Graphene Nanoplatelets: Potential Additive for Performance Improvement of Re-treaded Tyre

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Abstract

The growing demand for cost-effective and economical tyres has been driving the expansion of the tyre retread market. Increasing wear and tear of existing tyres, caused by various internal and external factors, has further contributed to the rising need for retreaded tyres.

Graphene, often referred to as a *wonder material*, has shown remarkable potential in enhancing rubber properties. Its incorporation into rubber significantly improves mechanical strength, electrical conductivity, dynamic performance, and wear resistance. Studies also indicate that graphene enhances cut-growth resistance, increases toughness, and boosts the shock-absorbing capability of rubber compounds.

Therefore, to extend the service life of retreaded tyres, integrating graphene into the tread compound presents a promising solution. This approach not only enhances tyre performance but also aligns with economic and environmental goals. Retreaded tyres are inherently more eco-friendly than new tyres, as the retreading process generates substantially lower carbon emissions and uses far fewer fossil-fuel-based raw materials compared to manufacturing new tyres.

References

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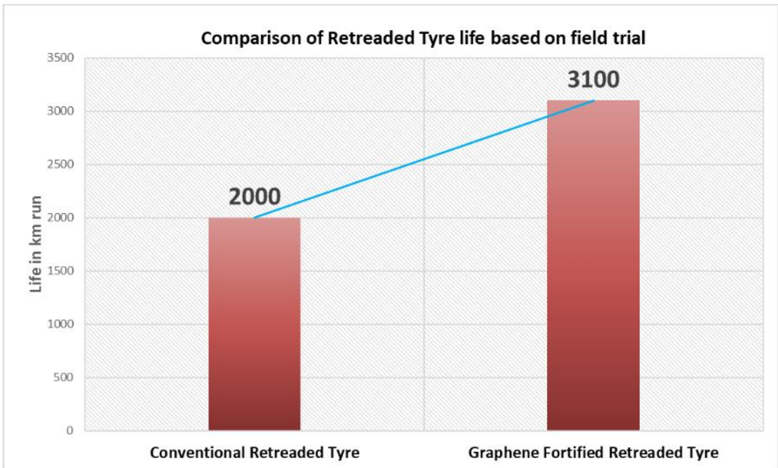
Figures

Figure 1: Life improvement of graphene enriched re-treaded tyre in comparison of conventional re-treaded tyre



*** Tyre Size: 11.00-20, Normal Truck Tyres**

Normal Tyre

Graphene enriched Tyre

Supply Masterbatch to OEM

Tear Strength
15 % Improvement

Wear Properties
20 % Improvement

Tyre Life
1.5 Times Increase

Market Size: 10.81 million units in 2021, CAGR 8.5% in India