



THE BRAZILIAN GRAND PRIX FROM A TYRE POINT OF VIEW

Interlagos, November 24th, 2011 – Pirelli's first season of Formula One after 20 years comes to an end at Interlagos: one of the shortest but most thrilling circuits on the calendar. Coming exactly eight months after the season started in Australia, this is the latest weekend of the year that the Formula One season has concluded since 1963.

The 71-lap race in Brazil has several unusual features to it, such as an anti-clockwise layout, an uphill start-finish straight (which increases the risk of the anti-stall mechanism kicking in at the start) and varying elevation, making it a popular venue for road cycling races as well. Here are some of the key points of the Autodromo Jose Carlos Pace (as it is officially known) from a tyre point of view:

The track

The start-finish straight is the highest part of a circuit, leading quickly downhill into the Senna Esses: a complex of corners where the stability of the car is vital, providing a good overtaking opportunity.

Under full acceleration at 250kph the drivers tackle the Curva do Sol, which generates a sideways acceleration of 4G. This places a heavy demand on the tyre structure and compound throughout the corner.

On the Reto Opposta straight the top speed is 310kph, on a bumpy surface that tends to destabilise the cars. The structure of the tyre absorbs the bumps in the track and neutralises the vertical movement of the chassis, meaning that the car is perfectly planted to the ground for the braking area and the following corner.

After the straight there is a complex of slower corners, taken in second and third gear, where the drivers use the kerbs. Here there is little downforce and traction is crucial, meaning that the tyres have to generate the entire grip required to take the car through this complicated series of bends.

Afterwards the track climbs back uphill towards the start finish straight in a series of increasingly fast left-hand corners, putting plenty of energy through the tyres. The final corner is crucial to get the correct drive onto the start-finish straight, by getting on the power as early as possible. Again, it's down to the tyres to translate the torque from the engine into effective grip as soon as possible. The track is less bumpy than it used to be since being resurfaced in 2005.

Pit stop strategy will be helped by the short time that it takes to make a stop: less than 20 seconds from start to finish.

Road car tyres and competition tyres

The return of Pirelli to Formula One has placed the tyre at the centre of attention for sports' lovers and drivers around the world. But how much do a P Zero Formula One tyre and its road-going equivalent really have in common?

The P Zero racing tyre is wider than a normal road tyre with an extremely rigid internal structure and a high shoulder. The road tyre by contrast is characterised by a deep tread pattern and a hard compound in order to guarantee a long life.

A P Zero road tyre will last for many thousands of kilometres, whereas a competition tyre will do around a hundred – but in the most dramatic way possible. The contact patch of a P Zero Formula One tyre can increase by up to three times under full aerodynamic loading at high speed, whereas the footprint of a road car tyre will always stay largely the same.

The P Zero track tyre is instead designed for maximum performance, giving perfect grip at speeds that are enough to generate 4G of lateral acceleration through fast corners.

This is four times as much grip as a road tyre will provide, thanks to an operating temperature of more than 100 degrees centigrade that maximises the F1 tyre's adhesion to the road surface. A road P Zero tyre operates at up to 40 degrees centigrade, thanks to its harder compound.

The superior grip of the P Zero F1 tyre is highlighted even more by braking performance. A road car generates 1G of deceleration under braking, but a Formula One car produces a figure of 5G, being able to slow from 330kph to 80kph in around three seconds.

The difference is just as pronounced when it comes to the rain tyres. On a wet surface, Pirelli's rain tyres will disperse around 60 litres of water per second. A soft compound and aerodynamic loading provides excellent road holding even at high speeds, with a dry contact patch and total control for the driver.

A road car tyre will disperse around 13 litres of water per second; an amount that will ensure perfect safety for every type of car under normal driving conditions.

But Formula One is far from normal driving conditions. The astonishing grip from tyres that have been specifically developed for racing allows the cars to make the most of all their power and acceleration.

A road car will go from zero to 60kph in about two and a half seconds. In the same time a single-seater will have reached 100kph. Both cars will have doubled their speed in the next five seconds. The difference in performance, grip and lateral road holding is so pronounced, that only P Zero competition tyres are effective enough to cope with the demands that are placed on them.

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