

Shaping the Future of Rubber Products: An overview of Advanced Materials and Processing Technologies

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Abstract

The global rubber industry is undergoing the most significant transformation since Charles Goodyear discovered vulcanization in 1839. Driven by demands for sustainability, extreme performance, traditional natural and synthetic rubbers are being re-engineered in response to rising performance expectation, sustainability compliance and increasingly complex application requirement. Further, conventional manufacturing approaches are no longer sufficient to meet future market demands. To remain competitive and relevant, the industry must embrace advanced materials and next generation processing technologies that tightly integrate product innovation with manufacturing excellence.

This presentation provides an overview how advances in rubber compounding, processing, moulding, and curing technologies are reshaping the future of rubber products since the ‘Liquid Phase Compounding’ process developed/commercialized by Bernard Wilkinson in 1923. The Malaysian rubber industry has been striving to evolve from a labour intensive, cost focused function to a strategic enabler of innovation, quality, and differentiation. Compounding technologies, including high performance bio-based sustainable elastomers, nanocomposite and hybrid fillers, reclaimed rubber devulcanization, etc coupled with improved mixing systems resulting in enhanced durability, consistency, safety and reliability to meet demanding applications. Precision moulding and advanced curing technologies that allow manufacturers to achieve tighter tolerances, improved the importance of integrating research and development with manufacturing capability, ensuring that new materials and product designs are scalable, robust, and commercially viable.

Through an industry leadership perspective, we highlight the role of collaboration, capability building, and ecosystem alignment—where industry associations such as MRPMA, MARGMA in collaboration with MRB, MRC, local universities, education/training institutions e.g. PRIM all play a key role in accelerating technology adoption and strengthening Malaysia’s rubber manufacturing competitiveness.

Biography (For Plenary, Keynote, and Invited Speakers)

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Personal History:

Pak-Kuen Chan has 44 years working experience in the latex and dry rubber manufacturing industry with main interests in research & technology and quality assurance. At least 10 years in the senior management team of the previous company.

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Research Keyword (3-5 keywords use commas to separate each word):

Latex, Rubber, Manufacturing, Quality Assurance