A heritage of humanity, 2 satellites, 9 wrestling mats and 290 residents help us explain brake use on the Azero circuit.

The European GP according to Brembo

An X-ray view of the demand on Formula 1 brakes at the Baku city circuit

From 17 to 19 June, the Baku city circuit in Azerbaijan will host the 8th round of the 2016 Formula 1 season.

Designed by architect Hermann Tilke, it is the 2nd longest track on the 2016 World Championship calendar. The track, never before used by Formula 1 cars, winds through some of the most picturesque streets of Baku. From the straight stretch that leads across the finish line, the 1.5 km track runs anticlockwise, brushing up against the walls of the old city, considered by Unesco to be a heritage of humanity. The most demanding part of the track is the section that starts from turns 7 and 8, sections where the width closes down to 7.6 metres. The new asphalt was spread over the cobbled streets.

According to the Brembo engineers, who have classified the 21 tracks in the Championship on a scale from 1 to 10, the Baku circuit falls under the category of medium demanding tracks for brakes. The Azerbaijan track earned a difficulty index of 7, identical to the value that the other city circuits of Monaco and Montreal have achieved.

Brake use during the GP
After the first four 90° turns, the track becomes more twisty and has a total of 12 braking sections per lap, which means that the drivers will be on the brakes for 21% of the total race time. With the exception of Monaco, average deceleration here is the lowest of any races this year: 3.3g. The energy dissipated during braking by each car throughout the entire GP is 139 kWh, in other words, the electricity consumed during the entire race by about 290 residents of Azerbaijan. From the start to the chequered flag, each driver applies a total load of 58 tonnes on the pedal, in other words, slightly less than double the weight of the AzerSat-1 satellite that cost $120 million and was launched into orbit in 2013.

The most demanding braking sections
Of the 12 braking sections on the Baku circuit, Brembo engineers have not classified any as demanding for the brakes. 9 are medium difficulty and 3 are light.
The first braking section after the start and the third, both sharp left-handers, compete for the hardest braking: in the former, the single-seaters go from 341 km/h to 115 km/h in just 1.2 seconds with deceleration of 4.3 g. The load on the brake pedal is 128 kg (the equivalent of the weight of 2 drivers), compared to the 126 kg on turn three where deceleration goes from 328 km/h to 98 km/h in 126 metres. The last turn is also tricky because in just 86 metres, the equivalent of 9 wrestling mats, the single seaters must drop more than 120 km/h.
On the other hand, the 3 easiest turns are all in the central part of the track, the section that runs alongside the old city. The braking distance varies from 15 metres (turn 6) to 35 metres (turn 11).

Brembo victories
The single-seaters with Brembo brakes have won 13 editions of the European GP, including the last 5 held in Valencia, from 2008 to 2012. With 7 wins, Ferrari has won the European GP most often, 4 of which were won by Michael Schumacher at the Nürburgring.