

ENVIRONMENTAL CHALLENGE

PVC and its additives bravely battle ‘green’ brigade

Polyvinyl chloride (PVC) is amongst the most well known of commodity polymers and a forerunner to many other polymers, including polyolefins. Its discovery and subsequent commercialization many years later displaced many well-entrenched materials and even natural polymers (such as shellac – for which India was the world’s leading supplier) from a variety of applications. Wide application of the polymer only came with the ability to ‘plasticise’ it using chemical reagents and PVC has never looked back in spite of the many challenges thrown at it.

PVC still elicits a strong reaction – from industry proponents, regulators and NGOs. The polymer manufacturing industry is not surprisingly a strong votary of the material, which finds use in diverse applications ranging from blood bags to large pipes to carry fresh- and waste-waters. NGOs, on the other hand, warn about the safety, not just of the polymer and its manufacturing process, pointing to the toxicity and hazards of the principal raw material, vinyl chloride monomer (VCM); but also the many chemicals used to process the polymer, including plasticisers and heat stabilizers. They also allege that recycling of PVC is still to be proven on a commercial scale and raise doubts as to safety of incineration of the polymer when it is burnt for energy recovery.

Gaps in knowledge

In the din of the vociferous arguments for and against the polymer, the



truth – as often – lies somewhere in the middle. According to Dr. S. Sivaram, an internationally renowned polymer chemist, and a former Director of the National Chemical Laboratory (NCL), at Pune, even after 75 years of its discovery and a long history of use, there

are still many gaps in knowledge. “The issues concerning PVC raise many challenges for the vinyl industry and bring about opportunities as well,” he said when speaking at the inaugural session of a two-day conference, Vinyl India – 2011, organised by the Elite Plus, a conference organizer, and the Chemicals & Petrochemicals Manufacturers’ Association (CPMA).

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“PVC is unlikely to be substituted

in key applications, but we must look at applications in a rational manner and not just as legacies handed down to us from developed countries. Both the cost to the consumer and to society and the environment must be evaluated,” Dr. Sivaram says.

PVC’s major use in long-life applications and its low carbon footprint qualifies it for the tag of sustainability, say industry proponents. While mechanical recycling of the polymer is possible and indeed practiced, as of now no reliable recycling technology has yet been developed for flexible PVC products and current technologies use noxious solvents and are not environment-friendly. Gasification technologies have also been developed using waste PVC as raw material, but these are still in the pilot plant stage. “This problem is still wide open, and industry must take ownership of recycling,” says Dr. Sivaram.