3,902

PATENTS, UTILITY MODELS AND DESIGNS

THE DRIVE FOR INNOVATION

Innovation as a strategic lever for maintaining global technological leadership in the automotive world.
An attitude confirmed by the many patents filed
and the continuous exploration of artificial intelligence and its applications, combining design and excellence.

* Full Time Equivalent – FTE represents the workforce calculated based on the hours actually worked and/or paid by the company in which they are employed.

PEOPLE EMPLOYED IN R&D ACTIVITIES

1,555 FTE*

100%

PLANTS WITH IATF 16949 QUALITY CERTIFICATION**

** The Zaragoza site is ISO 9001 certified since the IATF scheme does not apply to aftermarket sites. For the plants of J.Juan (Myasl and Jiaxing), which were ISO 9001-certified upon their acquisition (occurred in the fiscal year 2023), activities are underway to integrate them into the Brembo Quality Management System. This will lead to the IATF 16949 certification by Q1 2024.

6. SYNERGIES AND INNOVATION

3,902
Patents, utility models and designs

1,555 FTE[69]
People employed in R&D activities

100%[70]
Plants with IATF 16949 quality certification

6.1 DESIGNING INNOVATION

Companies are increasingly called upon to respond comprehensively to the challenges of climate change and air pollution, especially in a complex sector like the automotive sector. Research and Development thus focuses on product solutions that, from the design stage, take into account the requirements of a market geared towards electrification and automation, as well as the need for sustainability throughout the product life cycle.
This commitment is reiterated by the adoption of a circularity-oriented business model, which may generate positive impacts in terms of reducing the environmental footprint (such as greenhouse gas emissions), both downstream and upstream the value chain, associated with the reduction of the use/purchase of virgin materials, while also promoting the design of products made with greater durability and recyclability.

Aware of the influence that environmental impact has on purchasing decisions in the automotive sector, Brembo is committed to developing innovative products with an environmentally sustainable, circular design. In this regard, in 2023 the Group worked on creating indicators relating to product eco-design, so as to be able to include sustainability criteria from the design phases.
The Company aims to reduce environmental impact along the entire value chain, promoting sustainable mobility and experimenting with revolutionary solutions to improve the sustainability and comfort of braking system components. Brembo is also oriented towards a design that harmonises functionality, comfort, durability and aesthetics.
Therefore, the aim of the Group's Research and Development work is to:

- **increase braking system performance** while ensuring maximum reliability and improving comfort through solutions that can reduce braking action noise, vibrations and harshness;
- **prolong the life of Brembo's products**, while studying and applying new product design rules and minimising disc and pad wear, in the framework of eco-design and circular economy;
- **reduce the environmental impact** resulting from the use of vehicles in terms of greenhouse gas and particulate emissions into the air, through the reduction of the weight of its products and the control of the dispersion of braking-related dust, but also an increase of the share of recycled raw materials thus contributing to combating the consumption of virgin materials and the climate change;
- **implement the LCA (Life Cycle Assessment) assessment for all new products**, using this tool as a binding step towards the approval of a product, similarly to cost evaluation and technical feasibility;

69 Full Time Equivalent – FTE represents the workforce calculated based on the hours actually worked and/or paid by the company in which they are employed.
70 The Zaragoza site is ISO 9001 certified since the IATF scheme does not apply to aftermarket sites. For the plants of J.Juan (Myasl and Jiaxing), which were ISO 9001-certified upon their acquisition (occurred in the fiscal year 2023), activities are underway to integrate them into the Brembo Quality Management System. This will lead to the IATF 16949 certification by Q1 2024.

- **reduce the final weight of vehicles** using increasingly lighter alloys to obtain lightweight products;
- **promote functional design** that enhances innovation, interprets trends and makes objects iconic.

The operating model, shared with the Environment and Energy area to reduce the environmental impact of Brembo's products throughout the life cycle, is now divided into the following action areas:

- understanding of the impact throughout the production chain;
- integration of the impacts emerged as part of the LCA studies on the new products designed during the Research and Development phase;
- definition of the project criteria (Process and Product);
- involvement of the supply chain;
- energy efficiency and transition to renewable energy sources through contractual forms of Power Purchasing Agreements and an increase in the capacity to self-produce electricity.

3,902

Patents, utility models and designs

Brembo's capacity to innovate and exploit its own expertise as a strategic lever for maintaining its technological and commercial leadership at global level can also be gauged by the number of patents filed by the Group over time. 3,902 patents, utility models and designs divided into 650 still valid families have already been registered in the world in over sixty years since its foundation.

During 2023, the Group filed several patent applications for automation methods thanks to the research, development and testing of systems based on artificial intelligence, through the study of computer vision and deep learning techniques so as to fully meet the sector's needs and win new market segments.

In 2023, 68 patents and 7 design models were filed, for a total of 75, in addition to 65 filed the previous year and 50 in 2021. In 2023, Brembo also registered 9 new trademarks, bringing the total registered since its foundation to 388, divided into 82 families.

Continuous innovation is the stylistic approach taken by Brembo to 100% of its products and processes, both existing and in development, with regard to quality and environmental impact, including through prior analysis of the relevant laws and regulations in force in the countries where the product will be marketed.

In addition, the Group uses the Life Cycle Assessment methodology to monitor the entire life cycle of products and processes, with the aim of extending it to all products and processes. Currently, several methodologies and software are used to quantify environmental impact, including ReCiPe 2016.

BREMBO'S DIGITAL LAB

Brembo has set up the Digital Lab, in line with the digitalisation process undertaken by the Group to become a "Digital Company". This is a digital laboratory that is responding to the Group's mission to develop a "data culture", increasingly considered as a corporate asset for creating new business opportunities and supporting partners in the challenges of the new mobility.

The aim of the Digital Lab is to design and implement the digitalisation projects in which three players operate: the "Domain Experts", "Data Scientists" and "Digital Project Managers". The projects will then be evaluated by the Global Digital & Innovation Committee (GDIC) which decides on which ones to implement and identifies the priorities. Finally, the digital ecosystem includes the Transformation GCF, which has the task of providing support through the entire infrastructure.

The new Brembo AppLogger App, available to all employees who have a company smartphone, is part of the Data Culture project. Once downloaded from the Brembo Workspace PlayStore and associated with the car, it allows to log data on braking, brake use and how brakes are used, in a reliable, constant, continuous and anonymous way, with absolute respect for privacy. The aim is precisely to create an overall database of information that can be reworked and used in product design, helping to provide the data that feed the innovative processes that are taking shape in the Company.

After the release in 2022 of a new version that allows data collection in the Brembo cloud, in 2023 the application was made available not only in EU countries, but also to Brembo employees in the rest of the world. And that's not all: the study of new features (for instance, the activation of personal statistics) that will allow further developments, also with a view to creating internal challenges, continued.

Conscious that dialogue with stakeholders is fundamental, Brembo takes care to maintaining a transparent relationship with its customers. The Group responds to the questionnaires it receives also in relation to environmental performance, and has strengthened collaborations with the value chain. Moreover, it adheres to external initiatives by taking part in workshops, conferences and webinars in order to improve its approach to managing stakeholder engagement. Brembo also participates in the Green Economy Observatory promoted by the Bocconi University of Milan, as well as in meetings promoted by trade associations such as Assofond, Confindustria, FIRE, ANFIA, and CLEPA. The operating model rest on the accuracy of impact data gathering, opening up possibilities for developing a software capable of measuring impacts such as those linked to raw materials production.

Beauty and functionality are in perfect harmony in Brembo which supervises the design of each product precisely in synergy with its functionality and safety. The Group carries out various activities related to design, a value that has always been its DNA. Each project is accompanied by digital communication, engagement on social media and communication with customers, in close collaboration with customers' style centres and designers to set the design guidelines for its new products. Moreover, for some years Brembo has participated in the prestigious Car Design Award organised by the magazine Auto&Design. This award is given to projects that have distinguished themselves in the field of automotive design, confirming design as a key element in the purchase of a new model. The Car Design Award is internationally recognised as an award for excellence in the highly competitive automotive design industry.

