



BREMBO INNOVATIONS FOR 2020 FORMULA 1 CHAMPIONSHIP: UP TO SIX DISCS VARIANTS WITH NEW TECHNOLOGY, LIGHTER CALIPERS AND MAXIMUM TEAM CUSTOMIZATION

Stezzano - 29th June 2020 Brembo reconfirms its commitment in the Formula 1 World Championship which will start with the Austrian GP, scheduled this year with a double race on 4th-5th July and 11th-12th July.

Thanks to the experience accumulated in **45 Formula 1 seasons**, during which the single-seaters with Brembo brakes achieved **25 Drivers World Championships, 29 Manufacturers World Championships and 425 Grand Prix won**, Brembo designed braking systems personalized for each team.

Six options of carbon discs

The cars' aerodynamic set-up defined for 2020 is similar to the one launched in 2019, with a simplified front wing to reduce downforce that means an increase in vehicle speed and consequently more braking efforts.

The cars go faster on the straights, but have less grip, which reduces the braking torque on the ground. This leads the driver to hit the brake pedal sooner, increasing the energy that needs to be dissipated mainly through heat.

Brembo has developed new carbon discs using specific ventilation technologies to manage greater thermal stress.

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 six different options of Brembo discs**.

In 2020 are confirmed **three disc solutions** for the **front braking system**:

- the **1480 holes disc** is the most extreme solution, called "**Very High Cooling**" arranged on 7 rows
- the **1250 holes disc** solution called "**High Cooling**" arranged on 6 rows
- the **800 holes disc** solution called "**Medium Cooling**" arranged on 4 rows

In addition, **each specification is also presented with a process on the external diameter**, that is called "**groove**".

The new family discs with "groove" is characterized by processing on the outer diameter of the disc which creates a section diverging from the air and which in turn comes out of the disc's ventilation holes. This geometry allows for greater material cooling efficiency.

For the **rear braking system**, are confirmed **two disc solutions**:

- the **1250 holes disc** solution called "**High Cooling**" arranged on 5 rows
- the **800 holes disc** solution called "**Medium Cooling**" arranged on 3 rows

The result is a **total of six different ventilation specifications only for the front axle and two different ventilation specifications for the rear axle**.

The secret behind this technology is here, the solution of 7 rows with "groove" to make it suitable for the most severe circuits, such as Sakhir's in Bahrain, Marina Bay's in Singapore, Montreal's in Canada and Yas Marina's in Abu Dhabi.

In tracks like these, the temperature of the discs can reach peaks of up to 1,200 degrees.

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 8 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 2020 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, define 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.

As for **carbon pads**, in 2020 season Brembo offers to the teams **a choice of two different compounds**.

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 14 countries on 3 continents, with 24 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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