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TYRE TESTING: FINAL CHECKPOINT

VIRUSSED !

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EDITOR'S NOTE

THE VIRUS TEST AND AFTER

When we planned Tyre Testing as a special focus subject for this edition, we never expected that the "Testing" part would attain a new dimension. It did and it came out of the blue. The "Testing" has now gone beyond tyres and even the tyre industry. It has brought to include the entire global economy. That is what the COVID 19 pandemic has done to the world and humanity at large.

The corona virus havoc has changed the way everything has been rolling so far in the world, let alone tyres. Its human toll has crossed over 170,000 and is still counting. Global economy, which is used to periodic slowdowns and crashes and depressions, has not seen anything like this in recent history. Even in the past, when epidemics and pestilences spread across societies, the havoc was regional. It hardly crossed borders. This time, a virus has shown how meaningless borders and tariffs and regulations are.

Globally the tyre industry ground to a standstill. Factories shut down. Inventories posed huge question marks. The business just stopped. The only possible thing to do is to stay home, wait and watch.

More than three months into the crisis, there are distant signs of action. Companies are planning resumption of production in one way or the other, because business matters as also lives.

This is the ideal opportunity to take a pause and see what all scenarios can unfold when the scary curves flatten out. The big thinking brains would wonder how, in future, similar crises could be tackled, how new business models could create situations where nothing stops the wheels from turning. This is the time to wonder how much valuable human lives are when corporate conceptualisers plan their next products.

However much one talk about Artificial Intelligence, Industry 4 or Automation, there is life beyond factory walls. Natural human life has nothing AI about it! The importance of health care, medical research and medical equipment cannot henceforth be overlooked. Mind you, many closed automobile manufacturers were called in to make ventilators for hospitals while their assembly lines rested.

The COVID kind of crisis may be the first of its kind to global economy. But then, that's no excuse. There is always a first time! The answer to the "Now What" question will define the future course of action. ■

Raghav Varma

TyreTrends

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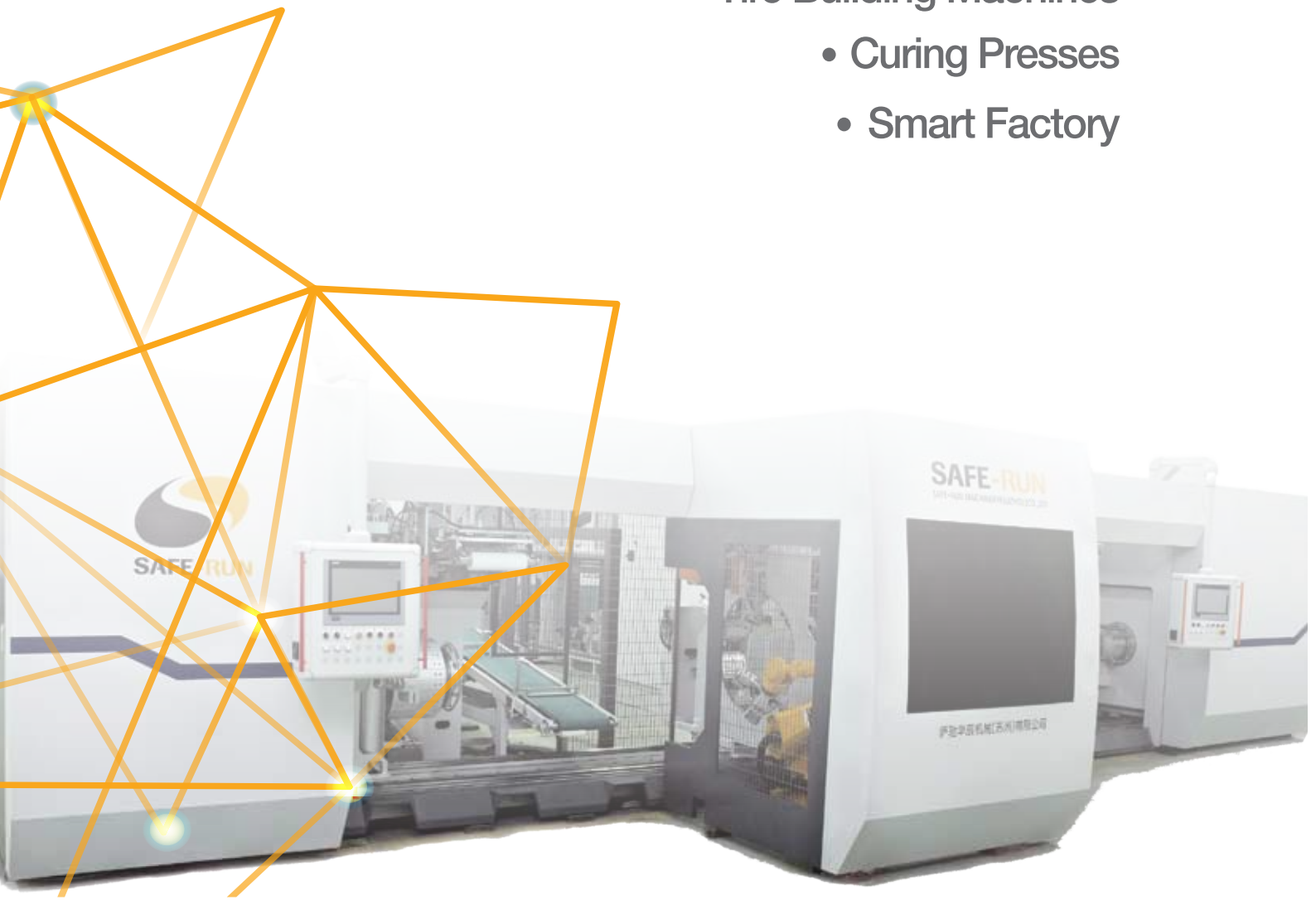

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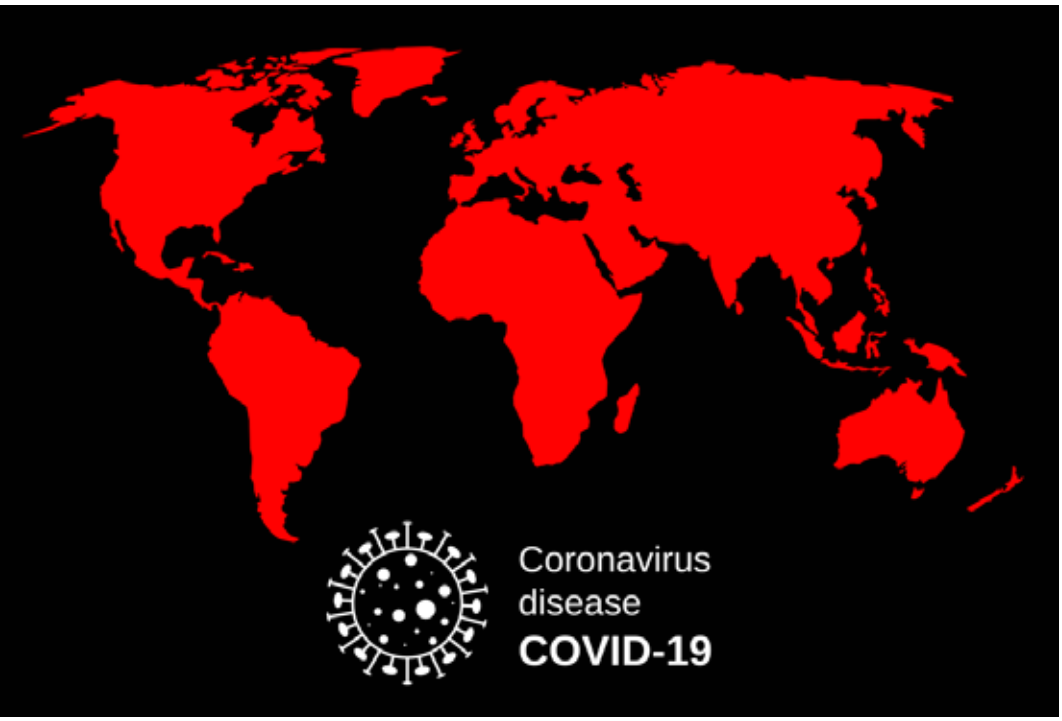
VIRUSSED!

The impact of the COVID 19 pandemic has nearly blown the fuse off global tyre and automotive industries. The question now is how long will it take to get the industry back on rails



Picture courtesy: etrma.org

The COVID 19 pandemic has wreaked havoc across the globe with the human toll reaching scary hights. Whatever expectations one had about its spread and the degree of disaster it could cause have been broken. Nations have been caught on the wrong foot by the speed with which the corona virus has spread across the globe. The toll number has become just a number because the intensity of the tragedy has gone beyond that.

Industries and economies, which are used to pass through periodic slowdowns and even depressions, have been impacted at an unprecedented level by a virus. It is like a bolt coming out of the blue. Like all other industries, the tyre, rubber and automotive-related sectors have also been severely struck down by the pandemic almost like a body blow. Budgets and projections have gone haywire, and it is in for a long haul for recovery.

Lock downs took all the vehicles off the road, except those that are needed for emergency. This has ground to a stop every sector that is linked to automotive industry. Tyre factories have been shut down, sales and service sectors pulled down the shutters, machinery makers suddenly had no takers, raw material suppliers wondered what to do, rubber plantations, which are under pressure even under normal circumstances, are at a standstill.

Almost all tyre factories across the world have been closed temporarily, putting thousands of workers under tremendous pressure. The closure is across the board.

Now, at the time this magazine edition is going online, several of those closed plants have started announcing plans to reopen, partially or otherwise. This is not because the pandemic situation has subsided substantially, but because long-term closure will have severe economic impact beyond repair. The opening is more out of compulsion rather than relief.

Initially, the pandemic caused a sharp drop-off in demand for tyres and cars, causing manufacturers across North and South America and across the world to furlough workers and implement partial factory shutdowns.

Goodyear

Already, companies are bracing for major loss of revenue. Goodyear, for example, has said it expects a loss of around $185 million or more for its first quarter. That compares to a loss of $61 million on revenue of $3.6 billion during the same period a year ago. The adjusted 2020 loss is anticipated to be $175 million to $185 million, the company said. Goodyear has suspended paying a dividend while planning to resume some of its closed plants. According to the company, this will save up to $37 million.

Goodyear's preliminary first quarter results showed the gravity of COVID 19 impact. It said in a statement that the 2020 first quarter results were greatly affected by "the economic disruption associated with the COVID-19 pandemic."

Tyre unit volume was about 31 million for the first quarter of 2020, down 18% from a year ago. That reflects significant declines in global original equipment shipments after auto manufacturers halted

Goodyear Danville plant (godanriver.com)

production, plus weak replacement tyre demand caused by mandates for people to shelter-in-place, the company said.

Bridgestone

Bridgestone has also announced that work will resume at its North American commercial tyre plant in Normal as well as its North American Firestone Industrial Products and Building Products manufacturing facilities. Normal's Bridgestone plant closed down March 21 as the company sought to reduce the spread of COVID-19.

"The company's start-up plans reflect the performance trend in several key areas of its commercial and diversified products businesses not as severely affected by the current crisis," Bridgestone Americas said in a news release.

"The company continues to work closely with its customers and partners to ensure adequate supply, while closely monitoring volatility in demand," it said.

"The start-up of our North American commercial tyre and diversified products operations will allow us to meet the increasing needs of businesses who are going above and beyond to provide essential services in our communities," said Bridgestone Americas CEO and President Pablo Ferrari.

Bridgestone said it is closely monitoring the situation and is "adjusting response plans and operations as necessary to ensure the health and safety of its employees while also addressing the needs of customers and the market."

Bridgestone La Vergne (bridgestoneamericas.com)

Pirelli

In an interview with CNN, Marco Tronchetti Provera, CEO of Pirelli, said: Prepare for the worst and your company may come through this crisis stronger than it was before.

"Considering that we are facing a very tough situation for many months. If we move in advance, we can cope with it and we can come out of it even stronger," he said

Pirelli has estimated that the demand for passenger car tyres will drop by 19 per cent due to the pandemic impact. The company had shut down plants in England, Italy and Romania.

Pirelli also announced it would halt the production and launch of the 2021 edition of its celebrated calendar in light of the pandemic. Pirelli has pledged to donate €100,000 to support "the fight against and research into coronavirus," a company news release said. Since the calendar's inception in 1964, this is only the third time it has stopped production.


Pirelli Romania plant (pirelli.com)

Michelin

Michelin Group, where some employees had to undergo partial unemployment measures due to the virus infection, demonstrated solidarity with the entire employee community. Its Managing Partners, the Executive Committee, as well as the Chairman and independent members of the Supervisory Board reduced their remuneration.

Florent Menegaux and Yves Chapot, Managing Partners of the Michelin Group, reduced their remuneration by around 25% for the months of April and May 2020, a company release said.

In addition, the members of the Group's Executive Committee have voluntarily decided to reduce their remuneration by around 10% during the same period.

The chairman of the Michelin Group Supervisory Board, Michel Rollier, and its independent members joined this effort by donating 25% of their attendance fees received in 2020 to foundations in their respective countries, which are part of the fight against Covid-19.

Cooper

Cooper Tire & Rubber temporarily shut down its US and Mexico plants on rolling schedules for three weeks. "Cooper is closely monitoring supply chain and product inventory levels as the company focuses on continuing to serve customers," it said in a release. "Cooper believes it currently has sufficient supply of product and will continue to operate distribution centres until further notice to meet customer needs."

The temporary plant closures were announced March 21, and include facilities in Findlay, Ohio; Clarksdale and Tupelo, Mississippi; Texarkana, Arkansas and El Salto, Mexico.

Cooper plants in Europe also continue to be temporarily closed. Its plants in China reopened several weeks ago and have continued to ramp up production and remain in operation.

Continued on page 22

APOLLO TYRES LEADERSHIP TAKES PAY CUT

The Apollo Tyres leadership team has announced a voluntary reduction in pay due to the impact of COVID-19 on the automotive industry. The Chairman and Managing Director, Onkar S Kanwar and the Vice Chairman & MD, Neeraj Kanwar announced a 25% reduction in their salary during these tough, testing times. Furthermore, the Senior Management has also taken a voluntary reduction in their salary by 15% in a show of solidarity due to the rapidly deteriorating market conditions caused by the COVID-19 pandemic.

Apollo Tyres has a diversified and multinational presence and the pay cuts will affect all senior management at the global level. Coronavirus is impacting sales and profitability across the automotive industry as anticipation builds that the worst is yet to come with COVID-19.

Commenting on this, Onkar S Kanwar, Chairman and Managing Director, Apollo Tyres Ltd said, "This is an incredibly difficult time for our employees and their families. We are in unchartered waters but as 'One Family' we will work together and make the necessary sacrifices to steer Apollo Tyres in the right direction, to overcome this period. We are experiencing slowing demand and disrupted supply chains due to COVID-19. We are working on further measures which we will provide updates on, as we make final decisions." ■

Survey of natural rubber plantation in Surat Thani, Thailand

Yokohama signs MOU with Rubber Authority of Thailand

The Yokohama Rubber Co., Ltd., has signed a Memorandum of Understanding (MOU) to cooperate with the Rubber Authority of Thailand (RAOT) to provide economic support for Thai natural rubber farmers and to improve traceability to ensure transparency and soundness of the supply chain. This agreement with RAOT is the latest concrete action based on the company's "Procurement Policy for Sustainable Natural Rubber." The agreement is a follow-up to a survey on Thai natural rubber plantations in Surat Thani conducted by Yokohama Rubber's local natural rubber processing subsidiary, YT Rubber Co., Ltd. (YTRC), since June last year.

YTRC has thus far interviewed about 70 natural rubber farmers and plans to continue the survey with the goal of surveying 500 farmers by the end of 2021. Yokohama Rubber plans to use the survey results to analyse the issues facing natural rubber plantations to better enable the company to contribute to sustainable operations of natural rubber farmers and to improve traceability.

In recent years, the demand for tyres and consequently natural rubber—the core raw material used in tyre production—has been expanding steadily as the world's population grows and mobility technologies become more advanced. However, this growth in demand has led to growing concerns about a host of problems, including unlawful deforestation, land exploitation, human rights violations, and adverse effects on biodiversity, in countries and regions where natural rubber is produced. To help resolve these problems, Yokohama Rubber is participating in the Sustainable Natural Rubber Initiative (SNR-i) advocated by the International Rubber Study Group. The company also is active as a founding member of the Global Platform for Sustainable Natural Rubber (GPSNR) launched in October 2018. ■

Birla Carbon again wins sustainability award

Birla Carbon has been awarded a Gold level rating for sustainable practices, for the fourth consecutive year by EcoVadis. Birla Carbon was recognised as an advanced practitioner of sustainability. The rating was awarded after EcoVadis reviewed Birla Carbon's sustainability reporting standards and practices, based on Birla Carbon's seventh sustainability report, Evolving, Sustainably Together.

Joe Gaynor, Chief Legal, Sustainability and Risk Officer, Birla Carbon, said: "This is Birla Carbon's fourth consecutive Gold rating with EcoVadis. The continued success only shows that our strategy, engagement and execution towards becoming a sustainable organisation is on the right track." He further added, "While we continue to pursue our vision to be the most respected, sustainable and dynamic global carbon black manufacturer, it is our Purpose – 'Share the Strength' that drives our engagement with our customers and our suppliers and motivates every employee at Birla Carbon to work towards building a sustainable carbon black business for the future." ■

HANKOOK STARTS IMPLEMENTING NEW AI-BASED TECHNOLOGY

Hankook Technodrome

Hankook Tire & Technology Co. Ltd. has started implementing a new AI-based digital sensor technology for the final inspection process of tyres, which it claims will enhance efficiency and consistency. According to the company, the new inspection system, which was announced in November 2019, is being developed as a proprietary technology, and the plan is to turn the system into a stand-alone business that might be licensed to third parties.

The final-stage inspection involves three types of examination for the detection of any possible defects: use of a type of shearography for internal inspection; X-ray inspection of a tyre's internal structure; and external visual inspection.

According to reports, Hankook will be using the AI-based technology particularly for the shearography and X-ray inspections. The company chose to term this as Interferometer Tire Testing (ITT).

The report said that currently, skilled technicians examine the ITT images based on experience they have gained over several years. The use of AI technology would make it possible for the computer to find defects in nonconforming patterns systematically, thus expediting the process.

Hankook said it developed and implemented this system based on machine-learning technology in collaboration with AI experts in the Department of Industrial and Systems Engineering at the Korea Advanced Institute of Science and Technology (KAIST).

Hankook claims that the new system offers two benefits: Reduction of decision-making time for final inspection and enhancement of plant efficiency. It can also maximise consistency and efficiency of the final inspection.

Hankook said it plans to leverage AI technology for X-ray inspection and external inspection as well.

In 2019, Hankook developed a "Virtual Compound Design" system that used AI for predicting the properties of tyre compounds. ■

Michelin, Goodyear get top rankings

Overall customer satisfaction with original equipment tyres affects tyre brand loyalty, but also vehicle brand loyalty, according to the JD Power 2019 US Original Equipment Tire Customer Satisfaction Study.

The annual study measures tyre owner satisfaction in four key areas (in order of importance): tyre wear; tyre ride; tyre appearance; and tyre traction/handling.

According to the study, Michelin ranked highest in three vehicle segments, scoring 772 in luxury; 756 in passenger car and 730 in truck/utility (out of 1,000). Goodyear ranks highest in performance sport with a score of 753.

"There is a big disconnect between consumers' expectation for the life of their OE tyres and their actual experience, which we find not only influences how likely owners are to repurchase the same brand of tyre, but also how likely they are to repurchase the same brand of vehicle," said Brent Gruber, Senior Director, Automotive Quality Practice at JD Power. "Wear is the biggest influence on tyre satisfaction and, when unhappy owners need to replace their tyres due to rapid wear, they place blame on the tyre manufacturer but also on the vehicle manufacturer. Although it is a challenge balancing performance with long tread life, owners expect more from their tyres."

The study finds that owners report replacing full sets of original equipment tires at just over 26,000 miles on average yet expected more than 40,000 miles on average. "Based on typical driving habits, that could result in costly purchases a full year earlier than expected, or worse yet, an unexpected replacement just before turning in a leased vehicle," Gruber said. "That type of experience can make it very challenging to maintain owner loyalty." According to the study, 74% of owners who are extremely satisfied with both their vehicle and original equipment tires indicate that they 'definitely would' repurchase their vehicle brand. However, when satisfaction with the vehicle remains extremely high yet tire satisfaction is less than ideal, only 62% indicate they would definitely repurchase their vehicle brand. "While the tire experience alone may not completely deter someone from remaining loyal to their vehicle brand, a bad tire experience can certainly erode future owner loyalty," added Gruber.

The 2019 US Original Equipment Tire Customer Satisfaction Study is based on responses from 27,777 owners of 2017 and 2018 model-year vehicles and was fielded from October through December 2018, JD Power said.

Michelin has a 20 per cent stake in the Swedish recycling firm, Enviro, the company said. It will collaborate with Enviro in a project that would involve the development and commercialization of an innovative pyrolysis technology to recycle old tyres. ■

KM Mammen

Anshuman Singhania

KM MAMMEN, SINGHANIA RE-ELECTED TO LEAD ATMA

KM Mammen, Chairman and MD, MRF Ltd, and Anshuman Singhania, Dy MD JK Tyre & Industries, have been unanimously re-elected as Chairman and Vice Chairman of Automotive Tyre Manufacturers' Association (ATMA), the national industry body for automotive tyre sector in India.

Mammen is the Chairman & Managing Director of MRF since 2003. He has held various executive positions in business associations in the country including as President of the Indo Australian Chamber of Commerce. He is an executive member on the board of FICCI and Chairman of the Board of Madras Christian College Association. Mammen has been at the helm of every landmark that has brought the company to the milestone of over Rs 15000 crore (over USD 2.2 billion) turnover and ranking amongst top 20 tyre companies in the world.

Singhania, ATMA Vice Chairman, is a graduate from Oxford Brookes University, UK and an alumnus of London Business School. As a young leader, he started his career from the shop floor as an apprentice and has held several positions in Planning, Production, Product Development, Quality Control, Stores & Purchase, Finance as well as Sales & Marketing. Being a techno-savvy person, he has played a key role in implementing the latest technologies in the manufacturing process at JK Tyre.

ATMA Core Group has been reconstituted. Rajesh Dahiya, Vice President Marketing, Sales & Service, Apollo Tyres, Ltd is the new Convener of ATMA Industry, Public & Economic Affairs (IPEA) Group that looks at developing new markets and increasing export competitiveness of Indian tyre industry. ATMA Supply Chain & Resources (SCR) Group that works to ensure fair and sustainable supply of raw materials to the industry will now be headed by Mohan Kurian, Vice President – Material, MRF Ltd. Tom Thomas, Executive Director – Tech. & Projects, CEAT Ltd, a veteran of the industry, has taken over the reins of ATMA Technology, Environment, Safety & Standards (TESS) Group. The policy formulation aspects of the industry will be taken care of by Sanjiv Saxena, Sr. Vice President – Corporate Accounts, JK Tyre & Industries, as Convener of ATMA Government Affairs & Legislation (GAL) Group. ■

VASUDEVA RAO NAMED SECRETARY, IRI GOVERNING COUNCIL

S Vasudeva Rao

S Vasudeva Rao, who was associated with Indian Rubber industry for the last 35 years and served 25 years in JK Tyre, has been nominated as Hon. Secretary of IRI Governing Council. Prior to this he was the Hon. Secretary of IRI Karnataka Branch since its inception. He took charge in October 2019.

His profile includes: Visiting Faculty for Tripura University: Rubber Science and Technology, Agartala; Visiting Faculty for Tyre Technology for Department of Polymer Science, SJCE college, Mysuru; Regular faculty for DIRI & PGD-IRI Courses in IRI, Karnataka Branch, India. Rao is an expert in Tyre Technology, and has been conducting training classes in TechnoBiz, Bangkok. He had 19 years of experience in tyre manufacturing with Vikrant Tyre Company, Mysuru, India, and also vast experience in Tyre, Tube, Flap and Bladder design & manufacturing in JK Tyre & Industries Ltd, Mysuru, India ■

Ed Miller

ED MILLER RETIRES FROM ACS

Ed Miller retired as Executive Director of the Rubber Division, ACS, headquartered in Akron, Ohio. Prior to this position, he was President and CEO of the Asphalt Institute for nine years, serving as spokesperson for the asphalt sector of the oil industry and leading engineers and chemists in research, engineering applications and education.

Ed retired from the US Air Force in 1992, after serving 20 years. He has been involved in research, design and construction, developing new products, teaching graduate school as Assistant Professor and technical consulting in 15 countries.

He is a graduate of the US Air Force Academy, holds masters' degrees in both Civil Engineering and Business Administration and is a licensed Professional Engineer. ■

Arjen de Kruijf

MAGNA APPOINTS ARJEN DE KRUIJF AS CFO

Magna Tyres Group has appointed Arjen de Kruijf as Chief Financial Officer. As of 1 April 2020, Arjen de Kruijf is joining Magna Tyres Group as CFO. De Kruijf is a highly qualified financial director with a strong background and a broad exposure in several financial disciplines. His financial expertise, astute analytical abilities and financial insights will be a major asset to contribute immediately to advancing our priorities along with further developing the strong financial position.