6.2 COLLABORATIONS TO REDUCE THE ENVIRONMENTAL IMPACT

For Brembo, innovation aims to ensure increasingly cutting-edge products able not only to anticipate and meet the new needs typical of the automotive industry, but that also allow to improve the environmental impact through:

- the design of products involving the use of low-impact materials and protections;
- the reduction of GHG emissions thanks to the use of lights alloys allowing to limit braking systems weight;
- the reduction of particulates during braking, harmful for human health thanks to the use of technical materials and solutions;
- the development of smart products such as mechatronic components;
- the implementation and improvement of structured Life Cycle Assessments, both on process and material level.

In a perspective of open-innovation, and to improve the effectiveness of research in these areas, the Group encourages collaboration, through networks and joint work projects, with other players in the automotive sector: Research Centres and Universities both at Italian level (including the Milan Polytechnic, the University of Padua, the University of Trento, the Mario Negri Pharmacological Research Institute) and at international level (where Brembo collaborates with the Lund University and continues to partner with the Royal Institute of Technology in Stockholm).

Brembo subscribes to various coordinating organisations that promote industrial research in the automobile field, including AIRI (Italian Association for Industrial Research), ATA (Technical Automobile Association), Automotive SPIN Italia, CAAR (Automotive Cluster of Aragon Region), CLEPA (European Association of Automotive Suppliers) and the Lombardy Mobility Cluster.

In 2023, Brembo also continued to implement a series of European projects, two of which funded by the National Recovery and Resilience Plan (PNRR).

nPETS (nano Particle Emissions from the Transport Sector)

The project, which is expected to end in June 2024, has received funding from the European Union's Horizon 2020 Programme in order to understand and mitigate the effects of emerging emissions of unregulated nanoparticles generated by transport on public health and the new public policies. The goal is to monitor and sample with state-of-the-art instruments the sub 100 nm emissions generated by maritime, road, rail and air transport, both in the field and in controlled laboratory environments. Emissions will be characterised in terms of size, morphology and chemical composition linked with specific emission sources, such as engines, brakes, clutches and tyres, to increase understanding of the mechanisms underlying the adverse risks posed by the different types and sources of identified sub 100 nm particles. The effects of nanoparticles from various modes of transport and fuels, as well as from specific emission sources, will be compared paying particular attention to markers significant for carcinogenesis and inflammation.

In addition, the goal is also to complete a comprehensive public database that collects all the chemical and toxicological information obtained to provide science-based suggestions for new policies specifically related to nanoparticulates.

For further information: www.npets-project.eu.

MODALES (MOdify Drivers' behaviour to Adapt for Lower EmissionS)

Launched in 2019, the MODALES project aimed to substantially reduce air pollution from petrol and diesel vehicles. The 18 project partners worked together for 45 months to bring this vision to life and propose an approach based on users and how their behaviour affects powertrain emissions, and brake and tyre wear. The MODALES vision is to reduce air pollution from all types of vehicles on the road by encouraging the adoption of low-emission driving behaviours and correct maintenance choices. The project, which ended in May 2023, researched, developed and tested a range of innovative and complementary solutions that include the driver, on-board diagnostics, periodic inspections and retrofits.

MODALES was granted a nine-month extension since part of the project consisted of driving activities for data collection. This extension was the result of delays caused by safety measures related to the COVID-19 pandemic.

For further information: https://modales-project.eu/brembo/

LIFE RE-BREATH
is an ambitious project funded by European Commission's LIFE programme in the field of sustainable urban mobility. Launched in August 2022, this project will continue until August 2025, as part of the control and technical countermeasures for particulate emissions (PM) of public transport vehicles. In recent years, there has been a greater awareness of pollutant emissions from braking systems and specific countermeasures are currently being developed for cars, but not an equal attention was given to the public transport area. In this scenario, the RE-BREATH project has 4 objectives:

1. to measure and demonstrate the reduction of PM10 emissions, related to the braking system of buses, at stops;
2. to support national authorities in the estimation of non-exhaust emissions to be calculated in the EMEP/EEA emission inventory, according to Directive (EU) 2016/2284;
3. to demonstrate the decrease in the brake wear rate, and the consequent increase in the life of the braking system compared to the traditional system, for a more sustainable economy;
4. to model a concentration map for pollutants emitted by brake wear and a map of the exposure risk to pedestrian health, in order to support the design of a "green intervention" along bus routes in Bergamo and Bratislava and the formulation of Guidelines for local administrations.

In practice, two fleets of 10 buses each will be implemented in two European cities, Bergamo and Bratislava, located in regions where the EEA has declared the highest concentrations of PM (2.5 and 10). During 2023, the first braking system retrofitting solution was designed, developed, tested and installed on a number of buses in Bergamo and Bratislava.

The RE-BREATH braking solution stems from the AM Beyond Greenance Kit solution, adapted for bus application with a dedicated friction formulation, designed for the vehicle's specific mission.
During 2023, the first RE-BREATH solution was validated by performing performance and wear tests that were compared with the original components of the reference application. Compared to passenger cars and light commercial vehicles, as no test procedures exist for the assessment of bus emissions, specific activities were carried out to assess emissions behaviour.

In 2024, work will continue with the development of improved solutions and the definition of optimised procedures for measuring bus emissions.

For further information:
https://www.brembo.com/en/company/news/re-breath

VERA
The VERA project is aimed at developing and optimising innovative tailpipe and brake retrofit solutions to tackle the issue of emissions associated with road transport. These solutions will be mainly dedicated to the fleet of circulating vehicles, which are obsolete in a high percentage, with particular reference to those that travel high mileages within cities (taxis, delivery vans, buses). On the brake side, retrofit solutions will include innovative discs and pads to reduce brake wear and an active filtration system to capture the particles generated. Environmental and health impacts will be analysed and a cost-benefit analysis will be conducted to assess the benefits of applying the new solutions. Finally, incentive and regulatory schemes will be considered to promote the retrofitting of existing vehicles. The project was launched in December 2022, and an analysis was conducted during 2023 to assess the global size of the retrofit market, examine existing retrofit solutions that aim to reduce exhaust or brake emissions, and finally highlight market gaps to guide the project's technical developments.

In addition, the test procedures to be used for the validation of both exhaust and brake emissions have been defined, along with the methods used to perform the chemical and toxicological analysis of the emissions generated. Current activities focus on measuring baseline emissions and setting emission reduction targets. Retrofit solutions for the tailpipes and brakes are being developed, with the aim of carrying out validation tests scheduled for the end of 2024.

For further information:
https://cordis.europa.eu/project/id/101056893.

EMPOWER
The project stems from the European Commission Horizon Europe framework programme through the 2Zero Partnership and the call to develop a modular powertrain for heavy trucks, adaptable to different mission needs.

It focuses on a modular vehicle for the IVECO platform (VECTO 9), designed for fuel cell electric vehicles (FCEVs) and battery electric vehicles (BEVs) for long distances and regional distribution. EMPOWER aims to reduce costs and improve energy efficiency, contributing to a total cost of ownership (TCO) equal to 2020 diesel trucks. The project involves the creation of digital models of the demonstrator vehicles and the operational demonstration of at least two prototypes in real mission conditions.

For further information: www.projectempower.eu.

METABRAKE

Over a period of 36 months, the MODALES consortium will monitor the variability of driving behaviour and recognise typical driving patterns and practices. Subsequently, based on this knowledge, MODALES will establish the link between real-world powertrain emissions and driving behaviour with measurement campaigns using portable emission measurement systems (PEMS) and laboratory tests. In addition, laboratory measurements for brake and tyre emissions will be conducted. In a second phase, MODALES will create low-emission driving training courses, which will be taught and validated in pilot exercises. Knowledge, experience and practices will be shared with other cities in China and Latin America.

Aspects related to poor maintenance and tampering will be analysed with a fleet of cars whose emissions are intentionally affected by lack of maintenance and/or tampering, and MODALES will observe whether current OBDs and inspections are able to detect them. Finally, an assessment of the prospects and potential impacts of retrofits for light and heavy-duty road vehicles and non-road mobile machinery (NRMM) will be carried out, including the promotion of their application in selected pilot cities with significant pollution problems.

