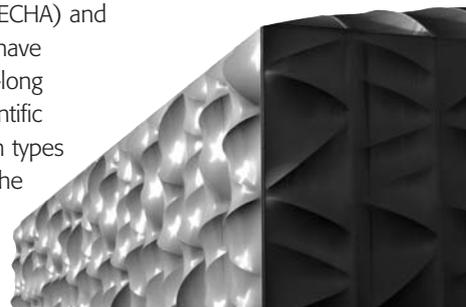
**Stuart Patrick  
Chair Polymer Society Board  
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Phthalate PVC plasticisers are a generic group covering a number of chemicals made by reacting phthalic anhydride with alcohols. They are divided into two distinct groups, with very different applications, toxicological properties and classification.

In Europe, the European Commission, the European Chemicals Agency (ECHA) and EU Member States have undertaken 10-year-long comprehensive scientific assessments of both types of phthalate under the EU Risk Assessment Regulation.

High molecular weight phthalates represent more than 80% of all the phthalates being produced in Europe. Risk assessments have shown positive results regarding the safe use of this group of substances. They all have been registered for REACH and do not require any classification for health and environmental effects, nor are they on the Candidate List for Authorisation. Consequently, under the Classification, Labelling and Packaging (CLP) Directive, there are no specific requirements.

Low molecular weight phthalates represent about 10% of the European market. Risk assessments have led to their classification and labelling as Category 1B Reproductive agents. They have been registered under REACH but are included in the EU Candidate List based on their hazard classification and will therefore have to go through the REACH Authorisation process. These plasticisers will be phased out by the EU by February 2015 unless an application for authorisation is made before July 2013 and an authorisation granted. As a result of the classification, these materials must now carry a label with the appropriate CLP Pictogram and Hazard and Precautionary Statements.



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