Arjen de Kruijf said: "I am very excited to have been appointed to the role as Chief Financial Officer at such an industry-leading business as Magna Tyres Group. I am looking forward to contribute to the further execution of strategy and cost management performance in the upcoming years. As we expand our global footprint, capture new markets, my focus would be on further strengthening the balance sheet."

Also, Nico Jacobs has been appointed Advisor, Financial Projects. ■

MICHAEL RUFF NEW CEO OF KRAUSSMAFFEI

Dr. Frank Stieler

Dr. Micael Ruf

Dr. Frank Stieler has resigned as CEO of KraussMaffei Group GmbH. Dr. Michael Ruf, present COO of the company, has replaced him, a statement from the company said. The COO position will not be taken again. Since 2018 KraussMaffei Group GmbH is part of KraussMaffei Company Limited, a public company listed on the Shanghai Stock Exchange. Dr. Stieler has been CEO of KraussMaffei Group GmbH since July 2015 and of KraussMaffei Company Limited since May 2019.

Under the leadership of Dr. Ruf the company will streamline its organisation. This allows further rationalisation to deal with the challenges from the current complicated and volatile economic situation and the impact from the Corona crisis. Dr. Ruf: "We are ready to face such challenges. I enjoyed working with Dr. Frank Stieler thereby creating the concepts for the changes together. I am grateful that he developed the company to this level." ■

TVS SCS NAMES RAVI VISWANATHAN AS JMD

Ravi Viswanathan

Supply Chain Solutions (TVS SCS), India's leading end-to-end Supply Chain Management Services company and part of the $8.5 bn TVS group, has appointed Ravi Viswanathan as Joint Managing Director (JMD).

Ravi Viswanathan joined TVS Supply Chain Solutions from TCS (Tata Consultancy Services), where he was, until recently, the Global Chief Marketing Officer. He is a distinguished alumni from REC (now NIT), Tiruchirappalli, and has lived and worked in India, the US and Scandinavia. Over his thirty-year career at the Tata Group, Ravi Viswanathan has built and led multiple business units and P&Ls at TCS, in addition to establishing a strong TCS brand and the capabilities to support their global clients.

R. Dinesh, Managing Director, said: "We are delighted to have Ravi join us as Joint MD of TVS Supply Chain Solutions. With his multi-faceted career at TCS, he brings the experience of creating a truly global Indian business, working across industries, clients and cultures. The Board believes that Ravi is the right person to take TVS Supply Chain Solutions forward, as we build a globally integrated, and technology-driven supply chain solutions company." ■

COOPER'S DEPINET HONOURED

Missy Depinet

The Manufacturing Institute honoured Missy Depinet, Procurement Director for Cooper Tire & Rubber Company, with a Women in Manufacturing STEP (Science, Technology, Engineering and Production) Ahead Award for 2020. Depinet is among 130 women nationally who earned the honour this year from a field of hundreds of nominees.

The STEP Ahead Awards program, now in its eighth year, recognises women who have demonstrated excellence and leadership in their careers and represent all levels of manufacturing, from the factory floor to senior executive leadership.

"Through a career spanning more than two decades with Cooper Tire, Missy has demonstrated her leadership capability in a variety of roles across the company. Her project planning skills as well as her ability to develop and implement key processes have been valuable in supporting Cooper's business goals," said Brad Hughes, Cooper's President & Chief Executive Officer. "She is a great ambassador of Cooper, and on behalf of the entire organization, I congratulate Missy and wish her continued success." ■

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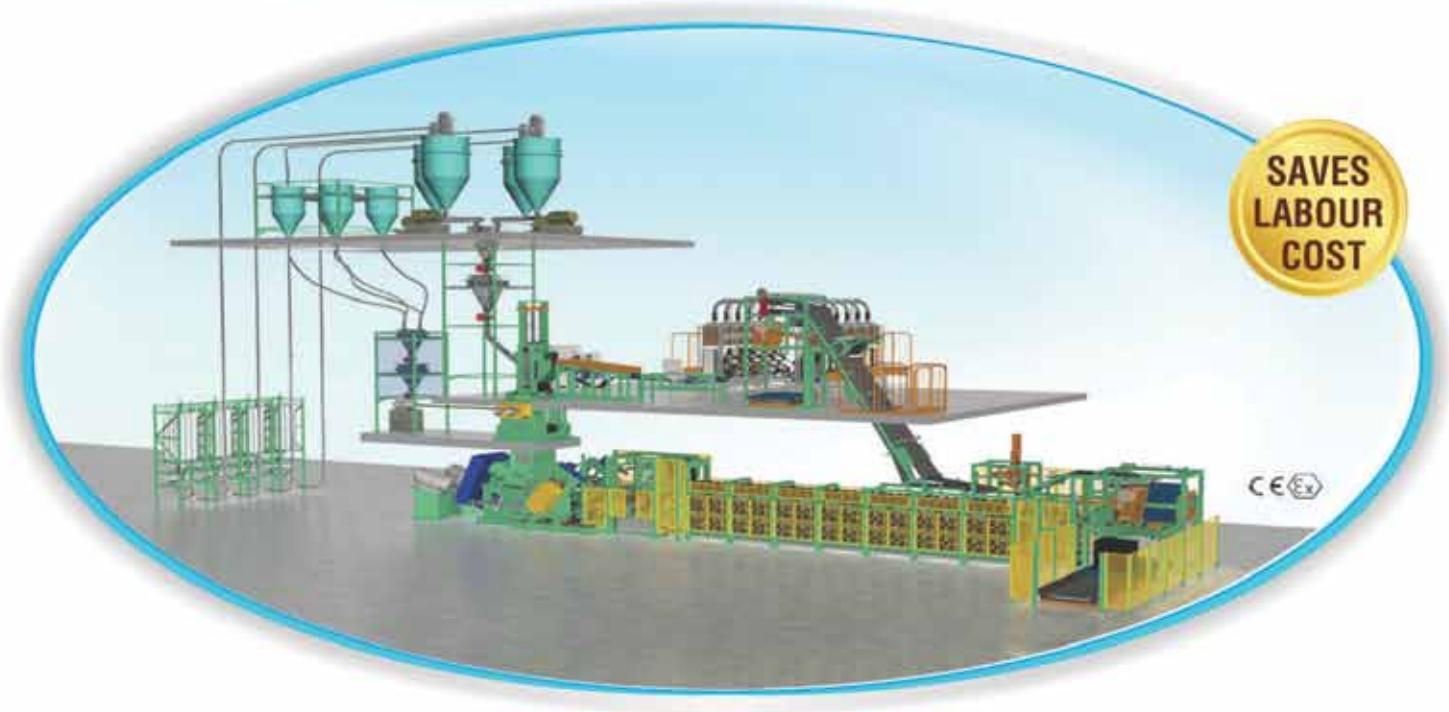

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By Sharad Matade

Manardi Global Consulting's Eduardo Minardi believes that future mobility will be adopted with 'different characteristics and speeds' in mature and emerging markets, but hard changes, such as the adoption of EVs, will be sooner than expected in large cities. "Emerging markets that are lacking infrastructure could find it easier to move on those mature countries that need to change the culture and scrap old infrastructure," says Minardi.

After having over 35 years of successful performance in C suite roles in four continents, Minardi leads a global consulting practice that supports CEOs and mentors leaders that need to reshape business and organisations. In his view, new strategic thinking is required to create value given the simultaneous shift in paradigms provoked by technologies, social and generational trends. On the tyre business space, the ex-senior official of Bridgestone says, emerging tyre companies have grown fundamentally by implementing a low-cost model while copying the leading tyre companies' practices established for years. "Meanwhile, market leaders are investing in new technologies to business models. He stresses the need for emerging players to re-define their role in the marketplace.

CHANGES HAPPEN SOONER THAN EXPECTED

Eduardo Minardi

Q

How would you differentiate future mobility for developed and developing markets as the growth drivers and influential determinants are different for both markets?

The transition from the current model to a future mobility model will take time. It will also have different characteristics and speeds in mature and emerging markets and in large urban cities versus rural areas. This is particularly important for countries like India with such vast territory.

What I usually describe is my understanding of the future mobility model in large mature urban cities. Given the specifics of each country or region, you could infer the evolution of that market.

For sure "hard" changes, like the adoption of EVs, are going to take longer in rural areas but might be sooner than expected in large cities. Emerging markets that are lacking infrastructure could find it easier to move on those mature countries that need to change the culture and scrap old infrastructure.

In any case, I anticipate "soft" changes, like the adoption of digital solutions, will expand very

quickly in all markets, including India. The speed will be determined by the ability to innovate and the expansion of broadband internet and intelligent mobile devices.

We see many disruptive technologies innovated in Europe being adopted in developing countries in the local context. Do you agree to this? Do you think this attitude or strategy will sustain in the long term, or emerging countries need to be more innovative for future mobility?

Emerging countries have shown the ability to create mobility solutions in response to their own restrictions and needs. The BRT (Bus Rapid Transit) solution is just an example.

I estimate there will be a mix of innovative solutions together with the adoption of good practices from mature markets. Like I said before, I see a fast growth of digital startups playing a role in the customer inter-facing sphere. But one model will not fit all as the "emerging market" category is quite heterogeneous.

In developing countries, new mobility has been primarily supported by government incentives. But for the long term, do you think that the automotive players in developing or emerging markets need to change the attitude and strategy to lessen the dependency on government incentives?

Government incentives are needed when the model they pursue does not have the scale to be sustainable or the technology is immature. At the same time, when we mention incentives, we should consider not only "benefits" for the consumers to adopt a certain type of vehicle but "penalties" to the producing companies for not delivering on the CO2 emission reduction, for instance.

Once the market reaches the point it has "critical mass" the incentives will be less critical. Tesla is about to demonstrate EV vehicle production can be profitable at a certain scale. That is going to set up a new paradigm for the whole vehicle industry.

In Emerging markets, we are also witnessing that hundreds of new startups coming in the electric vehicle space and competing with the well-established players. What advice do you offer to such startup founders?

Eduardo Minardi: This situation is taking place in many different industries and markets, not only mobility related. Take, for instance, the beer industry with the disruptive growth of artisanal beer companies. They have created new concepts, new products and even new ways of producing and commercialising them. Large companies have put an eye on the newcomers and made acquisitions and/or JVs. I would encourage the startups in the mobility arena to keep innovating and challenging the status quo. Some will fail, but the prevailing ones will have an impact on human mobility and will be rewarded for that.

What overall impact do you expect on the tyre companies in emerging markets due to CASE?

Eduardo Minardi: The new mobility models in the emerging markets will take longer to displace the traditional tyre business. So, tyre companies can keep producing and serving the market as they do it today. But this will only provide some time to the tyre companies to innovate and adjust their models. Otherwise, they will fall behind and will not be able to compete.

Asian tyre companies are expanding their businesses in Europe, citing better margins and proximity to technologically advanced players. How do you see their future? At the same time, which kind of tyre companies, according to you, will sustain in the future mobility as due to the megatrends the entire supply chain, production and business practices will change.

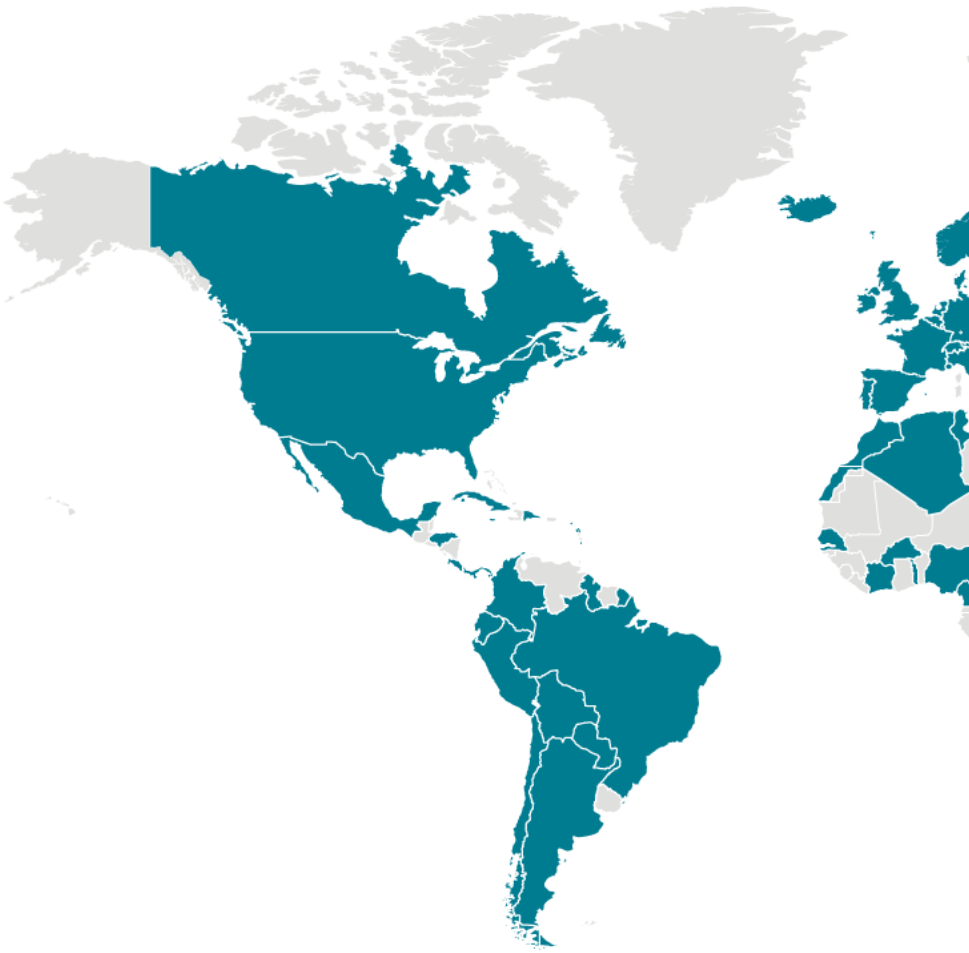
Eduardo Minardi: Emerging tyre companies have grown fundamentally by implementing a low-cost model while copying the leading tyre companies practices established for years. They are getting closer and closer in terms of quality and performance and settling in mature markets. But this is taking place at the time leading tyre companies are moving into new territories actively by participating in the design of future mobility solutions, shortening the R&D process by introducing digital simulations and A/I, creating smart and connected tyres that suit the performance of the new mobility requirements, digitalising the entire value-chain, including manufacturing processes, serving the market through a strong (and in many cases owned) retail network and having invested heavily in on-line and digital marketing. From there, you can see how limited the "copy and paste" model is. I think emerging tyre companies will have to revisit in which market they are, which role do they want to play in the new mobility arena, who their customers will be and how they will serve them, etc. I don't say it will be easy, but absolutely possible for the Asian tyre companies to expand their business if they go through a profound debate to re-define their role in the marketplace.■

By Louis Rumao

Louis Rumao

COVID 19 HITS GLOBAL ECONOMY

The alarming spread of Corona Virus (COVID-19) has been declared as a pandemic by the World Health Organisation. Apart from the loss of human life – over 5,000 and counting - global industry has been hit so hard by it that it will take a long time to get back on rails. So many unknowns remain about this new strain of virus.



Exposure to the Coronavirus (COVID-19) is an unusual, evolving situation with global implications for people and companies in all industries and businesses. The reason for the panic is due to the facts that we still do not know much about its origin, its mode of transmission, incubation period, lack of vaccine and proven treatment protocol.

As COVID-19 continues to spread across the globe, tens of thousands of people have been infected in dozens of countries. The disease originated in China, which has the highest number of confirmed cases to date, but it is now impacting every continent except Antarctica. As the number of reported infections continues to increase globally, countries are bracing for a surge in cases, while hoping that the outbreak has peaked or will peak soon. China's massive containment effort may be succeeding, based on data recently released by the Chinese Center for Disease Control and Prevention. Nonetheless, it is taking a toll in global economies.

Travel Down

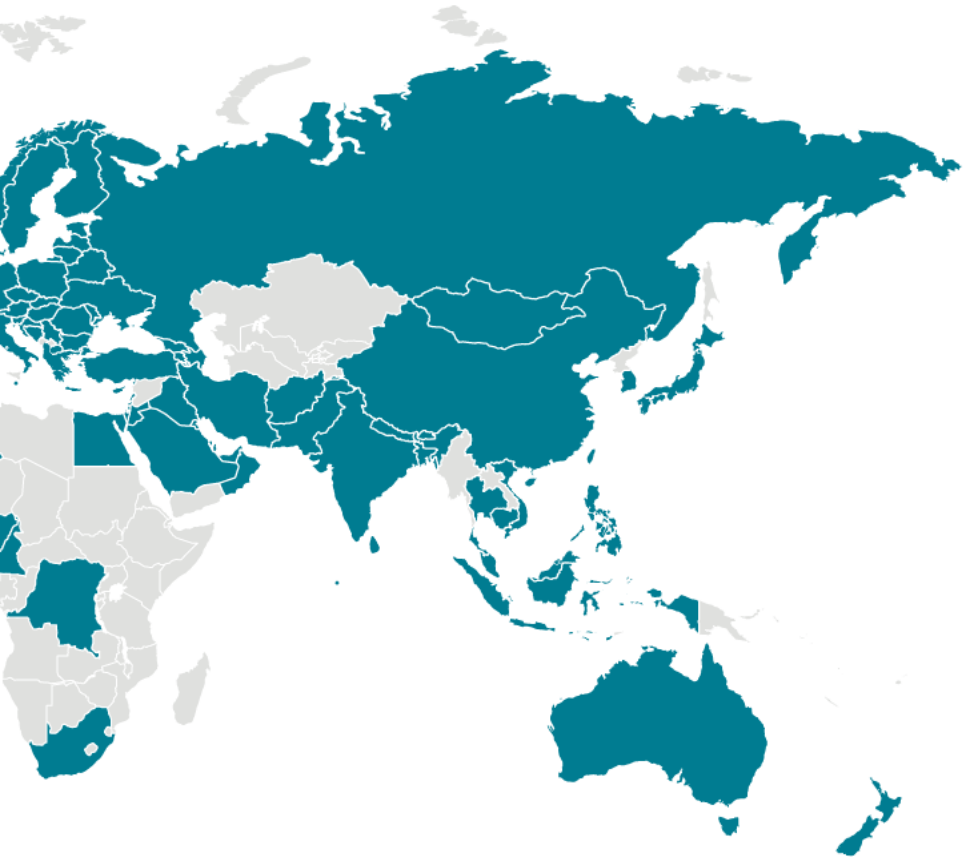
Most businesses have either cancelled, or severely restricted, employee travel to virus-affected zones, and tourism industry is also down. Airlines, faced with a steep drop in travel demand due to the Coronavirus outbreak, are aggressively cutting April and May flights, freezing hiring and asking employees to take voluntary

unpaid leave."Due to decline in demand flowing from the impact of COVID-19, we're taking additional steps to reduce our international and domestic schedules," United Airlines said in a memo from management, affecting 20% of international and 10% of domestic flights. Many airlines are waiving change fees for new tickets. The International Air Transport Association (IATA) had published, just two weeks ago, an initial loss estimateof nearly $30 billion for airline revenue in 2020, which just has been increased to $100 billion plus, with Chinese airlines being the most affected.

Events affected

Promotors of events, such as shows, expositions and conferences, being concerned about the safety and well-being of their attendees, staff and other stakeholders at-large, are either canceling their events outright or announcing detailed steps and precautions being taken at the venue, and publishing guidelines for personal protection while at the event. Many organizers are refunding registration fees for attendees from virus-affected zones.

This year's Geneva Motor Show was canceled, leaving many automakers to unveil their flashy, luxury concepts via live streams and digital events. In the tech world, the most notable cancellations have been Mobile World Congress, which is the biggest smart phone show in the world, and Facebook's F8 developer conference. Google also has announced that its I/O developer conference in May would be cancelled. Some sporting events have been canceled, too. Both Formula One and Formula E have canceled races in China, and the International Olympic Committee has faced increasing questions about this year's summer Olympics in Japan. Italy and few other countries have closed schools for next few weeks.



outbreak-www.cdc.gov

Auto Industry

Even before the Coronavirus outbreak, global auto sales were estimated to decline by nearly 1% this year. Now it seems that sales could dip by as much as 2.5 percent, a significantly sharper decline. According to the China Passenger Car Association report, car sales during the first half of February in China declined a whopping 90%, due to steps taken to contain the epidemic, including quarantines. While China is not a significant exporter of fully assembled vehicles, it does play a major role in the worldwide auto parts and component network. According to industry experts, outlook for the auto industry has turned "negative," but they do see improvements in 2021

For the longer term, it is anyone's guess as to how the epidemic will impact the global industry. The question is how widely the disease may spread and what can be done in response. The latest news from China about slowdown in Coronavirus cases, if true, may offer a sliver of hope that the global outbreak can be controlled. All are hoping that it will happen real soon! ■

By Simon Hodson

SUPPORT FROM OVERSEAS SUPPLY BASES

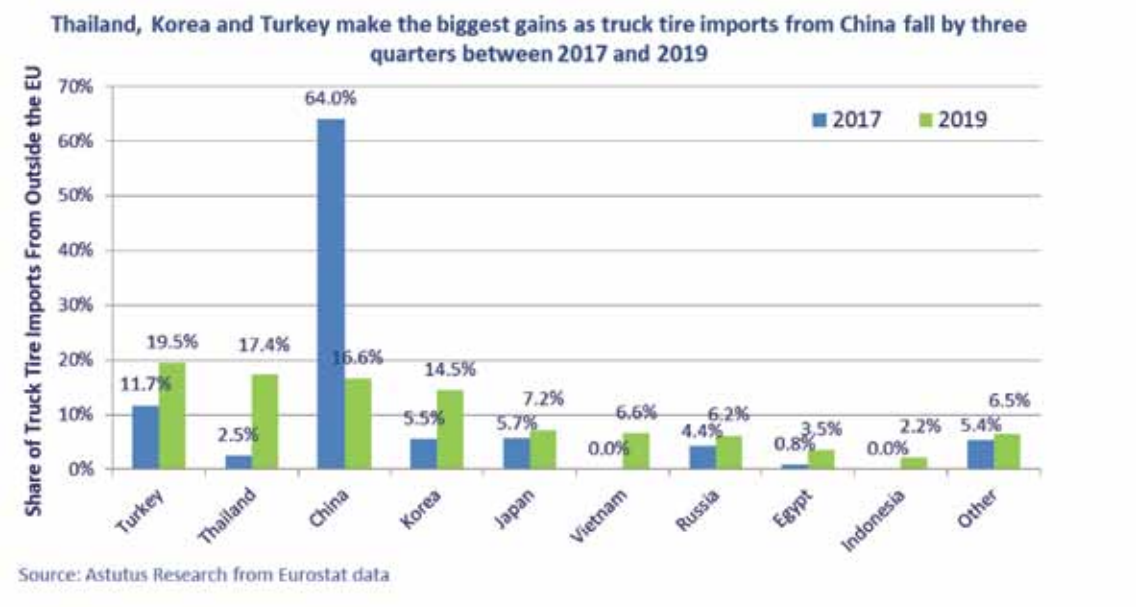
Adjustments for tariffs and overseas investment by China-based manufacturers has significantly reduced the impact of potential disruption to the Chinese tyre manufacturing sector

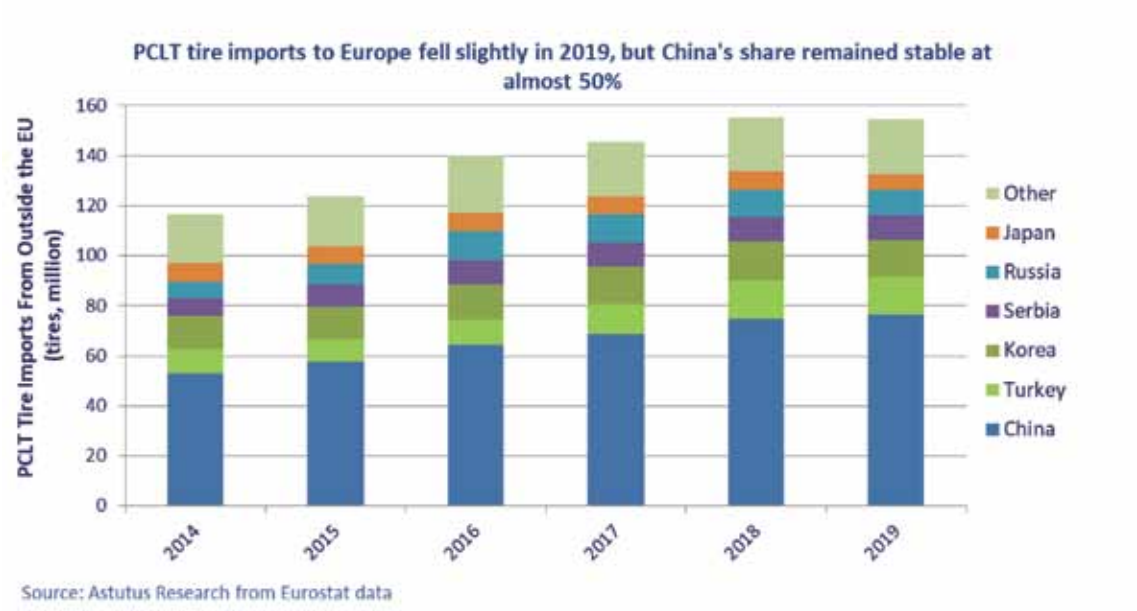
The emergence of coronavirus (COVID-19) in China during the first months of the year has again put the spotlight on the country's pivotal role in the global automotive supply chain. The Chinese tyre segment has undoubtedly been significantly affected, in terms of both the interruption of supply and a sharp drop off in domestic demand.