For further information: https://modales-project.eu/

The two projects benefitting from the National Recovery and Resilience Plan (NRRP) funding are illustrated here below:

National Centre for Sustainable Mobility – MOST

In the next decades, the main challenge for tomorrow's mobility will be to dramatically reduce emissions by reaching the maximum possible level of sustainability at global level. The MOST will be fully interconnected with the NextGenerationEU and, specifically, with the implementation of the National Recovery and Resilience Plan by Italy, which will encourage the spread of low and zero emission vehicles and renewable and low-carbon fuels for road, water, air and rail transport with specific measures on several levels: investing in green technologies, spreading greener vehicles and public transport and promoting equal opportunities nationwide, given the major geographical discrepancies existing in Italy.

Brembo S.p.A. is a founding partner of MOST with 25 Universities and Research Institutes, which in the three-year period 2023-2025, will be able to count on a structured staff of 696 researchers, including 574 newly-hired personnel and an investment capacity of €378 million. The MOST will provide a pivotal opportunity for the national scientific, industrial and economic system, addressing current and future scientific and social challenges related to the Sustainable Mobility paradigm. The ambition is to build a competent Italian leadership, strongly integrated into the local areas and local businesses, able to support the future development towards an inclusive, sustainable and decarbonised mobility.

"Made in Italy Circular and Sustainable"

the Brembo's ambitious vision is to enable the design and production of Made in Italy closed-loop, self-sufficient, self-regenerative, reliable, safe and energy-aware products and services. The proposed expanded partnership will conduct the fundamental research underpinning the achievement of this vision. It thus proposes eight thematic areas on which to focus to address the challenges currently faced by our design, production, and consumption models, as well as the end-of-life of materials, products, production technologies and processes needed to move to greener, more circular pathways and models.

6.3 PRODUCT INNOVATION

The automotive market has embarked on one of the most important revolutions in its history, which could radically alter the concept of the car and its use. A profound transition as a mark of the new electric drive systems, autonomous driving and integration of different vehicle systems, where the car is increasingly more able to carry out independent actions and provide assistance to the driver in real time. In particular, over the next few years a sharp increase is expected in cars fitted with hybrid and electric motors in response to the new European regulations.

This is a revolution for which Brembo has been preparing for almost twenty years, due to an ever greater focus and investment spending on electric braking system and mechatronic product research and development, through the development of competences applied to systems such as Electric Parking Brake and SENSIFY™.

In all sectors of operation, each product is developed in accordance with the Group's vision and the following three guidelines: "low emission", "high performance" and "best driving experience". These products will thus be aimed at reducing the environmental impact, improving the performance and ensuring the best user experience.
The main example of the implementation of these three guidelines is SENSIFY™, officially presented in 2021 and representing the latest development in the research work on the braking system with by-wire technology. SENSIFY™ is an intelligent braking system that integrates the most advanced software based on artificial intelligence with the Company's brake components. SENSIFY™ combines the current Brembo product portfolio of calipers, discs and friction materials with digital technology and artificial intelligence to create a flexible and revolutionary platform that includes software, predictive algorithms and data management to control the brake system digitally.

With SENSIFY™ the braking system is no longer simply a sum of its parts but an ecosystem, where artificial intelligence and software play an active role. Data collection is leveraged to improve the driver experience and allows the system to be constantly updated.

To learn more about
Brembo SENSIFY™

Its application development and industrialisation phases are currently ongoing, whereas launch into production will take place in 2025. Moreover, in keeping with Brembo's strategic priorities, its promotional phase is underway for both Group clients and new players entering the electric vehicles market.

In addition to product quality, Brembo is also particularly committed to adapting to the tightest development times imposed by the market and accordingly is dedicating a large number of resources to perfecting advanced simulation methodologies in which artificial intelligence and virtual reality are increasingly applied. The Research and Development Centres operating in Italy, Poland, Denmark, Spain, North America, China and India play a key role in these developments.

Apart from cars and commercial vehicles, Brembo intends to achieve a greater presence in the scooter market. The search for new markets in the field of two-wheelers thus continued. To this end, benchmarking has been carried out with currently mass-produced products to define a product specification, as well as a market to enter onto. The design activity has led to the construction of the first prototypes. Within this context, the collaboration with new players that have entered the EV sector has become a priority strategy for the Group which has begun to define the market and the product technical specifications with some of them.

Moreover, Brembo continued to conduct R&D activities in cooperation with international Universities and Research Centres with the aim of constantly seeking out new solutions to apply to brake discs and calipers, in terms of new materials, innovative technologies and mechanical and electronic components. The need to reduce product weight is leading the research function to evaluate the use of unconventional materials, such as technopolymers or reinforced light metal alloys, to produce structural components.

Another initiative in this area is Brembo's investment in Infibra Technologies, a spin-off of the academic institution Scuola Superiore Sant'Anna in Pisa, specialised in developing photonic sensors through the use of fibre-optics as the sensor element.

Within the Systems GBU, the goal of using the braking system to help reduce vehicle consumption and resultant CO_2 emissions and particulates is being pursued through the

development of new solutions. In detail, the use of methodologies to minimise caliper mass for the same performance, the improvement of caliper functionality by defining new characteristics for the pairing of seal and piston and optimisation of a new-concept pad sliding system continue to feature among the main areas of development.

Overall, the main areas that reflect the Group's capacity to develop new generation brake systems are as follows:

DISCS AND CALIPERS

In the area of brake discs for cars and light commercial vehicles, the strategic priority for 2023 was the development of brake discs with solutions designed to meet the criteria of the new Euro 7 standard on pollutant emissions from cars and commercial vehicles and which, for the first time, also introduces new provisions for particulate emissions from braking systems.
Brembo has been active for years in the development of solutions for the reduction of particulate emissions from brakes. As early as in 2020, it presented the Greentive® disc, characterised by an innovative coating applied to the cast-iron braking ring that ensures very low wear and tear, extends disc life and, thanks to the combination with the specifically developed friction material, also reduces particulate emissions during braking, thus limiting the impact on the environment.

Relying on the expertise gained through the Greentive® disc, over the years Brembo has forged ahead with research, development and testing of advanced solutions to be applied to cast-iron discs through the study of new materials and the adoption of technologies and surface treatments never used before for brake disc applications. The research focused in particular on the "Laser Metal Deposition" technology, where a thin layer of material is deposited on the disc at high speed by means of laser overlaying, which due to its characteristics reduces wear and tear and emissions of particulates from the disc itself during braking.

Equally important is Brembo Friction's concurrent development of brake pads that can markedly contribute to creating an ideal combination with the brake disc.

Thinking of the single component — disc or pad — as an independent unit fails to address the problem of emissions in its entirety. The development of a friction module, consisting of disc and pad, designed for each of these new types of disc therefore becomes essential for achieving emission targets without compromising performance, thus managing to offer Brembo customers solutions consistent with the Group's vision and its guidelines.

Considerable attention is being devoted to the new needs of hybrid and electric vehicles, which use regenerative braking and thus introduce new requirements for brake discs, instrumental to solving issues relating to disc resistance to corrosion.

All the new solutions, which aim to reduce environmental impact and improve aesthetics and corrosion resistance, are meeting with strong interest among Brembo's main clients. In this regard, the development phases with major car manufacturers continued, while in Europe production of discs that will adopt one of these technologies began in 2023 for a major electrical vehicle manufacturer.

According to precise guidelines applied throughout the automotive sector and all of Brembo's development activities, considerable attention is also paid to new solutions that are able to reduce disc weight: a lower weight translates into a greater driving range for electric vehicles and lower fuel consumption of internal combustion vehicles, and consequently into a reduced environmental impact in both cases. This aspect will become even more important due to the entry into force of the new Euro 7 Regulation. In car applications, after having worked with a major German customer to develop the concept for the light brake disc installed in its new platform of core vehicles, Brembo will also extend the supply of this product — which enables a reduction in weight of up to 15% compared to a conventional disc — also to a new platform of fully electric vehicles, whose application development phase is underway.

