TyreStewardship AUSTRALIA

Australian Government Accredited Product Stewardship Scheme

OTR Tyre Composition

Project Objectives

To test several off-the-road (OTR) tyres for their estimated composition of rubber, additives and fillers, and the proportion of reinforcing materials*.

Tyres Tested

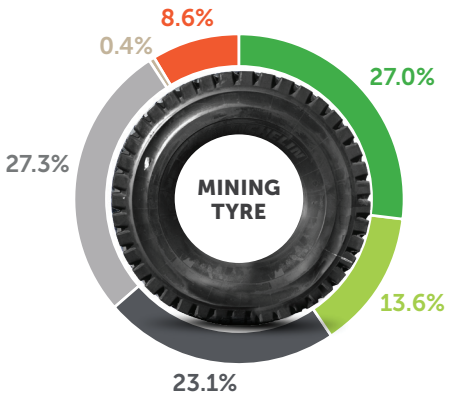
- 14 tyres of different sizes and types were tested, using the tread and sidewall via a cross-section piece of an OTR tyre.
- Tyres were selected based on availability and use in Australia.

Tyre Grouping	Rim Size	Number tested
Mining	24" to <29"	4
	29" to 35"	2
	>45"	1
	>57"	1
Agricultural	24" to <32"	2
	32" to <38"	1
	>= 38"	3

Results

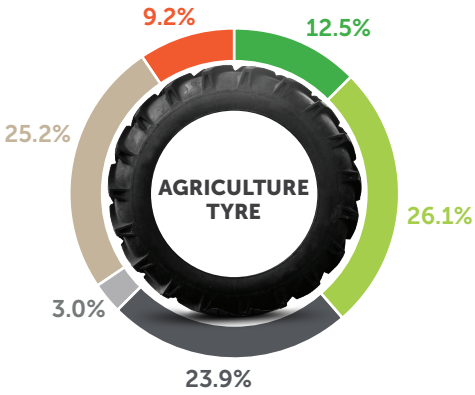
Mining Tyre

- Natural Rubber
- Synthetic Rubbers
- Fillers (carbon black, silica)
- Steel reinforcement
- Textile reinforcement
- Oils, antidegradants, resins, curing agents



Agricultural Tyre

- Natural Rubber
- Synthetic Rubbers
- Fillers (carbon black, silica)
- Steel reinforcement
- Textile reinforcement
- Oils, antidegradants, resins, curing agents



Key Insights

- **Overall the differences in composition related to size, section of the tyre, use and brand, regardless of tyre group. However, there were certain trends that emerged between the tyres that were tested:**
  - Mining tyres, on average, had a higher natural rubber proportion.
  - Agricultural tyres, on average, had a higher synthetic rubber proportion (butadiene and styrene butadiene).
  - Mining tyres, on average, had 26-28% steel reinforcement and no textile reinforcement
  - Agricultural tyres, on average, had 25% fabric/textile reinforcement, and 3-4% steel reinforcement.
- **The proportions of carbon black and other compounding materials are similar in both mining and agricultural tyres compared to industry averages of passenger and truck tyres.**
- **The biggest variation within a tyre grouping was the proportion of rubbers, particularly in the tread.** For example, whilst mining tyres displayed an overall higher natural rubber proportion in both the tread and sidewall, one tyre tested (29" rim size) contained 4 times more synthetic than natural rubber in the tread.

These results are averages and may be useful for organisations seeking to process OTR tyres, use the processed materials in new products, and to understand this topic more broadly. The results illustrate general trends exist across tyre groupings, sizes and parts of the tyre, however several assumptions have been made in the data analysis process to create averages. As such, it is not representative of individual tyres in isolation, and it is recommended that further analysis be conducted to capture specificity within a tyre grouping, if required.

*Testing was done by Smithers Tire Testing – an independent and commercial tyre testing facility. https://www.smithers.com