The full economic impact of the spread of the virus is difficult to predict at this stage, particularly should it take hold in other regions. However, the global knock-on effectsfrom disruption in China's tyre manufacturing sector should be lessened by the fact that numerous Chinese manufacturers have established overseas export-focused supply bases. Furthermore, in two of the world's biggest markets, the United States and the European Union, sourcing has already been adjusted following the introduction of duties on imports of certain Chinese tyres.

In the US, by 2019 imports of passenger car and light truck (PCLT) tyres from China were down more than 90% from their peak in 2014. PCLT tyres from Mexico and Indonesia have increased significantly; meanwhile the volumes from Thailand have tripled, making it the leading source of imports. Similarly truck tyre imports from China have declined by over 60% between 2014 and 2019 but again total imports have risen as new sources have emerged – particularly the ASEAN countries.

The ability of the industry to shift supply is highlighted by the rapid change in the sourcing of truck tyres in Europe following the European Union's introduction of duties on truck tyres





imported from China during 2018. Data for 2018 includes periods under the two different tariff regimes, and therefore a comparison with 2017 provides a better illustration of the changes.

In absolute terms, and amid the disruption caused by the duties, truck tyre imports from outside the EU fell by 11% in 2018, with tyres manufactured within the region gaining market share. Imports rebounded in 2019 and took back some share, with unit volumes increasing by 6.5%.

In 2017, almost two thirds of truck tyres imported from outside the EU originated in China; Turkey, the second most important source, accounted for less than 12%. In the first quarter of 2018 China represented 65% of imports, but by the third quarter this had fallen to just 12%. Over the whole of 2018 the volume of imports from China halved, then fell by a further 50% in 2019.

By 2019 the origin of imports was more diverse, with the four leading sources collectively accounting for 68% of truck tyres from outside the EU and China standing in third place. Imports from Turkey have risen by almost 60% between 2017 and 2019, and it is now the leading country of origin. South Korean imports have increased by 150%, with a 20% unit increase from Japan in the same period.

The most dramatic growthhas come from the ASEAN region where several China-based manufacturers have built truck tyre plants in recent years, including Zhongce Rubber Group and Linglong in Thailand and Sailun in Vietnam. Imports from Thailand have increased five-fold and the country is now the second largest source of EU imports. Vietnam accounted for 6.6% of units imported in 2019, from virtually nothing in 2017. Elsewhere, there was also a three-fold increase in imports from Egypt, where Prometeon operates a truck tyre plant.

One segment where Chinese imports remain strong, and are not subject to tariffs, is European PCLT tyres. Total imports into the EU have increased by a third between 2014 and 2019, despite a small decline last year. Imports from China grew by 45% in this same period, and now represent just under half the total, around 75 million tyres. The volume of tyres sourced from Turkey and Russia has increased at an even faster pace and these are now the second and fifth largest sources.

It will likely be later in the second quarter before any significant impact on supplies from disruption in China becomes apparent in import data. There is clearly spare capacity outside China that could be put to use if necessary. However, where there to be significant disruption within Korea, or contagion to the ASEAN nations or Turkey that impacted on tyre manufacturing, then there would be the potential for interruption to smooth flow of global supplies. ■

***Simon Hodson is Research Director at Astutus Research: shodson@astutusresearch.com**

Continuation from page 9

VIRUSSED!

In November, Cooper Tire increased its ownership stake to 100% at its plant in Guadalajara, Mexico. Cooper Tire had been involved in a venture partnership at the plant with Trabajadores Democráticos de Occidente (TRADOC), which has owned 42% of the plant since 2008.

Indian scene

The Indian tyre industry shared the woes with its global partners. The shutdowns are expected to cause a loss of Rs 4,500 to 5,000 crore for six months from February to July 2020. All plants were closed in March when the nation went into complete lockdown. Reopening plans will be delayed till the lockdown measures are expected to be relaxed as per the ground condition, in early May.

Rajiv Budhraja, Director General of Automotive Tyre Manufacturer's Association (ATMA), was quoted by media as saying: "We have estimated the loss assuming things will get better from August."

According to him after re-starting operations, it would take another six months for the market to stabilise. So, the impact of Covid-19 will be felt for the entire financial year, he was quoted by the media.

"The abrupt stoppage has led to the accumulation of raw materials, semi-finished and finished goods in the supply chain process," he said.

Rubber

The lockdown has affected global rubber production and supply chain movement as well. With practically no production at the plantations, the grind has impacted severely. India, one of the major sources of global natural rubber, saw NR prices falling below Rs100 a kilogram. However, the glove manufacturing sector found the situation at an advantage as medical demand increased dramatically.

The Indian government relaxed the norms for plantation crops during the nationwide lockdown. But rubber farmers and dealers across Kerala, the biggest producer of NR in the country, are still looking for the bright end of the tunnel. Rubber cultivation was done in 5.51 lakh hectares in 2018 with an annual production of 5.4 lakh tonnes. This year, the tapping season ended in February and was about to resume by March-end when the pandemic hit, leading to the lockdown, a media report said. Now, most rubber farmers who kept stocks ready for sale during the off-season are facing severe financial crunch as many retailers are not ready to procure rubber.

According to the Indian Rubber Dealers' Federation (IRDF), the present stock of rubber amounts to Rs700 crore worth. Unless and until tyre companies resume procuring it, the crisis will continue. ■

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By Adam Gosling

Adam Gosling

INSURANCE: TYRED OR JUST TIRED?

Many people fail to acknowledge the tyre simply ASSuMing that their vehicle will respond when they require and as the driver commands. The tyre is the connection between the vehicle and the pavement. It is the weakest link in the modern motor vehicle, the limiting factor of performance

Many of us have insurance for our residences, our vehicles. Business owners are mandated by law in many places to carry insurance. Differing aspects of business require specialist insurance such as liability or indemnity. Yet many operations that utilise vehicles neglect the most basic form and the cheapest form of insurance available.

The humble tyre provides for our societies by supporting our many different styles of vehicles, from a bicycle, motorcycles and the variants of 3-wheelers, the ubiquitous passenger car, the road trucks that provide lifelines to our cities transporting our daily needs and supplying us with building materials. The giant equipment mining minerals and metals that contribute to the structures where we live and work all use the same humble tyre, albeit scaled to gigantic proportions.

Many people fail to acknowledge the tyre simply ASSuMing that their vehicle will respond when they require and as the driver commands. The tyre is the connection between the vehicle and the pavement. It is the weakest link in the modern motor vehicle, the limiting factor of performance.

For a vehicle to perform as the designer intends, and as the driver reasonably expects, all the vehicle systems must be to the designer's requirements. An engine will not operate as expected if the oil levels are low or if the coolant is not full. Many drivers expect the vehicle to "look after them" by having warning alarms to fluid levels that are not "right." Imagine, if only half the windows were functional in our vehicle, or only one of the two windscreen wipers worked during rain. There would be a huge complaint. But when we consider tyres "they are just round and black, they don't matter" seems to be the general attitude. For a vehicle to operate as the designer intended tyres must work as a team, they must all react in the same way at the same time, we can't have multiple individuals working at differing rates on the same vehicle. If such a situation is to occur then the vehicle may respond in different ways, say when turning left compared to turning right, or when braking to avoid an impact. Can you predict which way the vehicle will react? How do you as a driver react when the vehicle does not perform as you quite reasonably expect. The vehicle designers invest astounding amounts of time to get the design "right" but the success of their designs all comes back to simple maintenance, the lowest cost insurance available to you as a driver, appropriate tyre inflation.

Advanced electronics

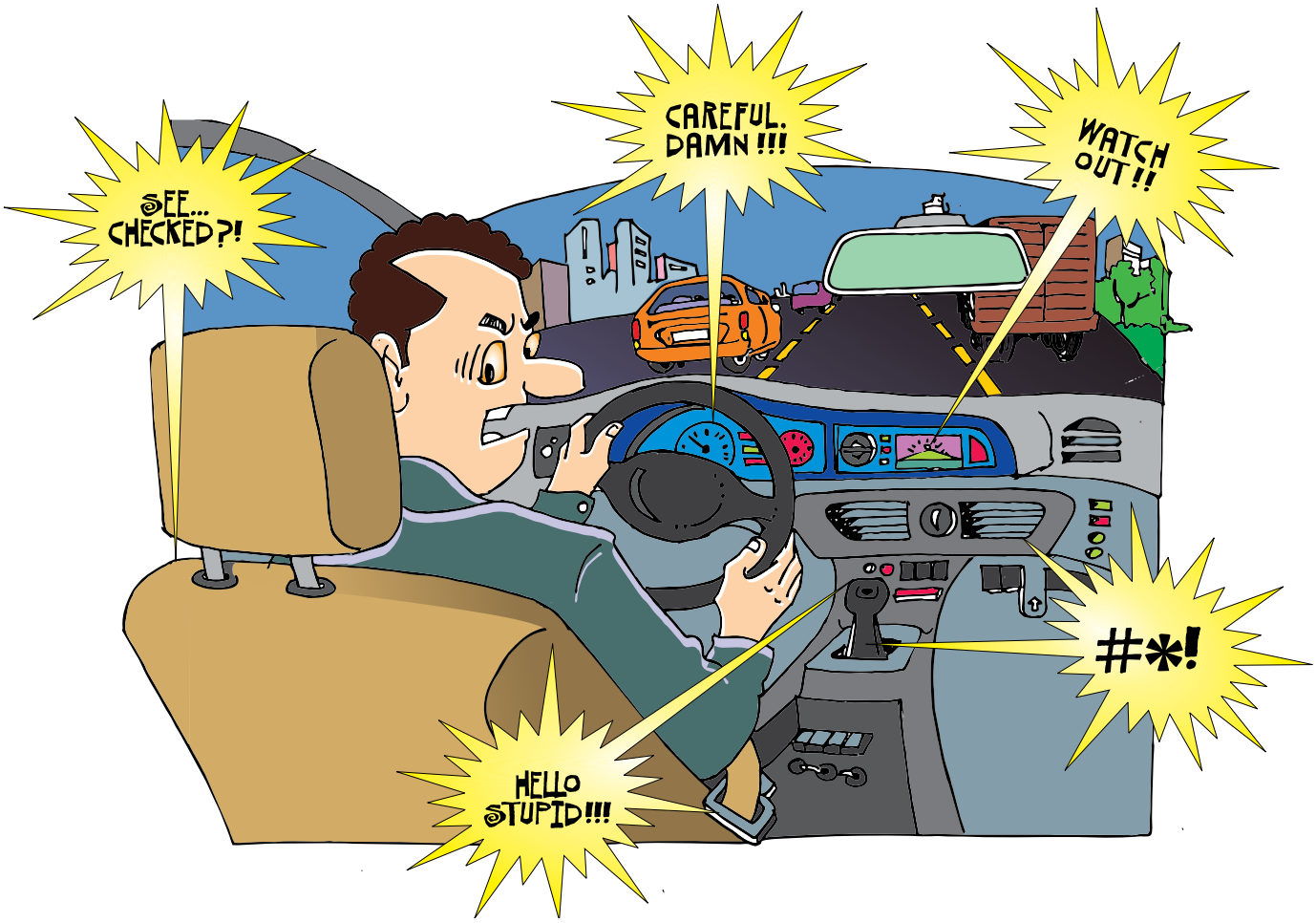
Modern passenger cars have advanced electronics that require certain actions to be completed by the driver, for instance seat belt alerts. These advanced electronics can even maintain the vehicle speed in traffic that is varying in speed. Devices such as LIDAR are indeed controlling the vehicles and yes these systems are used for the autonomous vehicles that are becoming more than just a sci-fi dream. Yet, the foundation of all these vehicle styles is generally ignored by the operators as well as by the regulators. Many seem to ASSuMe that the humble tyre will continue to do the work we

require without maintenance, without attention. Pavement engineers fail to understand the ramifications of improper tyre care. Road safety proponents focus on hi-tech systems with now even exploding bags to hold the driver and passengers in place and cushion external impacts. Tyres?

For all these wondrous developments the humble tyre really has not changed that much since the first road-going vehicles were developed. Sure, technology has advanced with material sciences providing quantum gains but at the core the tyre is still the same as it was. It contains the air that supports the loads applied to it. The engines driving our vehicles have changed and with the evolution of electric vehicles the industry is in a state of rapid evolution. Body shapes have changed to consider aero dynamics; collision safety has driven wholesale changes in vehicle construction with crumple zones. Absolutely agreed, tyres have changed too, The radial tyre developed by Michelin has advanced vehicle performance and comfort of our vehicles in large margins.

Many road safety programmes concentrate on the amount of tread remaining on our road-going tyres. As any racing aficionado will attest a slick (a tyre without a tread pattern) outperforms a treaded tyre by quantum margins but an under-inflated slick tyre will not perform as expected. Knowledge of this aspect of tyre performance assists those outside of the tyre industry to understand how and what a tyre requires to operate successfully and safely. A tyre must be equipped to deal with the worst case scenario it will experience. Again, as racing people understand, slick tyres do not perform on wet pavements. Take it a step further for those livening in environments that experience snow and ice so that sometimes even studs are required to maintain appropriate levels of traction. The humble tyre has to be equipped to perform as we expect in the worst conditions it will experience. Road safety regulators demand consideration is given to the worst condition, as is sensible to expect. So the tread patterns we observe on a modern tyre are a response essentially to wet roads. The tread designs permit the tyre tread to maintain contact with the pavement by pumping water from the contact patch area of the tyre. Some of us may have experienced aquaplaning or hitting a pavement covered in ice with the realisation that you as the driver are simply a passenger is unnerving to say the very least.

For a tyre designer the performance of the tread is a complex design area. The balance



between life and performance requires extensive calculations and testing. Then there are the production aspects where whilst a tread may have all performance aspects covered it won't actually release from the mould used to cure the tyre.

I agree, we, as a society, expect the tyre designers to have the required expertise to be able to provide a product that works not only as the vehicle designer requires but also as the driver will reasonably expect when required. The weak link in this chain is neither the vehicle designer, nor the regulator, it is actually the person who can maintain the tyre in the condition the designer expects. Failure by the driver to perform such maintenance could be the key that results in an "un-explained" accident such as failure to stop causing an impact or a loss of control failing to take a corner.

As electronics have developed rapidly the prospect of being able to monitor a tyre in real time is now very achievable in fact is mandated by many regulators over differing jurisdictions for passenger vehicle tyres. Yet, the humble tyre used on heavy road transport acts on exactly the same manner as their smaller car cousins in requiring the appropriate level of inflation for the load and speed experienced.

The question then begs to be asked "why do regulators consider truck tyres to be different to passenger car tyres?" There is a huge discrimination whichever way this aspect of motoring is considered. If tyre pressure monitoring (TPMS) is required for cars then why not for trucks? If tyre monitoring is not required for trucks, then why is it required for cars? Some bureaucrats may exclaim truck drivers are professionals, they should know! Then I ask how does an autonomous truck know that it has an underinflated tyre and the usual reaction from them is to hide under the desk.

You see the most basic and cheapest insurance you, as a vehicle operator can have, is knowing, I mean actually knowing, not ASSuMing, that your tyres are appropriately inflated. This action costs just a little time, it may well save your life and those of other road users about you.

A safe tyre is one that is appropriately inflated. It is that simple and with tyre pressure monitoring (TPMS) this critical aspect of vehicle safety can be monitored in real time from the driver's seat, even at highway speed. Why do you as a driver ignore the cheapest insurance available? Why do organisations that provide vehicle insurance ignore the simplicity of real time tyre monitoring? Don't ASSuMe, actually know what your tyres are doing in real time.

TyreSafe Australia applies the 5M principle. We need to be able to MEASURE to be able to MONITOR to be able to MAINTAIN so we can MANAGE then we can Make money! It doesn't matter whether we consider tyres or engines if we don't engage the 5M principle then we are losing money, and jeopardising our safety.

The question then remains why do people ASSuMe their tyres are "ok" when in actual fact they have no idea? How safe is this? ■

• Adam Gosling and the team at TyreSafe Australia provide guidance and direction for all tyre users. Safety is paramount, so is efficiency and sustainability. Tyres are a globally universal product, the requirement for tyre safety is also a global standard

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By Ertugrul Bahan, Senior Tyre Expert

TYRES REMAIN MASSIVE AND GREEN!

Ertugrul Bahan

Today, public is more aware of global warming and the sensitivity increases on global environmental issues. Vehicles and tyres ensuring mobility could not remain behind and against this awareness.

Not only are the vehicles on the ground, but each mobility system is under pressure to be lighter and more environmentally friendly. Flying objects, shipping vehicles and all equipment on warships are subject to this pressure.

The main concern of all commercial objects is the mass of the unit, which means weight, cost and inertia for mobility.

Vehicle itself consist main body part and inertia. If the weight is heavy, even though the structure is aerodynamic, total energy consumption remains high.

The vehicle itself plays the main role in energy consumption, since reducing the vehicle weight by 10% leads to fuel savings of 7%, so that the weight has a direct impact on energy consumption. In car manufacturing, ferrous and non-ferrous metals are replaced by materials that increase the specific strength and rigidity.

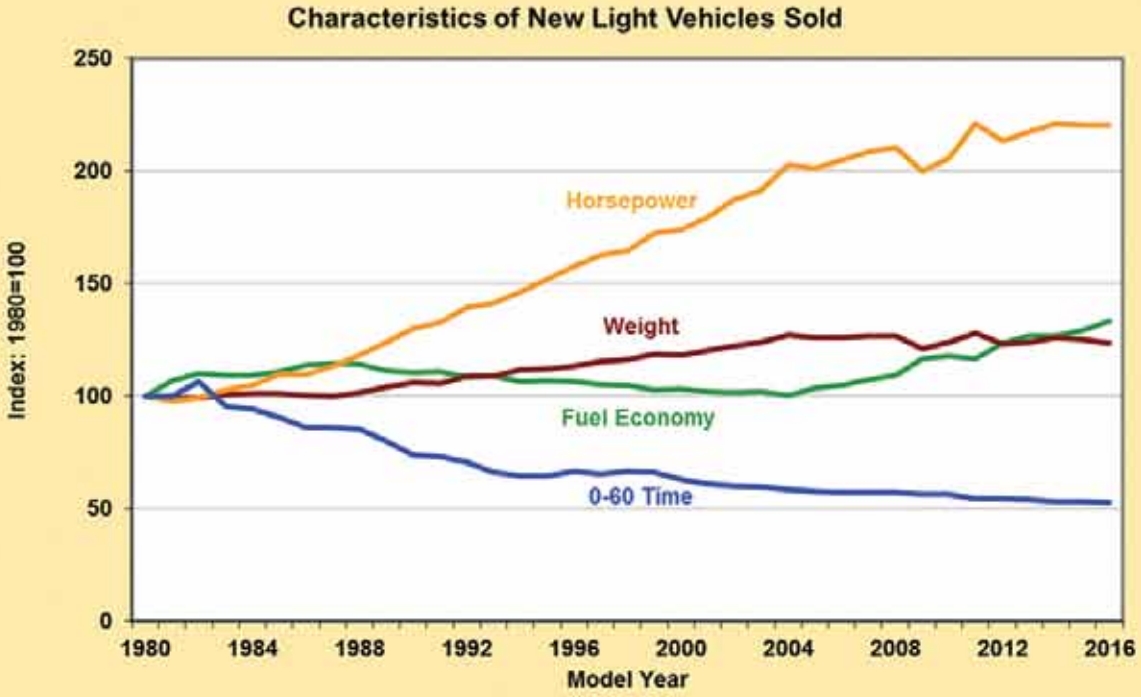
Approaches to reducing the weight of vehicles use new polymers, reinforced polymer composites, nano composites and nano textiles. Not only light weight, but also superior strength, flexibility, efficiency and improved automotive performance are met for specific requirements.

Vehicles always determine the tyre standards. Tyres are still subject to total fuel consumption due to their rubber composition and heat generation structure that form the high-speed rolling part of the vehicle.

In the 1980s, regulations initially forced automakers to limit and eliminate lead balance in time for tyre and rim assemblies. On the other hand, we know that tyre imbalance is parametric with tyre weight. For this reason, reducing the weight of tyres has become a challenge for the first time in recent years. Manufacturers later started producing lighter tyres to maximise comfort and minimise costs and productivity.

Low rolling resistance means less weight and more fuel economy...

Thanks to energy-efficient petrol engines, the vehicle's overall fuel consumption has decreased, but the average vehicle weight has increased to offer passengers greater comfort, safety and space. For reasons of convenience, the tyres have become more massive over the years ... The average weight of car tyres was 7 to 9 kg in the 1990s, when the rim size was a maximum of 15 to 16 inches. The weight of the tyres on the market today is 12 to 15 kg. The rim sizes reached 20 inches, while the 17 to 18 inches were medium in size and



source: www.energy.gov

covered new generation cars. This is actually a huge change in the car market that is forcing all vehicle and tyre designers to forget what they knew before and do everything from scratch.

Regardless of the shape of the tyre, the energy loss due to the rolling resistance of the tyre should be minimal and it is an unlimited topic as long as new materials and new technologies are on the way.

The body mass of the tyre simultaneously provides the rim and brake size, determines the conditions of its load-bearing capacity and its grip on the road. If you want thinner tyres for better aerodynamic configuration, you'll need to switch to 21-22-inch rim models to keep the load capacity constant. The light tyre is therefore a real challenge, which is the main topic of future tyres.

The fact is that regardless of the shape of the tyre, the energy loss due to the rolling resistance of the tyre should be minimal among competitors and meet the automaker's goal. It is an unlimited topic as long as new materials and new technologies are on the way.

Tyre labelling system was introduced in 2010 and the distribution rate of low fuel consumption tyres for passenger cars has increased steadily. The production of "A" quality tyres, which means better rolling resistance, is the main goal of tyre manufacturers. In addition, the design of electric cars as a current trend generally aims to extend the range with a single charge.

The low rolling resistance of a car can even reduce fuel consumption by 0.25 liters per 100 km. This corresponds to a maximum saving of 4% compared to the total cost of fuel and may not appear impressive. However, if you assume that you drive 20,000 km a year or that around 300 million passenger cars are registered in Europe, the annual fuel consumption is EUR 250 per vehicle or a total of EUR 75 billion.

The tyres have to be lighter and more ecological, even if the use of advanced materials can make them more expensive ...

Among a variety of design variables that cover tread, sidewall, belts, inner liner, carcass and their construction and materials, optimising tyre performance is a constant challenge for tyre manufacturers. They choose to reduce the weight of their tyres with every new generation. This not only leads to higher performance, but also to lower production and material costs.

What do drivers gain from it? A lower tyre weight takes a number of factors into account. One of the most important is reduction in rolling resistance, which can reduce the fuel consumption of the vehicle itself, and we have to take environmental effects into account.

The so-called less weight of tyres means reducing the weight of individual components and using lighter design concepts that are in line with technological developments for the use of lighter materials. Here, companies often use advanced technologies and materials that can make the tyre more expensive, even if it's lighter. Recently, various polymeric nano composites have been widely used in tire application to extend tyre life, reduce rolling resistance, abrasion resistance, friction and wet grip.

Tire designers must always meet the expectations of car manufacturers with regard to rolling resistance criteria and offer the class A + tyres in order not to lag behind their competitors. Reducing tyre weight is one way to show and prove success. However, we have to say that the physical shape of the tyres remains large and massive, but the tyres have to be greener! ■

By PP Perera

Sustainability or vulnerability?

It is rather ironic that even the indigenous entrepreneurs of the Sub-continent, let alone the West, have not thought of integrating the principles and concepts to generate a synergy with the modern concepts to maintain sustainability in the real sense and minimise the vulnerability

PP Perera

The world has witnessed tremendous and meteoric progress in the growth of business enterprises, contributing to national wealth and raising the standards of living, especially in the West. The growth that followed in educational, social, health-care and consumerism, has been monumental.

However, episodes of huge investments, both local and across borders, run hand in hand with closures, downsizing, right-sizing, rationalising, layoffs, Golden Handshakes, streamlining the value chain, becoming lean, BPR, and a whole plethora of terms and definitions which denote drastic reactive measures to put matters correct. This made me wonder whether things were not planned correctly in the first case with all the back-up from modern management thinking and knowledge-based approach, which has become a pet theme during the past two decades. Or whether the current paradigms have outlived their useful life cycles, proving again if the product life cycle applies to management thinking and strategies as well. One is tempted to speculate if the modern corporate world is suffering from the "Boiling Frog Syndrome." If a frog is put in hot water, it will immediately jump out. However, if it is put in cold water and the water is slowly heated, it will keep on acclimitasing to the temperatures by virtue of the inbuilt biological mechanism common to cold blooded animals. During the process it uses its energy, and when the water reaches the boiling point, it will have no energy left to jump out of the water. On looking back, we can see remnants of such companies in the corporate grave yards. Success stories are more often disturbed by stories of failures and disaster.