Application development activity on discs for heavy commercial vehicles with major European clients with solutions aimed at improving performance and reducing weight is in the final phase. The related series production will begin during 2024.

Building on the experience gained in the field of light commercial vehicles, the research and development of new products compliant with the requirements for pollutant emissions (Euro 7), which are also being released for this category of vehicles, will continue in 2024 for this market segment as well.

The search for new markets in the two-wheel field is also focusing on green mobility. The Group has signed a collaboration agreement with a first client for the development of a high-performance braking system for use on high-performance products. After concluding the first tests, the product requirements have been frozen and the Group is currently engaged in the "Design Freeze" phase, which will be closed in February 2024.

Activities are also continuing for the development of green materials such as recycled aluminium for calipers and on the pad friction materials.

Finally, the Group continued to invest in the search for low environmental impact friction materials for the "low emission" and "high performance" line. In the case of the former, materials paired with coated discs are being developed, whereas in the case of the latter materials under development are paired with all types of carbon ceramic discs.

PADS

Brembo Friction, structure dedicated to the study and production of brake pads, continues with its steady commitment to developing traditional customer-oriented friction materials and increasingly high-performance materials for racing cars. The consolidated expertise on friction materials also relies on the know-how of the subsidiary BSCCB (Brembo SGL Carbon Ceramic Brakes), for the development of pads combined with carbon ceramic discs for ultra-high performance cars.

This focus also sits alongside accompanying and anticipating the automotive market trends, which are increasingly green-oriented and the introduction of hybrid and electric vehicles that require materials that are no longer merely high-performance, but also environmentally friendly, with a focus also dedicated to the aesthetic aspect of corrosion.

The inclusion, for the first time, in the Euro 7 standard also of braking system emissions, with particular regard to pad emissions, reflects a clear vision of current trends.

Brembo Friction is therefore decisive for expanding the braking materials portfolio that allow to maintain high performance, ensuring braking safety, with increased attention to both the aesthetic aspect in general and component corrosion, without neglecting driving comfort (absence of noise and vibrations), as well as developing expertise that can also be applied in new and increasingly complex systems such as the Electric Parking Brake and SENSIFY™.

The integration with the new mechatronic systems thanks to the constant technological evolution in the automotive field has paved the way for the development of a brake pad concept with embedded sensors that aims to make the braking system increasingly integrated within new vehicles.

To this end, Brembo Friction avails of data-driven methods. This year, it participated in the Hackaton event at the Brembo Inspiration Lab — Advanced Technology Center in California, with the aim of developing the formulations of specific friction materials and identifying the raw materials that most influence their properties.

On this basis, dedicated works continued on developing friction materials aimed at increasingly innovative discs. In fact, new coatings and new treatments require pads designed and produced specifically to reduce PM10 emissions. This development is made possible — also thanks to the increasingly close partnership with the main global manufacturers —, by the support of cutting-edge internal testing, a top-tier laboratory, and constant collaboration with university centres. These allow to define synergistically, every time, the new approach, obtaining the best results, and thus enable the expertise acquired in the field of passenger cars to be extended to light and heavy commercial vehicles as well.

LIFE CYCLE ASSESSMENT

Brembo looks to a future in which the Life Cycle Assessment methodology will also be extended to all products and processes, a study that allows the impacts on the environment and human health to be quantified, starting from the consumption of resources and CO_2 emissions.

Projects such as AFFIDA and LIBRA flow from Brembo's increasingly close focus on the environment.
AFFIDA, the natural extension of the COBRA project (which was part of the European Life+ project), in collaboration with the Mario Negri Institute, seeks to bring to the OE market the innovative technology of inorganic binders, having a key role in reducing volatile organic compound (VOC) emissions, with important positive repercussions for the environment. The new materials reach performances on a par with their traditional predecessors, while also meeting the high-performance standards required by the most challenging sporting applications and guaranteeing low fine particulate emissions and a lower consumption of resources. Thanks to a press created with ad hoc technology, this innovative technology, completely different from that used traditionally, has now successfully passed the prototype pre-industrialisation phase. The specific improvement activity as regards NVH has thus been started.

LIBRA, a European project now concluded, but which has been ongoing since 2015 as an internal development activity, allowed to eliminate the steel backing plate in brake pads, replacing it with high-performance composite materials. The project continued with the research of new raw materials and new technologies, with clear advantages: from a lighter pad, with the resulting reduction in the overall brake system's weight, to a shorter production process.

Since 2022, a team has also been working on assessing the environmental impacts of products, providing guidance on the main areas of impact to be reduced through targeted interventions. The team achieved full operational status during 2023 and will support internal structures in assessing and identifying areas of sustainable development to be taken into account together with the design of products and processes. The activities carried out during last year led to the quantification of the environmental impacts along the entire life cycle for Brembo's main product families such as discs, brake calipers (including some Brembo-produced components) and brake pads. The impacts of other products still under development were also assessed.

Since 2021, several customers have started to request information in the LCA area, setting mandatory requirements applicable to new projects. To ensure a prompt and correct response to these requirements, Brembo has organised in-depth discussions on the topic with its main customers, aware that the involvement of the supply chain is necessary in order to have data on the impact of the materials being purchased.

INNOVATION IN THE R&D AREA

R&D GCF activities involve constant monitoring of the evolution of vehicles, in line with the main general trends of ensuring high performance, reducing emissions and providing users with the best possible experience.

To do this, Brembo is also investigating areas such as electrification and fuel cells, advanced driver assistance systems (ADAS) and autonomous driving, the constant reduction of environmental impact and connectivity. The high level of integration will increasingly bring the brake system into dialogue with other vehicle systems, such as electric-drive motors and new suspension/steering concepts. Such integration will allow for increased active safety and the optimisation of functions, such as regenerative braking.
The first half of 2023 also saw the start of the globalisation of innovation processes at the Brembo Inspiration Lab, with the launch of the new Advanced Technology Center (ATC) in Silicon Valley. Product innovation takes place in the ATC in synergy with the integration of new methodologies and algorithms linked to data science, making use of the research centres, institutions and universities within the local innovation ecosystem.

Brembo's ability to achieve relevant results in all the areas in which the Group is committed to product and process innovation stems from the work of the employees operating in the various company areas. Among them the following can be mentioned:

1,555FTE[71]

employees (Full Time Equivalent) engaged in research and development activities

303FTE

employees (Full Time Equivalent) engaged in testing activities

946FTE

employees (Full Time Equivalent) engaged in quality management and development activities

6.4 LISTENING TO CUSTOMERS FOR PRODUCT IMPROVEMENT

The Group collaborates and exchange views daily with the main manufacturers of vehicles equipped with Brembo brake systems to understand and anticipate their future needs and promote the joint development of new solutions in technological areas that have yet to be consolidated.
It is equally important for the Group to establish constant dialogue with the end users of vehicles equipped with its products, in order to understand to what extent Brembo's solutions meet their expectations and what aspects can be further improved, particularly with regard to perceived quality and comfort. For Brembo, end users are not only users of vehicles equipped with its products, but all those who interact and have an experience with the brand. Therefore, the end-user engagement strategy, i.e., the construction of a solid and long-lasting relationship of trust, not only with the buyer, sometimes indirectly, but with anyone who has interactions with the brand.

The Group is committed to the constant development of digital channels for contact and communication with its customers and end users. Important in this context is the Group's corporate website Brembo.com, which recorded over 4,100,000 million visitors in 2023. It should be noted that website visitors are increasingly "mobile" as nearly four out of five connected to the website through a smartphone or a tablet.

Brembo is also active on the main social media (Facebook, Instagram, Linkedin and Twitter) where it publishes numerous contents designed for different audience segments and optimised to be enjoyed in the best way on the various networks. The Group also recorded excellent performance on these channels during last year, with a general increase in engagement on the 4 main channels, with over eight million interactions.

71 Full Time Equivalent – FTE represents the workforce calculated based on the hours actually worked and/or paid by the company in which they are employed.

