

RubberAsia

DRIVING THE GLOBAL RUBBER INDUSTRY

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**ATRC 2019
WIDELY ACCLAIMED**



**TECHNOLOGY
IS VITAL TO
DEVELOPING
NEW USES
OF RUBBER**
Dr. RK Matthan



**WE PLAN TO
TAKE NR
PRODUCTION
TO NEW
HEIGHTS**
Dr. K N Raghavan



**GREAT
OPPORTUNITIES
FOR SR IN
ADVANCED
MATERIALS**
Jong-Hoon Baek



**ON CHALLENGES
IN NR
PRODUCTION**
Dr. S. Sivakumaran

**SPECIALISED RUBBER
PRODUCTS MARKET
BOOMING**





Adam Gosling

Adam Gosling heads up the team at TyreSafe Australia. Considering tyres holistically we help clients turn higher profits. Tyres reflect the whole operation, they don't tell lies. Transport and mining companies benefit from our tyre experience. If your tyres aren't turning, they're not earning!
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AVOID WASTE, IMPROVE YOUR ENVIRONMENT

Procurement attitude has changed from being one of purchasing the best possible quality to that of buying the cheapest available. Purchasing the cheapest tyre or any other item will come back to haunt us in the form of reduced performance or increased costs or increased waste

Waste takes many forms, just about all of us waste resources. It could be the precious renewable or non-renewable resources such as food; and it could be the most non-renewable of all time.

In the past, a vast majority of the societies, have not been really worried about waste. "Not in my backyard (NIMBY), push it away, if I don't see it, then it won't hurt me," has been the attitude.

As the globe shrinks at the communication level, the damage wrought by waste of all natures is becoming more pronounced and is thankfully accepted as a serious issue.

The air we breathe, the water we drink, the environment we live in all directly affect our quality of life. Ask any commuter in a large city about the air quality and you'll soon understand the issues.

Tyres support us

Now let's look at my pet topic of tyres. In days past, retreading was carried out as a matter of routine. The carcass/casing of the tyre was reused by installing another tread package onto it. Tyre manufacturers took

great pride in producing sound structures to support the wearing surface of the humble tyre. With procurement attitudes changing from being one of purchasing the best possible quality to that of buying the cheapest available, tyres have become an increasing waste stream, some would say an intractable waste stream; but that is not completely correct. Tyres support our societies, transport our food and goods that so many take for granted as just "being there". Tyres support the machinery required to build and maintain our cities and communities. So I ask the question: "Where would we be without the humble tyre?"

Several streams of reuse and recycling are available for End-of-Life tyres. Yes, like all waste streams, there is investment required to reuse the resources that are available to us. We all know that you only get a zero return for a zero investment, so methods and machinery have been developed to capture what would otherwise be a wasted resource.

Tyre rubber powder for pavement flexibility



& LIFE

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In one form of tyre recycling, the tyres can be shredded and ground to form a rubber powder. This powder has numerous uses and, to my way of thinking, one of the most useful is that of building roads. The crumbed rubber can be mixed with bitumen to form a flexible pavement that has multiple benefits including reduced noise (a major challenge for the tyre industry with the introduction of electric vehicles) and enhanced traction, especially in wet weather. From a pavement engineering viewpoint there are added advantages as the rubber component improves pavement flexibility, as it moves under loads that change rather than cracking as a rigid pavement does.

In our studies of tyre pressures on heavy haulage vehicles, we observe the differences between dualled tyres, i.e. two tyres side by side on a heavy vehicle. We see substantial differences in the operating inflation pressures between the two tyres. This in turn creates a large difference in the contact pressures at the tread / pavement interface. Pavement engineers have to over engineer their work to cater for this difference all because we, as the industry users, will not actually take responsibility for our tyres which is, yes, another form of unnecessary waste.

Poor maintained tyres, waste & risky

A tyre that has been well-maintained can be retreaded numerous times. Anyone who has travelled on a commercial jet aircraft has more than likely landed on retreaded tyres. Aircraft tyres are retreaded multiple times before the tyre is deemed as end-of-life. The level of maintenance in aviation is quite strict and regimented, thus aviation safety is extremely high. If such a regime was applied to the general passenger car fleet, a huge number of vehicles would be deemed as unsafe. For commercial fleets, such as heavy transport, maintenance regimes are better quality and some could be compared to aviation, but very very few. The poor maintenance is, when we consider reality, just money being thrown away, profits wasted and safety compromised.