Escape route

Downsizing and restructuring in the pretext on maintaining sustainability has become a key escape route for corporate giants, and tyre industry is no exception. Sustainability means that a process or state can be maintained at a certain level for as long as is wanted. One of the most often-cited definitions of sustainability is the one created by the Brundland Commission, which defined Sustainable Development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability relates to the connection of economic, social, institutional and environment aspects.

The holistic approach of management, evident in the ancient literature and practices have taken in to account, the physical and mental health, mental, social, environmental and spiritual aspects, to mount a comprehensive way of managing the personal as well as social and business life

While looking at the events happening in the corporate world. I am inclined to speculate if the corporate leaders have incorporated all these components or only prioritised the economic or sustainable profit motive

The bestseller "In Search of Excellence" by Tom Peters, and Robert. H. Waterman in 1982, identified eight

key features of the best American companies, as a result of an extensive survey. However, it is learnt that a substantial number of them ran in to difficulties during the next two decades. Similarly, some of the proponents, of the Five Forces Model of the Michael Porter Framework of 1979,are beginning to wonder about the utility of the approach to the modern times.

The nations of the world seem unthinkable to assume that their reserves of strengths are inexhaustible. Against such unwarranted beliefs stands the universal Law of Impermanence, the fact of incessant Change as found predominantly in the Hindu and Buddhist doctrines. The Law of Impermanence, includes the facts shown by the history and by the daily experience, that the external opportunities, for material and spiritual regeneration and the vital strength and the inner readiness required for it are never without limits, either for an enterprise or a country. It also raises the serious issue of Vulnerability. This has been aggravated by the coronavirus pandemic is having unprecedented impact on the global rubber industry as businesses close, production is scaled back, travel and shipping are disrupted, and events are canceled and postponed. Throughout the industry, company officials are trying to strike a balance between being prudent and cautious when it comes to navigating a business environment made uncertain by the coronavirus' impact. Global auto makers and suppliers are scrambling to respond to the massive dislocations in their supply chains caused by the coronavirus that broke out in China.

It seems time has come for the corporate world to reassess the business philosophies they have been practicing over the past fitty or sixty decades and search in to the ancient wisdom of East, especially those practiced for ages India and Sri Lanka, before the Western domination, enforced their own systems solely intended and economic gains. The holistic approach of management, evident in the ancient literature and practices have taken in to account, the physical and mental health, mental, social, environmental and spiritual aspects, to mount a comprehensive way of managing the personal as well as social and business life. Economic aspects are considered in conjunction with fulfilling social requirements while devoting much attention to the human individual, without, solely considering it as another resource component of the 4Ms). It is rather ironic that even the indigenous entrepreneurs of the sub-continent, let alone the West, have not thought of integrating the principles and concepts to generate a synergy with the modern concepts to maintain sustainability in the real sense and minimise the vulnerability.

The genius Albert Einstein, with his scientific and mathematical foresight once quoted "I know not with what weapons World War III will be fought, but World War IV will be fought with sticks and stones." I leave it to the readers to form their own interpretation of the quote.

**** PP Perera is a Colombo-based tyre/rubber industry veteran and management consultant***

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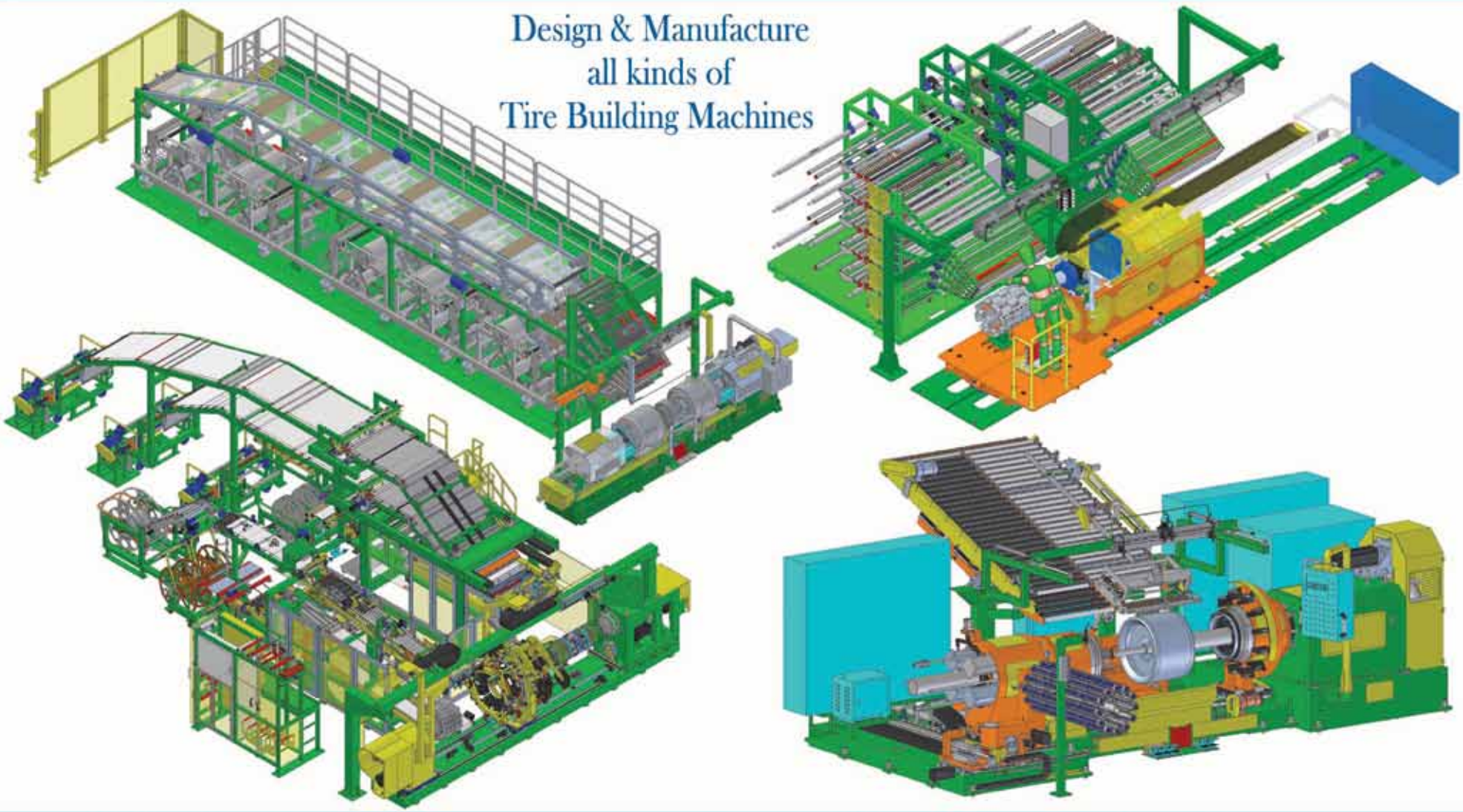

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TYRE TESTING: FINAL CHECKPOINT

TT News

Optimum level of safety, reliability and performance differentiate a good tyre from bad. The question of a "bad tyre" does not rise in the industry. So, manufacturers work to ensure that their product sticks to the best quality in all steps of its development. This makes Tyre Testing the crucial final check point before the tyre enters the market. Several factors need to be in place to achieve that level of quality. It is cutting edge technology that helps it to reach that level. This comes in the form of testing machines, testing processes and testing facilities. More importantly, this has to be changing in tune with the changing priorities of the industry. When it is Industry 4.0, then the final check point also needs to be Testing 4.0

COVER STORY

Transition to

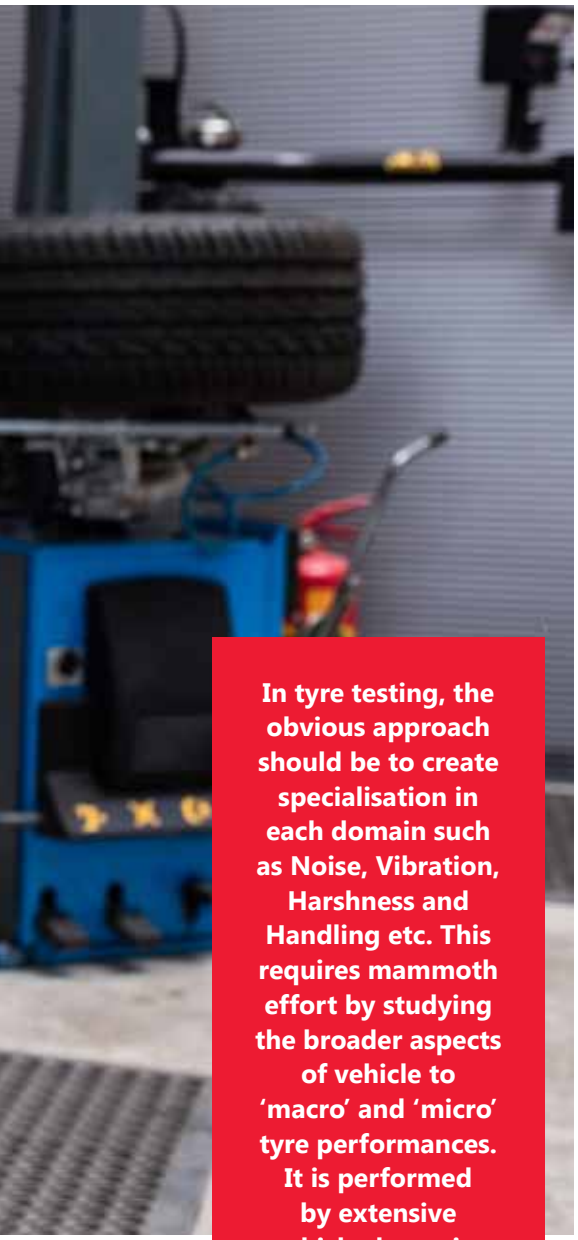
For tyre development and testing, there is a need for transition to Testing 4.0

Juban Thomas

By Juban Thomas,
Vice President - Global Testing and Vehicle Dynamics, CEAT

Disruption. This is one of the words that reverberates in numerous discussions at almost every work space. To succeed in disruption, the only constant is change. The initiation to change is triggered by internal drivers or external challenges, like today's global scenario. We need to evolve, adapt and amend the course at all times. Yet, the approach should be detailed with phase-wise change management. From a big picture point of view, this approach resonates with the Industry 4.0 revolution. On those lines, for tyre development and testing, there is a need for transition to Testing 4.0. Let me share the questions I ask myself for this transition and the motives I trust on.

Testing 4.0



In tyre testing, the obvious approach should be to create specialisation in each domain such as Noise, Vibration, Harshness and Handling etc. This requires mammoth effort by studying the broader aspects of vehicle to 'macro' and 'micro' tyre performances. It is performed by extensive vehicle dynamics measurements at the outdoor test track and correlating it to tyre performance data from advance tyre characteristics equipment

Why the need for this transition?

Tyre testing is a continuous effort to develop and confirm the quality, reliability and performance of a tyre, from inception to its end of life. As a tyre is developed with insights from customer's and consumer's requirement, the need for novel ways of tyre validation becomes imperative. Today, the need to move forward becomes vital with concepts like predicting tyre performances at early stage of development. This can be leveraged with analytics considering the abundance of valuable data. This realisation is key to gain first mover advantage, first time right products and reduce time to market.

We also need to invest in people capital to enable such a transformation. It can motivate and challenge individuals to unleash their talents.

How do we do this?

This needs visualisation of depth vs breadth dilemma. Like a banyan tree. The depth of the roots goes deep while it continues to grow taller and wider. It is a two-step process. Firstly, it is deepening of expertise and then, it is widening of knowledge.

In tyre testing, the obvious approach should be to create specialisation in each domain such as Noise, Vibration, Harshness and Handling etc. This requires mammoth effort by studying the broader aspects of vehicle to 'macro' and 'micro' tyre performances. It is performed by extensive vehicle dynamics measurements at the outdoor test track and correlating it to tyre performance data from advance tyre characteristics equipment. Some of the enablers could be DoE, attribute sensitivity studies and converting 'feeling' into 'data.' This journey put together forms Testing 3.0.

Why we need Testing 4.0?

For Testing 3.0 to sustain, specialisation of capability and specific domain expertise needs to be nurtured. However, there are limitations to it such as learning scalability, domain specific data complexity, horizontal deployment challenges, skilled manpower dependency and longer lead times. This includes the dependency on tools that are commercially available.

Hence, Testing 3.0 needs extension with a contemporary approach of deploying newer technologies like data analytics, machine learning and Artificial Intelligence. This is where, Testing 4.0 is conceived.

When can we start this transition to Testing 4.0?

After domain expertise is deepened, it aids expert teams to validate a tyre with a synergized cross functional perspective. This forms the basis of widening of knowledge. This is when, the boundaries of specific domains fade and merge as a collective breadth of know-how in tyre development and testing.

How do we go about Testing 4.0?

With the advent of open source applications, codes, affordable sensors and micro-electromechanical system (MEMS), it is exciting to create bespoke solutions for unique challenges faced in tyre testing. There are numerous benefits of this approach such as lower initial costs, quick to prototype, faster ROIs, flexibility in algorithms for prediction etc.

I feel, Testing 4.0 will stabilise and mature over the next 3 years, which will be an exciting new chapter in tyre development and testing. ■

Ralph Barres and Dieter Barz, Altracon

IGTS: The reference for wet and dry grip road measurements

Altracon has developed the new standard trailer for high-precision on-the-road tyre measurements in joint cooperation with tyre maker Michelin

By Ralf Berres and Dr. Dieter Barz

The Industry Grip Testing System (IGTS) is a brand new measurement trailer, developed as a joint project between tyre maker Michelin and solution provider Altracon. It comprehends the knowledge of both tyre and measurement equipment experts and represents the technically feasibility in terms of tyre characteristics measurement on the road with state of the art ease of use.

The Altracon Industrial Grip Trailer System IGTS consists of a modular concept design. One development target was to keep the system variable for existing as well as for future test- and measurement tasks and to adapt to any kind of on the road testing requirement.

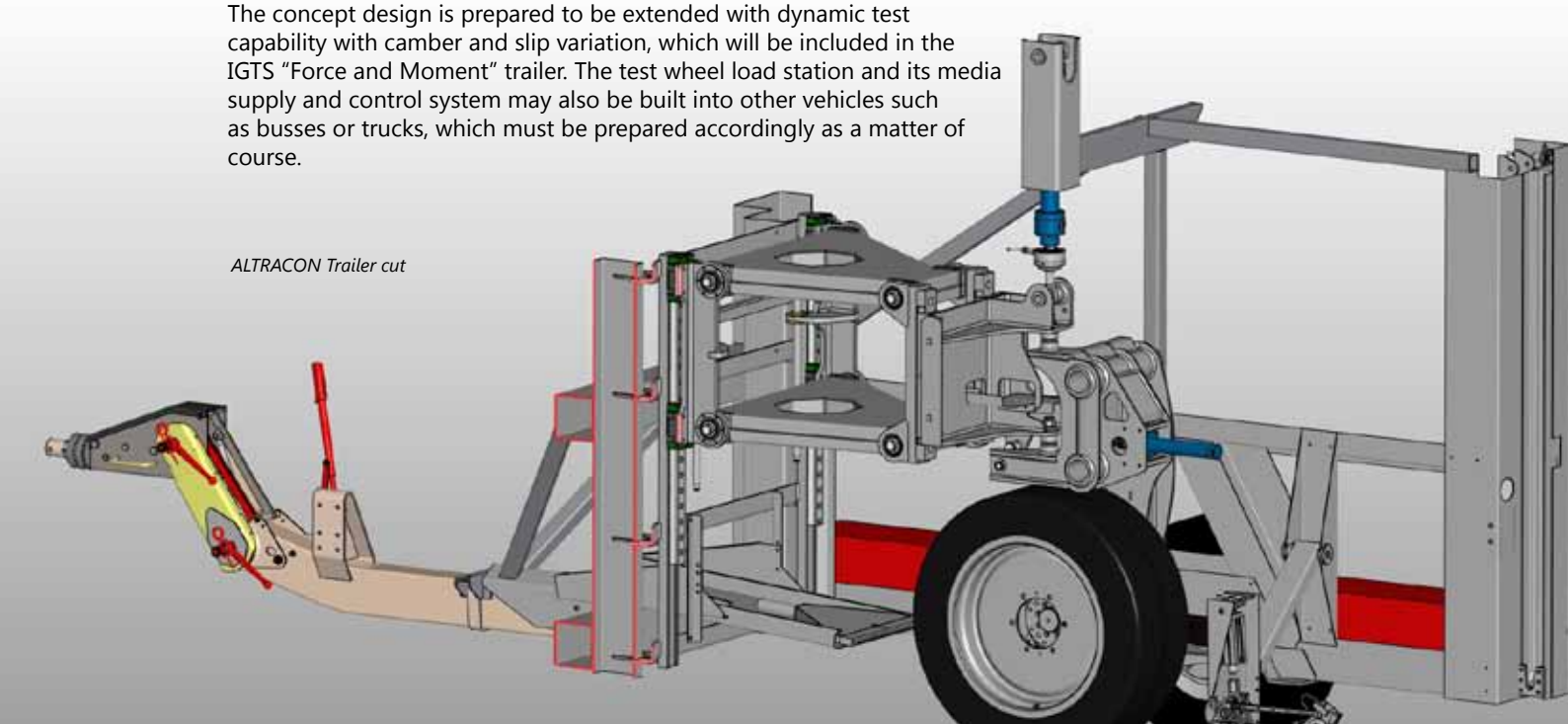
The IGTS grip testing trailer is built for straight dry and wet-braking tests. The trailer's frame and wheel load station are optimised by FEM technology for highest stiffness and lowest deformation.

Design features

The trailer is made of a stiff frame with independent wheel suspension for the left and right wheels and is equipped with a variable towing bar to level different heights of the vehicles hitches. It may be pulled from any drawing vehicle with sufficient trailing load and engine torque for the measurements, no matter if it is a Pick-up, SUV, or truck. The IGTS hosts an independent test wheel load station. It is placed in the center of the trailer between the carrying wheels and presses the test wheel to the road surface on a path between the trailer wheels. The test-wheel load station is equipped with a high-performance disk brake to apply the braking torque/ force to the test wheel for grip testing. All functions are independent from the drawing vehicle while it carries all the necessary supplies on board except of the water tank, which is carried by the drawing vehicle.

The concept design is prepared to be extended with dynamic test capability with camber and slip variation, which will be included in the IGTS "Force and Moment" trailer. The test wheel load station and its media supply and control system may also be built into other vehicles such as busses or trucks, which must be prepared accordingly as a matter of course.

The trailer is equipped with a modular undercarriage set-up. The basic trailer requires only one axle to perform grip measurements, which are done straight rolling/ braking. The directional stability of the trailer is enhanced by two additional lift axles, one in front and one behind the carrying axle of the trailer, to run dynamic tests with the IGTS on the road when it is equipped with camber and slip variation functionality. These lift axles are only used during the actual measurement and will be lifted for taxiing and transportation. Both axles use smaller wheels than the carrying axle and also have independent wheel suspension. The wheels of the lift axles are moreover actively steered to balance side forces which may be generated during testing. The drive performance control system adjusts the trailers' Eigen modes in vertical and lateral direction and significantly improves the directional stability.



ALTRACON Trailer cut

Altracon

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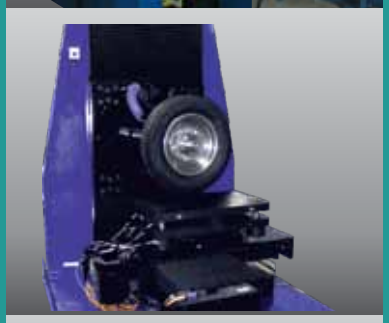
  - Loss of inflation pressure measurement
  - Tire burst testing systems
  - Drum tire testing machines
  - Dry-/ wet-braking grip measurement trailer
- Road surface evaluation systems
- Water jet cutting solutions for tires
- Retrofitting service







ALTRACON is respresented in India by DAWNSUN EXIM Corp. - dawnsun@tiretechindia.com

www.altracon.com

The IGTS test wheel load station is light-weight to reduce the effect of mass of inertia. It is equipped with an active wheel load control while previous test trailers just use dead weights. A fully automatic and adjustable damping control at the testing axle adjusts the Eigen mode and cares for smooth running and best precondition for the measurement on any road. The high-performance long-life wheel spindle is specially designed for lowest rolling resistance.

Power supply is done by batteries, which are loaded by generators. These are inbuilt to the carrying axle at each side. The power supply engineering may be designed as 48V DC as well as 240/400 1- or 3-phase AC with converter for special applications.

Compressed air is supplied from an inbuilt compressor with air tank for inflation pressure adjustment or control as well as for connection of air driven tools.

Hydraulic supply from an inbuilt hydraulic pump system with accumulator tank enables dynamic load, brake, and steering function. The high-speed characteristics of the hydraulic supply is suitable to simulate braking performance (ABS) and quick release brake pressure at the test wheel. It allows to run up to 8 repeatable tests per 100 m in a sequence in combination with the high-performance brake-control techniques.

The optional water management system is integrated and allows controlled watering of the test-wheels path. The nozzles are placed in front of the test wheel. Their watering width is adjustable to 420mm and their watering height is controlled by flow-measurement, which is adjustable between 0 and 4mm at maximum speed of 100 km/h. The system is operating with continuous water flow for quickest reaction times. It is pressure-controlled and switches between circulating and spraying mode without any time lag and pressure loss.

Measurements

The trailer speed measurement is precisely done directly at both carrying wheels. Different speeds measured at the left and right side indicate deviation from the straight path. The alignment of the drawing vehicle and the trailer is moreover precisely measured with a laser-based alignment measurement system if the IGTS is equipped with camber and slip variation functionality. Inputs from both, the speed and the alignment measurement system, will generate correction of the directional stability by the control system.

The wheel speed of the test-wheel is precisely measured directly at the test-wheel spindle with an encoder, which also gives information about the braking process of the test wheel.

Forces and moments at the test wheel are synchronously measured in x- and z-direction with 1-component sensors. A multi-component force and moment dynamometer, which may use strain gauge or quartz technology, is optionally available as an alternative. It is integrated to the wheel spindle, fully covered and shielded. However, both set-ups are available either independent or together.

All measurements of motion are done with precision sensors, using various technologies, depending on the entire parameter. For referencing, speed and location recording different control and measurements techniques are used as well.

Ergonomics

The test-wheel carrier design enables to turn the wheel by 90° around its vertical axle for wheel exchange and service. This allows the operator to access the wheel fixation from the back of the trailer. ■

SUMMARY OF DISTINCTIVE FEATURES

- Light-weight wheel suspension to reduce the mass of inertia
- Low rolling resistance high-performance long-life wheel spindle
- Measurement systems as single axle or with dynamometer technics
- High precise load control designed for equalised axle weight
- Eigen-mode adjustment by fully automatic and adjustable damping control at the testing axle
- Brake system with high speed characteristics hydraulic supply to simulate braking performance (ABS) and quick release brake pressure
- High performance braking control system
- Test sequences with up to 8 tests per 100 m in a row.
- Modular trailer undercarriage for one or three axle systems for characteristics testing including drive performance measurement and control technics to adjust the trailers' Eigen-mode in vertical and lateral direction
- Integration in existing testing environment and customised data solution
- Different control and measurement technics for referencing, speed and position recording
- Optional water-levelling system to apply an adjustable water film in front of the test-wheel in case of a missing road watering system

The challenging world of new tyre development tests

Mehmet Koral

Mehmet Koral has 40 years of experience in tyre industry. He started career at Lassa Tire Manufacturing, Izmit, Turkey (now BRISA). Koral has worked for BRISA Technology division for 22 plus years. He retired in 2003 and has been a consultant for several companies in China, India, Russia and the Republic of Tatarstan. He also helps well-known tyre manufacturing machinery companies from Europe, USA, China, and Japan. He has participated in performance improvement tests, OE tyre approval tests, road, and field tests, standard and regulatory tests both indoors and outdoors. He participated actively in ETRTO (European Tire and Rim Technical Organisation). He also served as the Chairmen of the UN ECE Tires S/C for Turkey about ten years.

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By Mehmet Koral

The point, or better area of contact, of the tyre with the road is in fact a surface. When the tyre is inflated onto a rim, and installed at a vehicle properly, the weight of the vehicle applies a certain vertical load for each tyre and rim assembly.

The safe and reliable driving of any vehicle is a resultant of the vehicle, its tyres, and the road and the driver interaction. It is a dynamic interaction between these variables and the climatic conditions in the environmental climate. Each may affect the safety of the travel and transportation differently e.g. dry road, wet road in the rain, snow and ice on the road in winter. We should better remember that the only contact area of vehicle is the contact patch (footprint) of the tyre and its response to everchanging road conditions. Driving uphill, driving downhill, taking curves along a travel are among them.

It is important to understand the tyre behavior before we start development of a tyre, and related tests to be applied indoors- on the drum, and outdoors- on the roads and test tracks.

In order to be able to analyze the forces and moments which are acting on a vehicle tyre, especially during cornering, we need to define an **axis (coordinate) system**. Since the wheel can move in three directions, we need a 3-D coordinate system. The most common one being the tyre axis system defined by the **Society of Automotive Engineers (SAE)** and by ISO (International Organization for Standardization).