Brembo's presence also continues to grow on WeChat, the most popular social network in China, and on other Chinese social platforms such as the WeiBo microblogging platform and the Youku video hosting channel.

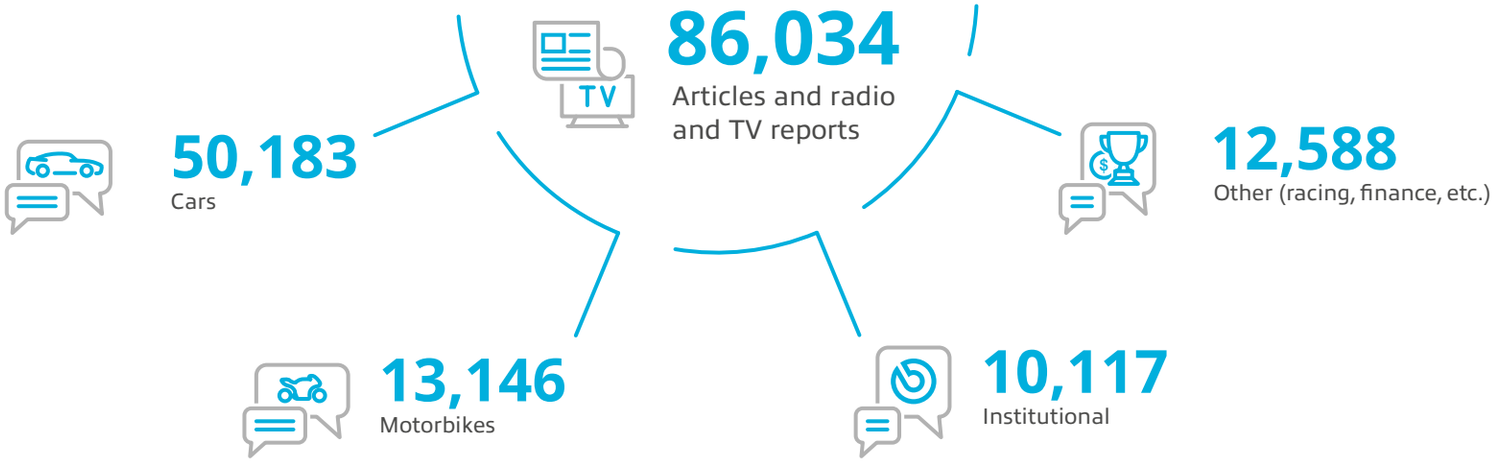
In this regard, Brembo has defined the "Group Guidelines for the Use of Social Media" containing guidance on the use of social media by Brembo People, where there is a clear or expressly stated link on the employment relationship between the Group and the individual, with the aim of preventing any conduct that may harm the business, Brembo's image and reputation.

Press office and media relations activities represent a fundamental asset to make the public aware, through relations with the press, of the Company's mission and vision, values, history, activity, its products and services. This type of activity takes place daily through personal relationships with the media, but also through the sending of information material, organisation of targeted interviews or press events dedicated to the launch of new products/services, and attendance at motor events, fairs and races. The result of this work is the publication of articles and radio and television reports, in which Brembo is mentioned or is the subject, which are collected in the monthly and annual press review. The total number of radio and television articles/reports published in 2023 in which Brembo was talked about or at least mentioned is 86,034.

The emerging data show that the topics most covered by the press involves cars with 50,183 articles, followed by motorbikes with over 13,146 articles and institutional matters — including CSR-related topics — with over 10,117 articles, and then by articles focused on products dedicated to enthusiasts, relating to financial matters and racing.

The above-mentioned data refers to figures recorded in 2023, up to the date of publication of this document. Additional mentions attributable to 2023 but received retrospectively are not included in this count.

Building a narrative universe around Brembo that is able to amaze, excite and involve all stakeholders: this is the goal with which, in 2023, the Group created several opportunities to talk about itself, its activities and its products, through trade fairs, meetings with the press and institutional and internal events.



Trade fairs represent the big stage where innovation takes centre stage and the Group unveils its latest braking solutions. In 2023, Brembo participated in Auto Shanghai where, during the press conference organised for more than 15 Chinese journalists, it presented its latest products dedicated to original equipment. The same format was used to present the new brake pads dedicated to the aftermarket for the first time in China, during Automechanika Shanghai, in November 2023.

At EICMA 2023, Brembo presented the new **Hypure** brake caliper, designed for high-performance motorbikes. The new Original Equipment brake caliper, that boasts unparalleled performance and a distinctive asymmetrical design, allows a 10% weight reduction compared to the reference caliper for the same application, making it the lightest component in its class.

To learn more about
Hypure

The latest evolution of the Brembo GP4 family was also presented during the event: the **GP4-MotoGP** brake caliper, designed and developed to equip the most powerful latest-generation racing motorbikes. Brembo's GP4-MotoGP is a brake caliper born from the racetrack for the road as it encompasses all the latest technologies, processes and the most innovative materials together with the know-how acquired by Brembo in its many years of experience in the racing world.

Particular attention has been paid to the introduction of ventilation fins on the outer body and the new racing pistons, both characteristics which improve the braking system's thermal exchange, contributing to cooling it.

To learn more about
GP4-MotoGP

EICMA also saw the presentation of the first high-performance braking system consisting of caliper and brake disc developed for SSVs (Side-by-Side Vehicles). Greatly increasing braking performance, the 4-piston SSV caliper provides driver confidence and easy maintenance, in addition to a weight reduction compared to the original parts. Designed to ensure robustness and safety, the Brembo SSV caliper combines the Group's experience in road applications with its history in motorsport.

Finally, Brembo presented the new 16RCS Corsa Corta RR. The design of this new clutch master cylinder incorporates all the style features already adopted in the company's RCS corsa corta RR family of products. That was also the reason why the brake master cylinder from the same range won the prestigious Red Dot design award in 2023.
Developed especially for widely popular high-performance motorbikes, the new RCS corsa corta RR clutch master cylinder has a 16mm floating piston diameter to improve the feel and application effort on high volume engines. The idle stroke setting is already set to minimum – like the master cylinders used in competitions – for greater precision in use.

Brembo has been recognised as "Top Innovator" in the "Green" category by the European Association of Automotive Component Manufacturers, thanks to its **Brembo Beyond Greenance** kit. This kit offers a more sustainable solution for light commercial vehicles, by reducing particulate emissions up to 83% in PM10 and 80% in PM2.5, ensuring savings over the life of the vehicle. The Greenance Kit, presented at Automechanika and now available in various light commercial vehicle models, ensures an increased durability of the brake discs, extended mileage and lower environmental impact.

To learn more about
Brembo Beyond Greenance

OCTYMA is the latest addition to the Brembo stable, an 8-piston aluminum brake caliper that blends style, design and identity with functionality, performance and cutting-edge content. OCTYMA, from the Latin "octo", indicates the number of pistons, but a figure of eight also symbolises infinity and a constant flow of energy and power that represents balance and harmony.

OCTYMA recalls the optimization of pad pressure distribution, made possible by the new cross layout for the pistons. This characteristic is highlighted in the caliper body design to convey the innovation and unique quality of the new braking system. OCTYMA is power and style.

Moving overseas, Brembo took part in AAPEX in the United States, where it presented the world premiere of the new Xtra brake pads for the aftermarket; while SEMA and PRI were the occasions to talk about the new CCM-R Plus brake disc for racing and supersport applications.

The star of the strategy for the development of innovative solutions is certainly SENSIFY,™ winner of the Gold Award in the "forward-looking chassis" category. The system consists of a flexible and revolutionary platform that includes software, predictive algorithms and data management to control the brake system digitally and customise brake response so as to improve driving pleasure.

In 2023, Brembo's intelligent braking system roadshow came to an end, reaching Japan, after Italy, the United States and China, with an exclusive track event dedicated to the press and the main Japanese manufacturers.

For Brembo, e-sport is certainly another important area in which to tell its story: in its capacity as technical partner of the video game Gran Turismo™ 7, it participated in the Gran Turismo World Finals in Barcelona. In addition, on the occasion of the launch of the film dedicated to the famous video game, the Group organised a preview for journalists and exclusive screenings in Italy, the US and Japan dedicated to its People and their families.

