

Academic Skills, ACHA4005

Technical report writing

Tyre Technologies in Motorsport

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28/11/2022

Tyre technologies in motorsport have been one of the biggest evolutions in motorsport, going from the narrow contact patch with very crude firm rubber to the soft grippy rubber of today's standards.

Tyres is arguably the most important part of motorsport as it is the only contact the vehicle should have with the ground at any given moment. Even the smallest wear and wrong compound of a Tyre can be harmful to a car's handling, acceleration, and braking, which could determine a win or loss for a team. Therefore, there is countless hours of research and development gone into the industry of tyres.

These upgrades have span across all areas of motorsport and made a huge impact on the sport as a whole. With the way the future is improving there will be many more upgrades and advancements in the not-so-distant future.

There are many attributes to a tyre performing correctly down to the rubber compound, tread pattern, air pressure and many more. Any one of these being off will massively impact the car's performance.

The current leading tyre manufacturer for formula 1 is Pirelli, this is because of an agreement in 2010 where they are the sole provider of tyres for the sport, this keeps competitiveness between the teams and keeps the sport as skill based as

possible so neither team would have an unfair advantage, but this is due to end in 2024

In modern formula 1 Pirelli uses 5 different tyre types ranging from soft high grip compound to a rain tyre with deep tread grooved into the rubber. These are swapped when needed during a race to the weather conditions

The tyre compounds for the 2022 season are as follows

C1 This is the hardest tire in the range, which will be nominated for the circuits that take the most energy out of the tires. These could typically include places like Silverstone or Suzuka. It's designed to provide maximum resistance to heat and extreme forces, being capable of running very long stints with minimal drop-off in terms of performance.

C2 The second-hardest compound is more versatile than the C1, but it sits at the harder end of the range, which makes it more suitable to the faster, hotter and abrasive circuits. The harder compounds are also sometimes nominated for new circuits, in order to provide a conservative selection when the circumstances are still relatively unknown.

C3 With three compounds nominated for each race, this one will be used at every event and as such it has to be extremely versatile – as it will sometimes be used as the hardest compound, sometimes as the middle compound, and sometimes as the softest compound. With an excellent balance

between performance and versatility, this is well-suited to a wide range of circumstances.

C4 It's designed to work well on the tight and twisty circuits, where quite a quick warm up is required to hit peak performance immediately. This is another tire that is used extensively throughout the season, making it adaptable to a number of different tracks.

C5 These are the very softest tires in the redeveloped range, designed for the slowest circuits with low wear and degradation where maximum mechanical grip is required from the rubber. These are normally seen at street circuits, most typically in Monaco, and also on circuits where the asphalt is exceptionally smooth.

“Taken from Pirelli tire website”

With my findings from my research, I have deduced that tires are a crucial part of motorsport, and the manufacturer Pirelli has cornered the market well with modern formula 1 which hasn't left much room for improvement in the past 12 years because there is no need for teams to compete against each other as there is with engine power and other car attributes. The contract formula 1 and Pirelli have ends in 2024 and there is not any hard evidence of what the future will hold for tires in F1.

In conclusion, from the basic tyres used since the start of formula 1 in 1950 to the modern high-tech tyres used today there's has been huge technological advancements. From 1950 tyres were another way the teams could get their advantage by making sure their technology and research in the tyres was ahead of the other teams which would give them a good chance in the tight bends of a Formula One track but because of the agreement in 2010 tyre research and development has made a massive slow down because of the fairness between Racers.