The SAE standard which defines the tyre axis system and terminology is **SAE J670 – Vehicle Dynamics Terminology.**

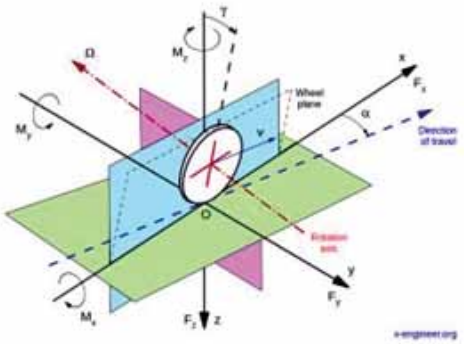


Figure: Tyre axis system and terminology defined by SAE standards (right-hand road wheel)

Who needs tyres?

Who needs and initiates a request for a specific tyre of a specific vehicle? Vehicle manufacturers.

It is not a secret that there are vehicles that do not need a driver today. However, we did not hear yet about a vehicle on the ground roads that runs without tyres!

All ground vehicles need tyres-one way or another. Pneumatic tyres or not, low profile or not. Textile belted or steel belted tyres or not. All steel

tyres or not? Simply because, without their tyres all vehicles are stationary machines only-they cannot move.

When does the development of a new tyre start, **where** does it start from? **How** does it deserve allocation of company resources for its development, testing indoors, testing outdoors, and for its production; money, manpower, machinery, material, time and technology concerted efforts of a large team of experts? It is initiated by the definitive needs in a certain segment of a vehicle market is agreed and signed by the Vehicle and Tyre manufacturer managements.

Tyre needs of today; there are new vehicles, with new tyre sizes imported and running on domestic roads. They have original tyres mounted under them as they are imported.

That fires the enthusiasm of local tyre manufacturers in the domestic market. Why? Due to the international partnerships worldwide, these new tyres are imported and sold in domestic market at start.

Tyre needs of tomorrow; domestic tyre manufacturers closely follow up of the imported vehicles be it a car, truck, light truck, or a giant off the road vehicle. Searches for the imported vehicle trends, and projections of the tyre sales needs of 2-3 years later are made. These indicate to the tyre needs of tomorrow in the market.

Tyre needs of today and tyre needs of tomorrow bring forward new tyre needs to be understood and put this need into a perspective of the company investment plans.

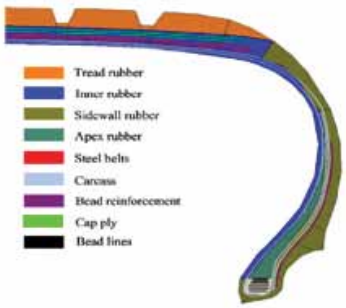
These findings are reviewed and used as a criterion to develop a new tyre, or not by the Tyre Company management. Sometimes it is decided to start development, because new projects bring eye-opening discoveries, they become new technologies and new technologies become new products to give better performance, more safety and greater economic benefits for the society and the providing Tyre company.

Development process for tyres.

How does the story of tyre development start, where does it tart from?

Due to the international trade, and due to partnerships established worldwide, the tyres may be imported and sold in domestic market. However, usually domestic tyre manufacturers closely follow up the imported vehicles; be it a car, truck, light truck, or a giant off the road vehicles. They estimate about tyre needs of 2-3 years later.

Tests applied during the design and development of a tyre

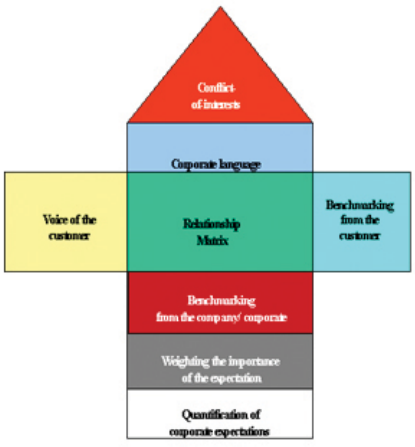


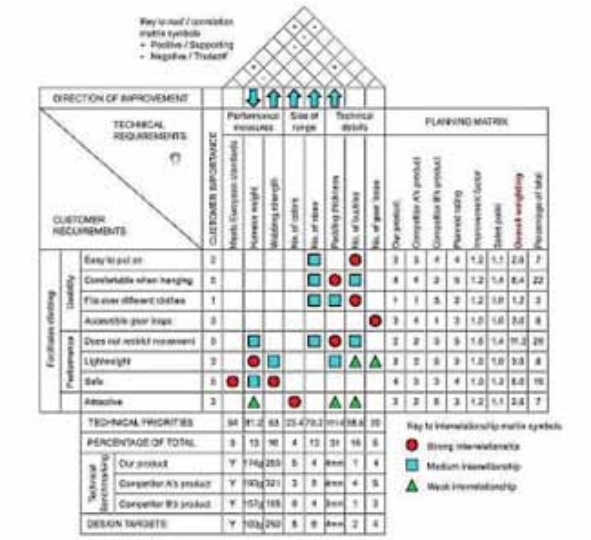
How long does it take to start from the scratch of pattern exercises to the tyre released for Warehousing, Shipment, and Sales in the market? 2-3 years normally.

Who takes care of all the detailed and sometimes tedious work to develop a new tyre?

A new tyre may be a new size for an existing tread pattern; it is then called "size expansion". It is relatively faster to complete. There is observed some active critic of the pattern expanded to cover a new tyre size. In such a case, it may be later understood that one property of the tread pattern for the new size is became bad. e.g. ride comfort, uneven wear, vibration and enveloping power of that tyre.

A new tyre may be a brand-new tread pattern for the market introduction. For such cases it is a must to employ the principles of the Quality Function Deployment (QFD. QFD methodology starts with listening to the customer (understand and learn her requirements), listen to his preferences in the competitor's tyres, and (make Benchmarking for your new tyre), then make deployment of the design to your manufacturing capabilities at production, complete any missing part in these series of deployment matrix, this will be a whole learning process together with Design, Engineering, Production, Production Planning, Marketing and Sales teams.





Some Tyre companies calls this as Tyre Project Marketing Review (TPMR) when they start the project.

Based on real life examples, this right approach does not perform, the ownership of the project is shifted to participating other groups. Management ownership loosens. The limiting factor is here the duration of the process, if it is not managed closely time is lost, resources are wasted. Release target of the new tyre project is lost. To eliminate such loses Process Ownership methodology is the approach to implement.

QFD also includes intensive works of competitor tyres, both construction and compounding is re-engineered and a Dimensional Standard Specification is created for that tyre; pattern, outside diameter, section width, s-depth, void-to rubber ratio, branding, its positioning according to tyre standards (e.g. ETRTO-European Tyre and Rim Technical Organisation head office in Brussel, EDI (Enginering Design Information) reference books of ETRTO for Tyre Design Engineering).

Its position in the other Tyre Standards and Regulations e.g. DOT (Department of Transportation, FMVSS (Federal Motor Vehicle Safety Standards) in the US is also cross checked and learned.

If that new tyre for an OEM customer, manufacturer of target vehicle may be contacted, consulted, and worked together if they look for another tyre as OEM part for that vehicle. If it is so, then a series of the tests and evaluations defined by the vehicle manufacturer is applied both indoors and outdoors at their proving grounds, and country roads, or private proving test grounds. Usually, the vehicle manufacturers have their own vehicle proving grounds, and sometimes they may utilize proving grounds closer to their manufacturing sites.

Some example can be mentioned as Renault OEM approval tests in the Monthlhery Racing Circuit (Autodrome) near Paris, for FIAT it may be the Valelunga Test track near the Balocco proving ground of FIAT. Toyota used her Proving Grounds in Japan for approval tests. Hyundai uses her Test Tracks in Korea. This is a well implemented approach by many OEM (Original Equipment Manufacturers).

These PG testing is usually accompanied by the ride comfort testing in the vicinity of the proving grounds.

Vallelunga Test Circuit near Rome is utilized by FIAT in Italy.

In Turkey, for example, the country roads are used for Ride comfort testing, highways are used for maneuverability tests. Ride and handling tests are done in the Korfez test track in Kocaeli, and sometimes it is done in the Formula 1 Test Track near Istanbul.

In recent years, Petlas tyre manufacturing has invested and built a Test Track near its plant in Kırsehır central Turkey. Two professional test drivers who are closely worked with the Tyre design engineers makes joint tests and make design review meetings based on the Ride and Handling results. Important to mention that these test pilots are involved in tyre and vehicle tests in the vehicle manufacturer's country together with their test drivers. **This is called as a calibration test for the test drive of the tyre and vehicle test drivers.** This shared experience, in a sense, is a mutual training of each test pilot to make similar test acts and make similar grading of the tyre and car joint behavior. They are calibrated first then they make pre-selection tests before they submit test tyres to OEM.

On the course of development do you expect a little excitement. There may be more than you imagine.

• Trials of a new compound?

• Designing, developing a new tyre that is lighter in weight, but has longer tread wear life?

• Low in rolling resistance (RR) but safe in wet performance?

• Low in pass by noise, but high in ride comfort, and very good in ride and handling-maneuverability?

• A tyre that is better in cut and chip resistance? Yes, but how about stone retention? How about tear and cut resistance?

• Safe in snow and ice, but also have a longer tyre wear life?

• Does it complete the ECE R30, or ECE R54 testing by the accredited labs? Does it carry an official approval number marked on the sidewall of that tyre?

• ECE R30 tests and marking approval number on the sidewall? ECE R54 tests and marking ECE R54 approval number on the on the sidewall?

It includes intensive works of competitor tyres, both construction and compounding is re-engineered and a dimensional standard is created for that tyre; pattern, outside diameter, section width, s-depth, void-to rubber ratio, branding, its positioning according to tyre standards (e.g. ETRTO-European Tyre and Rim Technical Organisation head office in Brussel, EDI (Enginering Design Information) reference books of ETRTO for Tyre Design Engineering).

Its position in the other Tyre Standards and Regulations e.g. DOT (Department of Transportation, FMVSS (Federal Motor Vehicle Safety Standards) in the US.are also considered .

Tyre dimensions and tyre branding concerns are similar but not the same in every market.

Many discussions on the branding of sidewall? Depends on the market you are going to sell that tyre. In Europe ECE Regulations are necessary and enough. In the USA market it is different rules and regulations for the same tyre. DOT, FMVSS, UTQG regulations are valid and they must be met by your tyres.

In European ECE Regulations you must complete successfully tyre tests indoors by accredited test labs, apply with these test results to governmental bodies, get an approval number, mark that number on your mold for that tyre. Then every single tyre has an official approval number on the sidewall, and you may ship and sell it in every European country.

In the US there are Tyre rules and regulations too. However, you are not forced to get your tyre tested by accredited test labs, get that result, apply to an authorized body, then receive an official approval number... this is not a process that you have to follow. and regulations are issued and every tyre manufacturer know about them.

What is the skid depth when it is a new tyre?

What is the skid depth after 6, 12...36 months, is its skid-depth above the legal limit of 1.6 mm or not?

I hear your question “how do I know the residual skid depth at that stage?

It is already marked along the circumference of a tyre at least at four points, you may see it from outside at upper sidewall area near the shoulder.

When you get a closer look at near that marks, you may see the small triangle marks. Then check in the grooves of the tread at that point, you may easily find a 1.6mm high spots in the grooves.

Also, the used tyre changes its appearance in the tread area. Some kerfs are worn out. All grooves and voids becomes shallower upon use and wear.

Is this tyre developed for OEM (e.g car manufacturer in domestic market, or a car manufacturer in the export markets? Who is going to evaluate it and technically homologize it for a model of a model of a car as original equipment for that car model? What will be the total weight of it? What will be the price? What will be the Rolling Resistance of that tyre? What will be the Pass By noise limits ? what will be its wet brake performance? How about the tread wear resistance? It is for the USA there are special rules for all.

In European markets there are certain performance, and branding criteria to be met.

In a more larger European areas ECE regulations must be met and this must be based on the data created by accredited Tyre Test centers. In Europe it may be TUV in Germany, it may be an accredited Test center where you can make tyre tests, submit data state officials and get a ECE R30 number, brand it on the tyre mold. That way every single tyre cured carries this number. Tyre designing, manufacturing and selling become more and more regulated already. Trend continues. ■

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TyreTrends Treading New Terrains
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By Sharad Matade

HF Q GUARD: PRECISION, QUALITY, TRACEABILITY

HF Group, the global market leader in machinery and systems for the rubber processing tyre industry, has brought out another innovation, HF Q Guard, to meet the growing demand for precision in splice measuring, quality control and traceability in the entire manufacturing process.

HF Tire Tech Group is one the largest manufacturers of high-end technical, tyre building machines and curing presses in the global tyre industry.

"HF Q Guard is the next step to our HF ONE tyre building machine and lifts tyre production to a new level when it comes to precision, quality and traceability. High-resolution images are taken with LEDs. We can get details of the height and width of materials inside the high-resolution images. HF Q Guard can also detect the edge of the materials, and that is a new thing," said Hartmut Hoops, Head of Process Engineering, Tire Building Machines, HF TireTech Group.

HF Q Guard comes into two variants: HF Q Guard 1000 and HF Q400 covering inspection width of 1000mm and 400 mm respectively. HF Q Guard sensor technology works with high precision and accuracy. It measures splices in real-time with an accuracy lower than half of a millimetre. The system covers a drum speed of up to 1500 mm/s speed, and distance to the surface is about 1.4 metres.

With its features, the HF Q Guard offers advantages to over the current laser splice

Hartmut Hoops, Head of Process Engineering, Tire Building Machines, HF TireTech Group

measurement systems, which have to be closer to the drums, need better light and are sensitive to vibrations of the drums.

Another feature of HF Q Guard is its compatibility to the existing and new tyre building machines available in the market, and it can be integrated very quickly and at low cost.

The new product is so robust, which could be fitted at any position to the drums, which is another advantage over the laser splice measuring machines. As it takes a few hours for installation, HF Q Guard needs minimal production downtime.

"The whole system is calibrated. A key factor about the installation of HF Q Guard is that we need a few information. We need to know the positioning of the drums. We can start with very limited interfacing to the machines. We need some information as such as the layer sequence, building procedure and tolerance of the tyres. Data collection is initiated by elegant technology," says Hoops.

Over the years, HF has developed innovative products that can be upgraded easily. The company has developed machine platforms such as PCR/LTR, PLT 2, and PLT 2 SD along with the award-winning HF ONE for which upgrades are planned to include the latest technologies such as auto bead loading, automated tyre handling, and the latest control systems with state-of-the-art HMIs. Servers can be added for additional strips such as Run-Flat technology or reinforcement strips.

According to the company, HF Q Guard can be used with almost all platforms.

Tyres could be damaged due to defective manufacturing. During manufacturing, if cord-cutting, building or vulcanising process are not done correctly, it could lead to damages in the tyres. The result is that the inner layers of the tyre are too close to the surface or that structural defects in the tyre occur. HF Q Guard significantly reduces the risk of the faulty tyre through permanent quality checks. The digital twin of a tyre can thus store the complete data on the surface of each layer and all splice length information.

"We have one IPC which does the algorithm for splice analysing, and that also connects to the cameras, and compression of data. We could also have possibilities to connect the existing PLCs in the machines, and we can connect data such as tolerance, width, building sequence as from there as well. On other hands, there are new tyre building machines have their data set on built tyres, and we can combine all data from the splice measurement systems and the machines itself for analysing systems," says Hoops.

Measurement data of tyres are prepared for visualisation according to individual needs, and this makes it possible to inspect the individual surfaces of the materials to identify defects in the construction or the tyre material used. Expand the existing scope of functions of the splice measurement of the HF Q Guard at any time to include features needed for improving quality assurance. HF Q Guard grows with specific requirements.

Overall market trends for the mobility and regulatory pressure are putting pressure on tyre manufacturing to have equipment that not only makes quality products but also are smart, flexible and compatible. OEs will be more focused to check its supplier's consistency in process and quality. From tyre makers, OEs now expect data on the material mix, extrusion process, tyre building, curing and finished products.

As HF Q Guard collects data and manages the complete documentation, it can help to prove that non-defect building of tyres at the factory any point of time.

The company has already spent a year on engineering the units and hardware, cameras and other components running.

In the next six months, HF Tire Tech will work on the collection of data and the results of HF Q Guard, and after that, the company will bring the product into the market.

"HF Q Guard has been tested in house on materials and are still in the process do the same in next months. We start a field test in the next months. The company will install HF Q Guard at the customer's factory to collect the data, and the company already found the customer to conduct the actual test," says Hoops. ■

Benefits

- Complete tracking of tyre data during the tyre production process
- Data storage for later analysis (Big Data)
- Meets todays and future requirements of the automotive industry (traceability of production data)
- Retrofit ability on older machines (manufacturer independent)
- Independent visual inspection during the tyre production process
- Analysis for optimising the tyre construction process

HIGH SPEED, NON-CONTACT 3D LASER SCANNING IN THE RUBBER & TYRE INDUSTRY

Rubber presents a challenge for optical-based measurement sensors. By nature, the black surface is difficult to capture reliable data from and accurately measure. This challenge is often intensified by the complex shapes into which rubber derivatives are extruded or molded.

As a solution to this challenge, 3D laser sensor manufacturers have optimised the design of their sensors to successfully implement scanning and quality control functions for both in-process and final product inspection applications in rubber and tyre manufacturing.

3D laser scanning

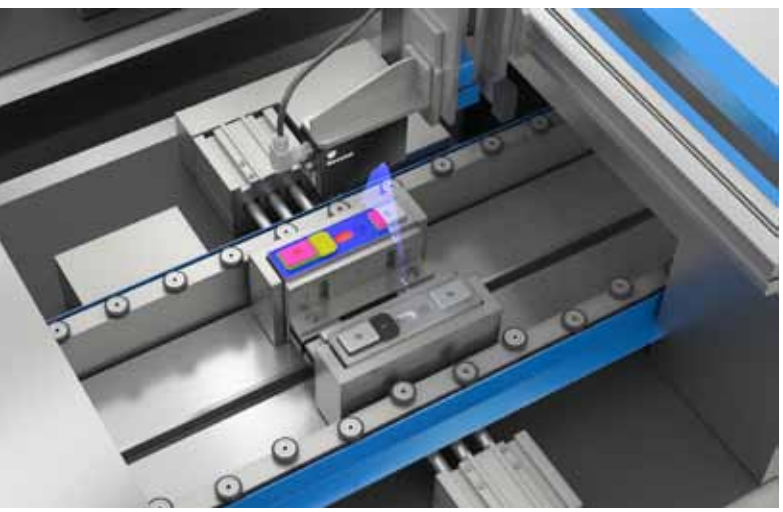
Rubber material comes in two forms on the production line, either as fresh and uncured from an extruder or a calender, or as a finished product (e.g., vulcanised tyres). Non-contact 3D laser scanning offers the most practical solution for inspection of both of these rubber material types.

Here's why:

1. The soft, gummy nature of the rubber makes **contact-type measurement** ineffective. This measurement approach is also too slow to keep up with the high-speeds of continuous web material production.

2. **2D sensors** require complex lighting to see black-on-black contrast. In some applications the lighting is placed underneath the material (e.g., when measuring the width of a strip), and hot sticking rubber can contaminate the lights. In addition, 2D can't produce measurements related to object geometry (i.e., 3D shape), which means they are unable to measure critical features such as object flatness, surface angles, or part volumes, and are limited to contrast-based inspection. This makes 2D sensors a poor solution for scanning complex shape-based features on dark surfaces, or for operation in low lighting conditions.

3. In comparison, **3D laser sensors** are contrast invariant and generate high-resolution scans regardless of the material or lighting conditions. They also capture the complete 3D geometry of the scan target, including critical depth measurements on surface features such as grooves in a tyre tread. 3D laser sensors are also able to achieve the high speeds required for continuous web material scanning.



Laser profile sensors provide an ideal solution to both in-process and final rubber and tyre measurement and quality control applications. Built-in measurement tools for strip positions, including multiple groove location and depth measurement monitoring with automated alignment enable engineers to configure setup parameters—without requiring any measurement software development.

In addition, the ability to store multiple geometry configurations in the sensor makes changes between different recipes quick and simple, which is critical in minimising downtime for operations that make model changes multiple times per shift.

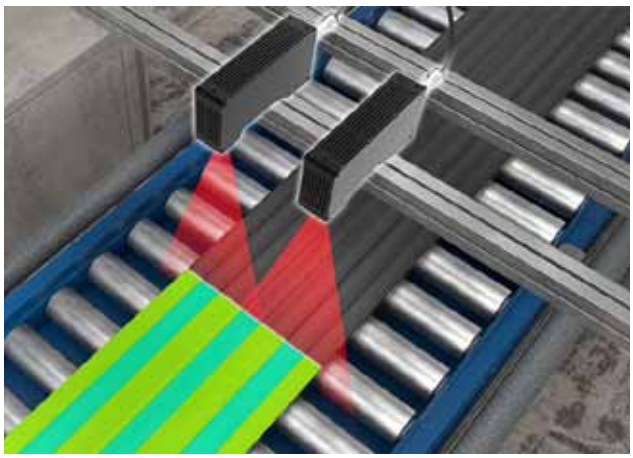
Application examples

1. In-Process Inspection

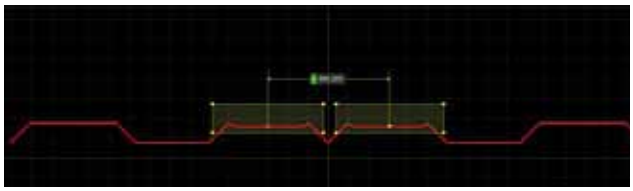
Extrusion Profiling with High-Resolution Gocator® 2440 Laser Profiler

Extruding rubber in a specific shape makes up the tread portion of a tyre. Measurement of the extrusion profile is carried out in-process, correcting the extrusion parameters in real-time to maintain the required shape. Key measurement parameters include thickness, width, and profile. Another required sensor capability is monitoring the position of surface features, such as ridges, center lines, and edges.

Profiling these tread extrusions is done by using 3D laser sensors to scan across the extrusion, generating a profile to which built-in measurement tools and pass/fail decision-making logic can be applied.



Gocator 2440 3D laser profilers scanning extruded tyre tread



Built-in Groove tool for measuring extrusion pattern, geometry, and location

In this example, two Gocator 2440 laser line profilers are used to measure the rubber web's extrusion groove pattern, geometry, and location with an X resolution down to 13 microns. Gocator 2440 sensors are able to inspect multiple grooves in a single setup, and groove measurements are unaffected by changes in surface angle relative to the sensor.

Most importantly, Gocator 2440 sensors generate critical 3D height data for robust shape measurement. 2D solutions are limited to contrast-based inspection.

2. Final tyre inspection

Tyre Sidewall Inspection with High-Speed Gocator 2530 Laser Profiler

Traditional methods for measuring tyre sidewalls for defects such as bulges and dents suffer from too many false rejects (i.e., classifying a good tyre as defective). Due to measurement system limitations, many manufacturers have no choice but to "oversensitise" their sidewall bulge and dent measurement systems, resulting in costly manual inspection requirements for all rejected tyres.

In fact, some measurement systems cannot even distinguish between bulges or dents. However, with state-of-the art laser measurement precision and advanced built-in software analysis, false positive rates can be substantially reduced and, in many cases, eliminated altogether.

Using a Gocator 2530 laser profiler the engineer is able to generate full surface point cloud geometry data in order to detect small defects (down to 28 microns X resolution) anywhere on the sidewall surface. The sensor also delivers complete scan, measurement, and control at 4 kHz, allowing engineers to meet stringent cycle time requirements—with no need for industrial PCs or external controllers.

In this configuration, two profile sensors are typically used, one for each sidewall (top and bottom buddy system). A third sensor is often used to monitor radial runout of the tread.

Gocator 2530 high speed 3D blue laser profiler scanning a tyre sidewall

Leveraging 3D Laser Scanning and Inspection

Laser-based laser triangulation sensors meet the high speed and high resolution requirements for accurate rubber and tyre measurement. These sensors are used in a variety of in-process and final inspection applications, including extrusion profiling and tyre sidewall inspection.

Adding 3D laser sensors for automated quality control is vital to reducing scrap and rework, and improving final product quality by maintaining consistency throughout the tyre manufacturing process. ■

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By Sunish Vadakkeveetil, Mehran Shams Kondori, and Saied Taheri
Center for Tire Research (CenTiRe), Virginia Tech

PHYSICS BEHIND RUBBER TRIBOLOGY


Saied Taheri


Mehran Shams Kondori


Sunish Vadakkeveetil

TRIBOLOGY, a greek word, is derived from Tribo meaning "rubbing," and logy meaning "study of." Though the term is a recent depiction of previous concepts related to friction, lubrication and wear that has been around from the advent of mankind – from chipping of stones for tools, to generating fire by rubbing wood or striking of flint stones from about 400,000 years ago. Friction is the resisting force at the interface due to the energy losses at the contact interface. Wear, a by-product of friction is a gradual material removal process at the contact.