Again in relation with the sports arena, though through a traditional channel, Brembo participated for the second year in a row in the "Festival dello Sport" with RCS-Trento where it played a leading role with its technology, racing products and contributions in the talks on the competitions. During the F1 GP at Monza, it organised an employee engagement activity at "Casa Brembo", the exclusive hospitality venue inside Monza Park, offering the unique experience of attending the qualifying day to some employees selected following an internal motorsport quiz.

On the Misano circuit, Brembo awarded Valentino Rossi a unique celebratory trophy, which tells the story of the unbreakable bond between the world champion and the Group. The award was in fact made with parts of the first braking system that Valentino used in 1996, at his debut in the 125 class, and the braking system that he used during the last MotoGP race, in Valencia, in 2021.

In 2023, Brembo was for the first time the official partner of the historic **Le Mans 24 Hours**, now in its 100th year, experiencing the event as a lead protagonist. As a Braking Technology Provider, it supplied 44 of the 62 cars in the race, thanks to the advanced braking technologies developed specifically for the needs of each team.

To learn more about
24 Ore di Le Mans

For Brembo, the value of sport is something that goes beyond the track. As Top Sponsor of Atalanta's Youth Sector, the Group supports the educational, cultural and competitive role of sport by rewarding the most deserving boys and girls who stand out for their loyalty, spirit of sacrifice and team spirit, skills transversal to school education.

2023 also saw the second HACKATHON organised by the Group at the Brembo Inspiration Lab in Sunnyvale, California. Based in the heart of the Silicon Valley, the Lab is a centre of excellence focused on strengthening the Group's expertise in software development, data science, and artificial intelligence. Participants had the opportunity to immerse themselves in machine learning and artificial intelligence (AI) to revolutionise current braking technologies, outside of traditional innovation processes, in line with Brembo's vision: "Turning Energy into Inspiration".

To learn more about
Brembo Hackathon

2023 was the year of Bergamo Brescia Italian Capital of Culture. As a system partner of the event, Brembo took part in its main press events and participated in "The Thinking Factories" and "Bergamo Brescia Business Culture" exhibitions, where it displayed its products winners of the Compasso d'Oro in 2004 and 2020. Two important events that told the story of the excellence, design and industrial culture of the local area where the Group originated and is still present today.

Brembo was also the protagonist in Delhi of "Italian Tech", the initiative promoted by the Italian Embassy and the Italian Chamber of Commerce in India to highlight Italian excellence in the country. As a guest of Ambassador Vincenzo De Luca, Brembo told the Minister of Commerce and Industry Piyush Goyal, the Minister of Foreign Affairs and Italian Deputy Prime Minister Antonio Tajani and the audience present about its presence in the area.

In May 2023, at the launch of the expansion of the site in Escobedo, Mexico, Brembo hosted numerous journalists and representatives of institutions, including Luigi De Chiara, Italian Ambassador to Mexico, Samuel Garcia Sepúlveda, Governor of the Mexican State of Nuevo León and Andrés Mijes, Mayor of Escobedo. In the same month, it welcomed Nicole Hoffmeister-Kraut, Minister for Economic Affairs, Labour and Tourism of the Federal State of Baden-Württemberg, to the Group's headquarters at Kilometro Rosso. In June, the Italian Minister for Education and Merit, Giuseppe Valditara visited the social project "House of Smile" in the city of Pune, India. The project was created in 2017 thanks to the collaboration between Brembo and Fondazione CESVI. Moreover, Italy's Ambassador to Poland, Luca Franchetti Pardo, visited Brembo's production site of Dąbrowa Górnicza.

Brembo's values and identity are certainly expressed through institutional events and media relations, but they find their maximum expression in the dialogue with those who live the Group, day after day: its People. An example of an engaging communicative approach are internal events which, thanks to their ability to create a strong sense of cohesion, belonging and community, are considered moments of cultural and personal growth, interaction and sharing of experiences.
The Brembo Awards, a global event that rewards the best ideas and projects on sustainability, innovation and excellence, are an example of this. In 2023 as well the event was fully digital and open to all the Group's People. An event built entirely around the ideas of the finalist teams to celebrate Brembo People whose projects had stood out in a particular manner.

The Group is committed to the constant development of digital channels for contacting and communicating with its customers and end users, both through an ecosystem of websites and through coverage of the most popular social network platforms.
The Brembo web ecosystem has, alongside the Brembo.com site, a set of other sites dedicated to specific stakeholders in order to provide each type of user with the best possible experience such as the bremboparts.com site (dedicated to consultation of the product catalogue and professionals) and the Brembostoreusa.com and Brembostore.cn sites (dedicated to e-commerce). These add to the websites dedicated to specific brands or products such as Sensify.brembo.com, Marchesiniwheels.com, Sbs.dk, Apracing.com, Jjuan.es or Carbonceramicbrakes.com.

The website Brembo.com seeks to communicate with all stakeholders in the relevant market sectors (Cars, Motorbikes and Performance), presenting the Group's global activities, product ranges and all market information to users the world over. It also offers a general overview of the Group's history, in addition to a wide range of editorial content. The production of new editorial content continued to be significant in 2023 as well, with 79 editorial content postings published.

In addition to the main Brembo's website, mention should be made above all of the success of BremboParts.com as a "one-catalogue" site that brings together in a single integrated catalogue all Brembo products (both Aftermarket and Upgrade) for cars, motorbikes and commercial vehicles.

Brembo performs very well on the main social platforms in terms of number of followers (both qualitatively and quantitatively) and user engagement level. The follower base of the nine main channels (Facebook, Instagram, LinkedIn, TikTok, Threads, We-Chat, Twitter, Douyin and Weibo) increased by over 20% in 2023, largely exceeding the milestone of three million followers.

The engagement level of Brembo's followers also significantly increased compared to the previous year, with an overall +9% increase compared to 2021. The level of engagement with its followers should be interpreted as the brand's ability to stimulate conversations and constantly offer a good reason to talk about and interact with

the brand, and considered as one of its most valuable intangible assets in the current context of the knowledge economy.
Considering all the social platforms on which Brembo is present, more than 1,500 postings and nearly 5,000 stories were developed and published in 2023.

Of particular note is the greater focus during 2023 on social platforms that are particularly popular among young people, such as Instagram and TikTok, and on video formats, content that is particularly appreciated especially by the younger generations thanks to their ability to be more immediate and engaging.

During 2023, about 250 reels were published on IG that obtained half a billion views overall. In total, all the content published by Brembo on its IG channel obtained over 1.7 billion impressions. This also contributed to a significant expansion of the follower base, which grew by 15% during 2023. The year that has just ended also saw the consolidation of the content of Brembo's TikTok channel, which received over 200 million views in 2023.

Finally, mention should be made of the birth of Threads, the Meta platform's new social channel, where the Brembo account has consolidated its presence thanks to an account that in a few months has exceeded 90,000 followers.

Brembo's social profiles are mainly directed at a young audience, distributed uniformly between Europe, the USA and Asia and with the aim of further increasing communication activities directed above all at GenZ. From an age point of view, almost 70% of the brand's followers are under 34 years old, a figure that allows to understand that Brembo is also well positioned in the younger generation segment. The aim is to further expand the audience of young and very young people, in line with Brembo's strategy and global approach.

No. OF FOLLOWERS IN 2023

Facebook	Instagram	LinkedIn	X	We-Chat	Weibo	Dou-yin	Tik-Tok
1,530,008	921,843	249,220	32,166	120,728	52,001	65,000	78,573

No. OF INTERACTIONS IN 2023

Facebook	Instagram	LinkedIn	X	We-Chat	Weibo	Dou-yin	Tik-Tok
2,050,959	15,923,467	91,753	9,872	9,373	33,242	1,100,000	1,200,000

6.5 CREATIVITY AND METHOD: ENSURING PRODUCT SAFETY

The main function of each Brembo product is to ensure people's health and safety through total reliability of its braking systems. Following a preventive and proactive approach, Brembo is committed to applying the voluntary technical standards that national and international standards bodies develop to define in detail how to produce excellent products and align its own production processes with best practice, guaranteeing safety, quality, respect for the environment and certain performance. All Brembo products have to pass controls and checks designed to ensure their quality and safety, following a logic of ongoing improvement, which makes an essential contribution to increasing the ability to meet all requirements, as well as process efficacy and efficiency, both within the Group and throughout the supply chain. From this standpoint, where applicable, every problem identified and resolved for a specific product is then extended, on the basis of a "lesson learnt" approach, to the entire Brembo product range.

