



Gopinath B Sekhar

# CLEANTECH SOLUTION

**The devulcanizing technology that Sekhar Research Innovations (SRI) has developed, for which it won the 2010 Asia Pacific Technology Innovation Award for Tire Recycling Technology by international consulting firm Frost & Sullivan, is set to change the way end-of-life tyres are perceived and managed. SRI CEO Gopinath B Sekhar says the compound created by his firm's cleantech process, which uses very little energy, can be utilised to make new tyres, retread old ones and make automotive parts. This will be particularly economically at a time when natural rubber prices have gone through the roof**

## Emerging problem

With automobile industry booming in China and India, tyre production in the world's most populous countries is growing very fast with China already topping the list as the world's largest producer. Along with this, comes the problem of environment-friendly disposal of end-of-life tyres. In this context, SRI's tyre recycling is a viable green option for emerging economies.

"India has a long history of recycling which predates the terms of 'cleantech' and 'green'. China in particular has shown a capacity for rapid adoption of all things green, with 1/4 of their energy requirements now being supplied by clean energy," Sekhar noted.

The need for the recycling of scrap tyres in a responsible and appropriate manner is no longer just a necessity but it is now an imperative, he emphasised.

The already substantial automotive markets of North America and Europe are now being joined and even surpassed by Asia where these industries are on explosive growth.

"Existing systems to manage the volumes of scrap generated are going to be outstripped very quickly leaving a path of unacceptable environmental damage in its wake," he warned.

"When I refer to the imperative, I'm not referring to lip service or peripheral low volume applications, but the imperative is for a process that can keep up with the volume of scrap generated."

With the volume system comes the need for adequate scrap supply and demand for its disposal, so the need for a viable volume-based tyre recycling is justified, enhanced and supported by the growth in the automobile sector.

"The need for green sustainable technologies has never been more important or crucial than at this point in time," Sekhar said.

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## PTA News Bureau

It did not come as a surprise when Sekhar Research Innovations (SRI) Sdn Bhd won the cleantech innovation award from the international technology consultancy firm Frost & Sullivan.

SRI's devulcanising process, which is a closed-loop rubber recycling solution that can match the volume requirements of rubber manufacturing, is not only an environment-friendly process but also holds out great commercial value.

SRI, founded by the doyen of modern rubber technology the late Tan Sri Dr BC Sekhar, is a renowned R&D firm working on ecological reuse of end-of-life tyres and waste rubber to produce premium tyres.

It won the Asia Pacific award in recognition of its technology's uniqueness that will have a defining impact on new products, applications, functionality and customer value.

The technology transforms the recycling of scrap rubber into a volume-based and industrially scalable process, said SRI CEO Gopinath B Sekhar in an interview to

### Polymers & Tyre Asia.

"Our solution provides for substantial economies of scale by having a modular,

high-volume processing system that lends itself to a very high-level of consistency in performance," he said.

"Further, our energy footprint is lower than any other available devulcanisation technology and we have zero discharge."

This is the first time that an eco-friendly technology will be able to match the sheer volume of tyre wastes generated in a way that is economically viable without relying on subsidies.

"Frost's innovation award was a welcome validation of our efforts and achievements thus far," Sekhar explained.

The product from SRI, which was a start-up based in the Malaysian city Petaling Jaya and is currently engaged in commercialising its process by opening a production facility in Malaysia, is a viable recycling solution that can address the problems of scrap tyres globally.

Sekhar said the world produces tyres in excess of 1 billion units yearly valued at more than US\$130 billion. But scrapping them poses a major environmental hazard because it is difficult to dispose end-of-life tyres. It has been found that the option of producing tyre derived fuel by incinerating them is a global public health concern.

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### Useful technology

This goal has driven SRI to develop a process that will have economic viability in terms of batch size and cure times while maintaining compatibility with existing machinery, infrastructure and process flow.

SRI's advanced technologies to produce next generation rubber recycling solutions, include custom compounds, processing aids and advanced state-of-the-art equipment for the global market.

It is delivering these innovations through its own operations, strategic partners and licensees globally.

Commenting on the way SRI recycling technology will impact rubber manufacturing and tyre waste management, Sekhar said that its high-recovery, high-volume devulcanisation technology and its resulting compound will change the way in which end-of-life tyres are perceived and managed.

SRI technology is the answer to pollution-causing scrap tyre disposal. SRI process produces industrial raw material feedstock from scrapped tyres thereby conserving precious resources.

Between some of the existing niche applications and SRI's volume-based devulcanisation system, the justification for burning tyre as a fuel, landfill and low value ground-based applications that may leach chemicals into the groundwater will no longer exist, Sekhar pointed out.

"The existence of a cost-effective recycled compound will enable manufacturers to have one more vital tool in their armour to enhance their viability and competitiveness."

Elaborating on the advantages of SRI technology, he said that tyre and rubber manufacturers would enjoy substantial costs savings and sustainability in their end products while maintaining high-

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quality and performance they require – without changing existing process or equipment.

"The goal of our process is not to replace virgin rubber but to replace a proportion of the virgin compound," he elaborated.

### Compound testing

The SRI compound is already at an advanced level of evaluation and

testing with some of the largest tyre manufacturers in the world.

"It not only can be used to substitute virgin compound in commercial vehicle and retread applications, we are actually going forward into commercialisation trials as we speak."

This threshold of establishing real recycling in tyre production applications has only been superficially addressed by way of fillers, diluents and processing aids so far, and it has never come close to being reached or breached.

"With the SRI Compound we are breaching this threshold for the very first time, where end-of-life tyres will go back into tyre production as an industrial raw material feed stock. It's the very definition of recycling."

Due to the advanced level of activity related to process and production trials in commercial vehicle-centred applications that are going on with several customers globally, SRI had to refocus its efforts and resources on completion of the evaluation process and establishing the desired template rather than its planned production unit in Klang.

"That said, this is still very much in our near-term planning," Sekhar explained.

"For the time being we have had to extend our existing laboratory production facilities due to the pressing and strategically important requirements at this time."

All of the leading manufacturers are working aggressively to substitute other than virgin materials due to record rubber prices, raw material shortages and increasing demands from growth in Asia.

By using a low-energy cost-effective system to process recycled tyre scrap into devulcanised rubber compound, SRI is offering a performing industrial raw material at a substantially lower cost to that of their virgin compounds.

When utilised in blends in varying yet significant proportions and without loss of properties, this substitution assures the manufacturer tangible savings in raw material costs.

"It is our firm belief that being green and sustainable is meaningless without ensuring the process and activity is profitable to all involved," Sekhar said.

"From those who collect the tyres to those who convert them into powder through to the production of SRI compound – all must be viable in the value chain." ▲



SRI Compound Masterbatch			
Compound	T.S (Mpa)	E.B%	DIN Abrasion
Virgin Control	15.58	504	178.22
5% SRI Comp	16.12	517	180.6
10% SRI Comp	15.95	491	170.69
15% SRI Comp	15.6	453	175.25
20% SRI Comp	16.04	456	169.1

The compound used as control was a medium quality, high volume based virgin compound used in the commercial manufacture of retread for truck tires. The results are of blends of the virgin compound with SRI Compound Masterbatch in proportions ranging from 5% to 20% in increments of 1%.