Rubber, mainly because of its viscous nature, is a widely used material for most contact applications such as, seals, tyres, footwear, wiper blades, bushings etc. The material possesses the property of both a liquid (viscous) and a solid (elastic). Hence, rubber frictional losses at the contact interface is classified into three mechanisms as shown in Figure 1. Hysteresis (μ_hys) – Energy dissipated due to internal damping of rubber caused by undulation in the surface. Adhesion (μ_adh) – Due to intermolecular or Vander Waals attraction at the contact interface. It vanishes in the presence of contaminants or lubricants on the surface. Viscous (μ_visc) – Due to hydrodynamic resistance caused by the fluid in the contact interface. It mainly occurs under the presence of lubricant or fluid in between the contact interface.

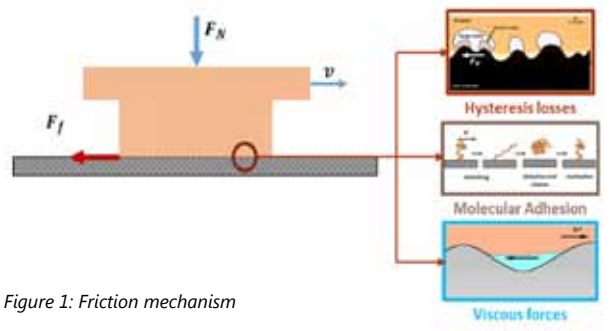

Figure 1: Friction mechanism

Friction as a concept has evolved, as shown in Figure 2 from a simple empirical relation, developed by Amonton's (1699) and Columb (1785) to a more complex representations by considering these different mechanisms of friction. Initial experimental observations by Bowden and Tabor [1] observed the microscopic behaviour of the contact and obtained that real area of contact is only a part of the nominal contact area. Grosch & Schallamach [2] performed experimental observation to determine the influential factors and obtain a relation between temperature and velocity dependent friction to frequency dependent viscoelastic behaviour. Savkoor[3] considers the frictional losses due to adhesive mechanism at the contact interface using a rudimentary theory where the interaction is considered as a series of processes from growth of contact area in the initial stage to initiation and propagation of crack in the final stage.

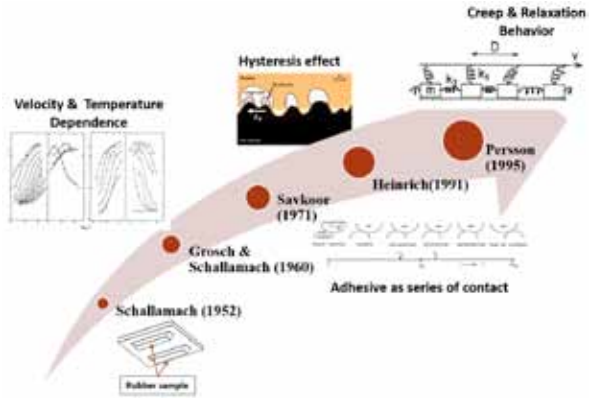

Figure 2: Evolution of friction

Heinrich [4] developed an analytical representation to estimate the hysteretic component of friction by considering the energy losses at the contact interface to the internal damping of rubber from the undulations of the surface. The energy loss thus obtained is related to the frictional shear stress by the energy relation given by Eq. (2).

$$\Delta E = \int d^3x\, dt\, \dot{u} \cdot \sigma \quad (1) \qquad \sigma_f = \frac{\Delta E}{A_0\, v\, t} \quad (2)$$

Persson and Klüppel [5] extended the theory to consider the effect of the surface roughness by assuming the surface to behave as a fractal nature and obtaining the total energy loss being the sum over the different length scales. Klüppel considers the GW theory to consider the contact mechanics where Persson developed a stochastic based contact mechanics theory assuming the rubber deformations to follow the surface asperities, the results are as shown in Figure 3. To consider the actual deformation profile of rubber, an affine transformation approach [6] is considered to obtain the actual deformation of rubber contact. The results are as shown in Figure 4.

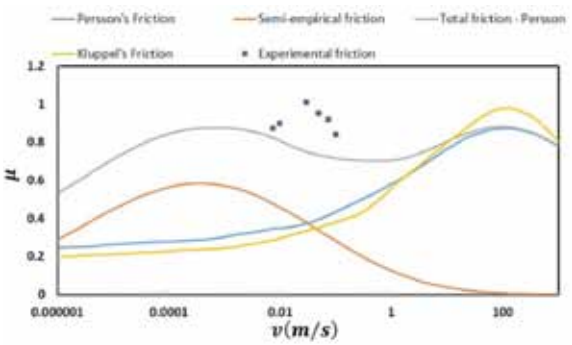

Figure 3: Comparison of klüppel & persson friction models

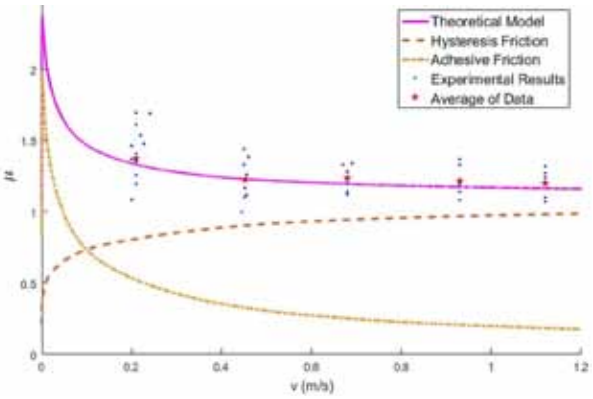

Figure 4: Modified persson's model

In addition to analytical methods, computational approaches are also considered to estimate deformation behaviour of a rubber block on a rough substrate (Figure 5). The numerical model [7] is validated using indentation experiment and compared against a single asperity model as shown in Figure 6. This is later being extended to obtain friction and wear characteristics of rubber at the contact interface by considering the deformations at the contact interface and obtaining the frictional force [5], [8].

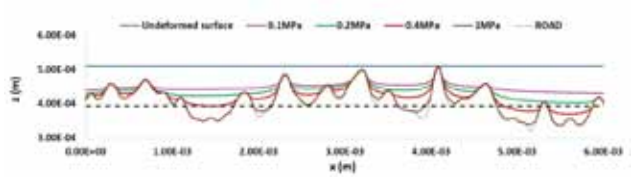

Figure 5: Deformation of the contact interface under different loading condition using fe model

Wear is mainly due to the frictional shear stress generated at the contact interface leads to energy dissipation at the rubber – substrate contact interface that is either transformed into heat or responsible for crack initiation

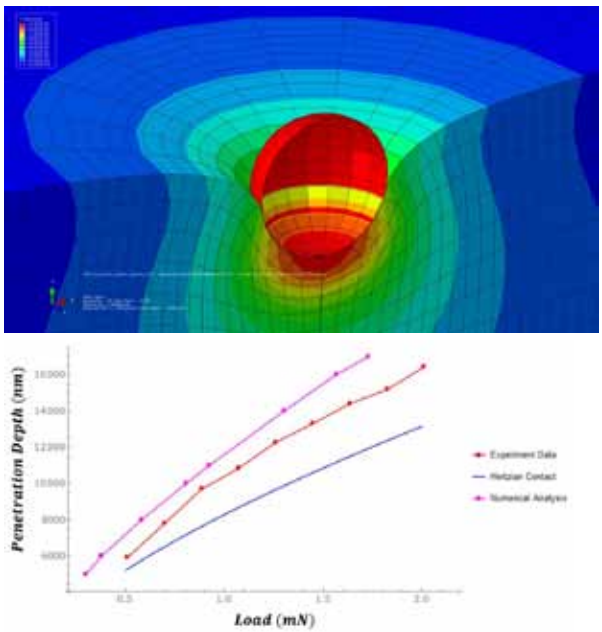

Figure 6: FE model of a single asperity & comparison of FE results with experimental & analytical approaches

and propagation eventually leading to material removal. The major contribution of the wear occurs either due to the interaction of smooth asperity and rubber surface (adhesive wear), Figure 7 (a) instantaneous tearing of rubber by sharp asperities (abrasive wear), Figure 7 (b) or due to repeated cyclic contact stress (fatigue wear, Figure 7 (c)).

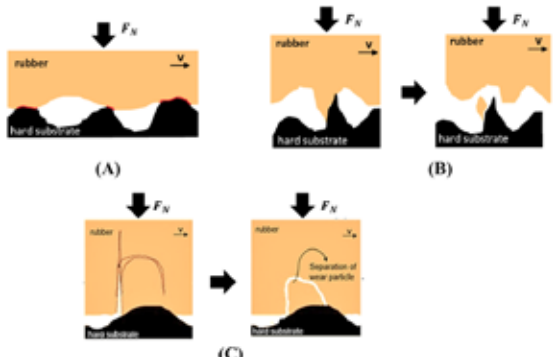

Figure 7: (A) adhesive (B) abrasive and (C) fatigue wear

Due to the importance and complexity of the wear problem, it has been a vital topic of interest studied by many researchers [2]. Numerical techniques and empirical approaches have seen their light in the midst of the

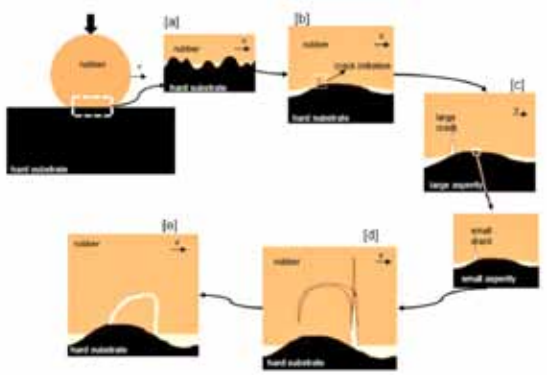

Figure 8: Fatigue wear process a) sliding on smooth surface b) crack initiation c) crack propagation d) crack turns around e) removal of wear particle

expensive and cumbersome experimental observations [9], [10]. Archard's law states that "the volume rate of wear (W) is proportional to the work done by the frictional forces" as given by Eq. (3), where τ_f is the frictional shear stress and v is sliding velocity.

$$W \propto \tau f \, v \quad (3)$$

In the case of road surfaces, the removal of rubber particles can be considered as a process of nucleation and propagation of crack like defects until it is detached to form a wear particle, as shown in Figure 8. Based on this mechanism of crack propagation, a physics-based theory assuming the crack propagates (Figure 9 & Figure 10) from already present defects or voids on the rubber surface was considered and then later compared with experimental methods performed using Dynamic Friction Tester (Figure 11) [6], [11], [12]. Future studies are being performed using analytical and computational approached to estimate the wear characteristics of a rubber material considering damage mechanics [8] and crack propagation theory considering the effect of surface roughness. An experimental technique is also being developed based on the Leonardo Da Vinci concept to experimental test the friction and wear characteristics of a rubber block under pure sliding.

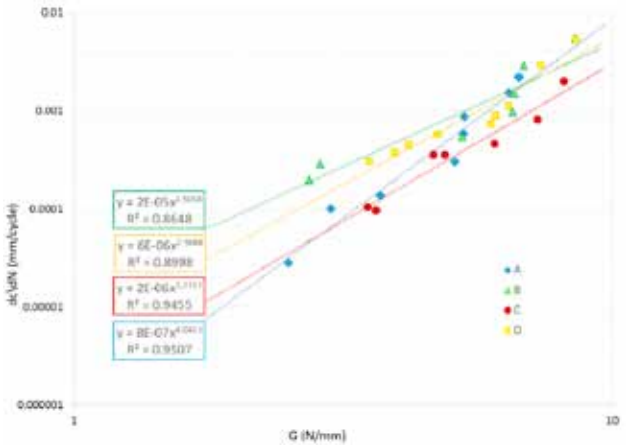

Figure 9: Fatigue crack propagation for rubber materials

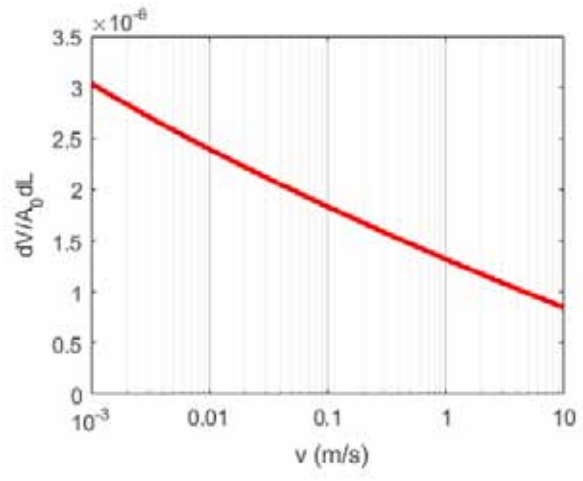

Figure 10: Wear rate vs sliding velocity

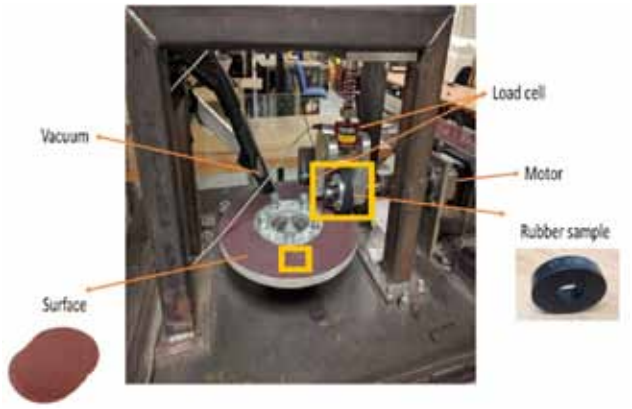

Figure 11: Dynamic friction tester

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POWERING IDEAS & NETWORKING

By Sharad Matade

Cyrille Roget

MICHELIN'S FUTURISTIC VISION CONCEPT

*"The Vision Concept illustrates our strategy for the circular economy and the focus of the research we are working on for the future, **Cyrille Roget**, Technical and Scientific Communications Director, Michelin Group, told **Tyre Trends** in this interview*

In tune with the changes in customer preferences and the shifting focus from ICE driven vehicles to the CASE mobility, the global tyre industry is redefining their business strategies, adapting unconventional ways and materials, pushing automation and technologies, and allowing 'outsiders' to play a role in the business.

Michelin, one of the leading players in global tyre business, has been in the forefront to bring about innovations that influence the industry. In 2017, Michelin, for research and development in sustainable mobility, introduced its Vision Concept, which is based on four pillars - airless technology in passenger tyres, sustainable materials, connected ecosystem and tread recharge with 3D printing.

"The Vision Concept illustrates our strategy for the circular economy and the focus of the research we are working on for the future. UPTIS, which is Unique Puncture-proof Tyre System and an assembled airless wheel structure, is the element of our airless mobility solution for passenger vehicles on which we are working on," Cyrille Roget, Technical and Scientific Communications Director, Michelin Group, told **Tyre Trends**.

UPTIS, which is also an evolution of Michelin's expertise in TWEEL technology, eliminates the possibilities of puncture and blowouts. It also requires near-zero levels of maintenance, making it a perfect option for the vehicles from self-driving shuttles to all-electric vehicles.

According to the Michelin website, 20% of tyres are scrapped each year due to punctures or irregular wear. It says airless technology makes the UPTIS prototype resistant to flats and blowouts. When applied to large-scale production, this characteristic means UPTIS offers 'significant potential' for reducing the use of raw materials and waste.

Based on its internal research, Michelin projects that UPTIS airless technology could prevent premature scrapping of up to 200 million tyres a year worldwide, says the company.

The company also adds that UPTIS can yield overall vehicle weight reductions by removing the need for a spare tyre, jack or tyre pressure monitoring system that exist in most vehicles today.

As per its concept vision, Michelin intends to have 100% sustainable renewable or bio-sourced materials in its tyres. "To determine the life of tyres, we need to have a balance between sustainable materials, whether renewable biomass sources or recycled tyres, that we will put in future tyres," Roget said.

The connected ecosystem helps Michelin to understand the usage patterns or behaviour of the consumers and the lifecycle of the tyres.

The fourth pillar is 3D printing technology, which is complicated. Roget believes that 3-D printing or rechargeable tread business will gain importance in the future. "With the help of 3D print, we will be able to re-put a thread on existing structure according to the need of the user, so the rubber will be used in the right amount," he said.

The rechargeable tread will also bring new business opportunities for Michelin. "It (rechargeable tread) will provide a completely different business model. In this, we will sell services where the consumers no need to take care of their tyres. For example, we will connect to our consumers and tell them to recharge their tyres for the winter season,"' explained Roget.

Going Forward, tyre manufacturers will not be only making tyres but selling and servicing tyre as well. "Being tyre manufacture, we are the expert in tyres, and this is why the connected ecosystem is important.

Through the connected ecosystem, we would guide them (users) to choose what is important and suitable for their vehicles according to their requirements," Roget said. In the B2B space, the company is already selling tyres on kilometres run.

Michelin's UPTIS is not just an example of an unconventional tyre but it, if industrialised and well accepted, will redefine the global tyre business.

Michelin and GM expect to make UPTIS solution operational and available as an option for select GM models as early as 2024.

However, challenges will be significant to industrialise UPTIS tyres. UPTIS needs different materials, design, and production process and that will impact the entire supply chain.

It is believed that industrialisation of UPTIS tyres will bring a massive transformation in the tyre industry as it experienced when the industry moved from bias tyres to radial tyres which brought the changes in raw materials, design, tyre building processes and the end products. "For UPTIS, it will be revolutionary on all fronts. We will have to invent new materials, the entire process and the supply chain to produce UPTIS. It is challenging and will take time," said Roget.

Talking on challenges on calibration or making changes in the vehicles to fit airless solutions like UPTIS, Cyrille Roget says that there will be no need to make changes in the vehicles. "That is one of the reasons GM is adapting UPTIS. The performance will be the same. GM is opting UPTIS as an option," said Roget.

The global auto sector is witnessing traditional OE rivals coming together to offer products and solutions. Tyre companies, which have always been knowns of their conservativeness, are also joining hands for innovations and sustainability causes.

"Tyre companies are working on ideas that are not competing. For example, TIP, and such projects are working on key issues that the tyre industry face as a whole."

According to Roget, Michelin has been proactive in sharing information and knowledge that interest of industry stakeholders through the various platforms, maintaining the balance with its competitive domain. Michelin has adapted the open innovation strategy under which it seeks expertise outside of the company.

"We are not trying to develop everything internally. We are looking for start-ups and big companies as well to develop technologies and competency that we do not have internally," Roget said.

Another challenge for companies is to bring innovations that are not only sustainable but accessible and affordable in different markets. Tyre companies are investing in sustainable and safe mobility to lessen the impact on the environment that benefit consumers, even they (consumers) are not willing to pay for it. "We need to find the balance between what we do to lessen footprint on the environment and the willingness of the customers to pay for it. You cannot put a thing in the market that is expensive even it is good. We need to make sure that it is accessible to everyone," Roget said.

Global tyre companies are buying dedicated online tyre e-commerce portals to get closer and provide faster service to customers. When asked, will growing online presence of tyre manufacturers eliminate tyre dealers, Roget says that dealers will remain an integral part of the between the companies and the customers. "Even if people buy tyres online, they will have to go dealers get them fitted properly. But yes, we are participating in the online market in a big way, and that is something our consumers are expecting. We prefer to engage with consumers directly in day to day use," he said. ■

By Dr Samir Majumdar

Dr Samir Majumdar, Rubber Consultant (India & Asia pacific), has served in leading tyre companies like JK Tyre, Kyoto Japan Tire, among others. He was technical and R&D head (Asia Pacific) in ExxonMobil. He has authored several research papers and technical books. smajumdar501234@yahoo.co.in

WORLDWIDE STATUS OF RUN FLAT TYRES

Delay in military convoy due to tyre damage was realized in World war-1. In world war, tyre for specialized military vehicles used to get damaged by bullet shots. Initial demand of run flat tyre came only from military demand such that tyres could be dragged on emergency without any problem even if tyre is flat with no inflation pressure. By definition, run-flat tyres are likely to have been driven 'flat' at certain speed for a considerable distance and this must be taken into account when considering the possibility for a repair.

Run Flat Tyres are those which have the capability of dragging the vehicle even the tyre got punctured or is with zero pressure until a point where the tyre could be repaired. With such tyres, vehicle may be driven till 80 km at around 80 km/h to the nearest tyre repairing shop. Today there are three technologies used as Original Equipment on vehicles to help maintain vehicle mobility even when a tyre is punctured or run flat. They are self-sealing tyres, self-supporting tyres and tyres supported by an auxiliary system.

Self-Sealing Tyres are not exactly in the category of run flat tyres (RFT) but a variation of Run-Flat technology (RFT), which allows you to continue driving despite puncture of tyre. Designed with standard tyre construction, self-sealing tyres have a great feature on the inner lining of the tyre—an extra lining of sticky gel-like polymer sealant , that helps in sealing tyre leaks. Such tyres are already in market ; Continental, Michelin are the major manufacturers worldwide for self sealing tyres.

Continental developed and designed to seal a damaged tyre tread,in case of penetration by foreign objects such as nails, for example (Fig.1), there is no need for immediate roadside tyre changes, and holes remain sealed even if the puncturing object becomes dislodged. Self-sealing tyre gel is a sticky, viscous sealant layer. They are designed to fix most tread-area punctures instantly and permanently. Self Sealing tyre gel is added inside a tyre and in contact with tyre inner-liner is an extra lining of sticky gel-like polymer sealant, a patented liquid, injected through tyre valve under pressure. A liquid contains patented polymer and fiber. During Puncture, when air rushes through, it also carries liquid and solidifies there, causing air sealing.

Today, most run-flat tyres use one of two technologies , self-supporting tyres and tyres supported by an auxiliary system. Most flat tyres or zero pressure air are the result of slow leaks that go unnoticed and allow the tyre's air pressure to escape over time. Therefore, monitoring tyre air pressure in real-time is extremely important. Fortunately, in these days we practically have such devices inbuilt in tyre, called, Tyre Pressure Monitoring System or TPMS, that indicates pressure loss in tyres in vehicle dash board (Fig.2).

Self-Supported Run-Flat Tyres are those which do not require any additional support for stiffening tyre sidewall. Self-supporting run-flats have a very stiff, reinforced sidewall and they do not require extra support. If the tyre loses

TPMS low pressure warning icon

TPMS system failure icon

Fig.2: Tyre Pressure Information

Fig.1: Self Sealing Tyres

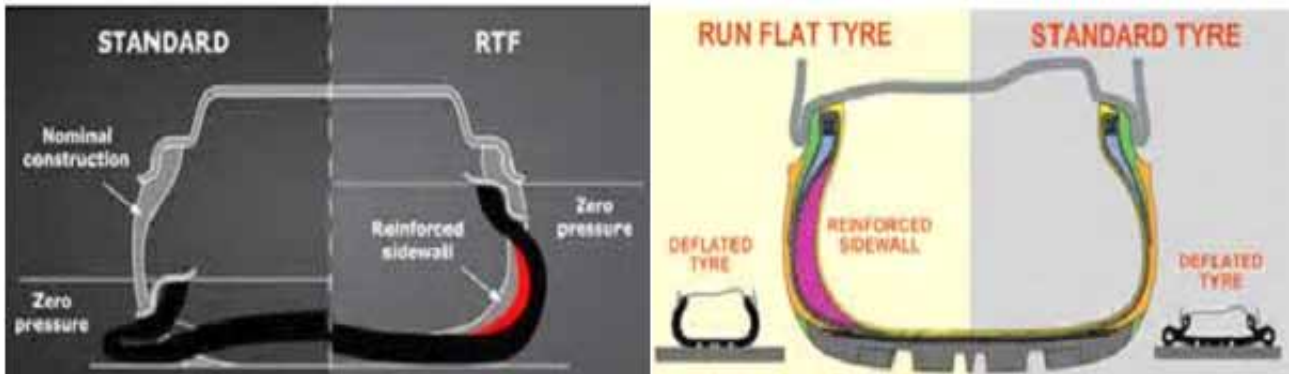

Fig.3: Self Supported Run-flat Tyres have a Reinforced Sidewall

Fig.4: Supporting Ring System

air, the sidewall stays on the rim and holds up the vehicle. This is the most common type of run-flat tyre (Fig.3).

Auxiliary Supported Run-Flat Tyres combine unique wheels and tyres used for Original Equipment vehicle applications. In these systems, the flat tyre tread rests on a support ring attached to the wheel when the tyre loses pressure (Fig.4).

Depending on typical design of RFT, they have limitation on mileage it can cover in flat condition and it generally varies from 50-80 miles till it reaches to a tyre repairing shop.

Just by looking such tyres it is difficult to differentiate a run flat tyre (Fig.5a) unless the tyre is having a symbol (Fig.5b) on it. The International Organization for Standardization (ISO), a worldwide federation of national standards bodies, has adopted a run-flat system symbol for extended mobility systems featuring self-supporting run-flat tyres.

These run-flat tyres provide the driver more flexibility when deciding where to have tyre repairs made. Began in the year 2000, all three giants Goodyear, Brdgestone and Michelin began to produce run flat tyres. But the customer response for this category was slow. Other than these three world tyre giants, there are also a number of RF tyre manufacturers today, for examples, Bridgestone RFT (Run-Flat Tyre), Dunlop DSST (Dunlop Self-Supporting Technology) and ROF (Run-On-Flat), Firestone RFT (Run-Flat Tyre), Goodyear EMT (Extended Mobility Technology) and ROF (Run-On-Flat), Kumho XRP, Michelin ZP (Zero Pressure), Pirelli RFT (Run-Flat Technology) and Yokohama Run-Flat and ZPS (Zero Pressure System) etc.

