



Ruud Burlet

From waste to resource

To build a sustainability economy, it is imperative that tyre manufacturers and recyclers should intensify cooperation to turn wastes into resources. Ruud Burlet, Tyre Committee Chairman of the Brussels-based Bureau of International Recycling (BIR), told Tyre Asia that by following his three-phase strategy, tyre recycling can become as successful as steel or glass recycling

TA News Bureau

The world produces almost one billion tyres each year, which is reckoned to be equivalent to 13.5 million tonnes of potential raw materials. But processing the end-of-life tyres (ELT) to turn them into valuable resources for industrial use still remains a major challenge because of the complexity of the tyre, which is made of over 30 different kinds of rubbers, fillers, textiles, steel, oil and other materials.

Ruud Burlet, Tyre Committee Chairman of the Brussels-based Bureau of International Recycling (BIR), said rubber processing has always been more complicated than, for example, the processing of plastic into final end products.

He told Tyre Asia in an interview that tyre-making requires mixing of rubber with different materials such as oil, filler, chemicals etc. The final step of vulcanisation gives the compound the desired properties. One of these properties is that the tyre doesn't melt like plastic.

It means that reusing the material will encounter major technical hurdles. For compounds to make one type of rubber composition (meaning one form of product

for one application), reverse vulcanisation is possible. As long as de-vulcanisation is not 100 per cent, the reverse product is more often called reclaiming.

Burlet, a polymer R&D specialist who began his career with Royal DSM of The Netherlands, the global leader in green technology and sciences, later joined Vredestein as General Manager of its rubber recycling activities, Rubber Resources. It expanded its operations to Belgium, South Africa and the US, and in 2011 it was taken over by India's ELGI Rubber and became ELGI-Rubber Resources.

He is now responsible for ELGI-Rubber Resources' recycling and

compounding operations and serves as the President of their European activities, including Russia, Northern Africa and Turkey. Its new extrusion technology enables higher processing temperatures and quicker internal cooling leading to better physical properties and flexibility in handling different polymer types.

Drawing from his international experience in recycling technologies, Burlet said there are many vexing issues right across the tyre recycling industry that should be addressed. Based on these, his three point strategy can be worked out in concert to make tyre recycling as successful as steel or glass recycling.

Close co-operation

Burlet said there should be close cooperation and communication among the stakeholders, including government regulators, to solve the short, medium and long-term problems facing the tyre recycling industry. It is important to eliminate the negative connotations linked to 'waste' while improving recycled materials' competitive position.

To achieve the properties desired, the tyre compounders should develop and test

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RUBBER RECYCLING STATUS



numerous formulations which have made de-vulcanisation a difficult proposition. "If you start to make use of different formulations for different tyre parts, your problems become even more difficult," he explained.

The tread, the bead, inner-liner and apex have different compositions. To make things even more complicated, a tyre doesn't consist only of rubber. It's a combination of steel and rubber (for producing most of the truck tyres) and a combination of rubber and textile and steel for car tyres.

And of course the formulations used in a car tyre (for instance more SBR rubber) differ strongly from that of a truck tyre (more NR rubber), Burlet pointed out. Different tyre makers use their own secret formulations.

There are also differences among bias ply tyres and the newer radial tyres. All these issues make recycling more challenging complicated.

But the properties of these products are phenomenal: High temperature and wear resistance, flexibility to aging. The tyres are designed for different driving properties such as low rolling resistance and

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noise, better wet grip etc.

However, these diverse tyre characteristics also have many drawbacks. "When you put a tyre on a waste dump, it remains there for almost for ever. So the first action on the part of governments is to control this flow of tyre waste into the dumps and come up with clear targets for recycling or energy recovery," Burlet asserts.

Now most developing countries have realised the problems with accumulating dumps of ELTs and have begun to take action to restrict dumping and burning in open air. The situation is grave

as millions of tonnes of ELTs are needed to be handled on each of the continent.

He, therefore, suggests that the authorities should first get the numbers right and then set the targets for recycling and recovery. Producer responsibility is to be introduced so that tyre makers should also get involved in collecting, transporting and recycling of the tyres.

The introduction of tougher laws and regulations in developed countries has almost eliminated dumping and burning, but differences still persist on how these tyres needed to be treated for effective disposal.

Burlet said retreading is on the retreat even though this marks high-value reuse. The price of (lower quality) low priced new tyres (often imported from Asia) is still making the recyclable issue grave. Car tyres are nearly nowhere retreaded anymore and truck tyres are getting into a difficult spot.

"So the next step is physical recycling. Remove the steel and textile, grind the rubber and you still have a set of interesting properties," he said. ▲

Concluding part of the article will be published in October / November issue