FAMILY FEELING

Design, for Brembo, is the way to be recognised at first glance. Combining one's own distinctive language and a "family feeling" with that of the customer means equipping the product with visually distinctive elements that immediately associate it with the brand to which it belongs. Similarly to what happens in a real family, every single member — each product — shares some features with other members, such as the colour and the shape, as well as some common elements of cohesion and quality. Adopting this approach requires the engagement of customers from the very early stages of project, to define together the main features of a product's design, colour and style. Once any product and process-related criticalities which have a potential to jeopardise the product's look and design have been analysed, corrections to be implemented are identified just before the beginning of the start of production. This phase is managed by the Research and Development department in collaboration with the Design area of the Marketing GCF to ensure that the innovative content is also emphasised during the development of new products.

100%

Safety performance assessments carried out of products and services

TESTING

During the development and technical approval stage, each product is subject to tests, carried out in different operating conditions. These are tests designed to define its quality, performance and efficiency and are performed both in type-approved laboratories, and on the road and racetrack. This process follows a rigorous sequence that includes static bench tests, dynamic bench test cycles and subsequent on-road tests. These three steps are needed to ensure that the products meet the relevant requirements, to identify any discrepancies with the quality standards pinpointed during the design phase and to test the braking systems in operating conditions similar to actual usage conditions. Specific checks are also carried out during the production cycle, covering up to 100% of products, designed to identify any discrepancies with the rigorous quality standards defined in the design phase.

The tests required for Brembo product approval are carried out by the Testing & Validation departments, where the prototypes manufactured are approved by performing a series of tests initially both on test benches (static, dynamic and roller) and on vehicles (on-road or on-track). These tests, shared with customers, are defined at the beginning of the project in order to verify all those characteristics that could be critical before entry into production, anticipating the checks that will be carried out at the end of the production line.
With a view to digitalisation, some of the approval tests are being carried out on a vehicle simulator in order to lighten the drivers' activities on the final vehicle (also with an eye to safety and sustainability), limiting them in relation with the most promising configurations.
The entire test system falls within the solid Project Management (BPDS - Brembo Product Development System) deeply renewed in 2022 with the creation of "Stargate", a management system based on Project Management, a structured method that, focusing on the principles of planning, coordination and control, enables to develop and follow a new project in all phases of its evolution. By planning and managing specific inspection moments ("gates") — approved by the relevant organisational levels according to risk level of a technical or financial nature assessed for each gate —, and handling any recovery plans, the Stargate system makes it possible to verify the suitability and completeness of the activities carried out during development, guaranteeing that the mass-produced products fully comply with the set requirements.

To learn more about **Brembo Design**

- The Group also works with the **National Unification Commission for the Automobile** which, in the framework of UNI federated bodies, assists with defining technical standards and instructions for production, testing, the correct use and maintenance of vehicles, motor vehicles, operating machines and related components so as to improve their safety and reliability.
- Moreover, as an expert member on functional safety, Brembo participates in the **joint working group in technical commission TC22/SC32/WG8 and TC22/SC32/WG13** appointed to improve standard WG 8 ISO 26262 regarding the functional safety of electrical and electronic systems in motor vehicle production.

In view of the importance that the Brembo Product Development System has for Brembo, the Quality GCF , with the support of the Brembo Academy, provides regular special courses on the BPDS both to train new personnel joining the Group in platform roles, and to standardise the methodology's development within all Platforms and across all Global Business Units.

FMEA/FMECA

To ensure maximum safety and quality of its products, Brembo adopts an approach enabling to anticipate any problems and criticalities along the entire production cycle, so as to take preventive correction measures. In detail, during the **design and development phase**, the Group carries out product and process FMEAs/FMECAs to identify in advance the weaknesses and critical issues that could compromise product reliability and safety, by defining the necessary improvements and priority measures to be taken before the product enters into production. FMEA methodology is used, in particular, to identify product and process characteristics having a potential impact on end-user safety, so that these characteristics can be managed and controlled systematically throughout the entire production chain (product development, internal process and supplier process). These elements represent a fundamental part of Brembo's Quality Management System, compliant with **IATF 16949:2016** technical specification[72].

This system, characterised by Guidelines common to all the Group's plants, allows best practices to be transferred from one plant to another, as well as all the sites to be managed with the same standards and quality indicators. The effectiveness of the Quality Management System is verified periodically through specific internal system and process audits and through third-party audits relating to compliance with IATF 16949, annually, ISO 26262 and ASPICE, on specific projects. Like other management systems, in newly opened sites the Quality Management System is implemented when production gets underway and certification audits are normally carried out around twelve months after the plant is commissioned.

100%
of manufacturing plants
is IATF 16949:2016-certified

QUALITY MONITORING PROCESS

Brembo has established a structured internal and external quality monitoring process, which also involves clients and suppliers. In detail, product quality and safety is monitored at all the Group's plants, by using specific indicators. The latter are set out annually by the Quality GCF as part of the Quality Plan, which also sets yearly quality objectives in this field for the individual GBUs, Plants and the Group.

72 The Zaragoza site is ISO 9001 certified as the IATF scheme does not apply to aftermarket sites. For the plants of J.Juan (Myasl and Jiaxing), which were ISO 9001-certified upon their acquisition, activities are underway to integrate them into the Brembo Quality Management System. This will lead to the IATF 16949 certification by Q1 2024.

From an internal standpoint, the most important indicators involved are those regarding waste, while from an external standpoint, those regarding complaint monitoring and the number of defective items sent out to clients are key, both as regards their level of criticality (in terms of inconvenience for the client) and severity (in terms of their impact on end-user safety).

Brembo also monitors any product recalls from the market, or customer's notifications of non-compliance with the pre-defined qualitative standards. A project was launched in 2023 for redefining quality indicators allowing to better assess Customer Perception. The monitoring of these indicators will be carried out as of 2024.

Specific indicators are used including to monitor the quality and safety of the products provided by suppliers and whose performance in assessed also in relation to the special supply statuses assigned and the impact generated by the related non-conformities on the end customer and on any market recalls.
Should these indicators reveal situations that diverge from the established objectives, action plans are immediately put in place to restore compliance and, where necessary, *ad hoc* committees are organised in which Top Managers are invited to take part as well.

News is regularly monitored, particularly government agency news, regarding recall campaigns already initiated on the market by vehicle/part manufacturers on products similar to Brembo products and with potentially relevant "failures". This activity is performed in order to verify the Brembo's robust design and initiate preventive checks on similar Brembo's components, where needed. Lastly, based on this information, a specific analysis may be performed relating to Brembo's risk exposure.

EUREKA: A SOFTWARE TO TACKLE AND MANAGE PRODUCT CRITICALITIES

As of 2019 Brembo implemented "Eureka", a software that will enable the company to revolutionise the management of all product issues, both in the development phase and for products that have already entered the mass production phase. Eureka is a tool intended to support those who have to face any critical product issues by conveying all the relevant information in a single container. The software allows not only to understand the underlying causes in a more structured and faster way, but it also enables the plants to more easily share solutions, by making such information available to the people involved at the various Brembo offices. The problems, whether internal to Brembo or reported by the client, can then be managed by the relevant teams using a common problem solving methodology. Thanks to Eureka it will also be possible to view similar cases that have already occurred at other sites and to know in real time how and by whom they have been solved. The goal is to use shared knowledge to preventively manage potential problems, prevent the occurrence of the same problem at other plants and / or on similar products. Eureka combines under the same name two basically 'twin' software, one dedicated to products under development (Eureka Development) and one to series products (Eureka Production). Finally, the new system allows real-time reporting of problems underway and how they are being managed, resolution times and compliance with the pre-set deadlines, providing a brief overview of the issues underway.

