



## PRESS RELEASE

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### **NEW BREMBO BRAKE SYSTEMS FOR THE 2017 FORMULA ONE WORLD CHAMPIONSHIP**

**The Italian Company has focused on the evolution of braking systems design and on an advanced discs cooling system, in line with the new FIA regulation**

The important regulatory developments planned for the 2017 Formula One World Championship resulted in a new technological challenge for Brembo, world leader in the production of braking systems, which is about to begin the 42nd season in the maximum premier motorsport series. During this season there will be a substantial change of the braking systems supplied to major teams taking part in the Championship.

Dealing with wide tires, more performing F1 cars able to develop greater braking torques, Brembo engineers have focused on the redesign of the individual elements composing the systems: starting from the brake calipers, which have to adapt to the increased thickness of the disc that has grown from 28mm to 32mm, up to get to the Brake by Wire components.

The increased size of the carbon discs has allowed to strengthen the design in the drop zone, increasing the braking capacity. Furthermore, the greater thickness allows more space for the ventilation holes, causing further evolution of the braking cooling system.

Even this year, the teams supplied by the Italian Company can count on a personalized cooling design. In this way, there will be an average increase of about 200 ventilation holes for each disc, compared to over 1,200 in 2016 and a consequent increase in heat dissipation, remembering that the temperature of the discs in F1 can exceed 1,000°C during braking.

Thanks to the exchange of information with the supplied teams, to the simulations related to the behaviour of the new cars and to the dynamic bench tests, the engineers have been able to estimate an increase of the braking torque of around 25%, which will bring the braking to over 6G deceleration.

The cars will be able to transmit greater braking force on the ground in the shortest time, with a possible decrease in the average lap time spent braking.

As no one yet knows the level of new generation tyres grip, Brembo technicians continue to work closely with the teams, in order to give the drivers optimum friction performance, an effective braking modulation and contained wear.

Formula One requires an extensive customization of braking systems resulting in the different design solutions of F1 cars. Each team supplied by Brembo requires a brake system that is increasingly "tailor-made", closely integrated with the design of the car and subject to continual development throughout the season.

It is also for this reason that the brake calipers have been totally redesigned for each supplied team, to integrate with the aerodynamic solutions studied by each team, trying to keep optimal lightness and stiffness, despite the increased size of the disc.

Furthermore, Brembo continues the development work of the individual components of the Brake By Wire system. The engineers further broadened their skills, designing the various components of BBW according to the demands of individual clients team and working further on the integration and on the miniaturization of various elements. As happened in 2016, the majority of the teams will opt for rear discs of small diameter, in line with the energy required, deriving from the recovery system. For certain teams, the Company developed only some BBW components, while for others



Brembo conducted more extensive work concerning the entire system: from the simulator on which operates the rear brake master cylinder, to the actuator controlled by the control unit and which drives calipers on the rear axle, to the safety valves system that controls the switching in case of system malfunction.

### **Significant decrease in the brake system wear level with CER**

During winter technicians worked on carbon brake disc material (named CER) to improve the performance continuity and the operating range. Thanks to an effective heat conduction, CER has considerably reduced wear. Besides, CER reduces the warm up time needed to reach operating temperature, offers a broader operating range in terms of both pressure and temperature, together with very linear friction characteristics. All of these features contribute to give the driver extremely precise control over the braking system. Furthermore, the incredibly low wear rate of this material ensures consistent, repeatable performance from the start of the race to the chequered flag.

In the 2017 season, all teams equipped by Brembo will use the same brake disc material. The Italian Company continues its research in this field to produce composite materials more effective. Due to the extreme design now reached, the track mileage recommended by Brembo for the use of brake discs is 800 km, in optimal temperature conditions.

### **Key facts and figures**

In a complete season, on average Brembo supplies the following materials to each team running 2 race cars:

- 10 sets of calipers
- From 140 to 240 discs
- From 280 to 480 brake pads

The manufacture of each brake calipers in aluminium/lithium with the perfect balance between weight and stiffness requires over 14 hours of consecutive machining.

Brembo recommends the revision of brake calipers after 2,500 km of normal use.

The production and the mechanical process of a brake disc require 9 months.

Brembo Racing structure includes more than hundred technical specialists for the various stages of simulation, calculation, design, engineering and testing. A staff of race engineers is available for the teams for all tests and races activities.

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