The waste from poorly maintained tyres does not just stop at reduced tyre life. Decreased tyre performance is a major factor. The traction available from an under-inflated or over-inflated tyre is compromised at best, greatly reduced in some cases. An under-inflated tyre requires more fuel to overcome the increased rolling resistance. Yes, you are right, many tyre manufacturers are promoting "green" tyres, or reduced rolling resistance (RR) tyres. Tyre RR is a major consumer of energy on a modern vehicle.

As layers are peeled back, the magnitude of the waste becomes a serious concern. An aspect that is not well-understood is the increased stopping distance stemming from inappropriately inflated tyres. On an under-inflated tyre, there is actually less rubber contacting (contact patch) the ground; so the brakes have to work harder and longer to reduce the vehicle speed. An over-inflated tyre also suffers reduced contact area and so also has increased braking distance. Both conditions impose higher contact pressures onto the pavement surfaces and substrates; so more waste happens as roads have to be over-constructed to cater for the poor attitudes of vehicle owners in performing what should be standard maintenance. There is a serious road safety issue as well. The absolute waste involved in road trauma is huge, the loss of life, the injuries sustained with life-changing consequences is horrific. Maintaining tyres appropriately can assist to reduce this waste.

Tyres for incineration processes

Tyres can also be re-purposed in an incineration processes. For many years, tyres have been burnt within the cement manufacturing process to improve the

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quality of the clinker or cement, thus providing superior concrete for our structures such as bridges and buildings. Many people equate burning tyres to the belching black smoke seen from uncontrolled tyre fires. Weight for weight tyres have a higher energy availability than most high grade coal, yet we don't see black smoke belching from power stations burning coal. When properly burned using the correct stoichiometric ratio, the resulting exhaust gases are clear, just as a car's exhaust is clear.

The components that make up a tyre can be reduced under a specific process to largely the original components, oil, metal and fabric and carbon. Yes, carbon is the building block of most matter in our lives from plants and trees to energy and even in printing (pencils and printer ink for instance). The process is commercially viable, but until our societies realise and engage to value the resources that we have rather than the "throw away" mentality we have now, the outcomes will only come back

to haunt us all at a later time.

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Purchasing the cheapest item will also come back to haunt us in the form of reduced performance or increased costs or increased waste, or option D/ all of the above.

A single use tyre has to be processed within the waste stream. If it is reused, then this waste stream is re-purposed, e.g. road building. If the tyre is retreaded, then the cost of the waste processing is spread over multiple uses. The "waste processing" has to be amortised over the single use instead of the multiple uses as in retreading. The "cheap" price is not actually real as the real costs are hidden in the waste processing.

Monitor tyres in real time

Tyre pressure monitoring systems (TPMS) provide a simple and effective way to review your tyre pressures in real time to reduce the waste stream motor vehicle users (you) generate. Ask your logistics supplier, do they monitor their tyres in real time? If the answer is NO, then I suggest that you're paying too much in too many senses. Efficiency from monitoring tyres in real time actually reduces costs. Simple gate or manual monitoring does nothing for the tyres when the vehicle is in use, it has to be real time TPMS.

Above all we have to be diligent in extracting the maximum performance from not only our tyres but every other resource we utilise. Everyone one of us wants the best value for our investments yet when it comes to tyres way too many of us ASSuMe our tyres are "ok". We throw money away in reduced performance, increased fuel consumption, increased mechanical wear, increased pavement costs and maintenance, increased emissions and increased waste processing costs. Is it not cheaper to actually check the inflation pressures of your tyres and maintain them appropriately? Why we waste our money and our environment by being lazy continues to puzzle me. It is quite simple to monitor your tyres in real time. Ask me or your tyre specialist, the answer is readily available.

Look after your tyres, maintain the appropriate pressures, reduce waste, improve the return on your tyre investment, enhance the environment you leave for your children and the future.

TyreSafe Australia, keeping your tyres turning for longer, keeping you safer. ■