



## PRESS RELEASE

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### **BRAKE DISCS UP TO 1.480 VENTILATION HOLES, LIGHTER CALIPERS AND LOWER BRAKING TORQUE: BREMBO INNOVATIONS FOR THE 2019 FORMULA 1 CHAMPIONSHIP**

Brembo reconfirms its commitment in the Formula 1 World Championship which will start with the Australian GP, scheduled this year from 14<sup>th</sup> to 17<sup>th</sup> March.

Thanks to the experience accumulated in 43 Formula 1 seasons, during which the single-seaters with Brembo brakes achieved 25 Drivers World Championships and 28 Manufacturers World Championships, Brembo designed braking systems personalized for each team.

#### **3 options of carbon discs**

The introduction of a **new wing** on all the single-seaters, simpler and with lower load at front, **will lead a lower braking torque** and, at the same time, an increase of energies to dissipate, being the cars faster and braking basically longer. To guarantee greater safety and best performance, Brembo maintained the values of limit torque used to static and dynamic benches substantially on the same levels of 2018 where the aerodynamic load was certainly greater.

The increase of energies, even if contained, determines an increase in temperatures. To overcome this issue, Brembo has optimized the brake discs ventilation to feature almost 1.500 ventilation holes in the most advanced versions.

The majority of the cars will use **front discs with 32 mm thickness and rear discs with 28 mm**. Depending on the temperatures expected during a Grand Prix and the specific race strategy, each driver can choose between 3 different options of Brembo discs: considering the front system the options available are **medium cooling** with 800 holes, **high cooling** with 1.250 holes and **very high cooling** with 1.480 holes.

Furthermore, in order to optimize the carbon performance, Brembo engineers are working to provide all teams with an option of a smaller diameter disc for the rear to use at the tracks that are less demanding for brakes, such as Le Castellet or Silverstone.

#### **More extreme research of lightness**

Brembo continues to work on the braking system with a specific focus on the maximum miniaturization of the elements composing the Brake by Wire system and the lightening of aluminium-lithium calipers. **Brembo will supply the traditional six-piston calipers**, maximum value established by the regulation, **to 7 teams out of 10**.

At the same time Bergamo-based company has tried to increase the system promptness of response and thus the reactivity of BBW units: the integration level with the cars is always greater and in 2019 there will be **4 teams to use Brembo BBW**.



## Customization, telemetry and maintenance

Each team, according to the specific needs of the car, together with Brembo technicians, defines the optimal ratio between weight and stiffness that the brake calipers must have. The sophisticated design methods available for Brembo engineers will make it possible to design for each team a brake caliper model that will optimize the desired weight-stiffness ratio. In this situation some teams will prefer lighter but also less stiff calipers, while others will opt for more conservative solutions characterized by a greater stiffness but also greater weight. **This delicate balance allows Brembo to develop the braking system in a totally autonomous way.**

Using the **sensors**, the teams know in every moment **the temperature of discs and calipers**: in this way they are able to calculate instantly disc and pad wear. Evaluating the data, technicians are able to give the driver any indications to adjust the brake balance of the car: this happens when anomalies are found.

On average, each team orders **from 10 to 15 sets of Brembo calipers per year**. This number allows to safely face any accidents and the lack of availability of some sets for revision. Some teams, on the other hand, proceed initially to a reduced order, foreseeing a development during the season and then a subsequent order of even more optimized calipers.

On circuits with a lot of brakings in sequence, the temperature of the calipers reaches 200°C. The useful life of a Formula 1 caliper does not exceed 10.000 km, during which periodic revisions are scheduled and carried out directly by Brembo inside of its production departments. As regards to friction material, **during the season Brembo supplies each team from 150 to 300 discs and up to 600 brake pads.**

## Brembo SpA

Brembo SpA is the world leader and acknowledged innovator of disc brake technology for automotive vehicles. Brembo supplies high performance brake systems for the most important manufacturers of cars, commercial vehicles and motorbikes worldwide, as well as clutches and other components for racing. Brembo is also a leader in the racing sector and has won more than 400 championships. Today the company operates in 15 countries on 3 continents, with 25 production and business sites, and a pool of over 10,600 employees, about 10% of whom are engineers and product specialists active in the R&D. 2018 turnover is €2,640 million (12.31.2018). Brembo is the owner of the Brembo, Breco, AP, Bybre, and Marchesini brands and operates through the AP Racing brand.

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