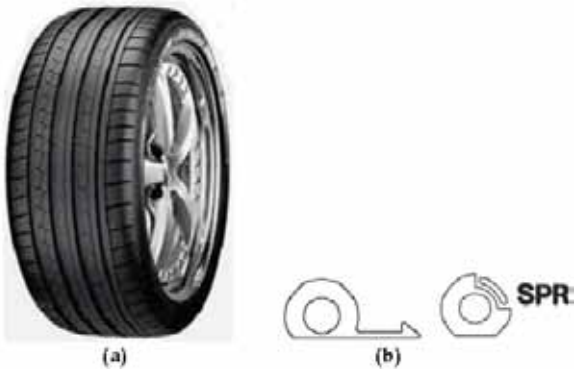

Fig.5: Typical Run Flat Tyres

By 2010, in USA the total market share was less than 1 % and the total RFT production in 2015 was only between 1-2 % of the total tyres sale worldwide. The quantum jump of RF tyres sales thought by tyre manufacturers has not taken place in reality, mostly because these tyres are still finding demands in defense vehicles. Global Run Flat Tyre Market is projected to reach USD 3 Billion by 2023, at a CAGR of over 2% during 2019-2023. The major factors propelling the growth of the market is increasing demand to boost the safety of military & border patrol vehicles across the globe.

Interesting to note that run flat tyres works well in extreme climatic conditions like humid day or snowy or cold night. Run flat tyres are built with armor-plated side-walls. Based on applications, the market has been segmented into Military, VIP cars, High Value Cargo Carriers and Others. In 2017, the military segment dominated the market and is anticipated to maintain its dominance over the next five years as well owing to increasing budget and investments of the security units.

Several governments across the globe are raising their budget on military and security units, which is predictable to provide good opportunities to the global run-flat tyre market. Based on region, the North America region dominated the global run flat tyre market and is anticipated to maintain its dominance over the next five years as well owing to growing investments for equipping military vehicles in the U.S. with run-flat tyre and advancements of military and security units and large scale investment.
The key players in the market are still continuing with Michelin, Goodyear, Pirelli, Bridgestone, among others. ■

GOODYEAR reCHARGE: FOREVER TYRE

Goodyear has done it again! Its new self-regenerating concept tyre reCharge is a revolutionary innovation that can adapt and change to meet what the customer needs at the given situation!

"Goodyear wants the tyre to be an even more powerful contributor to answering consumers' specific mobility needs, said Mike Rytokoski, Vice-President and Chief Marketing Officer, Goodyear Europe, "It was with that ambition that we set out to create a concept tyre primed for the future of personalised and convenient electric mobility."

The reCharge concept includes a number of innovative features that are built around three pillars, according to Goodyear Europe:

Personalised: At the core of the reCharge concept is a reloadable and biodegradable tread compound that can be recharged with individual capsules, radically simplifying the process of replacing the tyres. Filled with a customised liquid compound, these capsules allow the tread to regenerate and the tyre to adapt over time to climatic circumstances, road conditions, or simply how you want to travel. Thanks to artificial intelligence a driver profile would be created around which the liquid compound would be customised, generating a compound blend tailored to each individual.

Sustainable: The compound itself would be made from a biological material and would be reinforced with fibres inspired by one of the toughest natural materials in the world - spider silk. This would make it both extremely durable and 100 percent biodegradable.

Hassle-Free: In addition to radically simplifying the process of replacing tyres with rechargeable capsules, the tread would be supported by a light-weight, non-pneumatic frame and tall-and-narrow shape. This is a thin, robust low-maintenance construction that would eliminate the need for pressure maintenance or downtime related to punctures.

"The Goodyear reCharge is a concept tyre without compromise, supporting personalised, sustainable and hassle-free electric mobility," said Sebastien Fontaine, Lead Designer at the Goodyear Innovation Centre in Luxembourg. ■

TOYO NANOENERGY M671 LAUNCHED

The newest addition to Toyo Tire's commercial tyre line provides superior traction, exceptional fuel efficiency, and excellent wear life, the company said. It is also SmartWay verified. Improved tread compounds developed through the company's proprietary Nano Balance technology contribute to these features.

The M671 also incorporates Toyo's e-balance design, which maintains the tread profile of the tyre while reducing strain at the bead area and belt edge for greater stability and longevity under heavy loads, Toyo maintained. It also features an optimised wide tread pattern with 3D sipes that provide even contact pressure, increased traction, and reduces irregular wear for longer tyre life. ■

YOKOHAMA'S NEW CONCEPT FOR MARUTI SUZUKI EV

The Yokohama Rubber Co., Ltd., has developed a concept tyre in its fuel-efficient BluEarth brand for Maruti Suzuki India Limited's new concept electric vehicle (EV), the Concept FUTURO-e. The new tyre was displayed with the Concept FUTURO-e at the Auto Expo 2020 in New Delhi, India.

Yokohama said it developed a concept tyre exclusively for the Concept FUTURO-e based on the concept of "a tyre featuring a powerful and stylish design for the new generation of urban SUVs." By combining the large lug grooves typical of powerful SUVs with rib grooves associated with more stylish and smooth-running vehicles, Yokohama Rubber has created a design suitable for a new generation of urban SUVs.

Yokohama Rubber established Yokohama India Pvt. Ltd., in April 2007 as a tyre sales subsidiary. The subsidiary began local production in July 2014 after completion of its tyre plant. Yokohama has been supplying domestically made passenger car and SUV tyres for the replacement market and as original equipment for automobile makers in India. ■

COOPER EXPANDS WORK SERIES

Cooper Tire has expanded its WORK Series line of tyres with the introduction of two new tyres in 19.5-inch sizes (225/70R and 245/70R) for Class 4-6 trucks and vans. The WORK Series All-Steel Drive (ASD) tyre is an open shoulder steel-belted drive tyre, while the WORK Series All Steel All Position (ASA) tyre is an all-position, steel-belted tyre, with a less aggressive tread pattern.

The tyres are targeted toward the growing final mile marketplace, where smaller vehicles - requiring 19.5-inch size tyres -- are used. "More and more vans and delivery trucks are on the road in final mile deliveries, and those operations continue to grow exponentially," said Gary Schroeder, Executive Director of Cooper's Global Truck and Bus Tire Business. "These customers are looking for highly-engineered tyres that can hold up for long miles to removal, while providing excellent ride characteristics. That's where our new Cooper tyres come in." ■

NOKIAN PRESENTS GROUND KING, TRACTOR KING

Nokian has launched the Ground King, a multi-use tyre for road and field, and the Tractor King, for heavy-duty field work, in Canada. A multi-use implement can create a good financial return if it finds a variety of different uses. A mid-range tractor, for example, can be kept busy doing all sorts of field work, yard work and road hauling.

The high load-bearing Ground King brings new opportunities by combining on-road endurance with traction and grip on soft terrain. With its Hybrilug technology, the Nokian Ground King offers field and road versatility, says Toni Silfverberg, Head of Sales at Nokian.

Tractor King is intended for the heaviest machinery working in the most difficult terrain. It combines the strength of an earth-moving tyre with a new lug pattern. ■

WARBURG PINCUS TO INVEST $150 MILLION IN APOLLO TYRES

The Board of Directors of Apollo Tyres Ltd approved an issuance of compulsorily convertible preference shares in the company worth Rs 10,800 million (approximately US$150 million) to an affiliate of Warburg Pincus, a leading global private equity firm focused on growth investing, a statement from Apollo said. The investment represents a primary capital infusion into the company and is subject to shareholder and regulatory approvals.

Commenting on the transaction, Onkar S Kanwar, Chairman and Managing Director, Apollo Tyres Ltd said, "I am delighted to announce Warburg Pincus' investment in Apollo Tyres. Their investment is a strong vote of confidence in our business, management team and growth prospects. I believe the company will benefit from the backing of a large financial investor of their pedigree and our partnership will further strengthen Apollo Tyres' board and governance."

Vishal Mahadevia, Managing Director and Head, Warburg Pincus India, said "We see a compelling growth story in Apollo Tyres and believe the company is well-positioned to build upon the strong leadership position it has carved out within the industry. Warburg Pincus is excited to partner with the management team of Apollo Tyres in this journey and looks forward to supporting them during the next phase of the company's growth."

Meanwhile Apollo Tyres consolidated revenue for the 3rd Quarter (October to December) closed at Rs 4347 crores (4655 crores last year same period). The Sales for the nine months (April to December) of FY20 closed at Rs 12545 crores. While the challenges continue in the OE segment, company witnessed good growth in the replacement segment in India, especially in the passenger vehicle category, and also gained market share, a company statement said. EBITDA reported was Rs 551 crores, in comparison to Rs 560 crores. Net profit closed at Rs 174 crores, as compared to Rs 198 crores in the same period last fiscal

Nine months Consolidated Performance Highlights: 9M FY2019-20 (April – December) vs 9M FY 2018-19 (April – December): Sales closed at Rs 12545 crores, as against Rs 13097 crores; EBITDA reported was Rs 1490 crores, in comparison to Rs 1609 crores; Net profit closed at Rs 399 crores, as against Rs 596 crores in the same period last fiscal. ■

NOKIAN TYRES PROFIT DIPS

Nokian Tyres net sales during October–December 2019 were EUR 475.8 million (473.6 in 10–12/2018). With comparable currencies, net sales decreased by 0.4%, according to the company's Financial Statement Release 2019. Operating profit was EUR 101.0 million (117.2), with no significant currency impact.

• Profit for the period was EUR 81.1 million (96.0).

During January–December 2019, net sales were EUR 1,595.8 million (1,595.6 in 2018). With comparable currencies, net sales decreased by 0.3%.

• Operating profit was EUR 316.5 million (372.4), negatively impacted by the US factory ramp-up costs of approximately EUR 20 million as well as currencies by approximately EUR 7 million.

In 2020, net sales with comparable currencies are expected to decline and operating profit to be significantly below the level of 2019, the statement said. In line with Nokian Tyres' updated 2018 strategy, the company is targeting further growth in Russia, Central Europe, and North America. In 2020 however, net sales and operating profit in Russia are expected to decline substantially due to the changed market dynamics. Operating profit in 2020 will include costs related to the North American expansion and other investment programs to support long-term growth, as communicated in 2018.

Hille Korhonen, President and CEO: "Our net sales were on the previous year's level and operating profit decreased due to the weaker markets and increased expansion costs of approximately EUR 20 million in Passenger Car Tyres in the US. Heavy Tyres and Vianor continued to perform well."

The AGM decided that a dividend of EUR 0.79 per share shall be paid for the period ending on December 31, 2019. ■

USW, COOPER RATIFY NEW LABOUR AGREEMENT

Cooper Tire & Rubber Company confirmed that members of United Steelworkers (USW) Local 207L in Findlay, Ohio, have ratified a new four-year labour agreement, which covers approximately 800 USW members.

According to Brian Brubaker, President of USW Local 207L, "We were able to reach a favourable agreement, and are extremely proud of the USW team in Findlay."

"With much hard work and a thoughtful negotiation process by both the USW and company representatives, we are pleased that Findlay plant employees recognised the value of the new contract. We appreciate our positive relationship with the USW as our great team in Findlay continues to produce great tyres," said Cooper Tire Findlay Plant Manager Jeff Kamm. ■

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- Tyre Testing & evaluation
- Material Characterization
- Microscopy, Failure analysis & Reverse engineering
- Advanced rubber processing Automation related to rubber industries

Tyre simulation & modeling
Miscellaneous items interresting to rubber & allied industries
Books and periodicals

Workshop on topics:

1. Tyre Mechanics
2. Rubber Mixing
3. Automative Rubber Components & Speciality Synthetic Rubbers (at hotel Hilton on 13th & 14th October 2020)

To enhance the activities in the field of rubber science & technology, Indian Rubber Institute is setting up **Dr. D. Banerjee Centre of Excellence (DBCE)** in the premises of JSS science and technolgy University, Mysore, Karnataka, India for providing training, research and education to people to the people working especially in small and medium sector rubber manufacturing units. The construction of 32000 squarefeet building is under progress and expected to be ready by 2019.

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By Varun Awasthi

AUTO EXPO 2020

THE MOTOR SHOW, AN EVENT TO INDULGE IN

Even while the Automobile industry is facing its worst time in decades, it failed to dilute the excitement and thrill of the Indian Auto Expo 2020 – The Motor Show. According to The Society of Indian Automobile Manufacturers (SIAM), 608,526 people visited the show at the Greater Noida Expo Mart between February 7 and 12.

This Motor Show included 352 product displays from 108 exhibitors and included eight global premiers with over 70 launches and unveilings. It also comprised introduction of 35 electric vehicles and 15 concepts. Though some of the popular car companies like Honda, Toyota and BMW did not participate in the expo.

The theme of this biennial event, one of the biggest in the world, was green technology. The focus was on greener, cleaner and better mode of transportation.

Concept cars were the show stoppers. Some of the most striking revealed were Maruti Suzuki Futore-e, Mahindra Funster, Hyundai's Coupe Concept Le Fil Rouge and Kite, Tata's revival of old Sierra, now into new electric Sierra, MG Motors Vision – I, and Renault Symbioz.

Mercedez Benz seemed pretty optimistic with its new concept of airborne mobility and displayed an electric Urban Air Mobility (UAM) VoloCity 1:3 scale model called Volocopter. It's based on eVTOLs, which means Vertical Take-Off and Landing aircraft with an electric power train.

Great Wall Motors made a global preview of its plug-in hybrid SUV concept Haval-H at the Auto Expo 2020. The design states that thorough research of the Indian market is done before entering the market. GMW also showcased pure electric SUV Concept Vision 2025 is Haval's vision for its smart, capable, intelligent vehicle for 2025.

There were new launches, of course, but as the coronavirus had

a visible impact the buzz seemed missing and there were fewer launches than in other years.

Maruti Suzuki Ignis facelift with its mechanical update in the form of a BS6-compliant 1.2-litre petrol engine was one of the most anticipated launches, In addition, there was excitement for Maruti's first model to get a BS6-compliant, CNG version of the 1.0-litre K-series engine, the S-Presso S-CNG will be available in the showroom soon.

Hyundai's Grand i10 Nios Turbo is expected to hit the market soon, it comes with 100hp, 1.0-litre turbo-petrol engine is definitely something enthusiasts will be looking forward to.

The German luxury carmaker Mercedes Benz has opted to use the A-class Limousine mark for the upcoming sedan. While

the model showcased at the Expo was the range-topping AMG A35 – which is sportier in terms of its looks and power train – the models likely to come to India are the 163hp A 200 petrol and the 116hp A 180d diesel.

Companies like Tata, Skoda Rapid, will soon appear with its biggest update. The enhanced Ziptron technology will be featured in new Tata Altroz EV's range and performance is likely to beat that of the recently launched Nexon EV. The Skoda Superb facelift also gets a more powerful BS6-compliant engine. This 190hp, 2.0-litre turbo-petrol unit will be used on Skoda's larger models, where it effectively replaces the 1.8 TSI petrol and the 2.0 turbo-diesel engines available earlier.

Auto Expo 2020 was an adrenaline-raising event for four wheelers, It did not have much to offer in the two-wheeler segment In fact apart from Suzuki Motorcycle India, Hero and the Piaggio group, there were very few electric two-wheeler companies present at the expo.

Automobile Industry has a lot to offer to the Indian market and the concentration is towards Electric Vehicles, but until the global market gets stable. The platforms like Auto Expo can help in giving a boost to current market conditions. ■

TYRE INDUSTRY SEES DIGITALISATION BENEFITS

Customers, OEMs and systems integrators in the tyre industry aver that digitalisation has tangible benefits for the industry.

The tyre market is expected to witness significant growth over the forthcoming years. At the same time, it has become more complex than ever. The increasing number of vehicles variants calls for a greater variety of tyres. In addition, automotive trends such as eMobility and autonomous driving increase the demand for innovative concepts in tyre design and tyre production. That's why competitive tyre production needs to be highly flexible and able to react swiftly to meet volatile market developments. At the same time, it needs to meet today's high requirements in terms of quality, safety, environmental standards and increasing internationalisation.

Tyre manufactures as well as machine builders require innovative concepts in tyre design and production, improved production processes featuring an increased degree of automation and more transparent production. Further key aspects are reduced downtime, detailed diagnostics and lower energy consumption. At the same time, many plants need to be refurbished to meet the latest requirements and new production facilities need to be built to meet increasing product demand.

In order to achieve mass production and mass variations, the machine-to-machine communication is essential. Through this, we can reallocate resources that can save a lot of time that can be utilised in a productive manner on other significant tasks.

These perspectives were shared at the recently held Siemens Tyre Day at New Delhi, organised by Siemens Digital Industries, Factory Automation team. The theme was based on "Future of Tyre Manufacturing." The event saw participation key customers form tyre and automotive industry.

Through the Totally Integrated Automation and Siemens PLM software, Indian tyre manufacturers have ready access to technology for data integration between the various points of the value chain. The innovative engineering

framework of TIA Portal integrates HMI, controllers, distributed IO, motion control and drives seamlessly into one engineering environment. In addition, by implementing the SIMATIC range of solutions, machine builders for the tyre industry can increase productivity and cost efficiency through the latest technology. SIMATIC PLCs support tyre manufacturers right from factory layouts and factory designs that are highly automated according to their requirements across the product and production life cycle. These include operating environments such as, logistics, mixing, semi-production, tyre building machines, curing, testing and final finishing.

One of India's leading tyre manufacturers has two state-of-the-art manufacturing units and is planning to digitalise its production line in its upcoming third plant. The factory head of this tyre manufacturing company says, "We believe digitalisation will not only help us in automating our production line but also enable us to predict and plan more efficiently and help us to utilise our resources optimally. Digitalisation has great potential to offer us consistent solutions to optimise our plants' availability, reduce the Total Cost of Ownership (TCO) and improve time to market."

Peter Haan, Head of Global Business Development OEM Tyre, Digital Industries, Siemens AG, says, "The typical value chain for manufacturing tyres starts from R&D, moving to production planning, production of tyres, quality assurance, warehousing and supply the tyre industry in India can gain massively by integrating automation right at the onset of the tyre production lifecycle. Using cutting-edge technology from Siemens, Indian tyre manufacturers can use a mix of new and retrofit solutions to cater to their demand and sustain their profitable business models." ■

By Sharad Matade

INDUSTRY GIANTS ATTEND TIRE TECHNOLOGY EXPO 2020

VMI President and CEO Harm Voortman with the Tire Manufacturing Innovation of the Year Award. VMI won the award for its pioneering Synchro Crown Drum, a special drum for building light truck tyres on the VMI MAXX tyre building machine

Held under the shadow of the Coronavirus pandemic, Tire Technology Expo 2020 lived up to its reputation of being the biggest tyre industry event in Europe. The 20th edition of the show hosted innovative products and the conference covered a wide range of future-defining topics for the global tyre industry.

Held between February 25 and 27, 2020, at the Deutsche Messe, Hannover, the Tire Technology Expo hosted over 300 exhibitors from across the world, barring many traditional Chinese exhibitors due to the pandemic scenario. Industry giants such as HF, VMI, Siemens, Cimcorp, Michelin, Zeppelin Systems, Rockwell Automation, Mesnac, Bosch Rexoth, Troester, Emerson, Beckoff Automation, Millken Textiles, Sibur, JSR Elastomer Europe, Trinseo and others engaged visitors with their technologies that meet the new challenges and demands of the current and future mobility.

Growing emphasise on automation & industry 4.0, traceability, sustainability, and new materials reflected on the products displayed at the expo.

In its efforts to build tyres with the highest quality and safety standards, HF Tire Tech introduced HF Q Guard that brings precision in splice measuring and complete tracking of tyre data during the tyre production process. HF Q Guard sensor technology measures splices in real-time with an accuracy lower than half of a millimetre.

''With this innovation, HF is anticipating market demand for: the highest quality demands; safety, and the reduction of accidents caused by defective tyres; material and cost saving in the production process; traceability in the production process and beyond; big data – the digital twin of each tire delivers all information needed; and less downtime due to quick reactions and adjustments in the production process," said the company.

Uzer Makina launched its cross-placed floating-column hydraulic press for TBR tyres at the show. This brand-new curing press is much lighter and more compact than the existing frame type. At the same time, it has all the advantages of the internationally patented floating column technology, including automatic mould height adjustment, a locking mechanism that cannot jam, and low cycle time. Uzer Makina also announced that a new, 59' size of floating-column-type hydraulic press for SUV tyre will become available in 2020.

Michelin showcased its tyres embedded with RFID tags. According to the French tyre maker, RFID tags help to optimised logistics, better stock management, correct assembly (tyre/rim) and ensuring the right tyre is fitted to the right car, through to better claim management and better lifecycle management, RFID underpins a number of improvements.

Siemens showcased a broad-based digital enterprise portfolio for the whole value chain, especially for tyre manufacturers and machine builders. The company's digital twin of the tyre, the production machines and plants and its totally integrated automation portfolio link the digital and real-world of tyre production.

Rockwell Automation demonstrated the Factory Talk Innovation Suite powered by PTC, as well as its curing press experience using augmented reality.

Emerson presented its portfolio of automation technologies that help reduce energy and costs through better diagnostics, sensing and monitoring. The company showcased automation technology from its ASCO, AVENTICS, ROSEMOUNT and BRANSON portfolios, as well as new PACSystems edge devices from its machine automation solutions business.

Mesnac has upgraded its passenger tyre building machine for sizes between 13' and 24'. Its MERTC P-PRO2, depending on the version customers select, can support fully automated tyre production and has more control over the production process than before with improved data collection, smart maintenance. ''The MERTC PRO-VIS, visual inspection system, ensures the uniformity of building drums and that tyre components are placed correctly, as well as monitoring tyre component width, tyre component splicing, bead position and green tire uniformity," said the company.

Materials

Trinseo demonstrated how its proprietary functionalisation platform is enabling the tyre value chain to produce higher performing, more sustainable tyre. Trinseo said that its functionalised SSBRs are making a significant contribution to the production of more energy-efficient tyres, which enable the reduction of CO2 vehicle emissions in their use phase. ''This makes them an ideal solution to current megatrends and legislation affecting the global tyre industry, satisfying demand for synthetic rubber solutions that are as high performing as they are sustainable," said Trinseo.

JSR Elastomer highlighted its hydrogenated SSBR that, the company claims, increases the durability by 150%.

Kuraray presented a range of new liquid rubber grades, with a special focus on its bio-based Liquid Farnesene Rubber (L-FR), offering co-cross-linking, improved grip and greater sustainability.

Kordsa and Continental together showcased jointly developed new eco-friendly adhesion system innovative Cokoon dip technology. Cokoon enables the bonding activation of textile reinforcing materials with rubber compounds without the use of resorcinol and formaldehyde in the textile dip.

Schill & Seilacher "Struktol" highlighted its new reactive polymeric plasticisers called Struktol HT 815 and 820. These products have been developed as replacements for castor oil, which is widely used in the vast majority of tyre curing bladders.

The Struktol plasticisers exhibit low volatility; furthermore, migration of plasticiser from the bladder during extended service is reduced to a minimum. This means the rubber doesn't become stiff through extended use, thus significantly improving resistance to flex cracking.

The latest inkjet and laser marking systems for tyres were on display at REA JET's booth. The company will be presenting its new generation of large-character inkjet printing systems. The REA JET DOD 2.0 uses the latest production processes and new materials for less wear.

Fineline showed how its RFID tags help to track tyres – OTR tyres in particular – throughout the production process. With effective use of RFID encoded 1D or 2D barcode bead labels, one can track individual tyres not only through the production process, but also for warehouse logistics and inventory management, on storage racks, and eventually to a specific OE vehicle in use.

SinoARP had its new fourth-generation GENIV hydraulic curing press, suitable for a 45-52 inch size range. The GENIV press, which was launched late last year, distinguishes itself with a very small footprint and a short dry-cycle time. It uses SinoARP's ingenious hydraulic mould locking system principle, which has proved itself in the company's other press designs, as verified by the world's major tyre manufacturers.

Awards

The Tire Technology International Awards for Innovation and Excellence were divided into the seven categories. The winners were selected by a panel of international journalists and industry experts.

VMI won the Tire Manufacturing Innovation of the Year Award for its pioneering Synchro Crown Drum, a special drum for building light truck tyres on the VMI MAXX tyre building machine. The award was received by Harm Voortman, President and CEO of VMI Group. Harm Voortman said, "We are honoured to receive this important award. In 2009, VMI launched the MAXX tyre building machine, a revolution in tyre building. The MAXX not only changed the concept of tyre building, with its hands-off, eyes-off principle, it also introduced the platform approach. With this platform approach, VMI introduced a manufacturing system which can be continuously improved and updated, so that it remains at best practice level throughout its lifespan by means of upgrades, extension or retrofits. Now, with the addition of the Synchro Crown drum, customers can build all types of tyres on one platform, delivering a high return and maximised profitability to our customers".

Michelin bagged Tire Manufacturer of the Year Award for the second consecutive year - a first for this award, for its airless mobility solution for passenger vehicles, Uptis. Eliminating any risk of punctures, Uptis offers considerable advantages which will make it possible to offer greater peace of mind to motorists during their car journeys.