Brembo has defined a specific guideline to manage all product non-conformities reported by customers, describing their responsibilities and operating methods.
In particular, for each non-conformity, it provides for the implementation of a Structured Problem Solving process that makes it possible to identify the causes, as well as of appropriate remedial actions to eliminate said causes and standardise the solutions on similar products/processes so as to avoid the problem recurring.

Product quality and safety issues, if any, are discussed within specific Committees with the Top Management.

In order to promote and ensure the systematic application of the new tool, training activities have been carried out in all the plants worldwide involving all functions. To date, 100% of problems with customers were managed with Eureka Production, irrespective of the type of product and application, car or motorbike, discs or calipers, and positive feedback was also confirmed for the Eureka Development twin software.

ACTIVITIES GUARANTEEING PRODUCT AUTHENTICITY

For the Group, safeguarding the safety of those who buy and use Brembo equipment also means promoting initiatives aimed at countering product illegal counterfeiting activities and fraud in the distribution channels. The sale of counterfeit braking systems may represent a source of high risk for the end user due to the importance of the braking system as a safety component in vehicles. In fact, it is not uncommon that counterfeit products are found to be extremely dangerous because they are not made with controlled materials and are inadequately tested in the production phase.

As Brembo's main products are considered "high-class products", they are copied in many areas and especially in Asia. For this reason, the fight against counterfeiting was also part of Brembo's action plan in 2023, which is proving to be very efficient in terms of results obtained and total sales blocked.

The collaborations established by the Group over the years with public institutions, public security authorities and customs control authorities are also fundamental in Brembo's fight against the production of and illegal trade in counterfeit products. In this context, in line with the previous years, Brembo's collaboration with OLAF - European Commission Anti Fraud Office continued also in 2023 to prevent the growing presence of counterfeit products.

The Group has focused on online, on-site and trademark protection.

To better address online counterfeiting, Brembo carries out an in-depth and continuous analysis of more than 150 global market/social platforms, carefully monitoring any domain names that contain one of the Group's trademarks or similar.
Thanks to these activities, important results were achieved in 2023:

- over 30 thousand advertisements eliminated overall on e-commerce platforms;
- over 10 raids in China and Thailand;
- over 1,500 units of counterfeit products seized in China;
- over 500 domain name infringement cases resolved and over 70 domain names under monitoring;
- around 15 pending trademark oppositions worldwide.

In 2023, Brembo organised several investigation operations and blitzes against the Chinese market, in collaboration with the local police and port customs authorities. In addition, it opposed many registrations of worldwide trademarks (which appeared very similar to its trademarks), filed by individuals or companies operating in the same sector.

The main tool developed by Brembo to counter the sale of non-original products is an "**anti-fraud card**" which allows customers to easily check if their purchase is really "Made in Brembo". This anti-fraud card is delivered inside a sealed bag in the packing of the product purchased and gives a unique identification code, which — once entered on the website www.original.brembo.com together with the card number, component type and country of purchase — allows its authenticity to be checked. If the check fails to give a positive outcome, the purchaser is invited to enter further information to enable the Group to start investigations about the origin of the counterfeit part. The card also contains the quality control document, another tool for confirming product originality, whilst an external seal guarantees that the purchaser has received the product intact from the factory.

This tool has been supplemented by a further means of certifying product authenticity that has been made available to customers. This is the **"Brembo Check" app** which provides immediate confirmation of the product's originality by framing the unique QR Code on the label applied to the purchased component or to the box. To avoid tampering, the label is made following a printing and application protocol that prevents its removal. Finally, the QR Code can only be registered once, as an additional protection for the buyer.

The anti-fraud card is currently available for the Brembo High Performance and Brembo Racing lines, with reference to the following products: Sports discs, Rally discs and GT kits. For motorbikes, the initiative covers: calipers, discs, brake/clutch cylinders and replacement levers.

6.6 AWARDS FOR INNOVATIVE IDEAS

The contribution to innovation and the spirit of collaboration within the Group are important qualities. Therefore, Brembo intends to reward its People, by rewarding ideas that enable improvements and progress to be made in terms of quality, process or product innovation, cost reduction, increased productivity and simplified processes. Also in 2023, the Brembo Awards, the initiative that rewards the best ideas and projects on the theme of sustainability, innovation and excellence, were celebrated with a digital event accessible by all Brembo People around the world.

The 28 finalist projects were presented during the event, and 14 prizes were awarded:

- five awards in six categories and five special mention awards in the Sustainability Awards (one won by a Polish team, one by a Spanish team, one by an Italian team, one by a Danish team and one by an Indian team);
- seven awards in the Excellence Awards, for which the rules changed in 2022 since the categories have been eliminated and each site presents only its "Best Project";
- two Innovation Awards, both won by Italian teams.

BREMBO EXCELLENCE AWARDS

Brembo Excellence Awards

Brembo Excellence Awards was created to promote ideas and projects for continuous improvement that arise from the application of Lean Manufacturing principles to any area and process of the Group's plants. The competition is open to all employees of the plants who have developed improvement ideas or projects individually or in teams. Ideas and projects refer to different processes relating to Safety, Quality, Logistics, Maintenance and Manufacturing.

In 2022, the rules and the awarding system were changed: project categories were eliminated and each Plant is invited to only present its "Best Project" and no longer eight different projects as before. In light of this change, in 2022 a total of 24 projects were presented and seven plants were awarded, confirming the previous years' excellent results in terms of participation.

BREMBO INNOVATION AWARDS

Brembo Innovation Awards

The Innovation Awards have been established by Brembo in order to recognise each year the most innovative ideas relating to the Product and Process areas, with reference to the systems and discs production.

These annual awards are also accompanied by the Brembo Monthly Innovation Prize, which every month recognises the best projects developed by Group employees. The evaluation criteria focus on innovative content, possible cost reductions and project added value.
Among all the ideas that get recognised on a monthly basis, the award goes to the idea judged to be the best in product category, and that voted as the best for process for a given year.

In 2023, 66 ideas were presented, comprising 52 product ideas and 14 process ideas. Out of all those submitted, awards were given to 60 ideas: 47 product ideas and 13 process ideas.

BREMBO SUSTAINABILITY AWARDS

Brembo Sustainability Awards

"Thinking responsibly, acting concretely": this is Brembo's approach to sustainability. As of 2019, the Brembo Sustainability Awards competition complements the well-established Brembo Excellence Awards and Brembo Innovation Awards. This award is given to employees who come up with the best ideas in areas such as sustainable development at every level of the organisation.

The categories in which it is possible to submit projects relate to topics linked to the ISO 26000 guidelines and to the 17 Sustainable Development Goals with a special focus on People, Good Management Practices, Governance, Environment, Business Partners and Community Involvement and Development.

In line with the previous editions , the 2022 edition of the Brembo Sustainability Awards — for which awards were bestowed in 2023, met with excellent results in terms of participation. 57 projects were submitted which, in addition to the 171 projects of the previous editions, witnessed employees' interest towards sustainability issues. A total of 178 participants were recorded (28% more than the previous edition). Environment and People are the categories for which the highest number of projects were presented. The countries which submitted projects included Brazil, Mexico, China, Italy, Poland, India, Czech Republic, Denmark, Spain and the United States.

The Brembo Sustainability Awards made use of the CSR Ambassadors' and CSR Champions' contributions, these being people nominated by each Brembo country and plant with the aim of inspiring and engaging all Brembo People into CSR issues and to act as a bridge between the Corporate HQ and the Group's companies. They are the sustainability spokespeople, tasked with engaging all Brembo personnel into adopting sustainable behaviours, as well as with officially representing the Corporate HQ's CSR GCF.

In addition to the five winners, five special mentions awards were given to projects deemed worthy for the excellent results achieved, and the level of innovativeness, as well as to the country that submitted most ideas.


brembo