Eastman was awarded the Tire Industry Supplier of the Year Award 2020. The Environmental Achievement of the Year award grows in significance every year as the industry looks to become greener and more sustainable. 2020's winner was RubberJet Valley, commended for its environmentally friendly High-Pressure Water Jet Technology.

Andrew Tinker was felicitated with the Lifetime Achievement Award. ''Andrew's illustrious career spans over forty years, during which time he authored over eighty technical papers, co-edited a book and was the co-inventor on four patents for commercial products," said the organiser.

Dr Tinker has become a renowned expert in the study and development of rubber blends and thermoplastic elastomers based on natural rubber, and, although he retired as Director of Research of TARRC in 2009, he remains on a number of influential committees associated with the rubber industry.

The Young Scientist Award for 2020 went to Alex O'Neil a Jaguar Land Rover Research Engineer from the University of Surrey. Alex was commended for his research into the measurement of friction to predict tire behaviour on different road surfaces.

The Tire Technology Expo Conference featured over 170 presentations across 12 streams from experts at organisations from Bridgestone, Continental, ExxonMobil, Hankook, Jaguar Land Rover, Lamborghini, Michelin, and Yokohoma, to name a few. ■

By Sharad Matade

TARSUS TO FOCUS ON INDUSTRY NEEDS AND EVENT CONTENT

Douglas Emslie

Tarsus, the global B2B media group, last year acquired the TyreXpo series of events from Singapore-based organiser SingEx. Being the organiser of many tyre industry events, Tarsus will focus on the industry's needs, key industry players, event content and work with all other related stakeholders of the sector to deliver 'thought-leading content' for the exhibitors and buyers. "TyreXpo is well respected within the market and we could see plenty of scope to further develop the Singapore show in particular, especially through increased focus on our customers' customers and bringing key international buyers to the show," Douglas Emslie, CEO, Tarsus Group, told* Tyre Trends*. Tarsus also plans to host buyer programme to attract the top 150 tyre buyers from across the globe for the show. In the interview, Emslie also spoke about the challenges in organising the expos amid slowdown and the outlook of the global tyre industry

What prompted you to acquire the TyreXpo series? How does the TyreXpo compliment Tarsus' events?

Our approach at Tarsus has always been to pursue growth through a careful blend of strategic acquisitions and organic growth. Since being acquired by Charterhouse Capital Partners last year, we have set ourselves some ambitious growth targets and have been focused on opportunities that will enable us to accelerate the pace of growth.

TyreXpo presented an attractive opportunity for us – we already have a strong automotive and aftermarket event portfolio in China and Southeast Asia, along with a strong footprint in the region. TyreXpo is well respected within the market and we could see plenty of scope to further develop the Singapore show in particular, especially through increased focus on our customer's customers and bringing key international buyers to the show.

The acquisition comes at a time when the global automotive industry is going through a tough time. Many expos and events in the industry are either getting postponed or even cancelled? How do you see this as a challenge?

It's vital that events and tradeshows continuously evolve to meet the needs of the industry and the customers that they serve. We pride ourselves in staying close to the markets we operate in, listening to the key operators and delivering events that meet our customers' objectives. Whilst it's true that many of the more established automotive shows have faced challenges in recent years, we have also witnessed the automotive sector increasing its presence at other "non-traditional" shows such as CES in Las Vegas. This really demonstrates that the industry wants to be where the customers are and that's what we will deliver at TyreXpo going forward; along with really great content and a highly focused environment that's conducive to doing business.

How different will TyreXpo be from the past, and what will be the focus?

The focus will be on delivering a show that truly meets the industry's needs. We will actively recruit key buyers to attend the show as well as placing lots of emphasis on event content, working in tandem with relevant associations, media and partners to deliver thought-leading content for the exhibitors and buyers. We're also moving TyreXpo Asia to a fantastic venue – the Marina Bay Sands in Singapore.

A significant challenge for any organiser is to get visitors from diversified regions/ markets. We also see growing numbers of expos and other events across the globe. What will be your efforts to get visitors from different markets for the TyreXpo?

We plan to focus investment on a best-in-class hosted buyer programme to attract the top 150 tyre buyers from across the globe as well as developing an innovative affiliate programme to encourage personal recommendations and invitations. Interested buyers can find out more about the hosted buyer programme on our website.

What are the challenges in organising expos for the auto industry?

In our experience the challenges in organising B2B events are the same across most industries. We operate globally, in numerous verticals including aviation, medical, labels, travel and housewares – and our approach is the same irrespective of the industry we are delivering events for – there can be numerous shows competing for the same "dollar" so we always focus on our customers' ROI and delivering quality, relevant buyers. Ultimately that is how the value of an event is always measured and ensures customers come back to us year after year.

How do you evaluate the global tyre market?

Undoubtedly the tyre industry is facing a challenging time and is being affected by rubber prices, US-China trade relations and the current Covid-19 situation impacting production. Nonetheless, we consider the tyre industry to be a particularly resilient one and the demand for tyres is typically quite well insulated against economic downturns. Overall, we are very optimistic about the market; the outlook for consumption along with growth in both applications and end users looks very promising. ■

ATMA BRINGS TYRE SAFETY IN FOCUS

Tyre Safety Zone set up by Automotive Tyre Manufacturers Association (ATMA) to create awareness amongst visitors of Auto Expo emerged as a big draw. Set up on the theme "Play your PART, Be Tyre Smart," the tyre safety zone engaged audience in gripping games woven around the theme of tyre safety.

PART is an acronym for Pressure, Alignment, Repair & Rotation and Tread. Sensitising motorists on these five points is central to all tyre safety drives, states ATMA. Indian Tyre Technical Advisory Committee (ITTAC) the technical wing of ATMA has been driving the initiative.

"ATMA has been spreading tyre safety for quite some time through tyre clinics and direct interface with motorists. This time, we integrated the concept of tyre safety with few entertaining games and animated quizzes so as to spread the message in an entertaining format especially relevant for the youth," said VK Misra, Chairman, ITTAC.

There was a basketball game with tyre acting as a ring and five balls each named after Pressure, Alignment, Repair, Rotation and Tread. One was expected to put all the balls in the ring as a pledge to take care of these five vital aspects. Similarly, customised Carom Board and Dice games were geared towards registering five aspects towards tyre safety.

An interesting animated tyre quiz aimed at checking the knowledge about tyres has emerged as a major vehicle for spreading awareness about tyre safety at Auto Expo. Winners of the quiz and games were being presented with attractive prizes leading to further word of mouth visibility.

"The added advantage for creating awareness at Auto Expo is the fact that visitors are mentally receptive to learn more about cars, new automotive concepts and technologies. Tyre safety fits naturally in that mind space," said Rajiv Budhraja, Director General, ATMA.

ATMA has been mandated by Ministry of Road Transport & Highways (MoRTH) for creating awareness on tyres to serve the larger purpose of road safety in India. In collaboration with MoRTH, ATMA has developed posters to spread awareness on the hazards of worn out tyres and the need to check Tread Wear Indicators (TWI). TWI are present in tyres as a visual indicator of the degree of tyre tread wear.

Usage of worn out tyres on Indian highways has emerged as a safety hazard. TWI is an easy to understand feature designed to help motorists replace tyres well within time and pre-empt accidents.

Worn out tyres require longer distance to stop which could lead to accidents.

ATMA is joining hands with other stakeholders. As a first step, Honda Cars India has placed large posters creating awareness on TWI at their corporate office and manufacturing unit at Greater Noida for the benefit of all the employees.

ATMA members which have been participating in Tyre Safety campaigns include Apollo Tyres, Birla Tyres, Bridgestone India, CEAT, Continental India, Goodyear India, JK Tyre & Industries, Michelin, MRF, TVS Tyres and Yokohama. ■

By Rajiv Budhraja

Raising a toast to giant technological leap

Rajiv Budhraja is Director General of the New Delhi-based tyre industry association, Automotive Tyre Manufacturers' Association (ATMA). The views expressed here are personal

Amid the Corona pandemic that has sent shock waves across the world, a milestone has just been achieved in the 70-year history of Automobile sector in India. Termed as one of the biggest technological leaps ever taken by Auto sector anywhere in the world in such a short span of time, the adoption of BS VI emission norms (skipping BS V altogether) in a record time of three and a half years, is by no means a mean achievement.

It all started with an innocuous tweet by Minister of Road Transport and Highways Nitin Gadkari nearly four years ago wherein he stated "My colleagues — Prakash Javadekar, Anant Geete, Dharmendra Pradhan — and I have taken the unanimous decision to leapfrog from Bharat Stage (BS)-IV to BS-VI directly from April 1, 2020"

Needless to say, the tweet came as a shocker of sorts for the Automotive sector in India. After all, other countries had taken much longer to achieve the same feat. Europe took nine years to achieve effective equivalent of BSVI. Rajan Wadhera (now President Society of Indian Automobile Manufacturers, SIAM) termed the development as akin to "climbing the Mount Everest in a month." "In my last 50 years, I have not seen this kind of challenge. It's far more difficult than most of the technical transformations that I have seen so far," he had admitted that time.

The task at hand was mammoth indeed. It involved upgrading and overhauling the entire manufacturing ecosystem, calibration and re-calibration so as to fit the new technological criterion but with a rider - keeping the costs on a tight leash. How automakers raced against time to execute one of the most challenging projects has all the ingredients to be an international case study.

What made it all the more exceptional is the fact that Auto sector has been passing through an unprecedented difficult phase in the last two years. Especially in the year just gone by, the Auto sector witnessed worst slowdown in more than a decade.

The challenge was all the more tough for those companies that had products spanning several categories, ranging from passenger vehicles to two-wheelers and commercial vehicles. This meant that the companies had to invest more resources to build the requisite capabilities in a record time.

Successful achievement of BS VI emission norms has underlined the prowess of Indian auto sector in no uncertain terms. The industry was in for much-deserved praise from Gadkari when at the AutoExpo held earlier this year, he stated "I would like to thank the industry for its efforts in leapfrogging to BSVI in record time. I was tough on you. Many of you had reservations. But all of you cooperated. I can see you are about to succeed in a very challenging mission."

It must be reckoned that oil companies also worked relentlessly to prepare well in time. Two of the largest state-owned oil companies Bharat Petroleum Corporation Limited (BPCL)and Indian Oil Corporation (IOCL) had stated in February this year that they will be BS VI-ready at nozzle level much before the deadline of 31st March 2020.

Besides time and commitment, large scale investments have gone into achieving the onerous task. According to Wadhera, automotive manufacturers have invested about Rs 70000 crore (US$10 Bn) for developing the BS VI product portfolio. The total investment by the public sector refineries alone for conversion to BS VI is to the tune of Rs 35000 (US$5 Bn) crore.

Being an integral part of the automotive value chain, Tyre Industry is privileged to have aligned with the Auto makers by developing tyres with much better fuel efficiency and hence lower emissions.

Auto sector contributes the maximum to the manufacturing GDP of the country and has unparalleled potential for job creation. No doubt Covid-19 has dampened the sentiment and the economy is poised to spiral down for some more time but the resilience of the Indian industry, winning against all odds, is shining through. ■

By Antony Powath

Travelling across continents is not only a passion, but also an opportunity for Antony Powath to meet people from diverse backgrounds. It lets him understand more about the global tyre and rubber industry.

TIME TO GET BACK TO THE DRAWING BOARD

The one that has made all the waves for the wrong reasons is the COVID 19 virus aka Corona virus. There is a lot of panic all across the world. Many sporting events like the NBA have suspended the league from playing any more games until further notice. Other organisers such as the Indian Premier League (IPL) and Olympics may postpone the event until the situation gets better. Many events in our very own Automotive and Tyre industry have also been postponed or cancelled. The ones that did take place were subdued.

The WHO has said that the outbreak is now officially a Pandemic. People/ companies/ organisations are still coming to grips on how to address the situation. Government heads of various countries are trying to curb the situation by restricting entries of people who are affected from countries that are affected the most. Thus, airlines would have only diplomats and other certain level of people allowed to fly. Many airlines have suspended a good number of their flights. Many companies will be looking to take a hair cut on what they take back with them, just to see that business can be sustained during the trying situations.

The virus has led various markets to crash, courier services have been curtailed in certain countries. All types of cancellations, be it sport, expositions or business, have affected business world over. The transaction value in the losses may be difficult to gauge currently, however, it could be in the millions. Contracts would have to be reworked , and companies may have to come with new strategies.

However, in every situation there would be also a business opportunity, if you work your strategy right. The sale of masks, gloves, hand sanitisers, medical devices would be able to generate good business. Though it is seen that the outbreak is from China, you also got to give to them as to how they are trying to contain the situation by building hospital/s within 10 days. In other countries this would easily have taken much longer time period.

It is a given that the business scenario is not going to be the best for most of the companies; Therefore, companies may have to think and reevaluate the way they are currently running their company. Companies will look to get leaner in every possible way. Cut down on unwanted expenses. Many companies have started asking their employees to work from home. Some may look to have lesser number of people and look to automate some of the work, especially in the factories. Commercial properties being an expensive asset to maintain, some companies may look to perhaps go on rented co working spaces. Use less of one time use items like plastic and use more renewable/ reusable substitutes. Use of more environment friendly methods going forward will be the mantra.

This hit on our social system in a way will make us pause, think and have better suggestions as to how to look after ourselves and our environment at large. ■

Louis Rumao

By Louis Rumao

STATE OF OUR COMMUNICATION

Communication is the process of passing information and understanding from one to another – be it between humans, organizations or among animals - using a myriad of means, such as verbal, visual, touch, digital et al. It is very interesting to watch ants, termites and bees communicating with each other in a very effective and apparently non-verbal manner! Some animals even use urine to mark their territory or broadcast their sexual status. While the communication system in the animal kingdom has not changed, in the case of humans, the means of communication have evolved very rapidly.

Old ways:

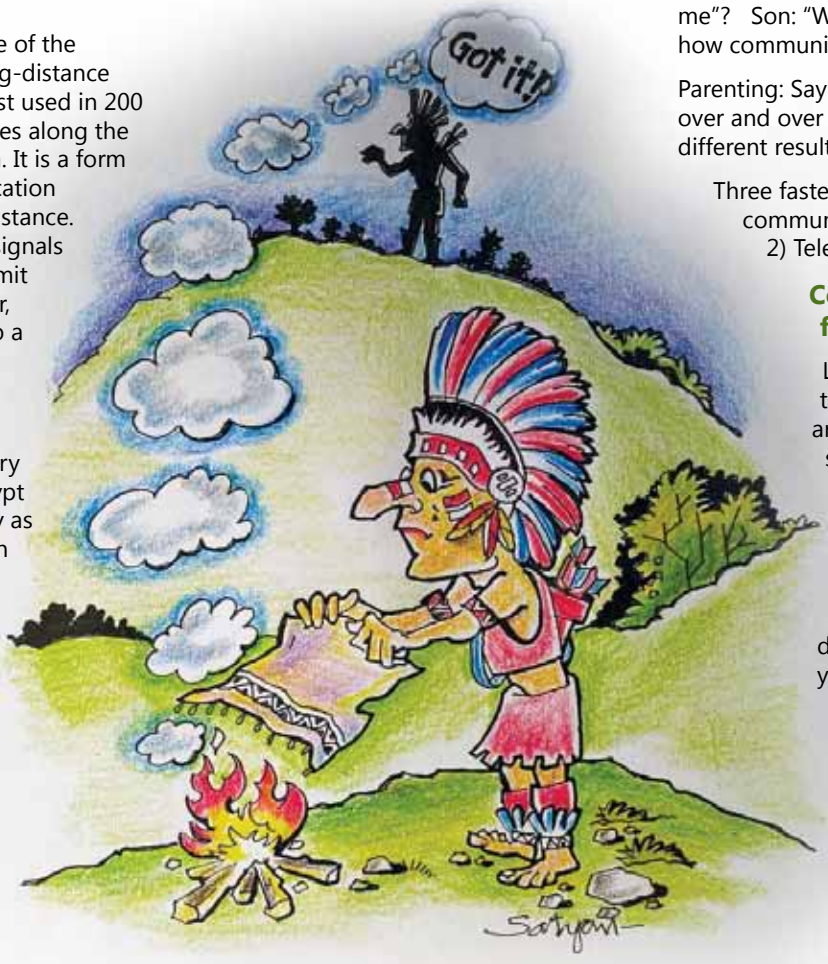
Smoke signal is one of the oldest forms of long-distance communication, first used in 200 BC to send messages along the Great Wall of China. It is a form of visual communication used over a long distance. In general, smoke signals were used to transmit news, signal danger, or gather people to a common area.

Carrier Pigeons were used in the 12th century to carry messages from Egypt to cities as far away as Baghdad in modern day Iraq. Pigeons also played a pivotal part in both WWI and WWII, unerringly delivering vital messages that helped to save the lives of thousands of civilians and combatants alike.

Mirrors were used in the 1860's by the British army In India, to transmit flashes of light, using heliographs, a special tripod-mounted mirror with a lever that tilted it. It was an ideal way to communicate in the rough, mountainous areas of northern India and Afghanistan. By the late 1800s, the U.S. Army was using relay networks of heliograph stations to send messages through the vast desert expanses of Arizona and New Mexico.

New Ways:

The photo of youngsters is enough to illustrate the current state of our communication!



Source: HuffPost.com

Some common observations about communication:

Politicians: Work their gums before an election and gum up the works after the election.

Preachers: "Do as I say, don't do as I do"

Father-to-son: "Are you talking back to me"? Son: "Well, yeah! That's kinda how communication works"!

Parenting: Saying the same thing over and over again, but expecting different results

Three fastest means of communication: 1) Tele-vision 2) Tele-phone 3) Tel-a-woman

Communication hints for married men:

Let the wife have the last word in any argument. Anything you says after that is the beginning of a new argument.

World's most dangerous communication – disagreeing with your wife.

A married man should forget his mistakes. There's no use in two people remembering the same thing! ■

By Sharad Matade

Hankook Tire's journey from being an Asian tyre manufacturer to an innovative and technology-driven tyre maker company is impressive. Today the South Korean tyre company is a "premium brand" in the global tyre company. Hankook Tire has grown to be the fifth-largest in tyre production capacity and seventh in sales internationally. However, for tyre companies, the future will be more challenging due to rapidly changing growth drivers, technologies and consumer demands in both, OEs and aftermarket. Aiming at being a global top tier company, Hankook is preparing for future with "disruptive innovations". "Hankook will not settle on the past performance and will engage in disruptive innovations in all areas, focusing on strategy, process and corporate culture, in order to move forward to the future," Soo Il Lee, Chief Operating Officer of Hankook Tire, told ***Tyre Trends***

BUILDING ON STRONG POINTS

Soo Il Lee

What are the factors that influence Hankook's tyre business in the Asian market?

Korea is our home market, and our strategy is suited for it. It is a market where diverse marketing activities, such as steady launching of new products, innovation of distribution structure, and strengthening of the retail services, are essential. In order to gain a firm control of the domestic market, Hankook Tire is pursuing activities to improve customer satisfaction and to enhance brand value.

For China, Hankook Tire will follow a new method - new high-inch products that will follow the Chinese market trend, expand tyre supply for new cars of premium vehicle brands, and improve investment and distribution structure. The company should not only continue to pursue growth in the Chinese market, but also establish the status as a premium brand through China-friendly market communication. On top of this, Hankook believes the Chinese market to be leading the future trend with EVs and such others. We will align to this trend and secure leadership in the EV segment.

ASEAN is a fast developing market, and is one of our future growth engines. It is a market where we believe we need to continuously expand our distribution networks, especially in retail businesses based on retail platforms that will increase brand value and awareness. Moreover, it is crucial to address exploring new markets (Vietnam, Taiwan, etc.) by expanding and stabilising new organisations. By improving brand recognition and value, we will drive greater market share.

What are the growing expectations of OEMs in the Asian market?

In South Korea, the expectation is to maintain a stable supply system

with existing customers including Hyundai Motors, KIA Motors, GM Korea, and SsangYong Motor Company, and to continuously supply tyres for new or modified models.

For the Chinese market, we are continuously supplying tyres for new models of existing customers as well as discussing equipping new cars of Chinese local automobile brands.

As far as the ASEAN market goes, Hankook Tire is equipping new tyres to seven models produced by Hyundai Motor India and will continue to maintain its stable supply system. We will also expand partnerships with Japanese carmakers in the Indo-ASEAN region.

In addition to the customisation strategy for the above regions, we seek to grow together with global car makers based on trust (trust in technology, trust in supply, etc.) and collaboration as an important partner in their future car business.

Major markets like China and India in Asia are facing a slowdown. How is Hankook coping with the slackening demand in these two countries which are the main growth drivers of the region?

China and India are markets that are our future growth engines. The Chinese market is focused on high-inch, UHP tyres for performance and premium vehicle segments in line with our premium brand strategy. We will further establish a sales strategy around the recently growing segments of electric vehicles and SUVs.

In the Indian market, we are pursuing a strategy to expand sales to improve market share and brand awareness. As such, we are investing in the expansion of infrastructure to collaborate with the workshops of auto companies and expand retail sales.

Developed economies are already adapting CASE mobility (connected, autonomous, shared and electric) aggressively and eventually, the trend will come to Asia in the near future. How are you preparing for it?

As a globally leading tyre company, Hankook Tire is responding to CASE in two major ways.

The first is a tyre for electric vehicles. The company recognises the difference between electric vehicles and general internal combustion engine vehicles and has reflected such characteristics in research. To minimise driving resistance, we are striving to lighten the weight and secure LRR technology. In addition to securing High Load Capacity technology to support high loads, R&D is underway to improve noise reduction performances.

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Hankook Technodome

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BUILDING ON STRONG POINTS

The second is intelligent tyre using the sensors. An intelligent tyre is essential for extended mobility and connectivity. Various R&D projects are being held to ensure an advanced sensor technology where the intelligent tyre can predict situations in advance and provide optimised information based on driving information and driving habits data analysis and networking between infrastructure and roads where the tyre crosses.

How do you evaluate OEMs and aftermarket in Asia?

We will focus on developing the tyre technology to cope with the ever-growing eco-friendly vehicle market. We will also expand the supply of special tyres such as run flat tyres and sealant tyres, which are already being supplied to the carmakers. As such, we will strengthen our portfolio for new cars by developing new technologies and expanding supply of tyres for new cars.

Market dynamics are changing rapidly and the response time - from design to product development and manufacturing - to the markets is getting reduced. This trend is putting much pressure on tyre companies. How is Hankook facing this challenge?

Hankook Tire established new teams that are centered on brand in 2020 to respond to the rapidly shifting market conditions. The company is operating a consumer, commercial team that manages everything from planning new products to development, production, sales and profit/loss on a product unit. Rapid responses to individual PM units have added wings to the Go-To-Market strategy.

In addition, we are going through a digital transformation, applying AI to the R&D stage (representatively, the VCD system that uses AI to predict compound property) to shorten the process and further applying it to the entire production and SCM.

How do you see the growing presence of e-commerce in selling tyres?

The e-commerce market is expanding gradually, and in response to the O2O market, Hankook Tire is approaching customers by establishing O2O Platform in Korea. In China, direct sales are conducted through major O2O site. In Australia and Germany, Hankook directly targets e-commerce markets with key distribution centers.

What are your future plans?

Innovation is the driving force behind Hankook's efforts to strengthen its performance. With continuous innovation, we have developed the best technology leadership, obtained premium brand value, and formed a unique corporate culture. Based on such strong points, we have grown to become one of the top global companies. Hankook will not settle on the past performance and has and will engage in disruptive innovations in all areas, focusing on strategy, process and corporate culture, in order to move forward to the future.

Through disruptive innovations involving all our employees, we will gain a strong competitive edge to solidify our status as a global top tier company. ■

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VMI's rich heritage dates back to 1945, when Mr Jan de Lange founded the Veluwse Machine Industrie with the laying of the foundation stones at exactly the same spot you can find the company's headquarters today. Soon after that, new businesses were entered; rubber and tire were followed by the can and care industry and VMI further expanded by setting up facilities across the world.

Nowadays, VMI is regarded market leader in most of its industries. By delivering customized solutions, we focus on your specific situation and provide exactly what is needed for your production process.

Together with our 1600 people across the globe, we will continue to bring our industries to the next level by providing state-of-the-art innovative technology to make you more successful.

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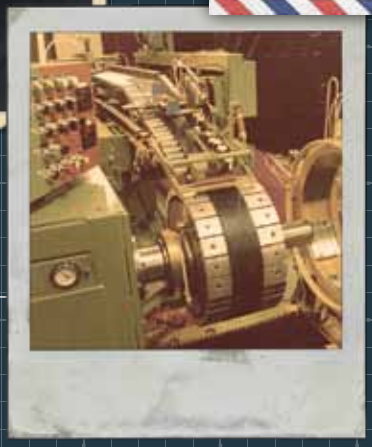
1945
Ing. Jan de Lange founded Veluwse Machine Industrie right after WWII.

1975
The first (semi) automatic single stage VRP (VMI Radial Passenger) 148 tire building machine was launched.



1996
VMI Yantai is started.

2009
VMI launches the MAXX, a revolution in the passenger tire manufacturing industry.

2016
VMI launches the MILEXX, a new dawn in truck tire building.

75 YEARS
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